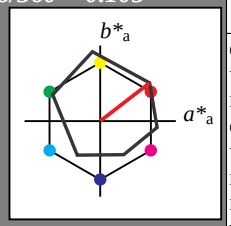
Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
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*LAB*LAB* 32.98 32.9 25.8
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*lab*lrj* 0.193 0.477 0.15
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*olvi3** 0.0 0.0 0.0 (1.0)
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***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
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relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

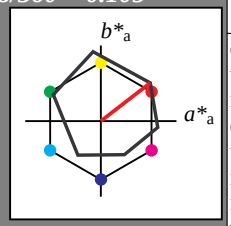
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
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V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
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%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

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*lab*lab* 1.0 0.0 0.0
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*lab*ncE* 0.0 0.0 –

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*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System ORS18

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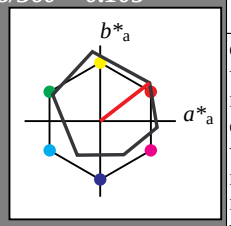
lab*tch* and *lab*nch

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

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M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
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G_{CIE}	52.23	−42.26	11.75	43.87	164
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%Gamut
u^*_{rel} = 93
%Regularity
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$g^*_{C,rel}$ = 59

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*LAB*TCHa* 99.99 0.01 –
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*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
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*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
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*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
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*LAB*LAB* 47.95 65.29 52.06
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*lab*tce* 0.5 1.0 0.048
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***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
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***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
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*lab*ncE* 0.5 0.5 r19j

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*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
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*LAB*LAB* 18.02 0.5 −0.46
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relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

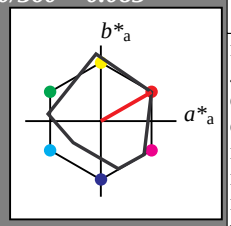
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

Output: Colorimetric Reflective System MRS18

for hue *h* = lab*h = 30/360 = 0.083*
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
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%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
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*LAB*LAB* 95.41 −0.97 4.75
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relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
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*olvi4** 1.0 0.5 0.5 1.0
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***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

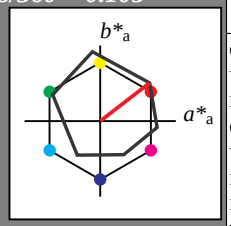
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

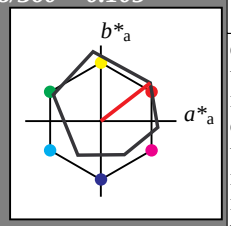
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

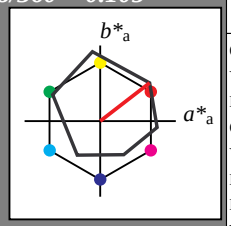
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
lab*tch* and *lab*nch

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

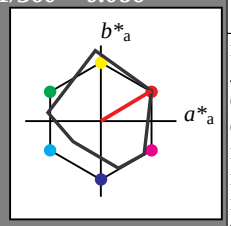
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

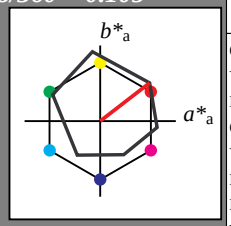
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

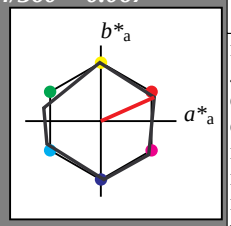
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

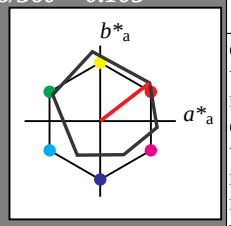
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
lab*tch* and *lab*nch

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

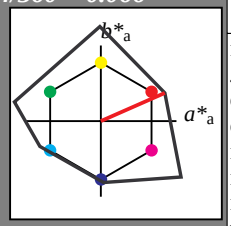
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

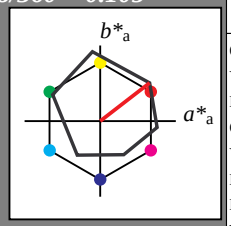
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

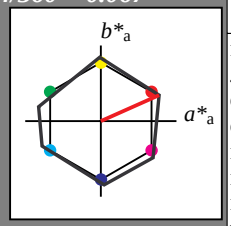
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

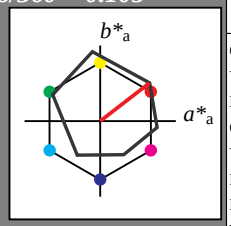
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

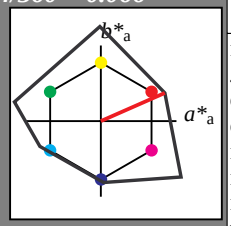
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

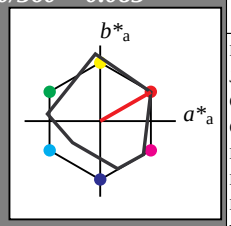
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

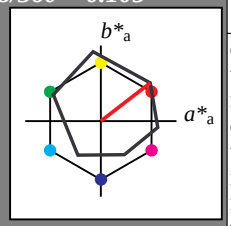
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

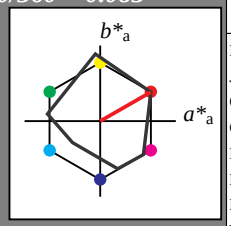
UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 30/360 = 0.083$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

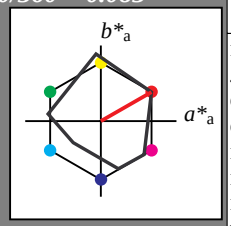
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 30/360 = 0.083$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

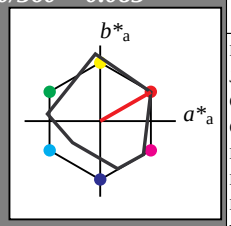
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

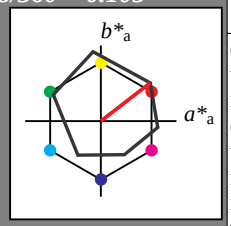
*n** = 1,0

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

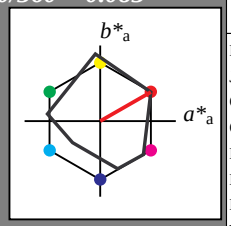
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

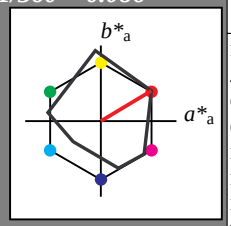
UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

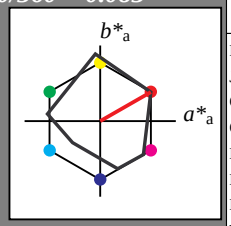
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

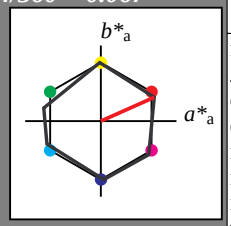
UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

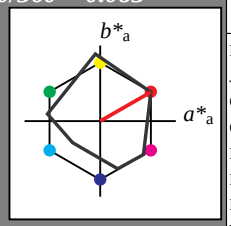
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

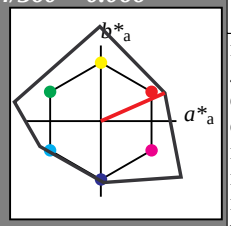
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

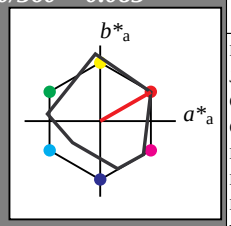
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

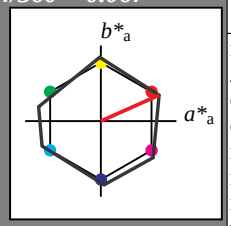
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

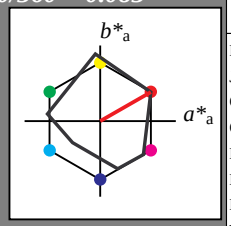
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 1.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

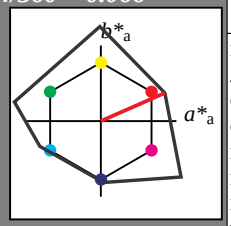
UE100−7, 3 step scales for constant CIELAB hue 30/360 = 0.083 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

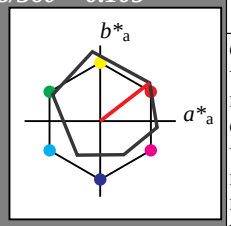
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

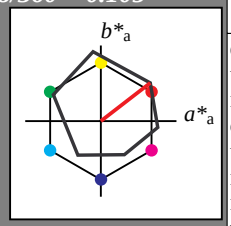
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

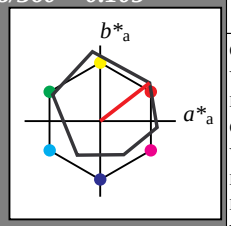
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

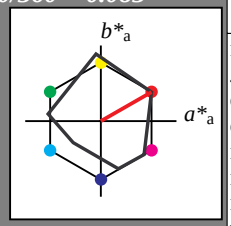
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

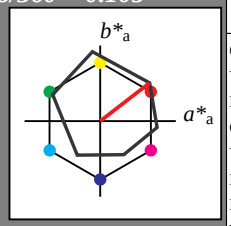
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System TRS18
for hue *h = *lab*h* = 38/360 = 0.105**
lab*tch* and *lab*nch

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

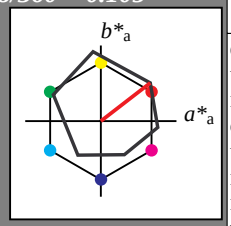
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System TRS18
for hue *h = *lab*h* = 38/360 = 0.105**
lab*tch* and *lab*nch

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

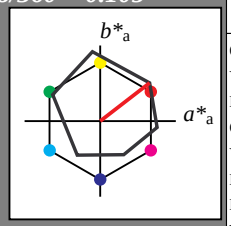
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

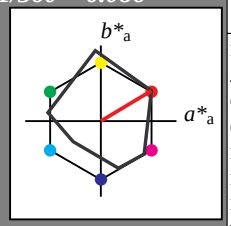
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

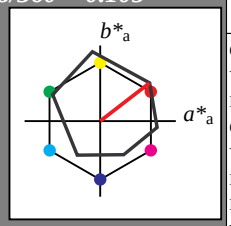
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

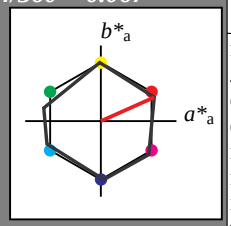
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

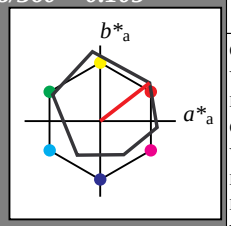
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

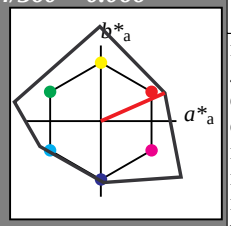
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

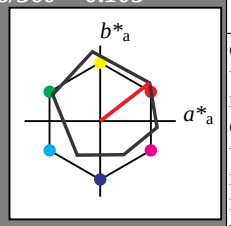
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

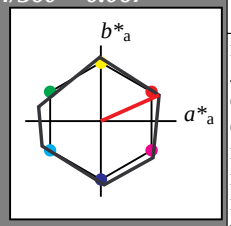
UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

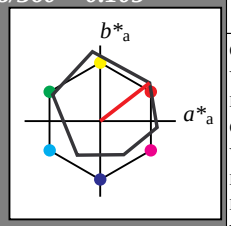
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

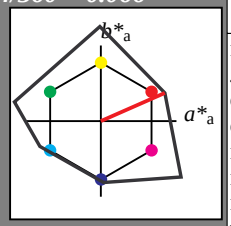
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 38/360 = 0.105 (left)

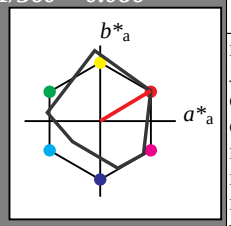
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

0,25 0,50 0,75 1,00

chromaticness c^*

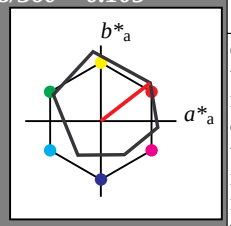
blackness n^*

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

0,25 0,50 0,75 1,00

chromaticness c^*

blackness n^*

UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

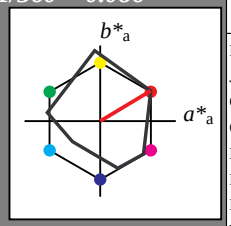
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

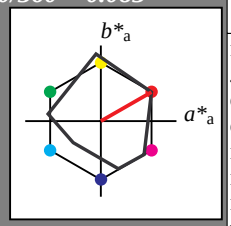
UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

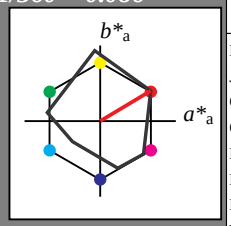
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

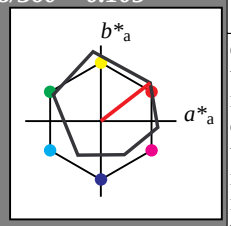
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

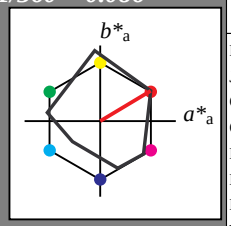
UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System MRS18a
for hue *h* = lab*h = 31/360 = 0.086*
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

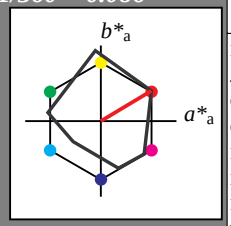
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

Output: Colorimetric Reflective System MRS18a
for hue *h* = lab*h = 31/360 = 0.086*
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

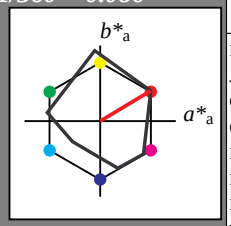
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 1.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

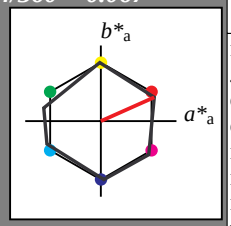
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

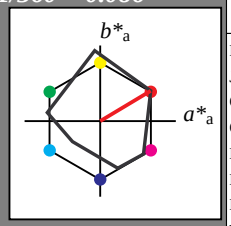
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

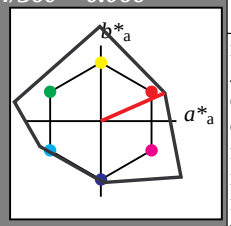
UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

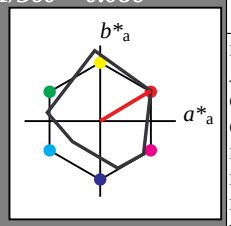
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

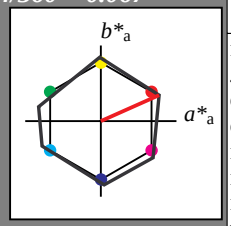
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

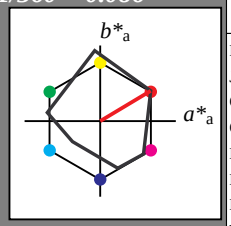
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

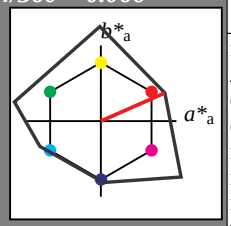
UE100−7, 3 step scales for constant CIELAB hue 31/360 = 0.086 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

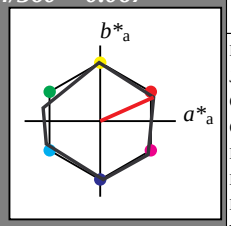
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

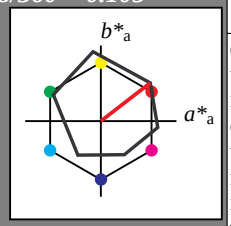
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

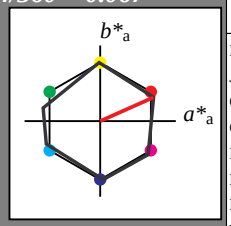
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	0.5	(1.0)
*cmyn3**	0.0	0.5	0.5	(0.0)
*olvi4**	1.0	0.5	0.5	1.0
*cmyn4**	0.0	0.5	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	35.35	15.74
*LAB*LABa*	76.05	35.32	15.73
*LAB*TCHa*	75.0	38.67	24.01

relative* CIELAB *lab*

*lab*lab*	0.75	0.457	0.203
*lab*tch*	0.75	0.5	0.067
*lab*nch*	0.0	0.5	0.067

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.5	−0.009
*lab*tce*	0.75	0.5	0.997
*lab*ncE*	0.0	0.5	b98r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	0.0	(1.0)
*cmyn3**	0.0	1.0	1.0	(0.0)
*olvi4**	1.0	0.0	0.0	1.0
*cmyn4**	0.0	1.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	70.69	31.48
*LAB*LABa*	56.7	70.64	31.46
*LAB*TCHa*	50.0	77.33	24.01

relative* CIELAB *lab*

*lab*lab*	0.5	0.913	0.407
*lab*tch*	0.5	1.0	0.067
*lab*nch*	0.0	1.0	0.067

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	1.0	−0.019
*lab*tce*	0.5	1.0	0.997
*lab*ncE*	0.0	1.0	b98r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.0	(1.0)
*cmyn3**	0.5	1.0	1.0	(0.0)
*olvi4**	1.0	0.5	0.5	0.5
*cmyn4**	0.0	0.5	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	35.4	15.75
*LAB*LABa*	37.36	35.32	15.73
*LAB*TCHa*	25.01	38.67	24.01

relative* CIELAB *lab*

*lab*lab*	0.25	0.457	0.203
*lab*tch*	0.25	0.5	0.067
*lab*nch*	0.5	0.5	0.067

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.5	−0.009
*lab*tce*	0.25	0.5	0.997
*lab*ncE*	0.5	0.5	b98r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

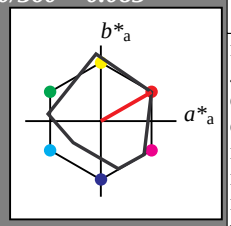
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	0.5	(1.0)
*cmyn3**	0.0	0.5	0.5	(0.0)
*olvi4**	1.0	0.5	0.5	1.0
*cmyn4**	0.0	0.5	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	72.52	32.93	22.4
*LAB*LABa*	72.52	33.47	19.18
*LAB*TCHa*	75.0	38.58	29.82

relative* CIELAB *lab*

*lab*lab*	0.704	0.434	0.249
*lab*tch*	0.75	0.5	0.083
*lab*nch*	0.0	0.5	0.083

***relative* Natural Colour (NC)**

*lab*lrj*	0.704	0.496	0.06
*lab*tce*	0.75	0.5	0.019
*lab*ncE*	0.0	0.5	r07j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	0.0	(1.0)
*cmyn3**	0.0	1.0	1.0	(0.0)
*olvi4**	1.0	0.0	0.0	1.0
*cmyn4**	0.0	1.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	49.63	66.84	40.03
*LAB*LABa*	49.63	66.95	38.36
*LAB*TCHa*	50.0	77.16	29.82

relative* CIELAB *lab*

*lab*lab*	0.409	0.867	0.497
*lab*tch*	0.5	1.0	0.083
*lab*nch*	0.0	1.0	0.083

***relative* Natural Colour (NC)**

*lab*lrj*	0.409	0.993	0.119
*lab*tce*	0.5	1.0	0.019
*lab*ncE*	0.0	1.0	r07j

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.0	(1.0)
*cmyn3**	0.5	1.0	1.0	(0.0)
*olvi4**	1.0	0.5	0.5	0.5
*cmyn4**	0.0	0.5	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.82	33.67	19.79
*LAB*LABa*	33.82	33.47	19.18
*LAB*TCHa*	25.01	38.58	29.82

relative* CIELAB *lab*

*lab*lab*	0.204	0.434	0.249
*lab*tch*	0.25	0.5	0.083
*lab*nch*	0.5	0.5	0.083

***relative* Natural Colour (NC)**

*lab*lrj*	0.204	0.496	0.06
*lab*tce*	0.25	0.5	0.019
*lab*ncE*	0.5	0.5	r07j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

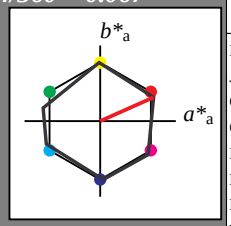
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

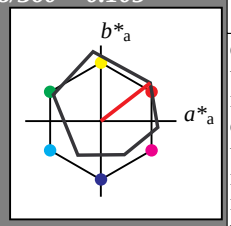
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

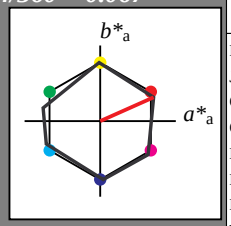
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

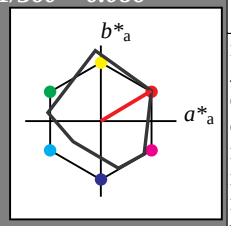
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

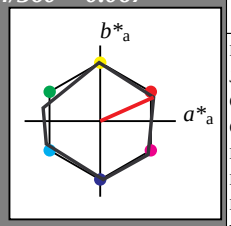
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 24/360 = 0.067$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

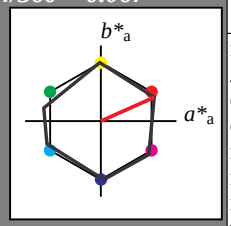
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 24/360 = 0.067$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

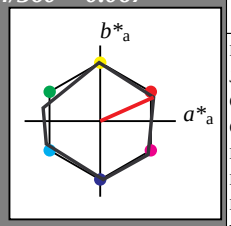
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	0.5	(1.0)
*cmyn3**	0.0	0.5	0.5	(0.0)
*olvi4**	1.0	0.5	0.5	1.0
*cmyn4**	0.0	0.5	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	35.35	15.74
*LAB*LABa*	76.05	35.32	15.73
*LAB*TCHa*	75.0	38.67	24.01

relative* CIELAB *lab*

*lab*lab*	0.75	0.457	0.203
*lab*tch*	0.75	0.5	0.067
*lab*nch*	0.0	0.5	0.067

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.5	−0.009
*lab*tce*	0.75	0.5	0.997
*lab*ncE*	0.0	0.5	b98r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	0.0	(1.0)
*cmyn3**	0.0	1.0	1.0	(0.0)
*olvi4**	1.0	0.0	0.0	1.0
*cmyn4**	0.0	1.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	70.69	31.48
*LAB*LABa*	56.7	70.64	31.46
*LAB*TCHa*	50.0	77.33	24.01

relative* CIELAB *lab*

*lab*lab*	0.5	0.913	0.407
*lab*tch*	0.5	1.0	0.067
*lab*nch*	0.0	1.0	0.067

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	1.0	−0.019
*lab*tce*	0.5	1.0	0.997
*lab*ncE*	0.0	1.0	b98r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.0	(1.0)
*cmyn3**	0.5	1.0	1.0	(0.0)
*olvi4**	1.0	0.5	0.5	0.5
*cmyn4**	0.0	0.5	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	35.4	15.75
*LAB*LABa*	37.36	35.32	15.73
*LAB*TCHa*	25.01	38.67	24.01

relative* CIELAB *lab*

*lab*lab*	0.25	0.457	0.203
*lab*tch*	0.25	0.5	0.067
*lab*nch*	0.5	0.5	0.067

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.5	−0.009
*lab*tce*	0.25	0.5	0.997
*lab*ncE*	0.5	0.5	b98r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

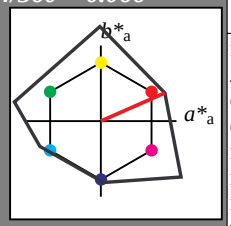
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	0.5	(1.0)
*cmyn3**	0.0	0.5	0.5	(0.0)
*olvi4**	1.0	0.5	0.5	1.0
*cmyn4**	0.0	0.5	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	71.27	42.34	18.63
*LAB*LABa*	71.27	42.31	18.62
*LAB*TCHa*	75.0	46.22	23.75

relative* CIELAB *lab*

*lab*lab*	0.688	0.458	0.201
*lab*tch*	0.75	0.5	0.066
*lab*nch*	0.0	0.5	0.066

***relative* Natural Colour (NC)**

*lab*lrj*	0.688	0.5	−0.011
*lab*tce*	0.75	0.5	0.996
*lab*ncE*	0.0	0.5	b98r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	0.0	(1.0)
*cmyn3**	0.0	1.0	1.0	(0.0)
*olvi4**	1.0	0.0	0.0	1.0
*cmyn4**	0.0	1.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	47.15	84.68	37.26
*LAB*LABa*	47.15	84.61	37.24
*LAB*TCHa*	50.0	92.44	23.75

relative* CIELAB *lab*

*lab*lab*	0.376	0.915	0.403
*lab*tch*	0.5	1.0	0.066
*lab*nch*	0.0	1.0	0.066

***relative* Natural Colour (NC)**

*lab*lrj*	0.376	1.0	−0.023
*lab*tce*	0.5	1.0	0.996
*lab*ncE*	0.0	1.0	b98r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.0	(1.0)
*cmyn3**	0.5	1.0	1.0	(0.0)
*olvi4**	1.0	0.5	0.5	0.5
*cmyn4**	0.0	0.5	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	32.58	42.39	18.64
*LAB*LABa*	32.58	42.31	18.62
*LAB*TCHa*	25.01	46.22	23.75

relative* CIELAB *lab*

*lab*lab*	0.188	0.458	0.201
*lab*tch*	0.25	0.5	0.066
*lab*nch*	0.5	0.5	0.066

***relative* Natural Colour (NC)**

*lab*lrj*	0.188	0.5	−0.011
*lab*tce*	0.25	0.5	0.996
*lab*ncE*	0.5	0.5	b98r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

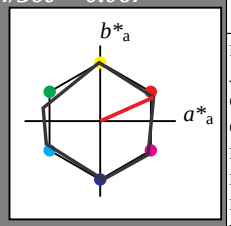
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

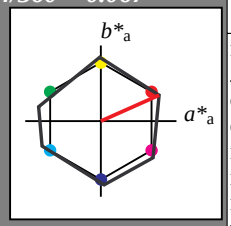
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

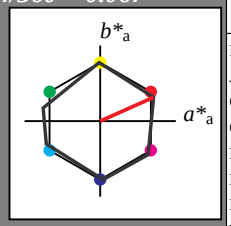
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

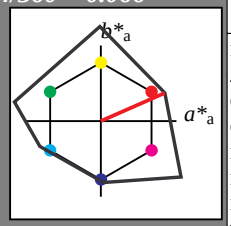
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

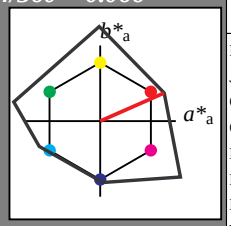
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

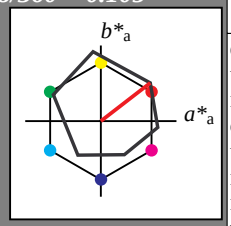
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

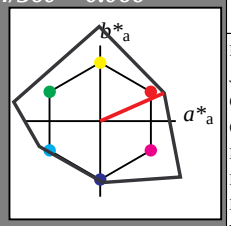
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

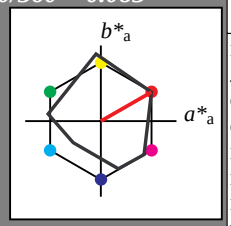
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

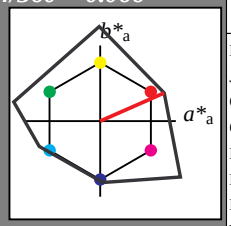
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

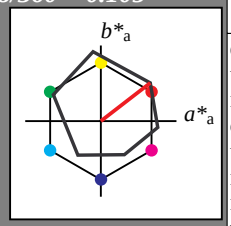
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

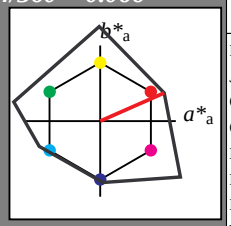
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

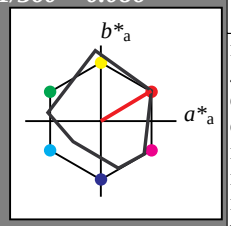
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

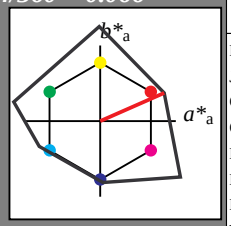
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

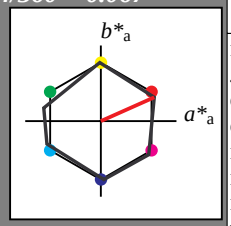
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

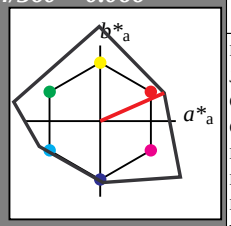
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

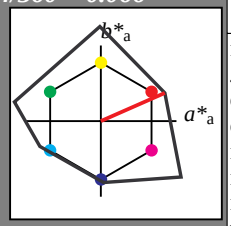
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

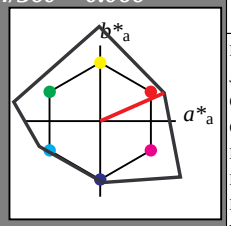
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

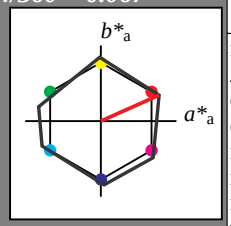
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

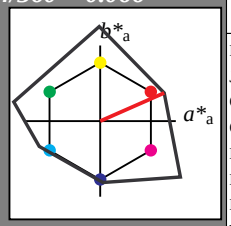
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

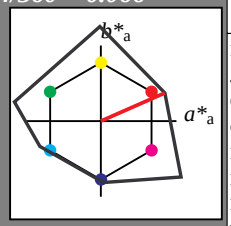
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

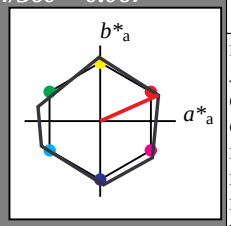
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

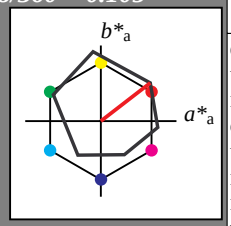
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

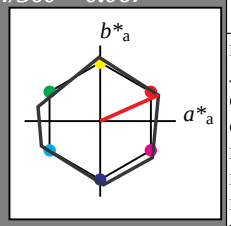
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

0,25 0,50 0,75 1,00

chromaticness *c**

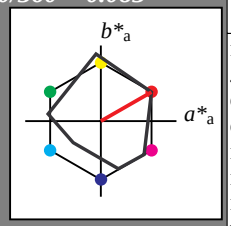
blackness *n**

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

0,25 0,50 0,75 1,00

chromaticness *c**

blackness *n**

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

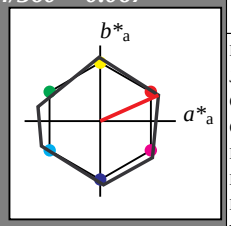
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

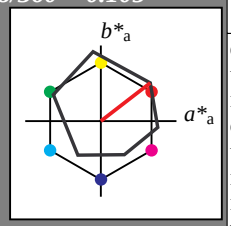
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

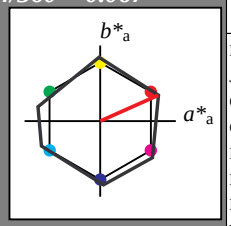
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 1.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

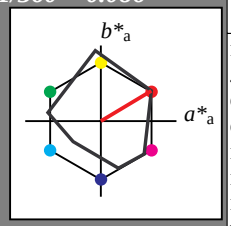
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

$n^* = 0{,}00$

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

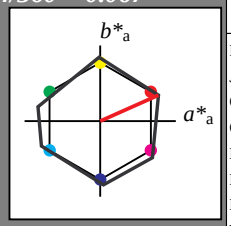
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

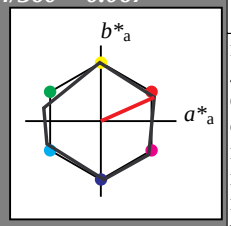
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

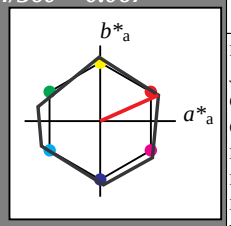
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 1.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

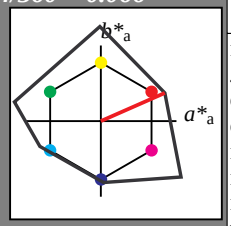
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

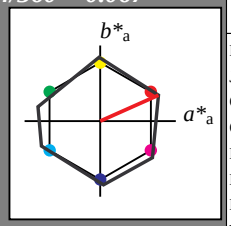
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 24/360 = 0.067$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

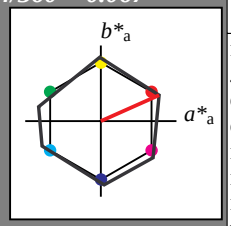
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 24/360 = 0.067$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

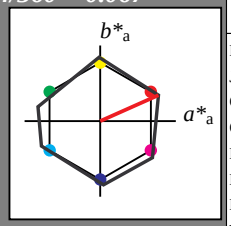
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

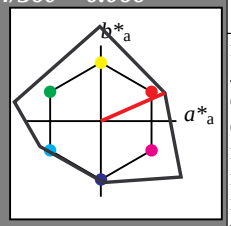
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.067 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

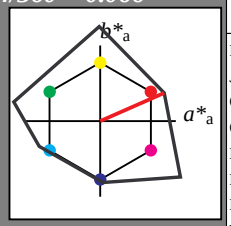
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

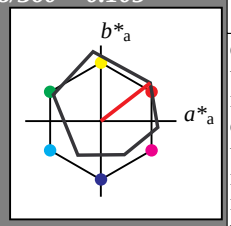
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

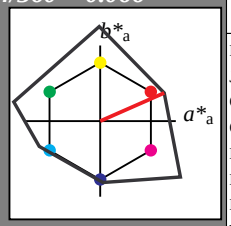
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

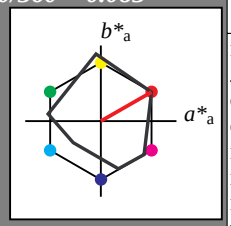
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 30/360 = 0.083$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 77 30
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 32.93 22.4
*LAB*LABa* 72.52 33.47 19.18
*LAB*TCHa* 75.0 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.704 0.434 0.249
*lab*tch* 0.75 0.5 0.083
*lab*nch* 0.0 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.06
*lab*tce* 0.75 0.5 0.019
*lab*ncE* 0.0 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.95 38.36
*LAB*TCHa* 50.0 77.16 29.82
relative* CIELAB *lab*
*lab*lab* 0.409 0.867 0.497
*lab*tch* 0.5 1.0 0.083
*lab*nch* 0.0 1.0 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.993 0.119
*lab*tce* 0.5 1.0 0.019
*lab*ncE* 0.0 1.0 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.67 19.79
*LAB*LABa* 33.82 33.47 19.18
*LAB*TCHa* 25.01 38.58 29.82
relative* CIELAB *lab*
*lab*lab* 0.204 0.434 0.249
*lab*tch* 0.25 0.5 0.083
*lab*nch* 0.5 0.5 0.083
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.06
*lab*tce* 0.25 0.5 0.019
*lab*ncE* 0.5 0.5 r07j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

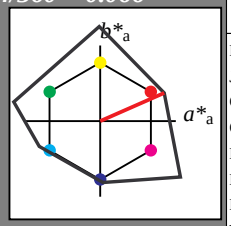
3 step scales for constant CIELAB hue 30/360 = 0.083 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

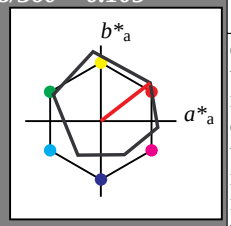
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 38/360 = 0.105$
*lab*tch* and *lab*nch*

D65: hue O
LCH*Ma: 48 83 38
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.67 32.15 28.41
*LAB*LABa* 71.67 32.68 25.25
*LAB*TCHa* 75.0 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.693 0.396 0.306
*lab*tch* 0.75 0.5 0.105
*lab*nch* 0.0 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.693 0.477 0.15
*lab*tce* 0.75 0.5 0.048
*lab*ncE* 0.0 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.95 65.29 52.06
*LAB*LABa* 47.95 65.36 50.51
*LAB*TCHa* 50.0 82.6 37.7
relative* CIELAB *lab*
*lab*lab* 0.387 0.791 0.611
*lab*tch* 0.5 1.0 0.105
*lab*nch* 0.0 1.0 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.387 0.954 0.299
*lab*tce* 0.5 1.0 0.048
*lab*ncE* 0.0 1.0 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.98 32.9 25.8
*LAB*LABa* 32.98 32.68 25.25
*LAB*TCHa* 25.01 41.3 37.7
relative* CIELAB *lab*
*lab*lab* 0.193 0.396 0.306
*lab*tch* 0.25 0.5 0.105
*lab*nch* 0.5 0.5 0.105
***relative* Natural Colour (NC)**
*lab*lrj* 0.193 0.477 0.15
*lab*tce* 0.25 0.5 0.048
*lab*ncE* 0.5 0.5 r19j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

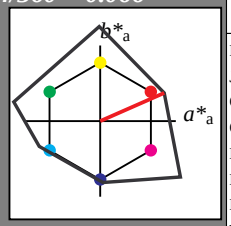
3 step scales for constant CIELAB hue 38/360 = 0.105 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

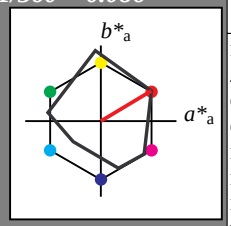
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 31/360 = 0.086$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 50 78 31
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.52 33.43 20.01
*LAB*LABa* 72.52 33.39 20.01
*LAB*TCHa* 75.0 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.704 0.429 0.257
*lab*tch* 0.75 0.5 0.086
*lab*nch* 0.0 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.704 0.496 0.064
*lab*tce* 0.75 0.5 0.02
*lab*ncE* 0.0 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.63 66.84 40.03
*LAB*LABa* 49.63 66.78 40.02
*LAB*TCHa* 50.0 77.85 30.93
relative* CIELAB *lab*
*lab*lab* 0.409 0.858 0.514
*lab*tch* 0.5 1.0 0.086
*lab*nch* 0.0 1.0 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.409 0.992 0.128
*lab*tce* 0.5 1.0 0.02
*lab*ncE* 0.0 1.0 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.82 33.47 20.03
*LAB*LABa* 33.82 33.39 20.01
*LAB*TCHa* 25.01 38.93 30.93
relative* CIELAB *lab*
*lab*lab* 0.204 0.429 0.257
*lab*tch* 0.25 0.5 0.086
*lab*nch* 0.5 0.5 0.086
***relative* Natural Colour (NC)**
*lab*lrj* 0.204 0.496 0.064
*lab*tce* 0.25 0.5 0.02
*lab*ncE* 0.5 0.5 r08j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

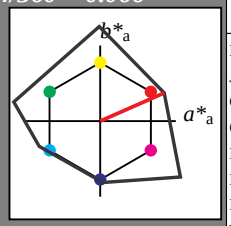
3 step scales for constant CIELAB hue 31/360 = 0.086 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

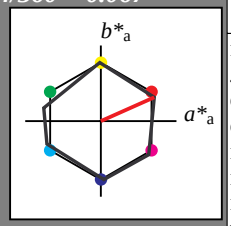
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 77 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 35.35 15.74
*LAB*LABa* 76.05 35.32 15.73
*LAB*TCHa* 75.0 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 70.69 31.48
*LAB*LABa* 56.7 70.64 31.46
*LAB*TCHa* 50.0 77.33 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 35.4 15.75
*LAB*LABa* 37.36 35.32 15.73
*LAB*TCHa* 25.01 38.67 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

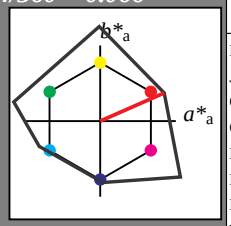
3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

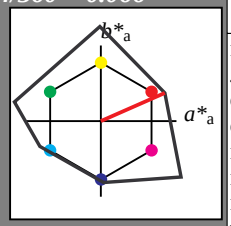
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.688 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.688 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.61 37.24
*LAB*TCHa* 50.0 92.44 23.75
relative* CIELAB *lab*
*lab*lab* 0.376 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.376 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.58 42.39 18.64
*LAB*LABa* 32.58 42.31 18.62
*LAB*TCHa* 25.01 46.22 23.75
relative* CIELAB *lab*
*lab*lab* 0.188 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.188 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

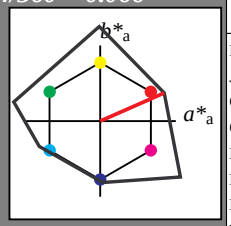
3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 24/360 = 0.066$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

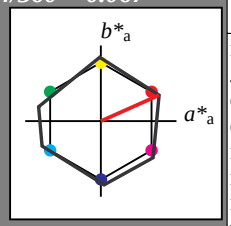
UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 24/360 = 0.067$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 84 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 38.55 17.16
*LAB*LABa* 74.3 38.52 17.16
*LAB*TCHa* 75.0 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.75 0.457 0.203
*lab*tch* 0.75 0.5 0.067
*lab*nch* 0.0 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 −0.009
*lab*tce* 0.75 0.5 0.997
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 77.09 34.32
*LAB*LABa* 53.2 77.04 34.31
*LAB*TCHa* 50.0 84.34 24.01
relative* CIELAB *lab*
*lab*lab* 0.5 0.913 0.407
*lab*tch* 0.5 1.0 0.067
*lab*nch* 0.0 1.0 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 −0.019
*lab*tce* 0.5 1.0 0.997
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 38.58 17.17
*LAB*LABa* 32.1 38.52 17.16
*LAB*TCHa* 25.01 42.17 24.01
relative* CIELAB *lab*
*lab*lab* 0.25 0.457 0.203
*lab*tch* 0.25 0.5 0.067
*lab*nch* 0.5 0.5 0.067
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 −0.009
*lab*tce* 0.25 0.5 0.997
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

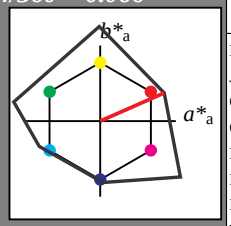
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 24/360 = 0.067 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 24/360 = 0.066$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

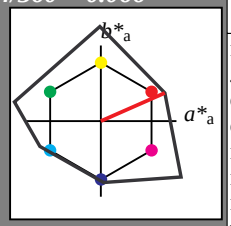
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 24/360 = 0.066 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 24/360 = 0.066$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 47 92 24
olv*Ma: 1.0 0.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.5 (1.0)
*cmyn3** 0.0 0.5 0.5 (0.0)
*olvi4** 1.0 0.5 0.5 1.0
*cmyn4** 0.0 0.5 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.27 42.34 18.63
*LAB*LABa* 71.27 42.31 18.62
*LAB*TCHa* 75.0 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.714 0.458 0.201
*lab*tch* 0.75 0.5 0.066
*lab*nch* 0.0 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.714 0.5 −0.011
*lab*tce* 0.75 0.5 0.996
*lab*ncE* 0.0 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.0 (1.0)
*cmyn3** 0.5 1.0 1.0 (0.0)
*olvi4** 1.0 0.5 0.5 0.5
*cmyn4** 0.0 0.5 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.07 42.38 18.64
*LAB*LABa* 29.07 42.31 18.62
*LAB*TCHa* 25.01 46.23 23.75
relative* CIELAB *lab*
*lab*lab* 0.214 0.458 0.201
*lab*tch* 0.25 0.5 0.066
*lab*nch* 0.5 0.5 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.214 0.5 −0.011
*lab*tce* 0.25 0.5 0.996
*lab*ncE* 0.5 0.5 b98r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.0 (1.0)
*cmyn3** 0.0 1.0 1.0 (0.0)
*olvi4** 1.0 0.0 0.0 1.0
*cmyn4** 0.0 1.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 47.15 84.68 37.26
*LAB*LABa* 47.15 84.63 37.24
*LAB*TCHa* 50.0 92.46 23.75
relative* CIELAB *lab*
*lab*lab* 0.428 0.915 0.403
*lab*tch* 0.5 1.0 0.066
*lab*nch* 0.0 1.0 0.066
***relative* Natural Colour (NC)**
*lab*lrj* 0.428 1.0 −0.023
*lab*tce* 0.5 1.0 0.996
*lab*ncE* 0.0 1.0 b98r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

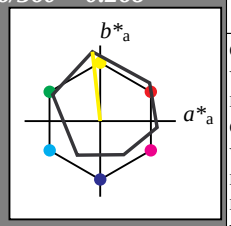
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 24/360 = 0.066 (right)

Input: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 96/360 = 0.268$
lab*tch* and *lab*nch

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

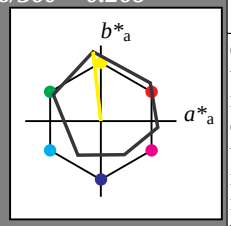
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

Output: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 96/360 = 0.268$
lab*tch* and *lab*nch

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

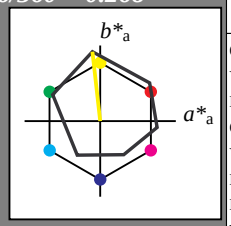
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

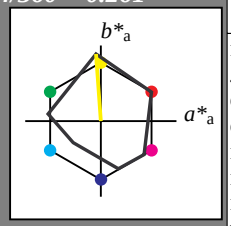
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

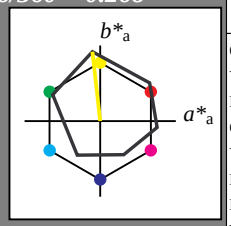
3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

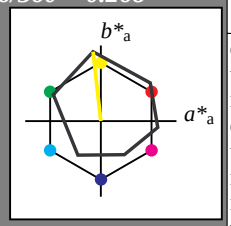
UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

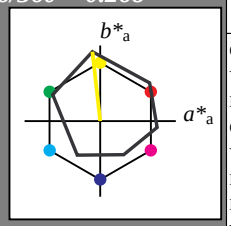
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

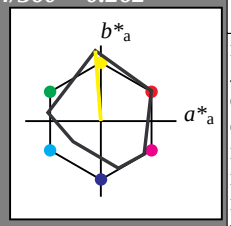
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

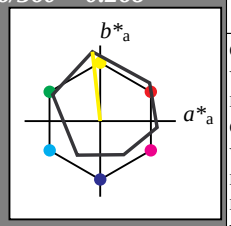
UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

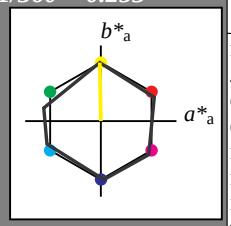
chromaticness *c**

$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

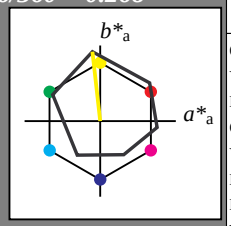
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

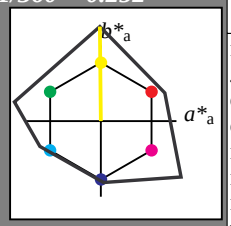
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

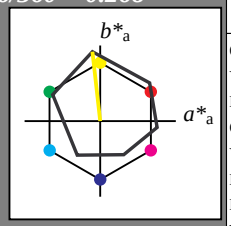
UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

triangle lightness t^*

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

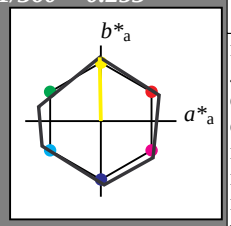
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

triangle lightness t^*

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

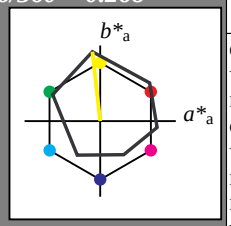
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

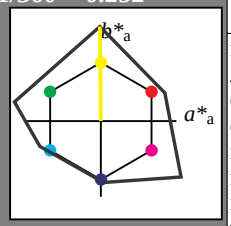
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

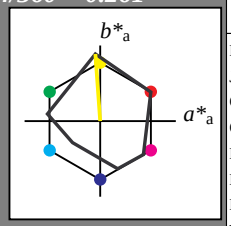
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

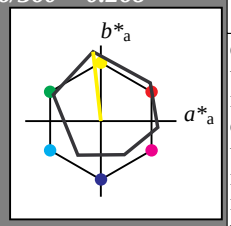
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

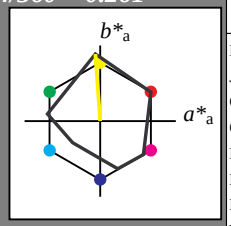
*n** = 1,0

3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 94/360 = 0.261$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

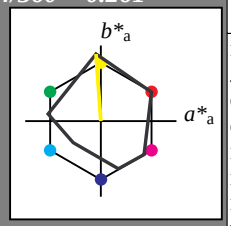
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 94/360 = 0.261$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

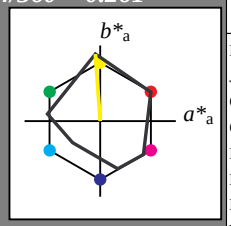
3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

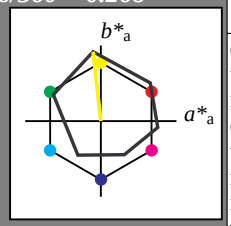
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

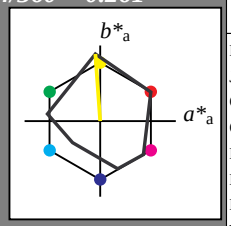
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

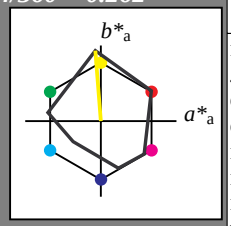
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

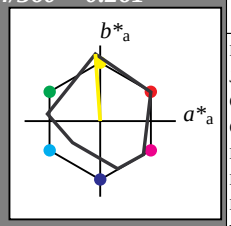
3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

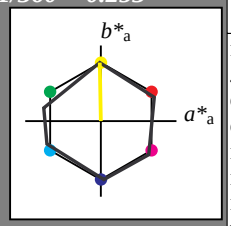
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

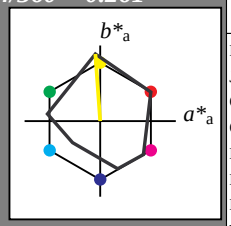
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

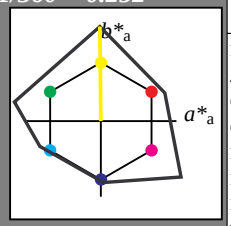
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

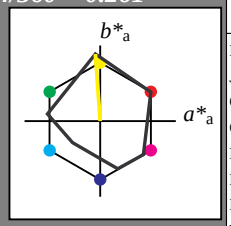
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

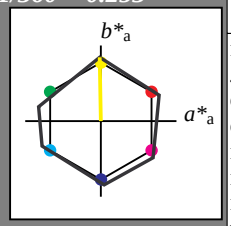
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

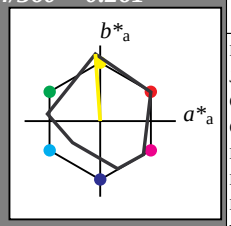
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

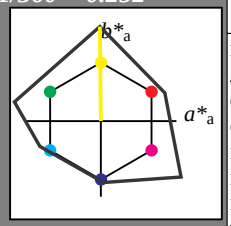
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.261 (left)

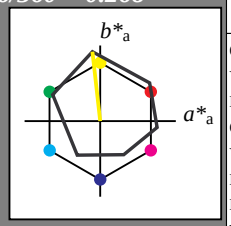
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

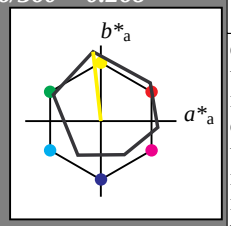
UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

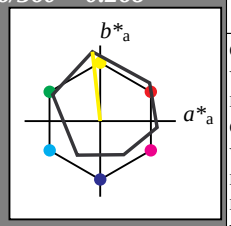
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

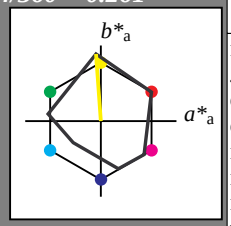
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

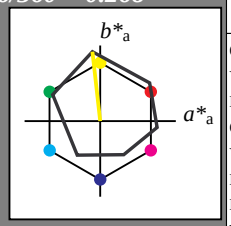
UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 96/360 = 0.268$
lab*tch* and *lab*nch

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

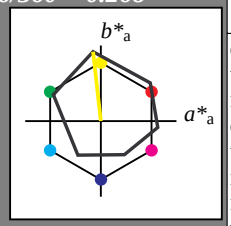
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 96/360 = 0.268$
lab*tch* and *lab*nch

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

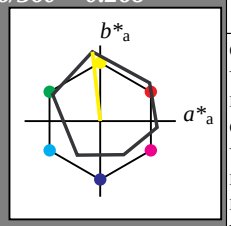
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

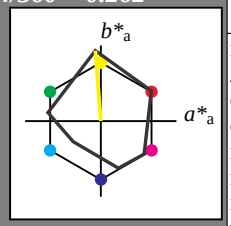
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System TRS18

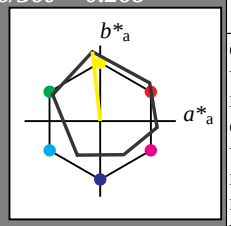
for hue $h^* = lab^*h = 96/360 = 0.268$

*lab*tch* and *lab*nch*

D65: hue Y

LCH*Ma: 90 92 96

olv*Ma: 1.0 1.0 0.0



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 93

%Regularity

$g^*_{H,rel}$ = 57

$g^*_{C,rel}$ = 59

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

Output: Colorimetric Reflective System NRS18

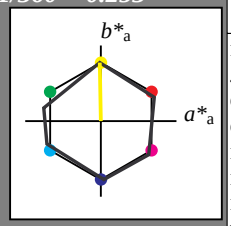
for hue $h^* = lab^*h = 91/360 = 0.253$

*lab*tch* and *lab*nch*

D65: hue J

LCH*Ma: 57 77 91

olv*Ma: 1.0 1.0 0.0



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut

u^*_{rel} = 100

%Regularity

$g^*_{H,rel}$ = 47

$g^*_{C,rel}$ = 100

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

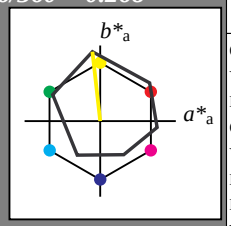
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

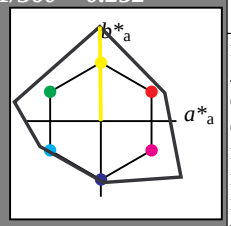
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System TRS18

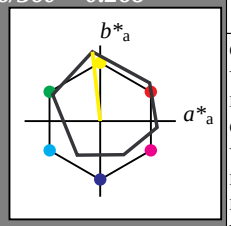
for hue $h^* = lab^*h = 96/360 = 0.268$

*lab*tch* and *lab*nch*

D65: hue Y

LCH*Ma: 90 92 96

olv*Ma: 1.0 1.0 0.0



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 93

%Regularity

$g^*_{H,rel}$ = 57

$g^*_{C,rel}$ = 59

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

Output: Colorimetric Reflective System NRS11

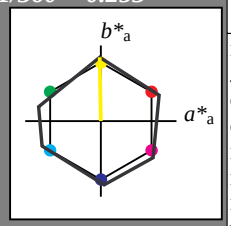
for hue $h^* = lab^*h = 91/360 = 0.253$

*lab*tch* and *lab*nch*

D65: hue J

LCH*Ma: 53 84 91

olv*Ma: 1.0 1.0 0.0



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut

u^*_{rel} = 119

%Regularity

$g^*_{H,rel}$ = 47

$g^*_{C,rel}$ = 100

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

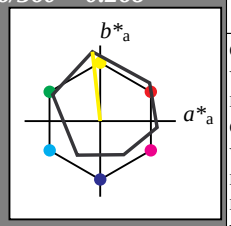
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

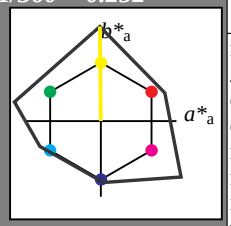
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 96/360 = 0.268 (left)

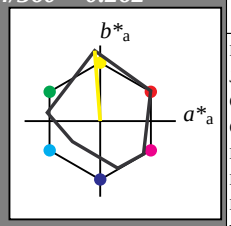
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

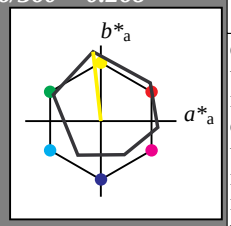
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

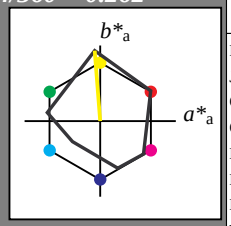
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

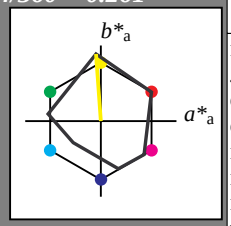
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

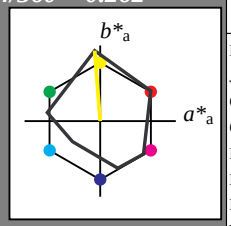
3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

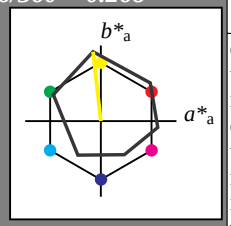
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

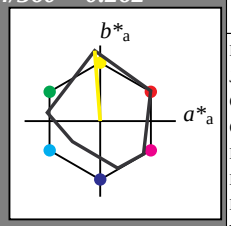
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 94/360 = 0.262$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

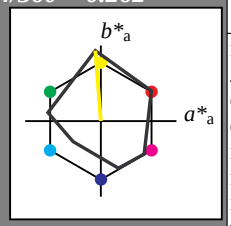
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 94/360 = 0.262$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

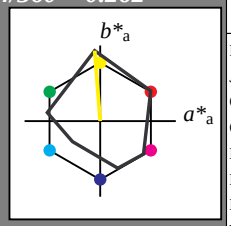
3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

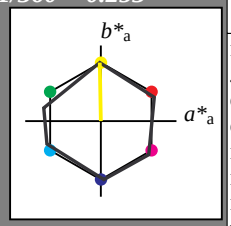
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

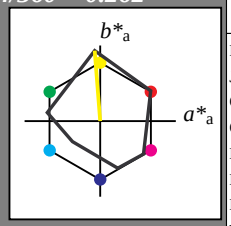
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.01	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.5	(1.0)
*cmyn3**	0.0	0.0	0.5	(0.0)
*olvi4**	1.0	1.0	0.5	1.0
*cmyn4**	0.0	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	93.05	−3.61	46.59
*LAB*LABa*	93.05	−3.63	46.59
*LAB*TCHa*	75.0	46.73	94.46

relative* CIELAB *lab*

*lab*lab*	0.969	−0.038	0.498
*lab*tch*	0.75	0.5	0.262
*lab*nch*	0.0	0.5	0.262

***relative* Natural Colour (NC)**

*lab*lrj*	0.969	−0.023	0.499
*lab*tce*	0.75	0.5	0.258
*lab*ncE*	0.0	0.5	j03g

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.0	(1.0)
*cmyn3**	0.0	0.0	1.0	(0.0)
*olvi4**	1.0	1.0	0.0	1.0
*cmyn4**	0.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	90.69	−7.25	93.17
*LAB*LABa*	90.69	−7.26	93.18
*LAB*TCHa*	50.0	93.46	94.46

relative* CIELAB *lab*

*lab*lab*	0.939	−0.077	0.997
*lab*tch*	0.5	1.0	0.262
*lab*nch*	0.0	1.0	0.262

***relative* Natural Colour (NC)**

*lab*lrj*	0.939	−0.047	0.999
*lab*tce*	0.5	1.0	0.258
*lab*ncE*	0.0	1.0	j03g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	0.05	0.0
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	0.5	0.5	1.0	(0.0)
*olvi4**	1.0	1.0	0.5	0.5
*cmyn4**	0.0	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	54.35	−3.57	46.6
*LAB*LABa*	54.35	−3.63	46.59
*LAB*TCHa*	25.01	46.73	94.46

relative* CIELAB *lab*

*lab*lab*	0.47	−0.038	0.498
*lab*tch*	0.25	0.5	0.262
*lab*nch*	0.5	0.5	0.262

***relative* Natural Colour (NC)**

*lab*lrj*	0.47	−0.023	0.499
*lab*tce*	0.25	0.5	0.258
*lab*ncE*	0.5	0.5	j03g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.1	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

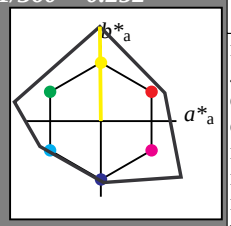
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.5	(1.0)
*cmyn3**	0.0	0.0	0.5	(0.0)
*olvi4**	1.0	1.0	0.5	1.0
*cmyn4**	0.0	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	93.38	−0.62	62.5
*LAB*LABa*	93.38	−0.63	62.5
*LAB*TCHa*	75.0	62.5	90.59

relative* CIELAB *lab*

*lab*lab*	0.974	−0.004	0.5
*lab*tch*	0.75	0.5	0.252
*lab*nch*	0.0	0.5	0.252

***relative* Natural Colour (NC)**

*lab*lrj*	0.974	0.021	0.499
*lab*tce*	0.75	0.5	0.243
*lab*ncE*	0.0	0.5	r97j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.0	(1.0)
*cmyn3**	0.0	0.0	1.0	(0.0)
*olvi4**	1.0	1.0	0.0	1.0
*cmyn4**	0.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	91.36	−1.26	125.0
*LAB*LABa*	91.36	−1.27	125.0
*LAB*TCHa*	50.0	125.01	90.59

relative* CIELAB *lab*

*lab*lab*	0.948	−0.009	1.0
*lab*tch*	0.5	1.0	0.252
*lab*nch*	0.0	1.0	0.252

***relative* Natural Colour (NC)**

*lab*lrj*	0.948	0.041	0.999
*lab*tce*	0.5	1.0	0.243
*lab*ncE*	0.0	1.0	r97j

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	0.5	0.5	1.0	(0.0)
*olvi4**	1.0	1.0	0.5	0.5
*cmyn4**	0.0	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	54.69	−0.58	62.52
*LAB*LABa*	54.69	−0.63	62.5
*LAB*TCHa*	25.01	62.5	90.59

relative* CIELAB *lab*

*lab*lab*	0.474	−0.004	0.5
*lab*tch*	0.25	0.5	0.252
*lab*nch*	0.5	0.5	0.252

***relative* Natural Colour (NC)**

*lab*lrj*	0.474	0.021	0.499
*lab*tce*	0.25	0.5	0.243
*lab*ncE*	0.5	0.5	r97j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

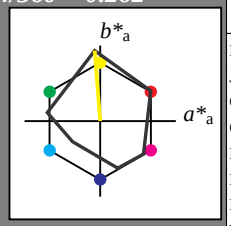
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

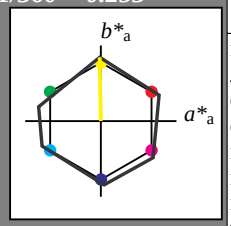
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

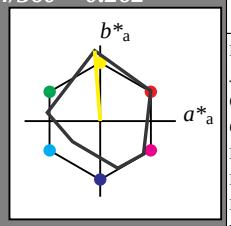
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

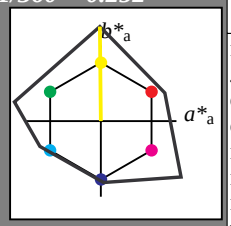
UE100−7, 3 step scales for constant CIELAB hue 94/360 = 0.262 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

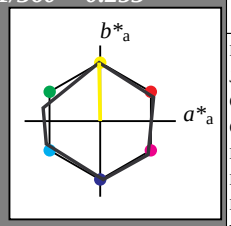
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

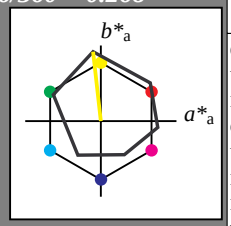
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
lab*tch* and *lab*nch

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

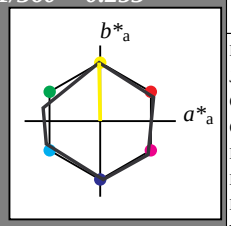
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

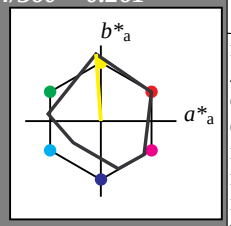
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

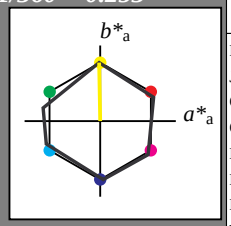
3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

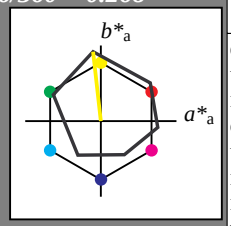
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

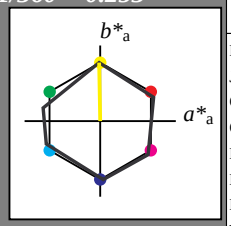
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

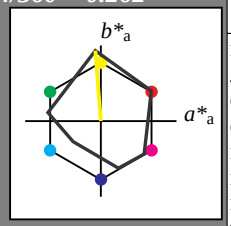
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

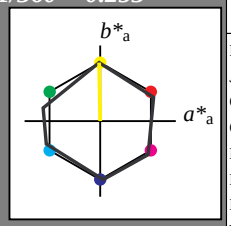
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 91/360 = 0.253$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

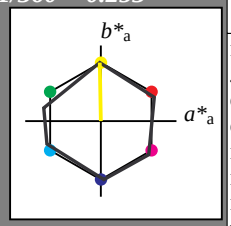
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 91/360 = 0.253$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

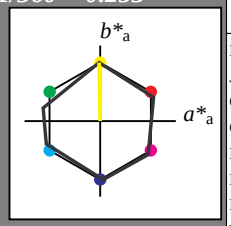
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

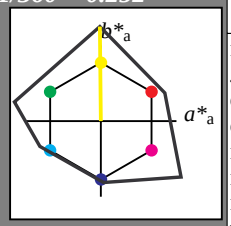
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

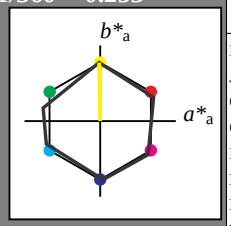
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

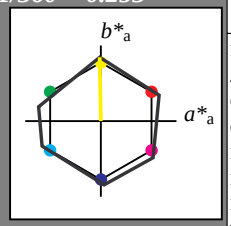
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

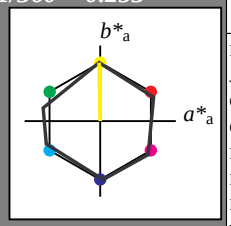
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

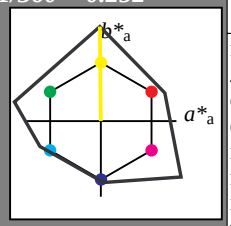
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

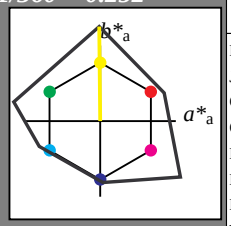
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

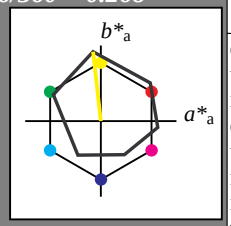
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

triangle lightness *t**

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

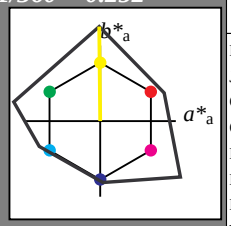
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

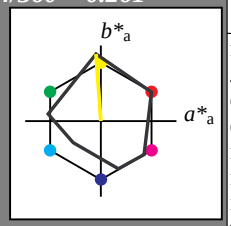
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

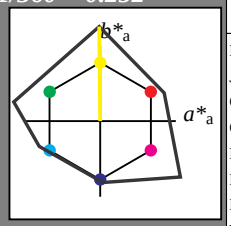
3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

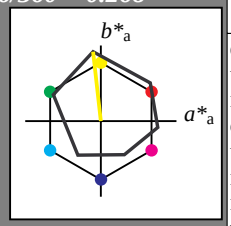
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

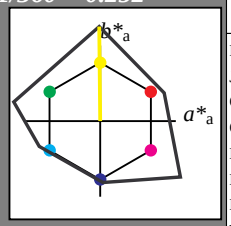
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.5	(1.0)
*cmyn3**	0.0	0.0	0.5	(0.0)
*olvi4**	1.0	1.0	0.5	1.0
*cmyn4**	0.0	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	93.38	−0.62	62.5
*LAB*LABa*	93.38	−0.63	62.5
*LAB*TCHa*	75.0	62.5	90.59

relative* CIELAB *lab*

*lab*lab*	0.974	−0.004	0.5
*lab*tch*	0.75	0.5	0.252
*lab*nch*	0.0	0.5	0.252

***relative* Natural Colour (NC)**

*lab*lrj*	0.974	0.021	0.499
*lab*tce*	0.75	0.5	0.243
*lab*ncE*	0.0	0.5	r97j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.0	(1.0)
*cmyn3**	0.0	0.0	1.0	(0.0)
*olvi4**	1.0	1.0	0.0	1.0
*cmyn4**	0.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	91.36	−1.26	125.0
*LAB*LABa*	91.36	−1.27	125.0
*LAB*TCHa*	50.0	125.01	90.59

relative* CIELAB *lab*

*lab*lab*	0.948	−0.009	1.0
*lab*tch*	0.5	1.0	0.252
*lab*nch*	0.0	1.0	0.252

***relative* Natural Colour (NC)**

*lab*lrj*	0.948	0.041	0.999
*lab*tce*	0.5	1.0	0.243
*lab*ncE*	0.0	1.0	r97j

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	0.5	0.5	1.0	(0.0)
*olvi4**	1.0	1.0	0.5	0.5
*cmyn4**	0.0	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	54.69	−0.58	62.52
*LAB*LABa*	54.69	−0.63	62.5
*LAB*TCHa*	25.01	62.5	90.59

relative* CIELAB *lab*

*lab*lab*	0.474	−0.004	0.5
*lab*tch*	0.25	0.5	0.252
*lab*nch*	0.5	0.5	0.252

***relative* Natural Colour (NC)**

*lab*lrj*	0.474	0.021	0.499
*lab*tce*	0.25	0.5	0.243
*lab*ncE*	0.5	0.5	r97j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

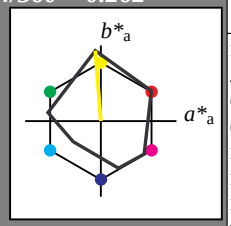
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.01	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.5	(1.0)
*cmyn3**	0.0	0.0	0.5	(0.0)
*olvi4**	1.0	1.0	0.5	1.0
*cmyn4**	0.0	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	93.05	−3.61	46.59
*LAB*LABa*	93.05	−3.63	46.59
*LAB*TCHa*	75.0	46.73	94.46

relative* CIELAB *lab*

*lab*lab*	0.969	−0.038	0.498
*lab*tch*	0.75	0.5	0.262
*lab*nch*	0.0	0.5	0.262

***relative* Natural Colour (NC)**

*lab*lrj*	0.969	−0.023	0.499
*lab*tce*	0.75	0.5	0.258
*lab*ncE*	0.0	0.5	j03g

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	0.0	(1.0)
*cmyn3**	0.0	0.0	1.0	(0.0)
*olvi4**	1.0	1.0	0.0	1.0
*cmyn4**	0.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	90.69	−7.25	93.17
*LAB*LABa*	90.69	−7.26	93.18
*LAB*TCHa*	50.0	93.46	94.46

relative* CIELAB *lab*

*lab*lab*	0.939	−0.077	0.997
*lab*tch*	0.5	1.0	0.262
*lab*nch*	0.0	1.0	0.262

***relative* Natural Colour (NC)**

*lab*lrj*	0.939	−0.047	0.999
*lab*tce*	0.5	1.0	0.258
*lab*ncE*	0.0	1.0	j03g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	0.05	0.0
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	0.5	0.5	1.0	(0.0)
*olvi4**	1.0	1.0	0.5	0.5
*cmyn4**	0.0	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	54.35	−3.57	46.6
*LAB*LABa*	54.35	−3.63	46.59
*LAB*TCHa*	25.01	46.73	94.46

relative* CIELAB *lab*

*lab*lab*	0.47	−0.038	0.498
*lab*tch*	0.25	0.5	0.262
*lab*nch*	0.5	0.5	0.262

***relative* Natural Colour (NC)**

*lab*lrj*	0.47	−0.023	0.499
*lab*tce*	0.25	0.5	0.258
*lab*ncE*	0.5	0.5	j03g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.1	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

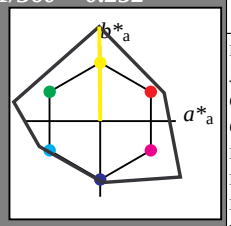
3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

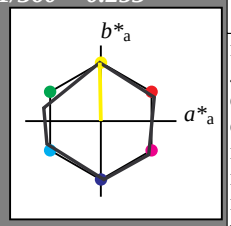
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

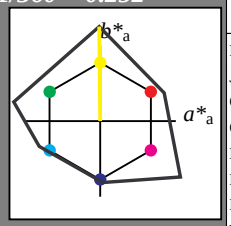
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 91/360 = 0.252$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

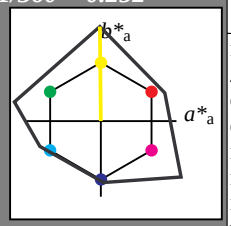
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 91/360 = 0.252$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

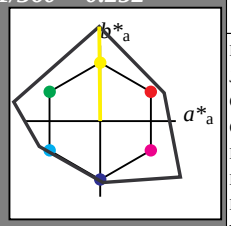
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

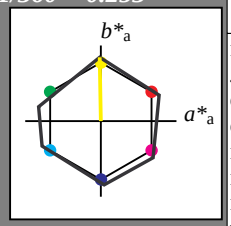
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

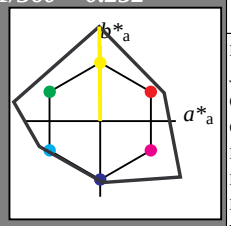
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

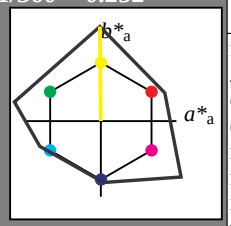
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$

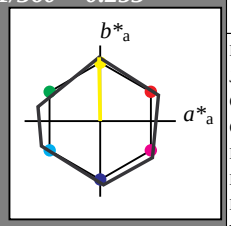
*lab*tch* and *lab*nch*

D65: hue J

LCH*Ma: 53 84 91

olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut

u^*_{rel} = 119

%Regularity

$g^*_{H,rel}$ = 47

$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$

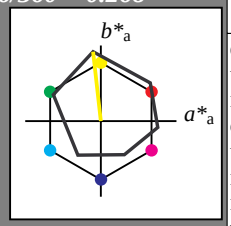
*lab*tch* and *lab*nch*

D65: hue Y

LCH*Ma: 90 92 96

olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 93

%Regularity

$g^*_{H,rel}$ = 57

$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

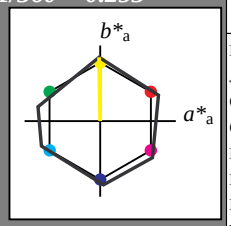
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

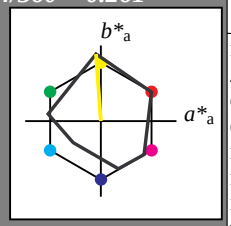
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System NRS11

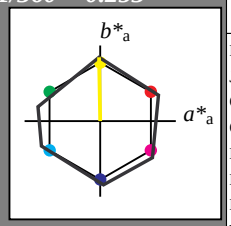
for hue $h^* = lab^*h = 91/360 = 0.253$

*lab*tch* and *lab*nch*

D65: hue J

LCH*Ma: 53 84 91

olv*Ma: 1.0 1.0 0.0



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

triangle lightness t^*

%Gamut

$u^*_{rel} = 119$

%Regularity

$g^*_{H,rel} = 47$

$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System TRS18

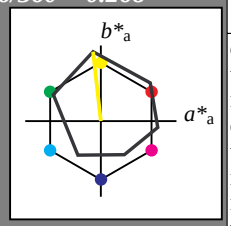
for hue $h^* = lab^*h = 96/360 = 0.268$

*lab*tch* and *lab*nch*

D65: hue Y

LCH*Ma: 90 92 96

olv*Ma: 1.0 1.0 0.0



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

triangle lightness t^*

%Gamut

$u^*_{rel} = 93$

%Regularity

$g^*_{H,rel} = 57$

$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

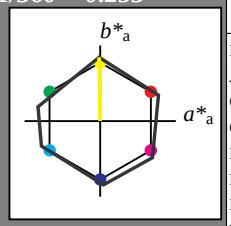
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

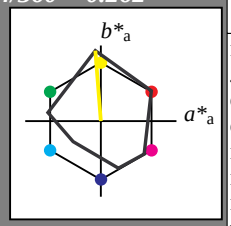
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

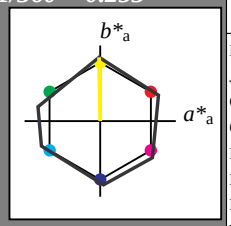
3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

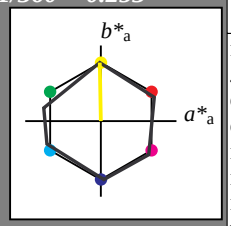
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

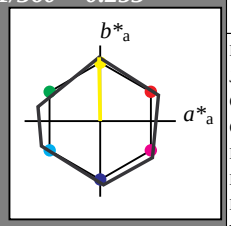
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

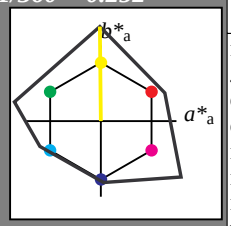
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

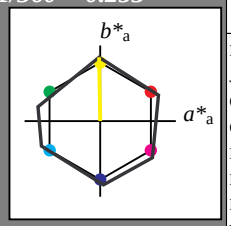
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 91/360 = 0.253$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

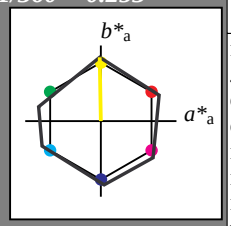
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 91/360 = 0.253$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

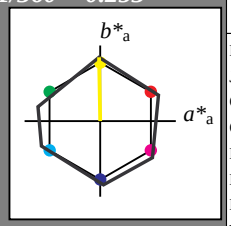
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
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N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

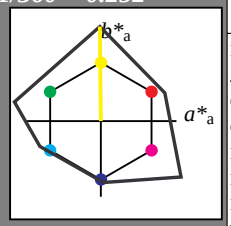
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.253 (left)

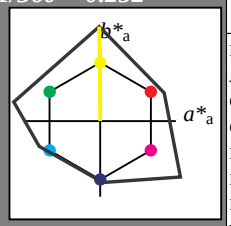
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

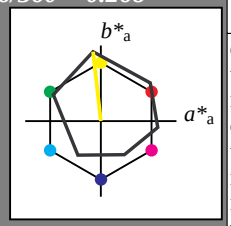
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

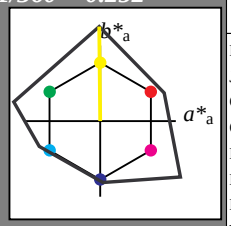
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

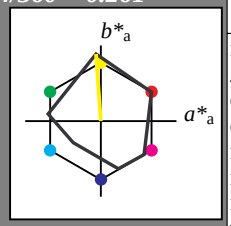
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 94/360 = 0.261$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 89 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −4.11 48.97
*LAB*LABa* 93.05 −3.17 44.37
*LAB*TCHa* 75.0 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.969 −0.035 0.499
*lab*tch* 0.75 0.5 0.261
*lab*nch* 0.0 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −6.36 88.73
*LAB*TCHa* 50.0 88.96 94.1
relative* CIELAB *lab*
*lab*lab* 0.939 −0.071 0.997
*lab*tch* 0.5 1.0 0.261
*lab*nch* 0.0 1.0 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.048 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.37 46.36
*LAB*LABa* 54.35 −3.17 44.37
*LAB*TCHa* 25.01 44.48 94.1
relative* CIELAB *lab*
*lab*lab* 0.47 −0.035 0.499
*lab*tch* 0.25 0.5 0.261
*lab*nch* 0.5 0.5 0.261
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

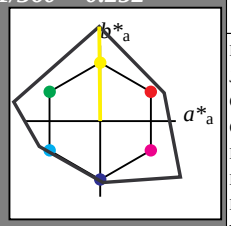
3 step scales for constant CIELAB hue 94/360 = 0.261 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

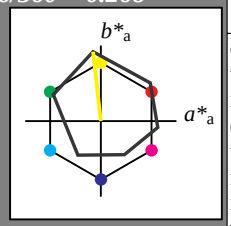
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 96/360 = 0.268$
*lab*tch* and *lab*nch*

D65: hue Y
LCH*Ma: 90 92 96
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.88 −6.06 50.46
*LAB*LABa* 92.88 −5.13 45.87
*LAB*TCHa* 75.0 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.967 −0.055 0.497
*lab*tch* 0.75 0.5 0.268
*lab*nch* 0.0 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.967 −0.048 0.497
*lab*tce* 0.75 0.5 0.266
*lab*ncE* 0.0 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.37 −11.15 96.17
*LAB*LABa* 90.37 −10.26 91.75
*LAB*TCHa* 50.0 92.32 96.39
relative* CIELAB *lab*
*lab*lab* 0.935 −0.11 0.994
*lab*tch* 0.5 1.0 0.268
*lab*nch* 0.0 1.0 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.935 −0.097 0.995
*lab*tce* 0.5 1.0 0.266
*lab*ncE* 0.0 1.0 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.19 −5.32 47.85
*LAB*LABa* 54.19 −5.13 45.87
*LAB*TCHa* 25.01 46.16 96.39
relative* CIELAB *lab*
*lab*lab* 0.467 −0.055 0.497
*lab*tch* 0.25 0.5 0.268
*lab*nch* 0.5 0.5 0.268
***relative* Natural Colour (NC)**
*lab*lrj* 0.467 −0.048 0.497
*lab*tce* 0.25 0.5 0.266
*lab*ncE* 0.5 0.5 j06g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

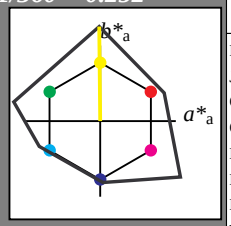
3 step scales for constant CIELAB hue 96/360 = 0.268 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

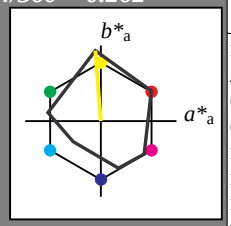
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 94/360 = 0.262$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 93 94
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.05 −3.61 46.59
*LAB*LABa* 93.05 −3.63 46.59
*LAB*TCHa* 75.0 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.969 −0.038 0.498
*lab*tch* 0.75 0.5 0.262
*lab*nch* 0.0 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.969 −0.023 0.499
*lab*tce* 0.75 0.5 0.258
*lab*ncE* 0.0 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.69 −7.25 93.17
*LAB*LABa* 90.69 −7.26 93.18
*LAB*TCHa* 50.0 93.46 94.46
relative* CIELAB *lab*
*lab*lab* 0.939 −0.077 0.997
*lab*tch* 0.5 1.0 0.262
*lab*nch* 0.0 1.0 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.939 −0.047 0.999
*lab*tce* 0.5 1.0 0.258
*lab*ncE* 0.0 1.0 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.35 −3.57 46.6
*LAB*LABa* 54.35 −3.63 46.59
*LAB*TCHa* 25.01 46.73 94.46
relative* CIELAB *lab*
*lab*lab* 0.47 −0.038 0.498
*lab*tch* 0.25 0.5 0.262
*lab*nch* 0.5 0.5 0.262
***relative* Natural Colour (NC)**
*lab*lrj* 0.47 −0.023 0.499
*lab*tce* 0.25 0.5 0.258
*lab*ncE* 0.5 0.5 j03g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

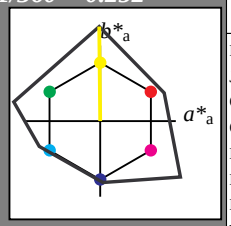
3 step scales for constant CIELAB hue 94/360 = 0.262 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

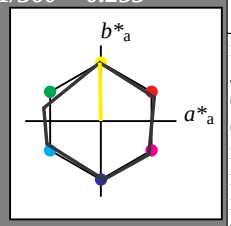
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 77 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −0.66 38.68
*LAB*LABa* 76.05 −0.69 38.68
*LAB*TCHa* 75.0 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −1.34 77.37
*LAB*LABa* 56.7 −1.39 77.36
*LAB*TCHa* 50.0 77.37 91.04
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.03 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −0.62 38.7
*LAB*LABa* 37.36 −0.69 38.68
*LAB*TCHa* 25.01 38.69 91.04
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

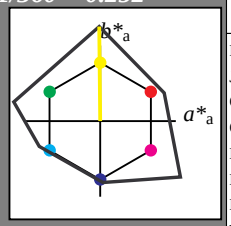
3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

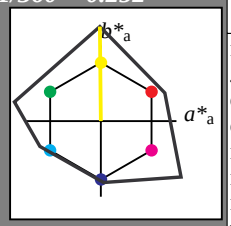
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.974 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.974 0.021 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.948 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.948 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.69 −0.58 62.52
*LAB*LABa* 54.69 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.474 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.474 0.021 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

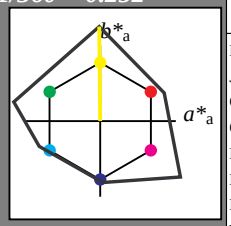
3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 91/360 = 0.252$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (0.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

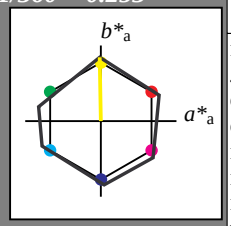
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 91/360 = 0.253$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 84 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −0.72 42.18
*LAB*LABa* 74.3 −0.75 42.18
*LAB*TCHa* 75.0 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.75 −0.008 0.5
*lab*tch* 0.75 0.5 0.253
*lab*nch* 0.0 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.015 0.5
*lab*tce* 0.75 0.5 0.245
*lab*ncE* 0.0 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −1.46 84.37
*LAB*LABa* 53.2 −1.51 84.36
*LAB*TCHa* 50.0 84.37 91.03
relative* CIELAB *lab*
*lab*lab* 0.5 −0.017 1.0
*lab*tch* 0.5 1.0 0.253
*lab*nch* 0.0 1.0 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.031 0.999
*lab*tce* 0.5 1.0 0.245
*lab*ncE* 0.0 1.0 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −0.69 42.2
*LAB*LABa* 32.1 −0.75 42.18
*LAB*TCHa* 25.01 42.19 91.03
relative* CIELAB *lab*
*lab*lab* 0.25 −0.008 0.5
*lab*tch* 0.25 0.5 0.253
*lab*nch* 0.5 0.5 0.253
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.015 0.5
*lab*tce* 0.25 0.5 0.245
*lab*ncE* 0.5 0.5 r98j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

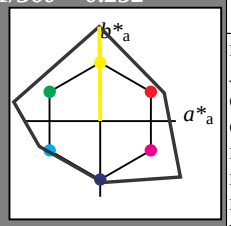
UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

3 step scales for constant CIELAB hue 91/360 = 0.253 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 91/360 = 0.252$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

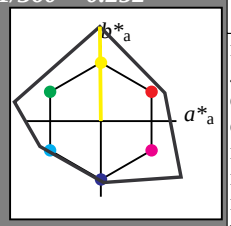
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 91/360 = 0.252 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 91/360 = 0.252$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 91 125 91
olv*Ma: 1.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 1.0 1.0 0.5 1.0
*cmyn4** 0.0 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 93.38 −0.62 62.5
*LAB*LABa* 93.38 −0.63 62.5
*LAB*TCHa* 75.0 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.976 −0.004 0.5
*lab*tch* 0.75 0.5 0.252
*lab*nch* 0.0 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.976 0.02 0.499
*lab*tce* 0.75 0.5 0.243
*lab*ncE* 0.0 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 0.0 (1.0)
*cmyn3** 0.0 0.0 1.0 (0.0)
*olvi4** 1.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 91.36 −1.26 125.0
*LAB*LABa* 91.36 −1.27 125.0
*LAB*TCHa* 50.0 125.01 90.59
relative* CIELAB *lab*
*lab*lab* 0.952 −0.009 1.0
*lab*tch* 0.5 1.0 0.252
*lab*nch* 0.0 1.0 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.952 0.041 0.999
*lab*tce* 0.5 1.0 0.243
*lab*ncE* 0.0 1.0 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 0.5 0.5 1.0 (0.0)
*olvi4** 1.0 1.0 0.5 0.5
*cmyn4** 0.0 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 51.18 −0.59 62.51
*LAB*LABa* 51.18 −0.63 62.5
*LAB*TCHa* 25.01 62.5 90.59
relative* CIELAB *lab*
*lab*lab* 0.476 −0.004 0.5
*lab*tch* 0.25 0.5 0.252
*lab*nch* 0.5 0.5 0.252
***relative* Natural Colour (NC)**
*lab*lrj* 0.476 0.02 0.499
*lab*tce* 0.25 0.5 0.243
*lab*ncE* 0.5 0.5 r97j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

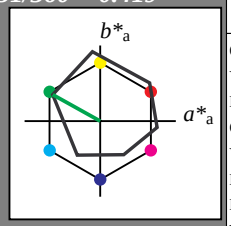
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 91/360 = 0.252 (right)

Input: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

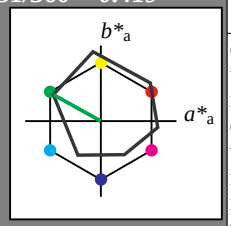
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

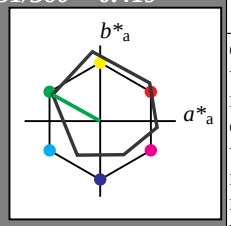
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System ORS18

for hue *h* = lab*h = 151/360 = 0.419*
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

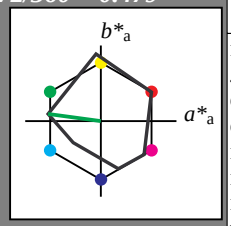
*n** = 1,0

Output: Colorimetric Reflective System MRS18

for hue *h* = lab*h = 172/360 = 0.479*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

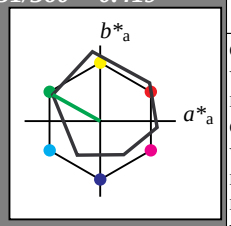
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

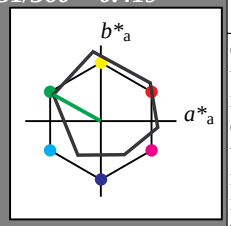
UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

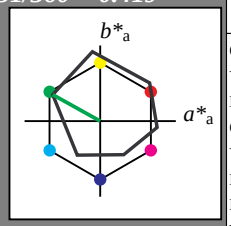
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

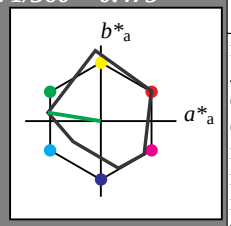
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

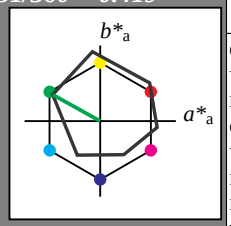
3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

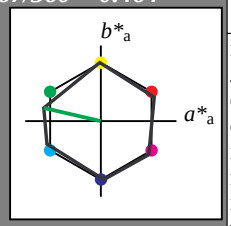
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

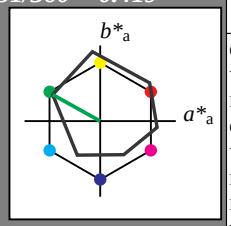
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

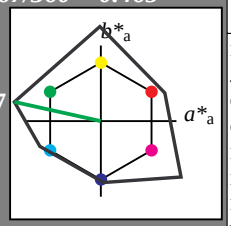
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

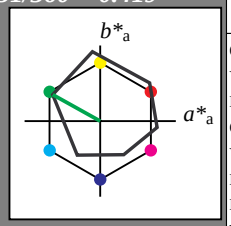
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

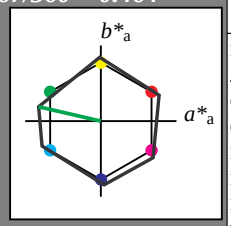
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

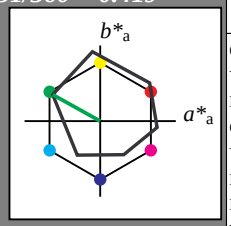
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

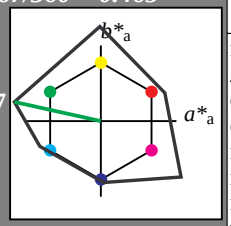
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

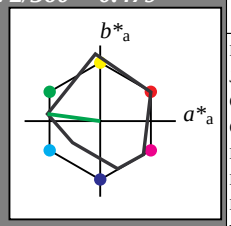
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

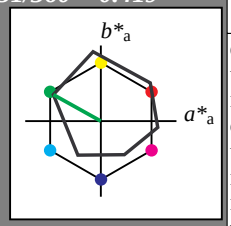
UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

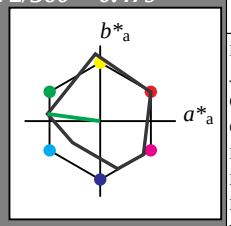
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 172/360 = 0.479$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

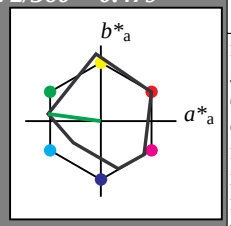
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 172/360 = 0.479$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

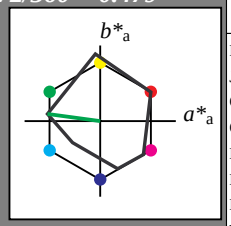
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
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G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

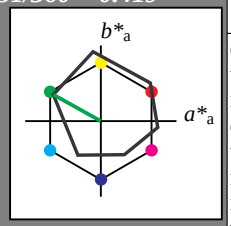
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

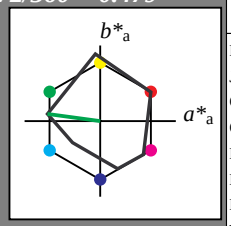
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

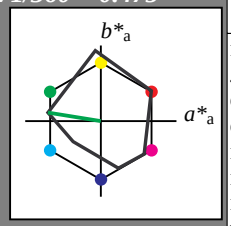
UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

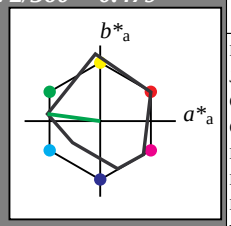
3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

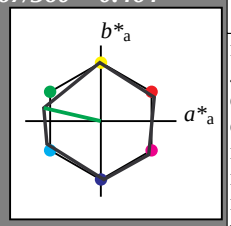
UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

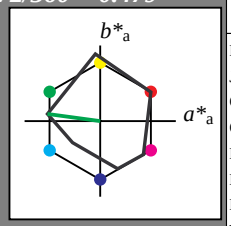
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

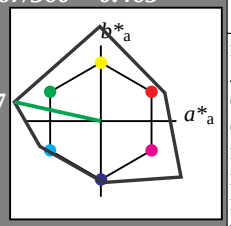
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

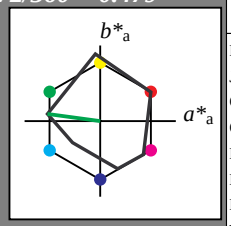
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

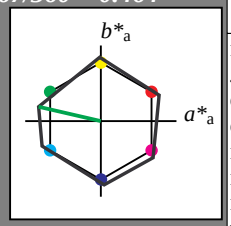
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

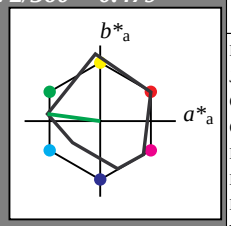
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

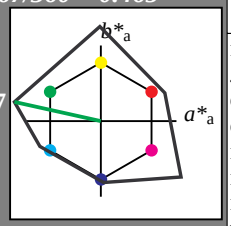
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 172/360 = 0.479 (left)

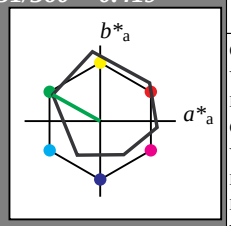
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

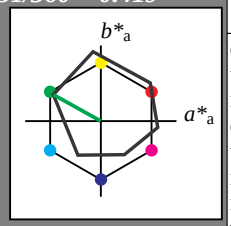
UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

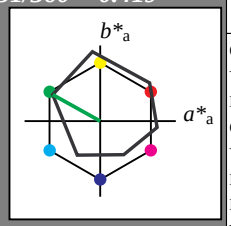
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System TRS18

for hue *h* = lab*h = 151/360 = 0.419*
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

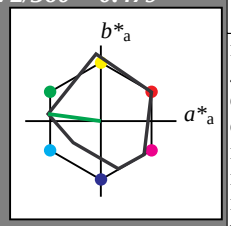
*n** = 1,0

Output: Colorimetric Reflective System MRS18

for hue *h* = lab*h = 172/360 = 0.479*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

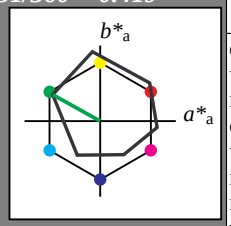
UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

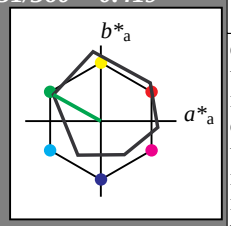
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

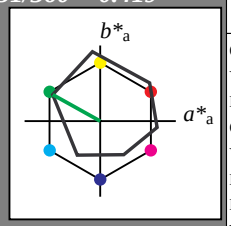
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

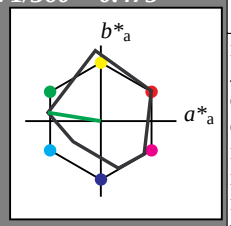
*n** = 1,0

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

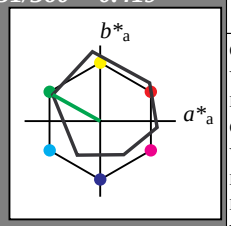
3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

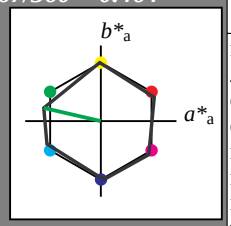
UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

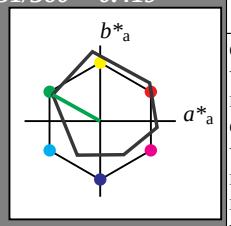
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
lab*tch* and *lab*nch

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

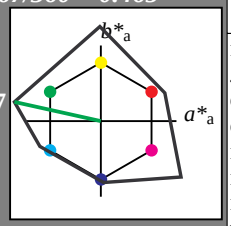
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

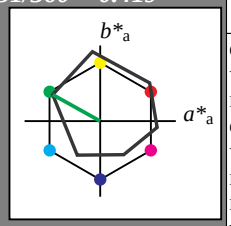
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

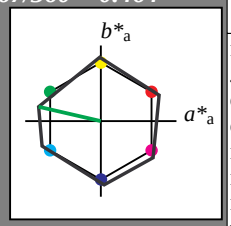
UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

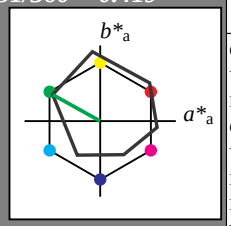
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	73.15	−31.94	20.73
*LAB*LABa*	73.15	−31.38	17.47
*LAB*TCHa*	75.0	35.93	150.91

relative* CIELAB *lab*

*lab*lab*	0.712	−0.436	0.243
*lab*tch*	0.75	0.5	0.419
*lab*nch*	0.0	0.5	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.712	−0.478	0.144
*lab*tce*	0.75	0.5	0.453
*lab*ncE*	0.0	0.5	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	50.9	−62.91	36.69
*LAB*LABa*	50.9	−62.78	34.94
*LAB*TCHa*	50.0	71.86	150.91

relative* CIELAB *lab*

*lab*lab*	0.425	−0.873	0.486
*lab*tch*	0.5	1.0	0.419
*lab*nch*	0.0	1.0	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.425	−0.956	0.289
*lab*tce*	0.5	1.0	0.453
*lab*ncE*	0.0	1.0	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	34.46	−31.2	18.11
*LAB*LABa*	34.46	−31.38	17.47
*LAB*TCHa*	25.01	35.93	150.91

relative* CIELAB *lab*

*lab*lab*	0.213	−0.436	0.243
*lab*tch*	0.25	0.5	0.419
*lab*nch*	0.5	0.5	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.213	−0.478	0.144
*lab*tce*	0.25	0.5	0.453
*lab*ncE*	0.5	0.5	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

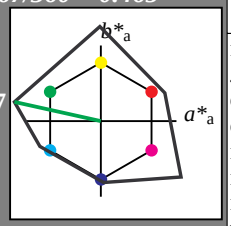
UE100−7, 3 step scales for constant CIELAB hue 151/360 = 0.419 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	79.24	−57.1	12.67
*LAB*LABa*	79.24	−57.12	12.67
*LAB*TCHa*	75.0	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.808	−0.487	0.108
*lab*tch*	0.75	0.5	0.465
*lab*nch*	0.0	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.808	−0.497	−0.037
*lab*tce*	0.75	0.5	0.512
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.21	0.04	0.0
*LAB*LABa*	53.21	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	63.07	−114.22	25.35
*LAB*LABa*	63.07	−114.25	25.34
*LAB*TCHa*	50.0	117.04	167.5

relative* CIELAB *lab*

*lab*lab*	0.617	−0.975	0.216
*lab*tch*	0.5	1.0	0.465
*lab*nch*	0.0	1.0	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.617	−0.996	−0.074
*lab*tce*	0.5	1.0	0.512
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.04	−57.07	12.69
*LAB*LABa*	37.04	−57.12	12.67
*LAB*TCHa*	25.01	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.309	−0.487	0.108
*lab*tch*	0.25	0.5	0.465
*lab*nch*	0.5	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.309	−0.497	−0.037
*lab*tce*	0.25	0.5	0.512
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	11.01	0.07	0.01
*LAB*LABa*	11.01	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

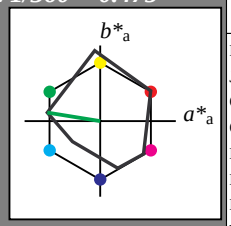
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

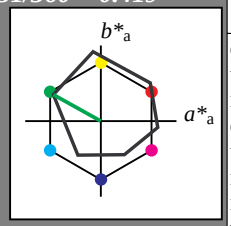
UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

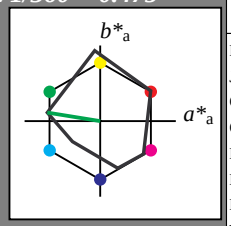
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

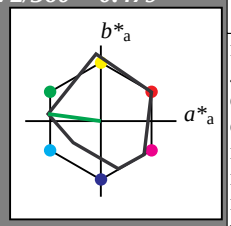
UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

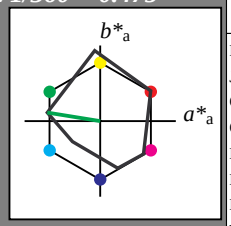
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

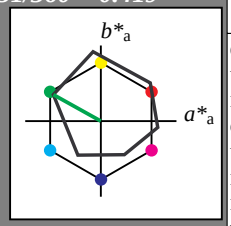
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

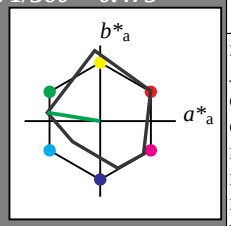
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

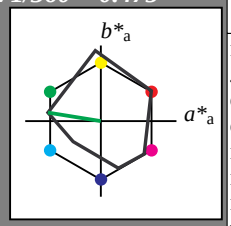
UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

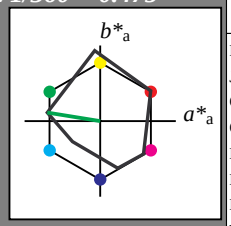
3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

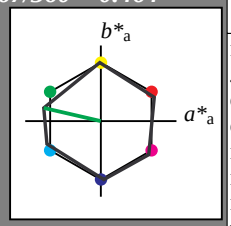
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

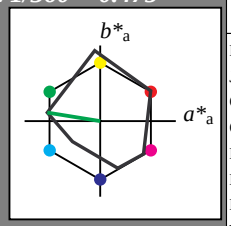
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.01	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	73.75	−34.92	5.64
*LAB*LABa*	73.75	−34.96	5.63
*LAB*TCHa*	75.0	35.42	170.85

relative* CIELAB *lab*

*lab*lab*	0.72	−0.493	0.079
*lab*tch*	0.75	0.5	0.475
*lab*nch*	0.0	0.5	0.475

***relative* Natural Colour (NC)**

*lab*lrj*	0.72	−0.495	−0.06
*lab*tce*	0.75	0.5	0.52
*lab*ncE*	0.0	0.5	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	52.11	−69.86	11.28
*LAB*LABa*	52.11	−69.92	11.26
*LAB*TCHa*	50.0	70.83	170.85

relative* CIELAB *lab*

*lab*lab*	0.441	−0.986	0.159
*lab*tch*	0.5	1.0	0.475
*lab*nch*	0.0	1.0	0.475

***relative* Natural Colour (NC)**

*lab*lrj*	0.441	−0.991	−0.122
*lab*tce*	0.5	1.0	0.52
*lab*ncE*	0.0	1.0	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	0.05	0.0
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	35.06	−34.88	5.65
*LAB*LABa*	35.06	−34.96	5.63
*LAB*TCHa*	25.01	35.42	170.85

relative* CIELAB *lab*

*lab*lab*	0.22	−0.493	0.079
*lab*tch*	0.25	0.5	0.475
*lab*nch*	0.5	0.5	0.475

***relative* Natural Colour (NC)**

*lab*lrj*	0.22	−0.495	−0.06
*lab*tce*	0.25	0.5	0.52
*lab*ncE*	0.5	0.5	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.1	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

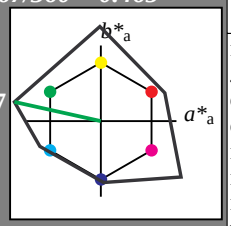
UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	79.24	−57.1	12.67
*LAB*LABa*	79.24	−57.13	12.67
*LAB*TCHa*	75.0	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.791	−0.487	0.108
*lab*tch*	0.75	0.5	0.465
*lab*nch*	0.0	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.791	−0.497	−0.037
*lab*tce*	0.75	0.5	0.512
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	63.07	−114.22	25.35
*LAB*LABa*	63.07	−114.26	25.34
*LAB*TCHa*	50.0	117.05	167.5

relative* CIELAB *lab*

*lab*lab*	0.582	−0.975	0.216
*lab*tch*	0.5	1.0	0.465
*lab*nch*	0.0	1.0	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.582	−0.996	−0.074
*lab*tce*	0.5	1.0	0.512
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	40.54	−57.06	12.69
*LAB*LABa*	40.54	−57.13	12.67
*LAB*TCHa*	25.01	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.291	−0.487	0.108
*lab*tch*	0.25	0.5	0.465
*lab*nch*	0.5	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.291	−0.497	−0.037
*lab*tce*	0.25	0.5	0.512
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

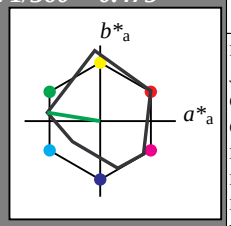
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.0 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

0,25 0,50 0,75 1,00

chromaticness *c**

blackness *n**

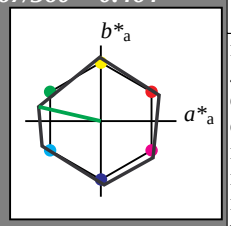
UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

0,25 0,50 0,75 1,00

chromaticness *c**

blackness *n**

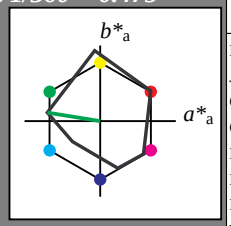
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

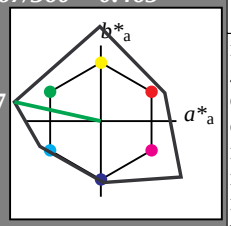
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 171/360 = 0.475 (left)

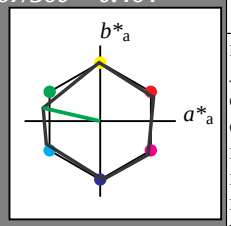
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	−37.69	8.7
*LAB*LABa*	76.05	−37.72	8.7
*LAB*TCHa*	75.0	38.72	167.02

relative* CIELAB *lab*

*lab*lab*	0.75	−0.486	0.112
*lab*tch*	0.75	0.5	0.464
*lab*nch*	0.0	0.5	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	−0.498	−0.033
*lab*tce*	0.75	0.5	0.511
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	−75.39	17.41
*LAB*LABa*	56.7	−75.44	17.39
*LAB*TCHa*	50.0	77.43	167.02

relative* CIELAB *lab*

*lab*lab*	0.5	−0.973	0.225
*lab*tch*	0.5	1.0	0.464
*lab*nch*	0.0	1.0	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	−0.996	−0.067
*lab*tce*	0.5	1.0	0.511
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	−37.64	8.72
*LAB*LABa*	37.36	−37.72	8.7
*LAB*TCHa*	25.01	38.72	167.02

relative* CIELAB *lab*

*lab*lab*	0.25	−0.486	0.112
*lab*tch*	0.25	0.5	0.464
*lab*nch*	0.5	0.5	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	−0.498	−0.033
*lab*tce*	0.25	0.5	0.511
*lab*ncE*	0.5	0.5	g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

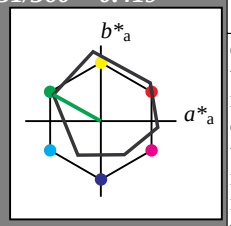
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	73.15	−31.94	20.73
*LAB*LABa*	73.15	−31.38	17.47
*LAB*TCHa*	75.0	35.93	150.91

relative* CIELAB *lab*

*lab*lab*	0.712	−0.436	0.243
*lab*tch*	0.75	0.5	0.419
*lab*nch*	0.0	0.5	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.712	−0.478	0.144
*lab*tce*	0.75	0.5	0.453
*lab*ncE*	0.0	0.5	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	50.9	−62.91	36.69
*LAB*LABa*	50.9	−62.78	34.94
*LAB*TCHa*	50.0	71.86	150.91

relative* CIELAB *lab*

*lab*lab*	0.425	−0.873	0.486
*lab*tch*	0.5	1.0	0.419
*lab*nch*	0.0	1.0	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.425	−0.956	0.289
*lab*tce*	0.5	1.0	0.453
*lab*ncE*	0.0	1.0	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	34.46	−31.2	18.11
*LAB*LABa*	34.46	−31.38	17.47
*LAB*TCHa*	25.01	35.93	150.91

relative* CIELAB *lab*

*lab*lab*	0.213	−0.436	0.243
*lab*tch*	0.25	0.5	0.419
*lab*nch*	0.5	0.5	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.213	−0.478	0.144
*lab*tce*	0.25	0.5	0.453
*lab*ncE*	0.5	0.5	j81g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

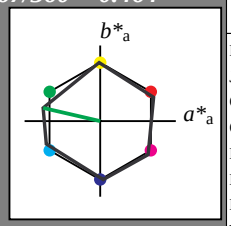
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	−37.69	8.7
*LAB*LABa*	76.05	−37.72	8.7
*LAB*TCHa*	75.0	38.72	167.02

relative* CIELAB *lab*

*lab*lab*	0.75	−0.486	0.112
*lab*tch*	0.75	0.5	0.464
*lab*nch*	0.0	0.5	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	−0.498	−0.033
*lab*tce*	0.75	0.5	0.511
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	−37.64	8.72
*LAB*LABa*	37.36	−37.72	8.7
*LAB*TCHa*	25.01	38.72	167.02

relative* CIELAB *lab*

*lab*lab*	0.25	−0.486	0.112
*lab*tch*	0.25	0.5	0.464
*lab*nch*	0.5	0.5	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	−0.498	−0.033
*lab*tce*	0.25	0.5	0.511
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	−75.39	17.41
*LAB*LABa*	56.7	−75.44	17.39
*LAB*TCHa*	50.0	77.43	167.02

relative* CIELAB *lab*

*lab*lab*	0.5	−0.973	0.225
*lab*tch*	0.5	1.0	0.464
*lab*nch*	0.0	1.0	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	−0.996	−0.067
*lab*tce*	0.5	1.0	0.511
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

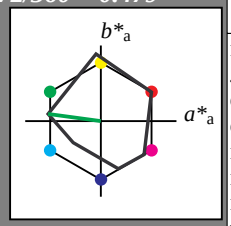
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	73.75	−35.42	8.02
*LAB*LABa*	73.75	−34.85	4.72
*LAB*TCHa*	75.0	35.18	172.29

relative* CIELAB *lab*

*lab*lab*	0.72	−0.494	0.067
*lab*tch*	0.75	0.5	0.479
*lab*nch*	0.0	0.5	0.479

***relative* Natural Colour (NC)**

*lab*lrj*	0.72	−0.496	−0.056
*lab*tce*	0.75	0.5	0.518
*lab*ncE*	0.0	0.5	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	35.06	−34.67	5.41
*LAB*LABa*	35.06	−34.85	4.72
*LAB*TCHa*	25.01	35.18	172.29

relative* CIELAB *lab*

*lab*lab*	0.22	−0.494	0.067
*lab*tch*	0.25	0.5	0.479
*lab*nch*	0.5	0.5	0.479

***relative* Natural Colour (NC)**

*lab*lrj*	0.22	−0.496	−0.056
*lab*tce*	0.25	0.5	0.518
*lab*ncE*	0.5	0.5	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	52.11	−69.86	11.28
*LAB*LABa*	52.11	−69.71	9.44
*LAB*TCHa*	50.0	70.36	172.29

relative* CIELAB *lab*

*lab*lab*	0.441	−0.99	0.134
*lab*tch*	0.5	1.0	0.479
*lab*nch*	0.0	1.0	0.479

***relative* Natural Colour (NC)**

*lab*lrj*	0.441	−0.992	−0.114
*lab*tce*	0.5	1.0	0.518
*lab*ncE*	0.0	1.0	g07b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

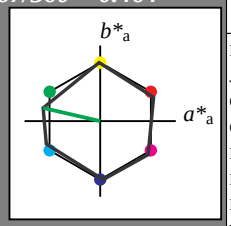
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

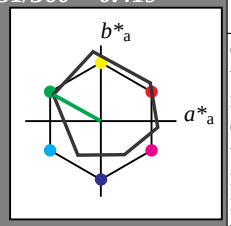
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

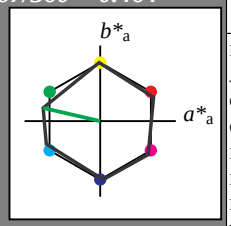
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

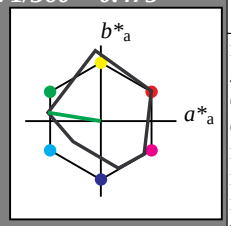
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

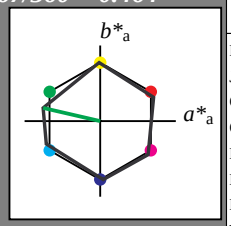
*n** = 1,0

3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System NRS18
for hue *h* = lab*h = 167/360 = 0.464*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

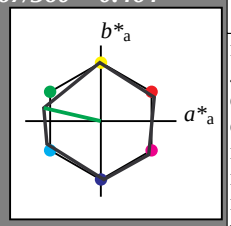
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System NRS18
for hue *h* = lab*h = 167/360 = 0.464*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

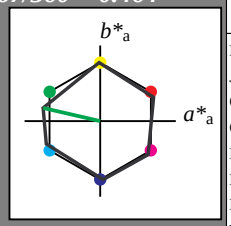
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

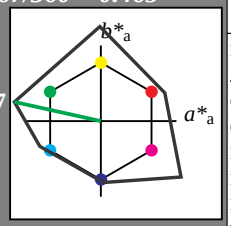
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

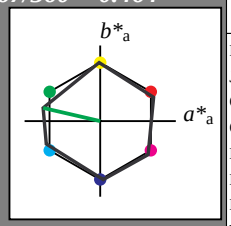
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

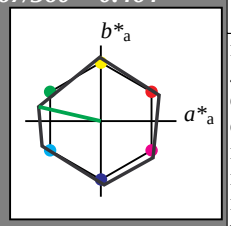
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

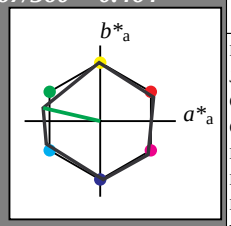
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

0,25 0,50 0,75 1,00

blackness n^*

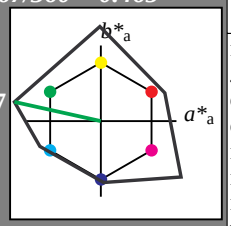
chromaticness c^*

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

0,25 0,50 0,75 1,00

blackness n^*

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

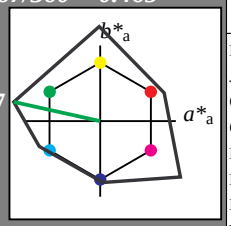
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	79.24	−57.1	12.67
*LAB*LABa*	79.24	−57.13	12.67
*LAB*TCHa*	75.0	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.791	−0.487	0.108
*lab*tch*	0.75	0.5	0.465
*lab*nch*	0.0	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.791	−0.497	−0.037
*lab*tce*	0.75	0.5	0.512
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	1.0	0.0	1.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	63.07	−114.22	25.35
*LAB*LABa*	63.07	−114.26	25.34
*LAB*TCHa*	50.0	117.05	167.5

relative* CIELAB *lab*

*lab*lab*	0.582	−0.975	0.216
*lab*tch*	0.5	1.0	0.465
*lab*nch*	0.0	1.0	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.582	−0.996	−0.074
*lab*tce*	0.5	1.0	0.512
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	40.54	−57.06	12.69
*LAB*LABa*	40.54	−57.13	12.67
*LAB*TCHa*	25.01	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.291	−0.487	0.108
*lab*tch*	0.25	0.5	0.465
*lab*nch*	0.5	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.291	−0.497	−0.037
*lab*tce*	0.25	0.5	0.512
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

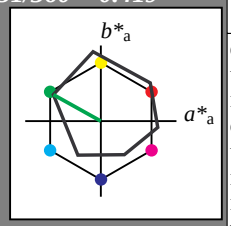
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	73.15	−31.94	20.73
*LAB*LABa*	73.15	−31.38	17.47
*LAB*TCHa*	75.0	35.93	150.91

relative* CIELAB *lab*

*lab*lab*	0.712	−0.436	0.243
*lab*tch*	0.75	0.5	0.419
*lab*nch*	0.0	0.5	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.712	−0.478	0.144
*lab*tce*	0.75	0.5	0.453
*lab*ncE*	0.0	0.5	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	50.9	−62.91	36.69
*LAB*LABa*	50.9	−62.78	34.94
*LAB*TCHa*	50.0	71.86	150.91

relative* CIELAB *lab*

*lab*lab*	0.425	−0.873	0.486
*lab*tch*	0.5	1.0	0.419
*lab*nch*	0.0	1.0	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.425	−0.956	0.289
*lab*tce*	0.5	1.0	0.453
*lab*ncE*	0.0	1.0	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	34.46	−31.2	18.11
*LAB*LABa*	34.46	−31.38	17.47
*LAB*TCHa*	25.01	35.93	150.91

relative* CIELAB *lab*

*lab*lab*	0.213	−0.436	0.243
*lab*tch*	0.25	0.5	0.419
*lab*nch*	0.5	0.5	0.419

***relative* Natural Colour (NC)**

*lab*lrj*	0.213	−0.478	0.144
*lab*tce*	0.25	0.5	0.453
*lab*ncE*	0.5	0.5	j81g

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

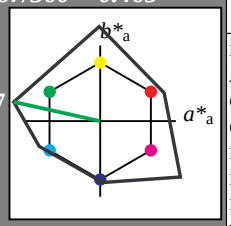
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	79.24	−57.1	12.67
*LAB*LABa*	79.24	−57.13	12.67
*LAB*TCHa*	75.0	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.791	−0.487	0.108
*lab*tch*	0.75	0.5	0.465
*lab*nch*	0.0	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.791	−0.497	−0.037
*lab*tce*	0.75	0.5	0.512
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	63.07	−114.22	25.35
*LAB*LABa*	63.07	−114.26	25.34
*LAB*TCHa*	50.0	117.05	167.5

relative* CIELAB *lab*

*lab*lab*	0.582	−0.975	0.216
*lab*tch*	0.5	1.0	0.465
*lab*nch*	0.0	1.0	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.582	−0.996	−0.074
*lab*tce*	0.5	1.0	0.512
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	40.54	−57.06	12.69
*LAB*LABa*	40.54	−57.13	12.67
*LAB*TCHa*	25.01	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.291	−0.487	0.108
*lab*tch*	0.25	0.5	0.465
*lab*nch*	0.5	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.291	−0.497	−0.037
*lab*tce*	0.25	0.5	0.512
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

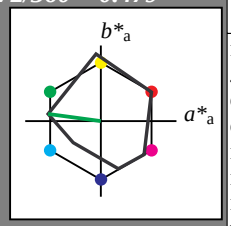
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	73.75	−35.42	8.02
*LAB*LABa*	73.75	−34.85	4.72
*LAB*TCHa*	75.0	35.18	172.29

relative* CIELAB *lab*

*lab*lab*	0.72	−0.494	0.067
*lab*tch*	0.75	0.5	0.479
*lab*nch*	0.0	0.5	0.479

***relative* Natural Colour (NC)**

*lab*lrj*	0.72	−0.496	−0.056
*lab*tce*	0.75	0.5	0.518
*lab*ncE*	0.0	0.5	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	52.11	−69.86	11.28
*LAB*LABa*	52.11	−69.71	9.44
*LAB*TCHa*	50.0	70.36	172.29

relative* CIELAB *lab*

*lab*lab*	0.441	−0.99	0.134
*lab*tch*	0.5	1.0	0.479
*lab*nch*	0.0	1.0	0.479

***relative* Natural Colour (NC)**

*lab*lrj*	0.441	−0.992	−0.114
*lab*tce*	0.5	1.0	0.518
*lab*ncE*	0.0	1.0	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	35.06	−34.67	5.41
*LAB*LABa*	35.06	−34.85	4.72
*LAB*TCHa*	25.01	35.18	172.29

relative* CIELAB *lab*

*lab*lab*	0.22	−0.494	0.067
*lab*tch*	0.25	0.5	0.479
*lab*nch*	0.5	0.5	0.479

***relative* Natural Colour (NC)**

*lab*lrj*	0.22	−0.496	−0.056
*lab*tce*	0.25	0.5	0.518
*lab*ncE*	0.5	0.5	g07b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

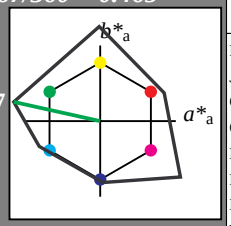
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

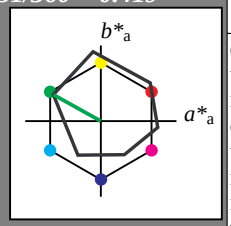
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

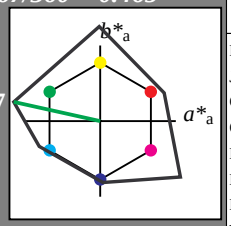
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

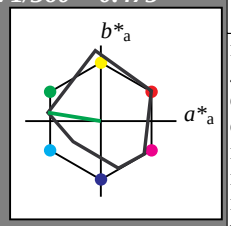
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

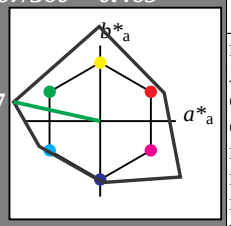
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

triangle lightness t^*

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	79.24	−57.1	12.67
*LAB*LABa*	79.24	−57.13	12.67
*LAB*TCHa*	75.0	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.791	−0.487	0.108
*lab*tch*	0.75	0.5	0.465
*lab*nch*	0.0	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.791	−0.497	−0.037
*lab*tce*	0.75	0.5	0.512
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	63.07	−114.22	25.35
*LAB*LABa*	63.07	−114.26	25.34
*LAB*TCHa*	50.0	117.05	167.5

relative* CIELAB *lab*

*lab*lab*	0.582	−0.975	0.216
*lab*tch*	0.5	1.0	0.465
*lab*nch*	0.0	1.0	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.582	−0.996	−0.074
*lab*tce*	0.5	1.0	0.512
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	40.54	−57.06	12.69
*LAB*LABa*	40.54	−57.13	12.67
*LAB*TCHa*	25.01	58.52	167.5

relative* CIELAB *lab*

*lab*lab*	0.291	−0.487	0.108
*lab*tch*	0.25	0.5	0.465
*lab*nch*	0.5	0.5	0.465

***relative* Natural Colour (NC)**

*lab*lrj*	0.291	−0.497	−0.037
*lab*tce*	0.25	0.5	0.512
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

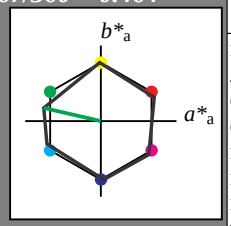
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

triangle lightness t^*

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	0.5	(1.0)
*cmyn3**	0.5	0.0	0.5	(0.0)
*olvi4**	0.5	1.0	0.5	1.0
*cmyn4**	0.5	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	−37.69	8.7
*LAB*LABa*	76.05	−37.72	8.7
*LAB*TCHa*	75.0	38.72	167.02

relative* CIELAB *lab*

*lab*lab*	0.75	−0.486	0.112
*lab*tch*	0.75	0.5	0.464
*lab*nch*	0.0	0.5	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	−0.498	−0.033
*lab*tce*	0.75	0.5	0.511
*lab*ncE*	0.0	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	0.0	(1.0)
*cmyn3**	1.0	0.0	1.0	(0.0)
*olvi4**	0.0	1.0	0.0	1.0
*cmyn4**	1.0	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	−75.39	17.41
*LAB*LABa*	56.7	−75.44	17.39
*LAB*TCHa*	50.0	77.43	167.02

relative* CIELAB *lab*

*lab*lab*	0.5	−0.973	0.225
*lab*tch*	0.5	1.0	0.464
*lab*nch*	0.0	1.0	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	−0.996	−0.067
*lab*tce*	0.5	1.0	0.511
*lab*ncE*	0.0	1.0	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.0	(1.0)
*cmyn3**	1.0	0.5	1.0	(0.0)
*olvi4**	0.5	1.0	0.5	0.5
*cmyn4**	0.5	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	−37.64	8.72
*LAB*LABa*	37.36	−37.72	8.7
*LAB*TCHa*	25.01	38.72	167.02

relative* CIELAB *lab*

*lab*lab*	0.25	−0.486	0.112
*lab*tch*	0.25	0.5	0.464
*lab*nch*	0.5	0.5	0.464

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	−0.498	−0.033
*lab*tce*	0.25	0.5	0.511
*lab*ncE*	0.5	0.5	g04b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

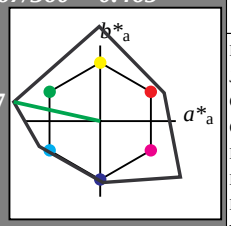
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

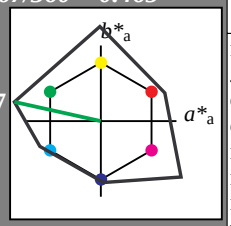
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

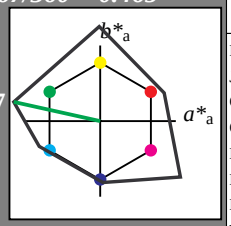
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0



triangle lightness t^*

NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

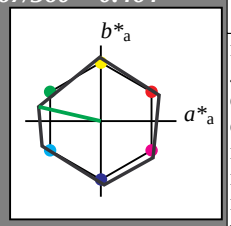
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0



triangle lightness t^*

NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

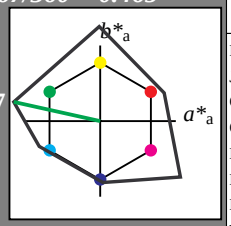
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

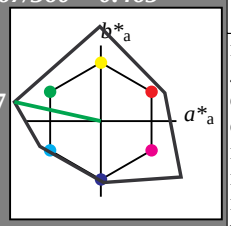
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

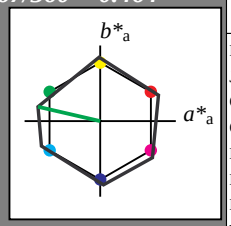
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

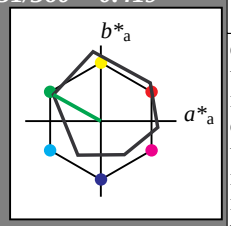
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

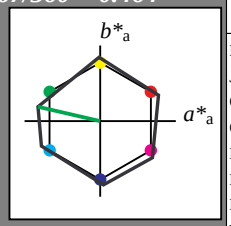
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

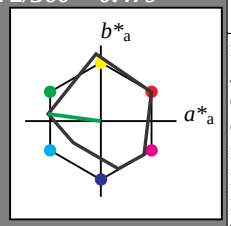
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

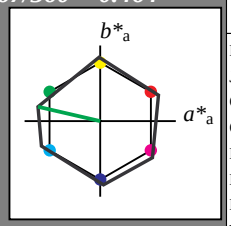
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

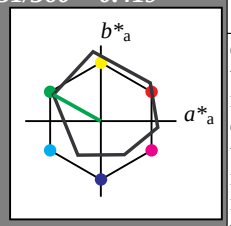
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

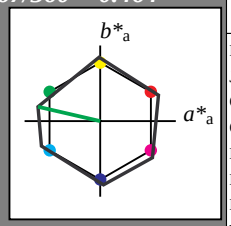
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

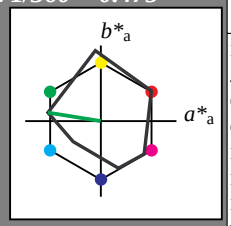
chromaticness c^*

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

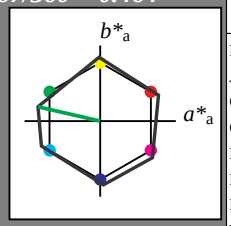
3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

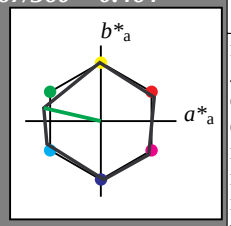
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

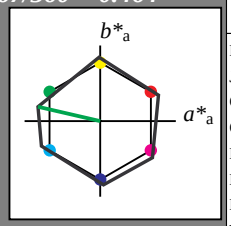
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

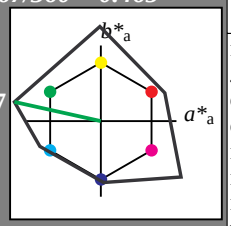
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

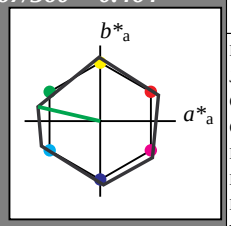
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 167/360 = 0.464$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

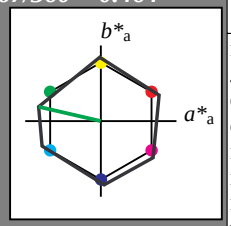
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 167/360 = 0.464$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

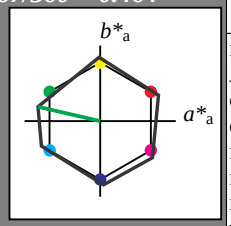
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

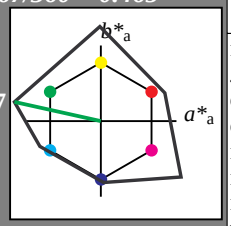
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.464 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

*n** = 1,0

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

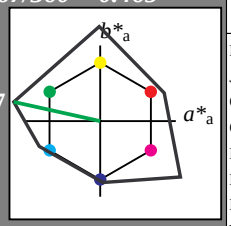
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

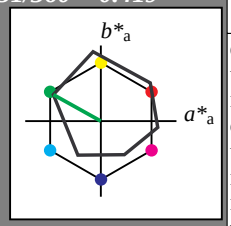
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

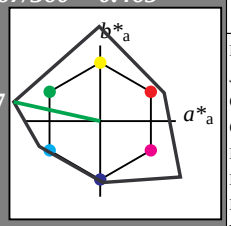
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 0.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

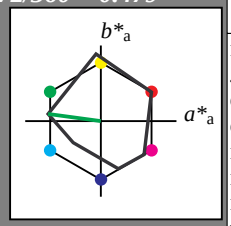
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 172/360 = 0.479$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 70 172
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −35.42 8.02
*LAB*LABa* 73.75 −34.85 4.72
*LAB*TCHa* 75.0 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.72 −0.494 0.067
*lab*tch* 0.75 0.5 0.479
*lab*nch* 0.0 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.496 −0.056
*lab*tce* 0.75 0.5 0.518
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.71 9.44
*LAB*TCHa* 50.0 70.36 172.29
relative* CIELAB *lab*
*lab*lab* 0.441 −0.99 0.134
*lab*tch* 0.5 1.0 0.479
*lab*nch* 0.0 1.0 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.992 −0.114
*lab*tce* 0.5 1.0 0.518
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.67 5.41
*LAB*LABa* 35.06 −34.85 4.72
*LAB*TCHa* 25.01 35.18 172.29
relative* CIELAB *lab*
*lab*lab* 0.22 −0.494 0.067
*lab*tch* 0.25 0.5 0.479
*lab*nch* 0.5 0.5 0.479
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.496 −0.056
*lab*tce* 0.25 0.5 0.518
*lab*ncE* 0.5 0.5 g07b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

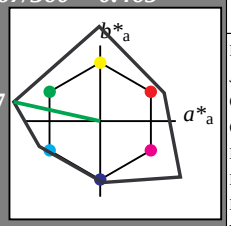
3 step scales for constant CIELAB hue 172/360 = 0.479 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (0.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

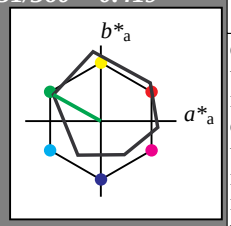
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 151/360 = 0.419$
*lab*tch* and *lab*nch*

D65: hue L
LCH*Ma: 51 72 151
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.15 −31.94 20.73
*LAB*LABa* 73.15 −31.38 17.47
*LAB*TCHa* 75.0 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.712 −0.436 0.243
*lab*tch* 0.75 0.5 0.419
*lab*nch* 0.0 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.712 −0.478 0.144
*lab*tce* 0.75 0.5 0.453
*lab*ncE* 0.0 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.46 −31.2 18.11
*LAB*LABa* 34.46 −31.38 17.47
*LAB*TCHa* 25.01 35.93 150.91
relative* CIELAB *lab*
*lab*lab* 0.213 −0.436 0.243
*lab*tch* 0.25 0.5 0.419
*lab*nch* 0.5 0.5 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.213 −0.478 0.144
*lab*tce* 0.25 0.5 0.453
*lab*ncE* 0.5 0.5 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.9 −62.91 36.69
*LAB*LABa* 50.9 −62.78 34.94
*LAB*TCHa* 50.0 71.86 150.91
relative* CIELAB *lab*
*lab*lab* 0.425 −0.873 0.486
*lab*tch* 0.5 1.0 0.419
*lab*nch* 0.0 1.0 0.419
***relative* Natural Colour (NC)**
*lab*lrj* 0.425 −0.956 0.289
*lab*tce* 0.5 1.0 0.453
*lab*ncE* 0.0 1.0 j81g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

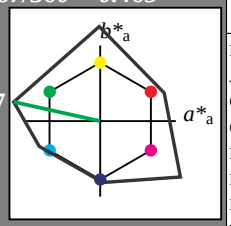
3 step scales for constant CIELAB hue 151/360 = 0.419 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

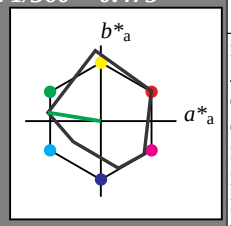
chromaticness c^*

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 171/360 = 0.475$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 52 71 171
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 73.75 −34.92 5.64
*LAB*LABa* 73.75 −34.96 5.63
*LAB*TCHa* 75.0 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.72 −0.493 0.079
*lab*tch* 0.75 0.5 0.475
*lab*nch* 0.0 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 −0.495 −0.06
*lab*tce* 0.75 0.5 0.52
*lab*ncE* 0.0 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.06 −34.88 5.65
*LAB*LABa* 35.06 −34.96 5.63
*LAB*TCHa* 25.01 35.42 170.85
relative* CIELAB *lab*
*lab*lab* 0.22 −0.493 0.079
*lab*tch* 0.25 0.5 0.475
*lab*nch* 0.5 0.5 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 −0.495 −0.06
*lab*tce* 0.25 0.5 0.52
*lab*ncE* 0.5 0.5 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.11 −69.86 11.28
*LAB*LABa* 52.11 −69.92 11.26
*LAB*TCHa* 50.0 70.83 170.85
relative* CIELAB *lab*
*lab*lab* 0.441 −0.986 0.159
*lab*tch* 0.5 1.0 0.475
*lab*nch* 0.0 1.0 0.475
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 −0.991 −0.122
*lab*tce* 0.5 1.0 0.52
*lab*ncE* 0.0 1.0 g07b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

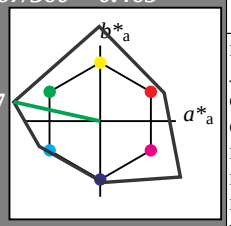
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

3 step scales for constant CIELAB hue 171/360 = 0.475 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

triangle lightness t^*

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

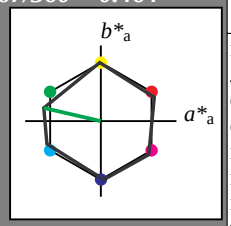
0,25 0,50 0,75 1,00

chromaticness c^*

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 77 167
olv*Ma: 0.0 1.0 0.0



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

triangle lightness t^*

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −37.69 8.7
*LAB*LABa* 76.05 −37.72 8.7
*LAB*TCHa* 75.0 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −37.64 8.72
*LAB*LABa* 37.36 −37.72 8.7
*LAB*TCHa* 25.01 38.72 167.02
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −75.39 17.41
*LAB*LABa* 56.7 −75.44 17.39
*LAB*TCHa* 50.0 77.43 167.02
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

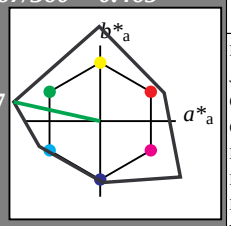
3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

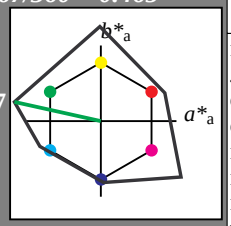
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.13 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.791 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.791 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 40.54 −57.06 12.69
*LAB*LABa* 40.54 −57.13 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.291 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.291 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.26 25.34
*LAB*TCHa* 50.0 117.05 167.5
relative* CIELAB *lab*
*lab*lab* 0.582 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.582 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

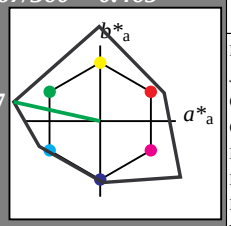
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 167/360 = 0.465$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

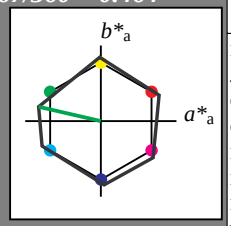
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 167/360 = 0.464$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 84 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −41.1 9.49
*LAB*LABa* 74.3 −41.12 9.49
*LAB*TCHa* 75.0 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.75 −0.486 0.112
*lab*tch* 0.75 0.5 0.464
*lab*nch* 0.0 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.498 −0.033
*lab*tce* 0.75 0.5 0.511
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −82.21 18.98
*LAB*LABa* 53.2 −82.25 18.97
*LAB*TCHa* 50.0 84.42 167.01
relative* CIELAB *lab*
*lab*lab* 0.5 −0.973 0.225
*lab*tch* 0.5 1.0 0.464
*lab*nch* 0.0 1.0 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.996 −0.067
*lab*tce* 0.5 1.0 0.511
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −41.06 9.5
*LAB*LABa* 32.1 −41.12 9.49
*LAB*TCHa* 25.01 42.21 167.01
relative* CIELAB *lab*
*lab*lab* 0.25 −0.486 0.112
*lab*tch* 0.25 0.5 0.464
*lab*nch* 0.5 0.5 0.464
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.498 −0.033
*lab*tce* 0.25 0.5 0.511
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

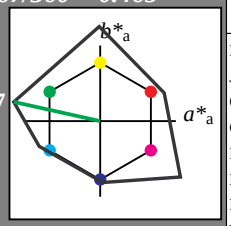
UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

3 step scales for constant CIELAB hue 167/360 = 0.464 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

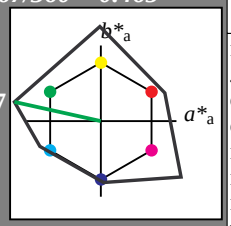
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 167/360 = 0.465 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 167/360 = 0.465$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 63 117 167
olv*Ma: 0.0 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 0.0 0.5 (0.0)
*olvi4** 0.5 1.0 0.5 1.0
*cmyn4** 0.5 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 79.24 −57.1 12.67
*LAB*LABa* 79.24 −57.12 12.67
*LAB*TCHa* 75.0 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.808 −0.487 0.108
*lab*tch* 0.75 0.5 0.465
*lab*nch* 0.0 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.808 −0.497 −0.037
*lab*tce* 0.75 0.5 0.512
*lab*ncE* 0.0 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.0 (1.0)
*cmyn3** 1.0 0.0 1.0 (0.0)
*olvi4** 0.0 1.0 0.0 1.0
*cmyn4** 1.0 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 63.07 −114.22 25.35
*LAB*LABa* 63.07 −114.25 25.34
*LAB*TCHa* 50.0 117.04 167.5
relative* CIELAB *lab*
*lab*lab* 0.617 −0.975 0.216
*lab*tch* 0.5 1.0 0.465
*lab*nch* 0.0 1.0 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.617 −0.996 −0.074
*lab*tce* 0.5 1.0 0.512
*lab*ncE* 0.0 1.0 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.0 (1.0)
*cmyn3** 1.0 0.5 1.0 (0.0)
*olvi4** 0.5 1.0 0.5 0.5
*cmyn4** 0.5 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −57.07 12.69
*LAB*LABa* 37.04 −57.12 12.67
*LAB*TCHa* 25.01 58.52 167.5
relative* CIELAB *lab*
*lab*lab* 0.309 −0.487 0.108
*lab*tch* 0.25 0.5 0.465
*lab*nch* 0.5 0.5 0.465
***relative* Natural Colour (NC)**
*lab*lrj* 0.309 −0.497 −0.037
*lab*tce* 0.25 0.5 0.512
*lab*ncE* 0.5 0.5 g04b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

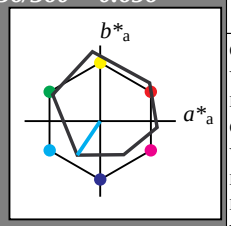
3 step scales for constant CIELAB hue 167/360 = 0.465 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

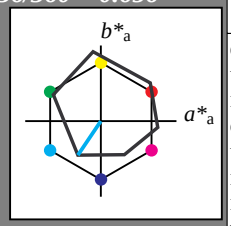
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

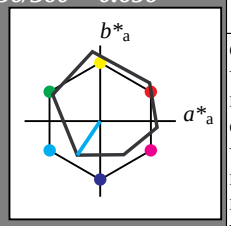
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

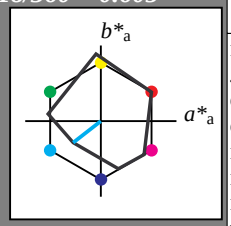
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

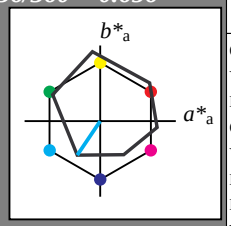
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

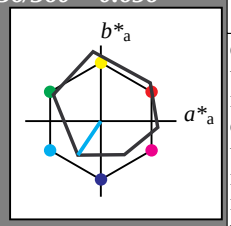
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

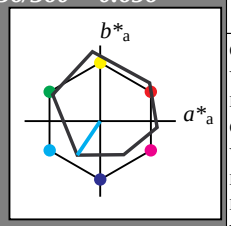
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

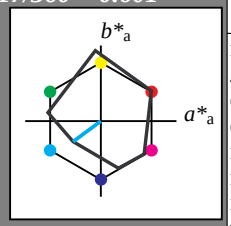
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

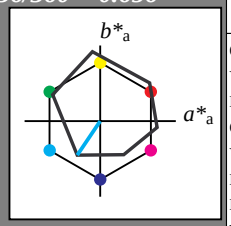
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

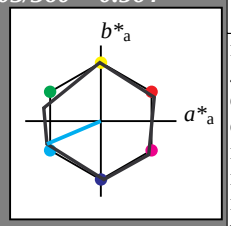
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

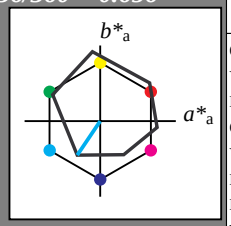
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

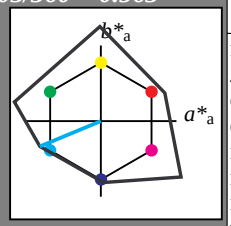
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

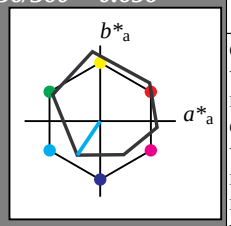
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
lab*tch* and *lab*nch

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

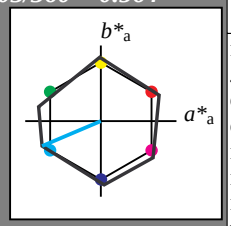
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

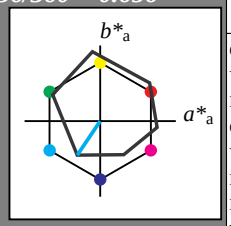
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

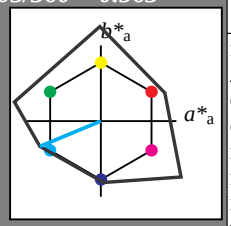
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

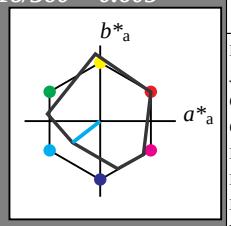
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

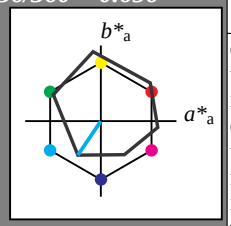
UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

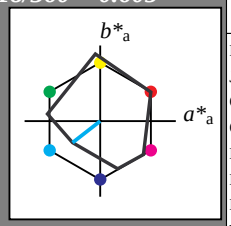
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System MRS18
for hue *h = *lab*h* = 218/360 = 0.605**
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

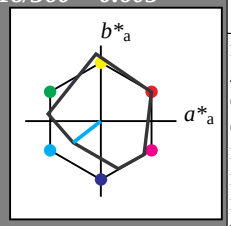
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

Output: Colorimetric Reflective System MRS18
for hue *h = *lab*h* = 218/360 = 0.605**
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

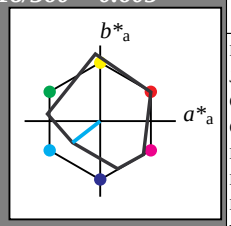
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

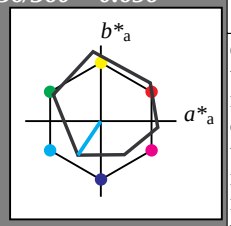
UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

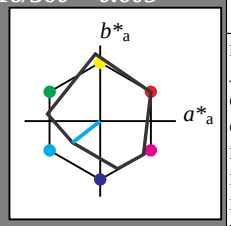
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

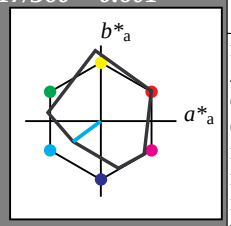
UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

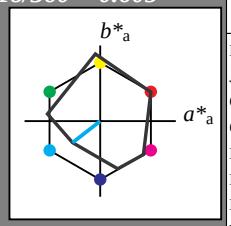
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

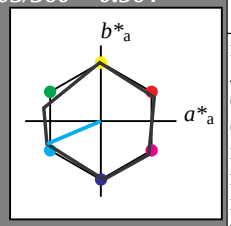
UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

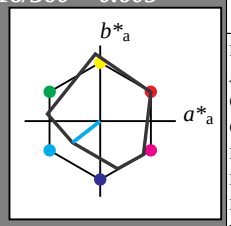
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

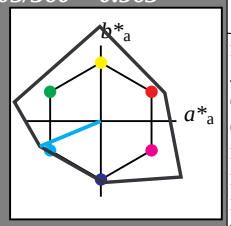
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

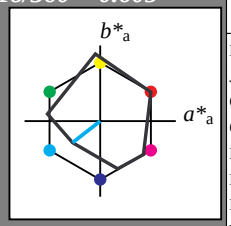
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

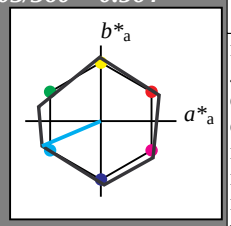
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

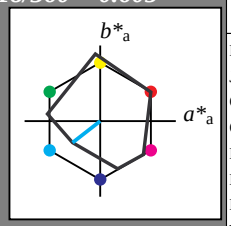
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

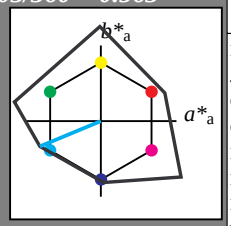
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 218/360 = 0.605 (left)

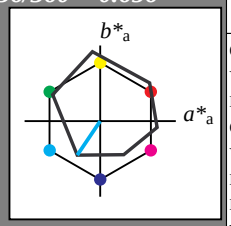
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

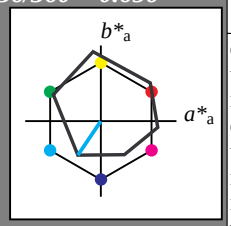
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

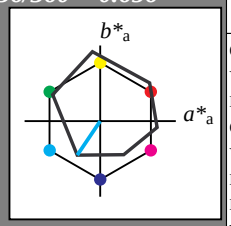
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

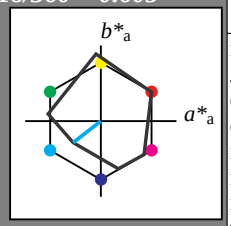
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

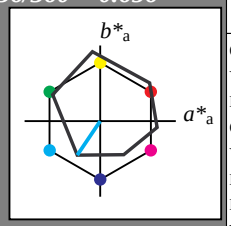
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 236/360 = 0.656$
lab*tch* and *lab*nch

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

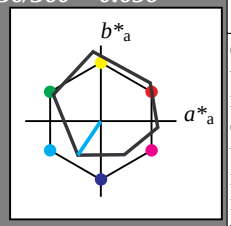
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 236/360 = 0.656$
lab*tch* and *lab*nch

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

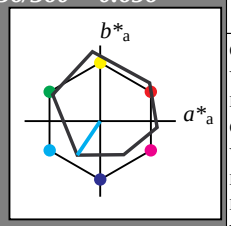
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

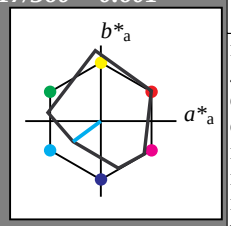
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

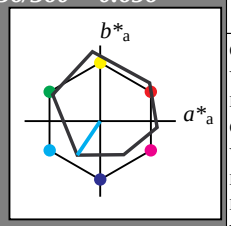
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

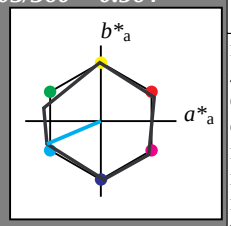
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

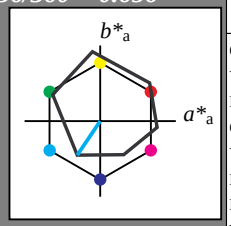
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

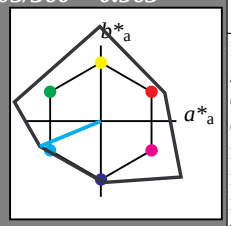
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

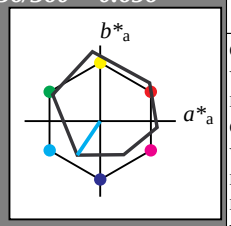
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

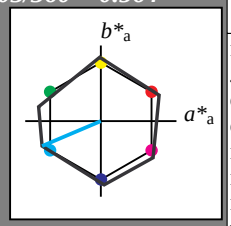
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

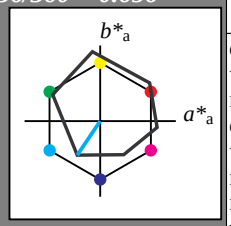
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

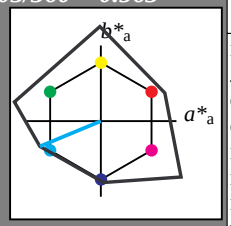
UE100−7, 3 step scales for constant CIELAB hue 236/360 = 0.656 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

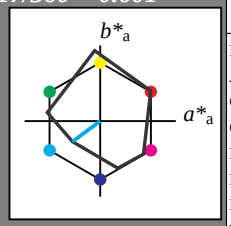
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

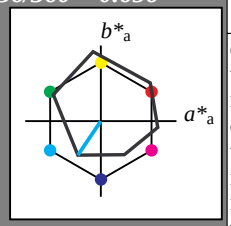
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

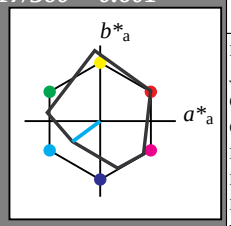
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

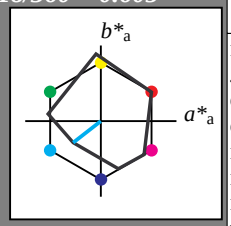
UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

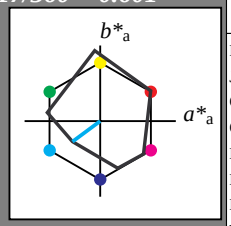
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

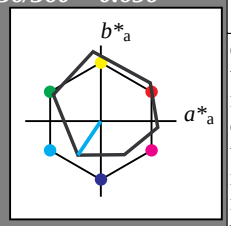
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

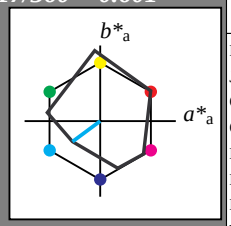
UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 217/360 = 0.601$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

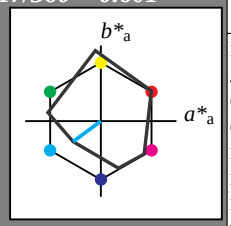
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

Output: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 217/360 = 0.601$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

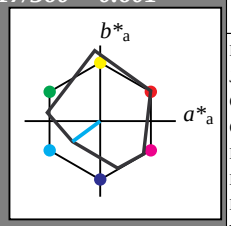
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

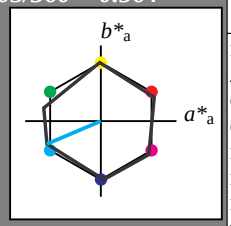
UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

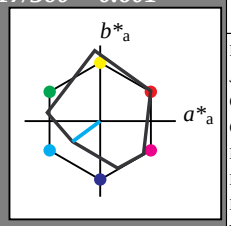
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

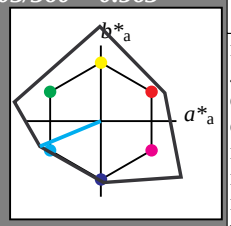
UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

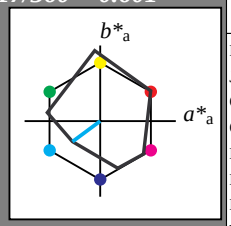
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

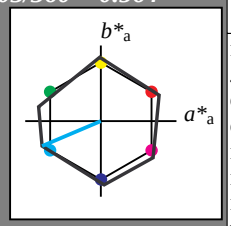
UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

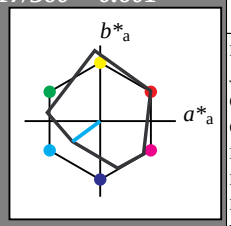
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

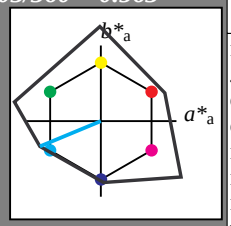
UE100−7, 3 step scales for constant CIELAB hue 217/360 = 0.601 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

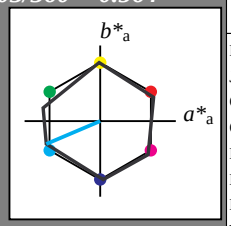
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

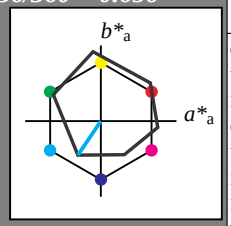
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

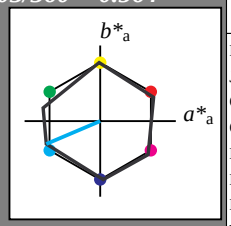
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	1.0	(1.0)
*cmyn3**	0.5	0.0	0.0	(0.0)
*olvi4**	0.5	1.0	1.0	1.0
*cmyn4**	0.5	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	−35.6	−15.11
*LAB*LABa*	76.05	−35.63	−15.11
*LAB*TCHa*	75.0	38.72	202.99

relative* CIELAB *lab*

*lab*lab*	0.75	−0.459	−0.194
*lab*tch*	0.75	0.5	0.564
*lab*nch*	0.0	0.5	0.564

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	−0.416	−0.275
*lab*tce*	0.75	0.5	0.593
*lab*ncE*	0.0	0.5	g37b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	1.0	(1.0)
*cmyn3**	1.0	0.0	0.0	(0.0)
*olvi4**	0.0	1.0	1.0	1.0
*cmyn4**	1.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	−71.22	−30.23
*LAB*LABa*	56.7	−71.28	−30.24
*LAB*TCHa*	50.0	77.44	202.99

relative* CIELAB *lab*

*lab*lab*	0.5	−0.919	−0.39
*lab*tch*	0.5	1.0	0.564
*lab*nch*	0.0	1.0	0.564

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	−0.833	−0.551
*lab*tce*	0.5	1.0	0.593
*lab*ncE*	0.0	1.0	g37b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	1.0	0.5	0.5	(0.0)
*olvi4**	0.5	1.0	1.0	0.5
*cmyn4**	0.5	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	−35.56	−15.09
*LAB*LABa*	37.36	−35.63	−15.11
*LAB*TCHa*	25.01	38.72	202.99

relative* CIELAB *lab*

*lab*lab*	0.25	−0.459	−0.194
*lab*tch*	0.25	0.5	0.564
*lab*nch*	0.5	0.5	0.564

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	−0.416	−0.275
*lab*tce*	0.25	0.5	0.593
*lab*ncE*	0.5	0.5	g37b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

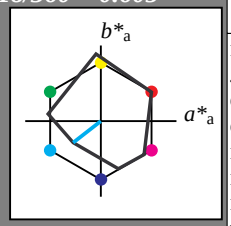
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	1.0	(1.0)
*cmyn3**	0.5	0.0	0.0	(0.0)
*olvi4**	0.5	1.0	1.0	1.0
*cmyn4**	0.5	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	70.21	−18.77	−11.17
*LAB*LABa*	70.21	−18.27	−14.23
*LAB*TCHa*	75.0	23.17	217.91

relative* CIELAB *lab*

*lab*lab*	0.674	−0.393	−0.306
*lab*tch*	0.75	0.5	0.605
*lab*nch*	0.0	0.5	0.605

***relative* Natural Colour (NC)**

*lab*lrj*	0.674	−0.353	−0.352
*lab*tce*	0.75	0.5	0.625
*lab*ncE*	0.0	0.5	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	1.0	(1.0)
*cmyn3**	1.0	0.0	0.0	(0.0)
*olvi4**	0.0	1.0	1.0	1.0
*cmyn4**	1.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	45.03	−36.57	−27.11
*LAB*LABa*	45.03	−36.56	−28.47
*LAB*TCHa*	50.0	46.35	217.91

relative* CIELAB *lab*

*lab*lab*	0.349	−0.788	−0.613
*lab*tch*	0.5	1.0	0.605
*lab*nch*	0.0	1.0	0.605

***relative* Natural Colour (NC)**

*lab*lrj*	0.349	−0.706	−0.706
*lab*tce*	0.5	1.0	0.625
*lab*ncE*	0.0	1.0	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	1.0	0.5	0.5	(0.0)
*olvi4**	0.5	1.0	1.0	0.5
*cmyn4**	0.5	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	31.52	−18.03	−13.78
*LAB*LABa*	31.52	−18.27	−14.23
*LAB*TCHa*	25.01	23.17	217.91

relative* CIELAB *lab*

*lab*lab*	0.175	−0.393	−0.306
*lab*tch*	0.25	0.5	0.605
*lab*nch*	0.5	0.5	0.605

***relative* Natural Colour (NC)**

*lab*lrj*	0.175	−0.353	−0.352
*lab*tce*	0.25	0.5	0.625
*lab*ncE*	0.5	0.5	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

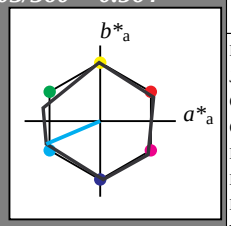
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

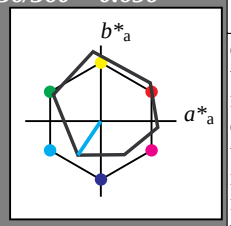
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

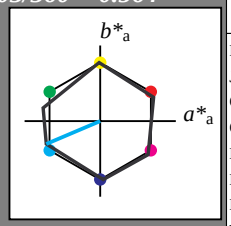
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

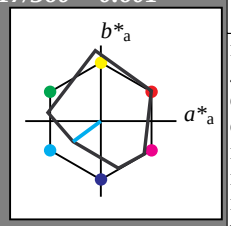
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

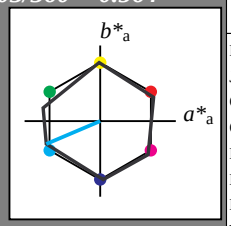
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System NRS18
for hue *h* = lab*h = 203/360 = 0.564*
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

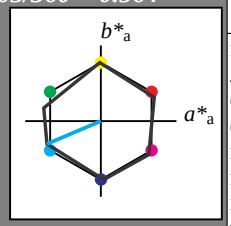
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NRS18
for hue *h* = lab*h = 203/360 = 0.564*
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

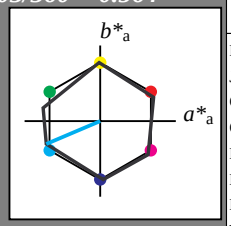
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

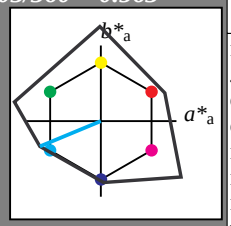
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

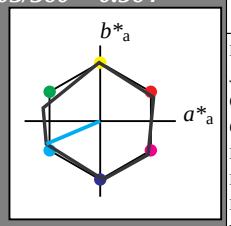
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

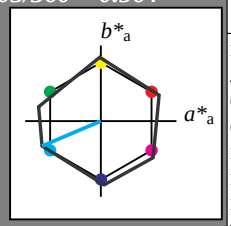
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

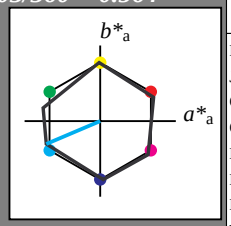
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

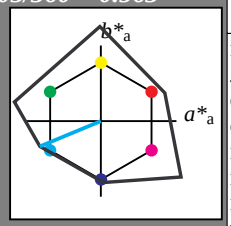
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

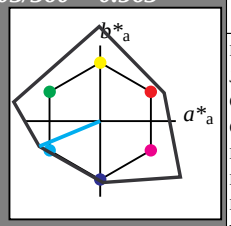
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NCS18

for hue *h* = lab*h = 203/360 = 0.563*
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

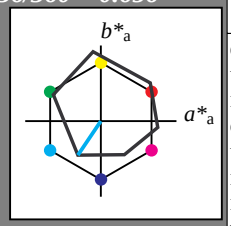
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System ORS18

for hue *h* = lab*h = 236/360 = 0.656*
lab*tch* and *lab*nch

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$

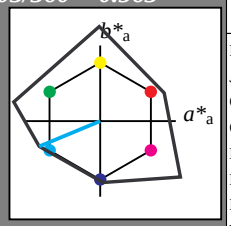
*lab*tch* and *lab*nch*

D65: hue G50B

LCH*Ma: 59 87 203

olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut

$u^*_{rel} = 136$

%Regularity

$g^*_{H,rel} = 46$

$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	1.0	(1.0)
*cmyn3**	0.5	0.0	0.0	(0.0)
*olvi4**	0.5	1.0	1.0	1.0
*cmyn4**	0.5	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	77.43	−40.26	−16.71
*LAB*LABa*	77.43	−40.29	−16.72
*LAB*TCHa*	75.0	43.64	202.54

relative* CIELAB *lab*

*lab*lab*	0.768	−0.461	−0.191
*lab*tch*	0.75	0.5	0.563
*lab*nch*	0.0	0.5	0.563

***relative* Natural Colour (NC)**

*lab*lrj*	0.768	−0.418	−0.272
*lab*tce*	0.75	0.5	0.592
*lab*ncE*	0.0	0.5	g36b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	1.0	(1.0)
*cmyn3**	1.0	0.0	0.0	(0.0)
*olvi4**	0.0	1.0	1.0	1.0
*cmyn4**	1.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	59.47	−80.55	−33.44
*LAB*LABa*	59.47	−80.6	−33.45
*LAB*TCHa*	50.0	87.28	202.54

relative* CIELAB *lab*

*lab*lab*	0.536	−0.922	−0.382
*lab*tch*	0.5	1.0	0.563
*lab*nch*	0.0	1.0	0.563

***relative* Natural Colour (NC)**

*lab*lrj*	0.536	−0.836	−0.546
*lab*tce*	0.5	1.0	0.592
*lab*ncE*	0.0	1.0	g36b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.5	(1.0)
*cmyn3**	1.0	0.5	0.5	(0.0)
*olvi4**	0.5	1.0	1.0	0.5
*cmyn4**	0.5	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	38.74	−40.22	−16.7
*LAB*LABa*	38.74	−40.29	−16.72
*LAB*TCHa*	25.01	43.64	202.54

relative* CIELAB *lab*

*lab*lab*	0.268	−0.461	−0.191
*lab*tch*	0.25	0.5	0.563
*lab*nch*	0.5	0.5	0.563

***relative* Natural Colour (NC)**

*lab*lrj*	0.268	−0.418	−0.272
*lab*tce*	0.25	0.5	0.592
*lab*ncE*	0.5	0.5	g36b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$

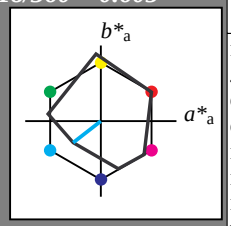
*lab*tch* and *lab*nch*

D65: hue G50B

LCH*Ma: 45 46 218

olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

$u^*_{rel} = 91$

%Regularity

$g^*_{H,rel} = 41$

$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	1.0	(1.0)
*cmyn3**	0.5	0.0	0.0	(0.0)
*olvi4**	0.5	1.0	1.0	1.0
*cmyn4**	0.5	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	70.21	−18.77	−11.17
*LAB*LABa*	70.21	−18.27	−14.23
*LAB*TCHa*	75.0	23.17	217.91

relative* CIELAB *lab*

*lab*lab*	0.674	−0.393	−0.306
*lab*tch*	0.75	0.5	0.605
*lab*nch*	0.0	0.5	0.605

***relative* Natural Colour (NC)**

*lab*lrj*	0.674	−0.353	−0.352
*lab*tce*	0.75	0.5	0.625
*lab*ncE*	0.0	0.5	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	1.0	(1.0)
*cmyn3**	1.0	0.0	0.0	(0.0)
*olvi4**	0.0	1.0	1.0	1.0
*cmyn4**	1.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	45.03	−36.57	−27.11
*LAB*LABa*	45.03	−36.56	−28.47
*LAB*TCHa*	50.0	46.35	217.91

relative* CIELAB *lab*

*lab*lab*	0.349	−0.788	−0.613
*lab*tch*	0.5	1.0	0.605
*lab*nch*	0.0	1.0	0.605

***relative* Natural Colour (NC)**

*lab*lrj*	0.349	−0.706	−0.706
*lab*tce*	0.5	1.0	0.625
*lab*ncE*	0.0	1.0	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.5	(1.0)
*cmyn3**	1.0	0.5	0.5	(0.0)
*olvi4**	0.5	1.0	1.0	0.5
*cmyn4**	0.5	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	31.52	−18.03	−13.78
*LAB*LABa*	31.52	−18.27	−14.23
*LAB*TCHa*	25.01	23.17	217.91

relative* CIELAB *lab*

*lab*lab*	0.175	−0.393	−0.306
*lab*tch*	0.25	0.5	0.605
*lab*nch*	0.5	0.5	0.605

***relative* Natural Colour (NC)**

*lab*lrj*	0.175	−0.353	−0.352
*lab*tce*	0.25	0.5	0.625
*lab*ncE*	0.5	0.5	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

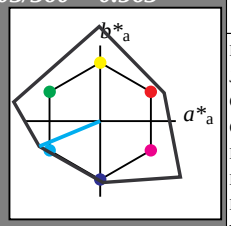
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

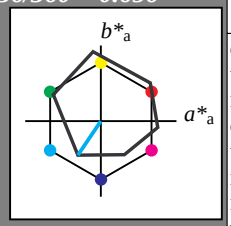
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$

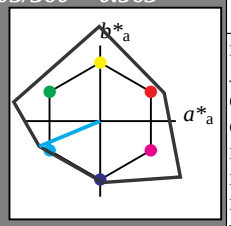
*lab*tch* and *lab*nch*

D65: hue G50B

LCH*Ma: 59 87 203

olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut

$u^*_{rel} = 136$

%Regularity

$g^*_{H,rel} = 46$

$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	1.0	(1.0)
*cmyn3**	0.5	0.0	0.0	(0.0)
*olvi4**	0.5	1.0	1.0	1.0
*cmyn4**	0.5	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	77.43	−40.26	−16.71
*LAB*LABa*	77.43	−40.29	−16.72
*LAB*TCHa*	75.0	43.64	202.54

relative* CIELAB *lab*

*lab*lab*	0.768	−0.461	−0.191
*lab*tch*	0.75	0.5	0.563
*lab*nch*	0.0	0.5	0.563

***relative* Natural Colour (NC)**

*lab*lrj*	0.768	−0.418	−0.272
*lab*tce*	0.75	0.5	0.592
*lab*ncE*	0.0	0.5	g36b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	1.0	(1.0)
*cmyn3**	1.0	0.0	0.0	(0.0)
*olvi4**	0.0	1.0	1.0	1.0
*cmyn4**	1.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	59.47	−80.55	−33.44
*LAB*LABa*	59.47	−80.6	−33.45
*LAB*TCHa*	50.0	87.28	202.54

relative* CIELAB *lab*

*lab*lab*	0.536	−0.922	−0.382
*lab*tch*	0.5	1.0	0.563
*lab*nch*	0.0	1.0	0.563

***relative* Natural Colour (NC)**

*lab*lrj*	0.536	−0.836	−0.546
*lab*tce*	0.5	1.0	0.592
*lab*ncE*	0.0	1.0	g36b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.5	(1.0)
*cmyn3**	1.0	0.5	0.5	(0.0)
*olvi4**	0.5	1.0	1.0	0.5
*cmyn4**	0.5	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	38.74	−40.22	−16.7
*LAB*LABa*	38.74	−40.29	−16.72
*LAB*TCHa*	25.01	43.64	202.54

relative* CIELAB *lab*

*lab*lab*	0.268	−0.461	−0.191
*lab*tch*	0.25	0.5	0.563
*lab*nch*	0.5	0.5	0.563

***relative* Natural Colour (NC)**

*lab*lrj*	0.268	−0.418	−0.272
*lab*tce*	0.25	0.5	0.592
*lab*ncE*	0.5	0.5	g36b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$

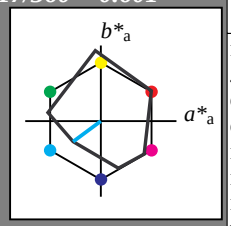
*lab*tch* and *lab*nch*

D65: hue G50B

LCH*Ma: 45 46 217

olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut

$u^*_{rel} = 92$

%Regularity

$g^*_{H,rel} = 42$

$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.01	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	1.0	1.0	(1.0)
*cmyn3**	0.5	0.0	0.0	(0.0)
*olvi4**	0.5	1.0	1.0	1.0
*cmyn4**	0.5	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	70.21	−18.28	−13.55
*LAB*LABa*	70.21	−18.31	−13.56
*LAB*TCHa*	75.0	22.8	216.52

relative* CIELAB *lab*

*lab*lab*	0.674	−0.401	−0.296
*lab*tch*	0.75	0.5	0.601
*lab*nch*	0.0	0.5	0.601

***relative* Natural Colour (NC)**

*lab*lrj*	0.674	−0.355	−0.35
*lab*tce*	0.75	0.5	0.624
*lab*ncE*	0.0	0.5	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	1.0	1.0	(1.0)
*cmyn3**	1.0	0.0	0.0	(0.0)
*olvi4**	0.0	1.0	1.0	1.0
*cmyn4**	1.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	45.03	−36.57	−27.11
*LAB*LABa*	45.03	−36.64	−27.13
*LAB*TCHa*	50.0	45.6	216.52

relative* CIELAB *lab*

*lab*lab*	0.349	−0.803	−0.594
*lab*tch*	0.5	1.0	0.601
*lab*nch*	0.0	1.0	0.601

***relative* Natural Colour (NC)**

*lab*lrj*	0.349	−0.71	−0.702
*lab*tce*	0.5	1.0	0.624
*lab*ncE*	0.0	1.0	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	0.05	0.0
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.5	0.5	(1.0)
*cmyn3**	1.0	0.5	0.5	(0.0)
*olvi4**	0.5	1.0	1.0	0.5
*cmyn4**	0.5	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	31.52	−18.23	−13.53
*LAB*LABa*	31.52	−18.31	−13.56
*LAB*TCHa*	25.01	22.8	216.52

relative* CIELAB *lab*

*lab*lab*	0.175	−0.401	−0.296
*lab*tch*	0.25	0.5	0.601
*lab*nch*	0.5	0.5	0.601

***relative* Natural Colour (NC)**

*lab*lrj*	0.175	−0.355	−0.35
*lab*tce*	0.25	0.5	0.624
*lab*ncE*	0.5	0.5	g49b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.1	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

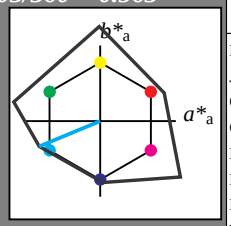
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

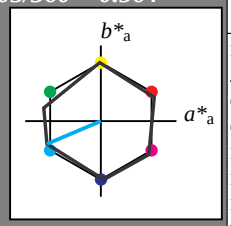
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

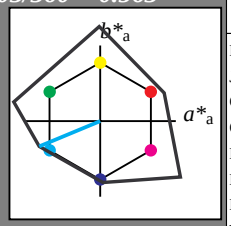
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 203/360 = 0.563$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

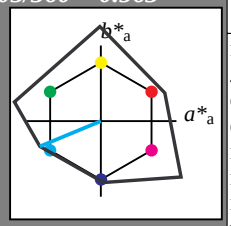
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 203/360 = 0.563$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

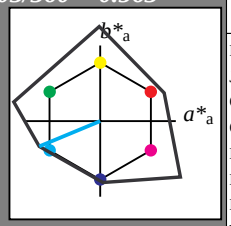
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

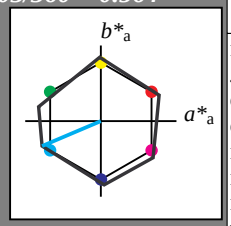
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

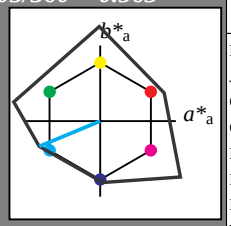
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

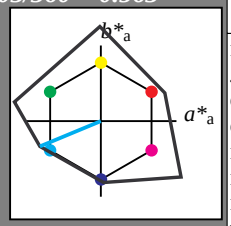
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

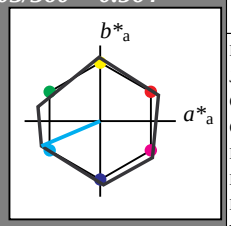
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

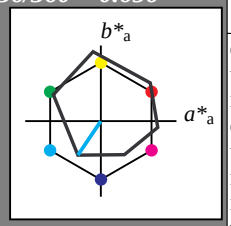
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

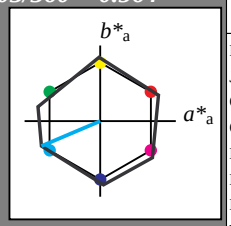
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

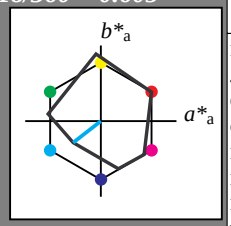
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 218
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

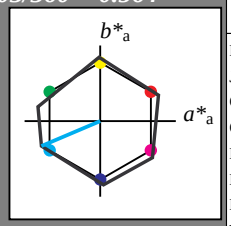
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

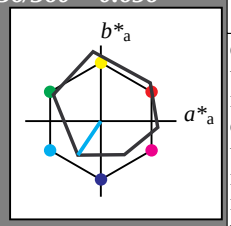
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

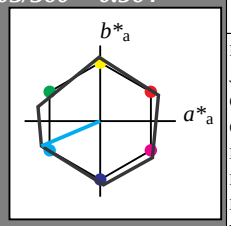
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

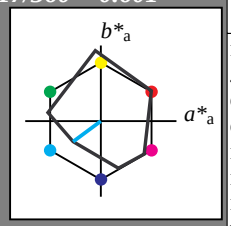
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

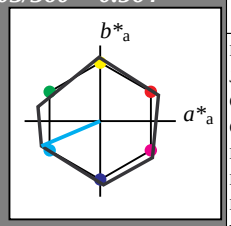
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

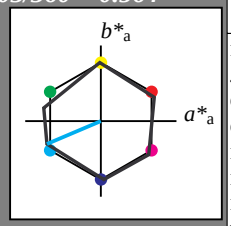
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

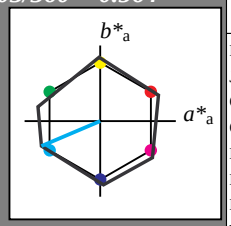
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

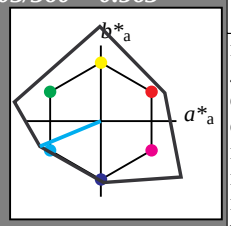
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

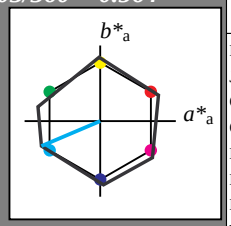
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 203/360 = 0.564$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

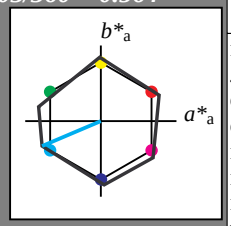
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 203/360 = 0.564$
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

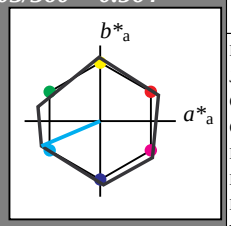
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

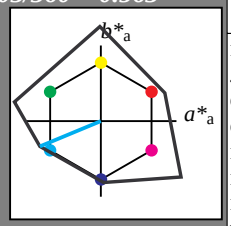
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.564 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

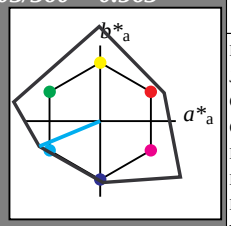
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

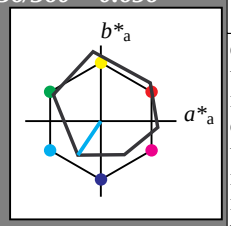
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$

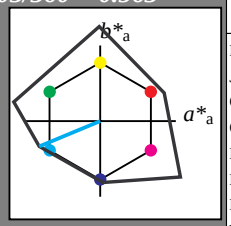
*lab*tch* and *lab*nch*

D65: hue G50B

LCH*Ma: 59 87 203

olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut

u^*_{rel} = 149

%Regularity

$g^*_{H,rel}$ = 46

$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 218/360 = 0.605$

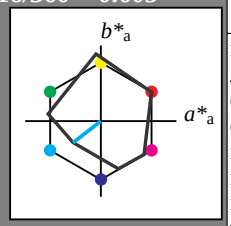
*lab*tch* and *lab*nch*

D65: hue G50B

LCH*Ma: 45 46 218

olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 91

%Regularity

$g^*_{H,rel}$ = 41

$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.77 −11.17
*LAB*LABa* 70.21 −18.27 −14.23
*LAB*TCHa* 75.0 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.674 −0.393 −0.306
*lab*tch* 0.75 0.5 0.605
*lab*nch* 0.0 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.353 −0.352
*lab*tce* 0.75 0.5 0.625
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.56 −28.47
*LAB*TCHa* 50.0 46.35 217.91
relative* CIELAB *lab*
*lab*lab* 0.349 −0.788 −0.613
*lab*tch* 0.5 1.0 0.605
*lab*nch* 0.0 1.0 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.706 −0.706
*lab*tce* 0.5 1.0 0.625
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.03 −13.78
*LAB*LABa* 31.52 −18.27 −14.23
*LAB*TCHa* 25.01 23.17 217.91
relative* CIELAB *lab*
*lab*lab* 0.175 −0.393 −0.306
*lab*tch* 0.25 0.5 0.605
*lab*nch* 0.5 0.5 0.605
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.353 −0.352
*lab*tce* 0.25 0.5 0.625
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

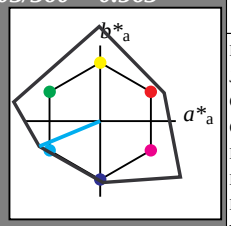
3 step scales for constant CIELAB hue 218/360 = 0.605 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

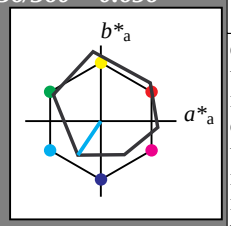
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 236/360 = 0.656$
*lab*tch* and *lab*nch*

D65: hue C
LCH*Ma: 59 54 236
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.01 −15.79 −18.98
*LAB*LABa* 77.01 −15.16 −22.5
*LAB*TCHa* 75.0 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.762 −0.278 −0.413
*lab*tch* 0.75 0.5 0.656
*lab*nch* 0.0 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.762 −0.247 −0.433
*lab*tce* 0.75 0.5 0.667
*lab*ncE* 0.0 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 58.62 −30.62 −42.73
*LAB*LABa* 58.62 −30.34 −45.01
*LAB*TCHa* 50.0 54.29 236.01
relative* CIELAB *lab*
*lab*lab* 0.525 −0.558 −0.828
*lab*tch* 0.5 1.0 0.656
*lab*nch* 0.0 1.0 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.525 −0.496 −0.867
*lab*tce* 0.5 1.0 0.667
*lab*ncE* 0.0 1.0 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.32 −15.05 −21.59
*LAB*LABa* 38.32 −15.16 −22.5
*LAB*TCHa* 25.01 27.15 236.01
relative* CIELAB *lab*
*lab*lab* 0.262 −0.278 −0.413
*lab*tch* 0.25 0.5 0.656
*lab*nch* 0.5 0.5 0.656
***relative* Natural Colour (NC)**
*lab*lrj* 0.262 −0.247 −0.433
*lab*tce* 0.25 0.5 0.667
*lab*ncE* 0.5 0.5 g66b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

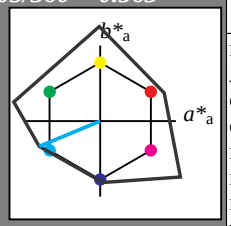
3 step scales for constant CIELAB hue 236/360 = 0.656 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

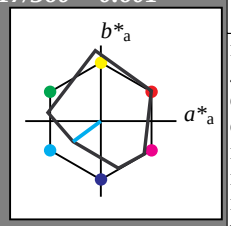
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 217/360 = 0.601$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 45 46 217
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 70.21 −18.28 −13.55
*LAB*LABa* 70.21 −18.31 −13.56
*LAB*TCHa* 75.0 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.674 −0.401 −0.296
*lab*tch* 0.75 0.5 0.601
*lab*nch* 0.0 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.674 −0.355 −0.35
*lab*tce* 0.75 0.5 0.624
*lab*ncE* 0.0 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 45.03 −36.57 −27.11
*LAB*LABa* 45.03 −36.64 −27.13
*LAB*TCHa* 50.0 45.6 216.52
relative* CIELAB *lab*
*lab*lab* 0.349 −0.803 −0.594
*lab*tch* 0.5 1.0 0.601
*lab*nch* 0.0 1.0 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.349 −0.71 −0.702
*lab*tce* 0.5 1.0 0.624
*lab*ncE* 0.0 1.0 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.52 −18.23 −13.53
*LAB*LABa* 31.52 −18.31 −13.56
*LAB*TCHa* 25.01 22.8 216.52
relative* CIELAB *lab*
*lab*lab* 0.175 −0.401 −0.296
*lab*tch* 0.25 0.5 0.601
*lab*nch* 0.5 0.5 0.601
***relative* Natural Colour (NC)**
*lab*lrj* 0.175 −0.355 −0.35
*lab*tce* 0.25 0.5 0.624
*lab*ncE* 0.5 0.5 g49b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

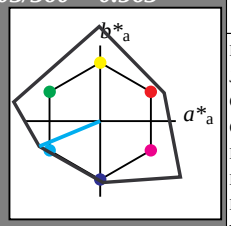
3 step scales for constant CIELAB hue 217/360 = 0.601 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

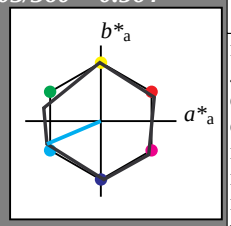
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 57 77 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −35.6 −15.11
*LAB*LABa* 76.05 −35.63 −15.11
*LAB*TCHa* 75.0 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −71.22 −30.23
*LAB*LABa* 56.7 −71.28 −30.24
*LAB*TCHa* 50.0 77.44 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −35.56 −15.09
*LAB*LABa* 37.36 −35.63 −15.11
*LAB*TCHa* 25.01 38.72 202.99
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

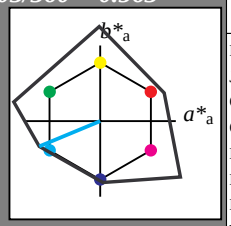
3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

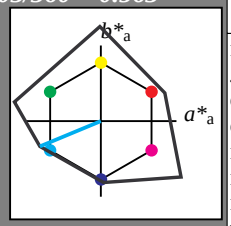
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.768 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.768 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.6 −33.45
*LAB*TCHa* 50.0 87.28 202.54
relative* CIELAB *lab*
*lab*lab* 0.536 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.536 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.74 −40.22 −16.7
*LAB*LABa* 38.74 −40.29 −16.72
*LAB*TCHa* 25.01 43.64 202.54
relative* CIELAB *lab*
*lab*lab* 0.268 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.268 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

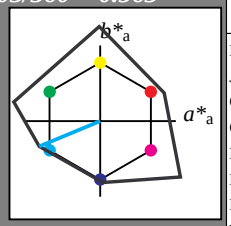
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 203/360 = 0.563$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

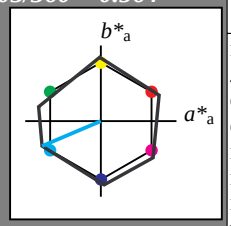
UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 203/360 = 0.564$
*lab*tch* and *lab*nch*

D65: hue G50B
LCH*Ma: 53 84 203
olv*Ma: 0.0 1.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −38.82 −16.48
*LAB*LABa* 74.3 −38.85 −16.48
*LAB*TCHa* 75.0 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.75 −0.459 −0.194
*lab*tch* 0.75 0.5 0.564
*lab*nch* 0.0 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.416 −0.275
*lab*tce* 0.75 0.5 0.593
*lab*ncE* 0.0 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −77.67 −32.96
*LAB*LABa* 53.2 −77.71 −32.97
*LAB*TCHa* 50.0 84.43 202.99
relative* CIELAB *lab*
*lab*lab* 0.5 −0.919 −0.39
*lab*tch* 0.5 1.0 0.564
*lab*nch* 0.0 1.0 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.833 −0.551
*lab*tce* 0.5 1.0 0.593
*lab*ncE* 0.0 1.0 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −38.79 −16.46
*LAB*LABa* 32.1 −38.85 −16.48
*LAB*TCHa* 25.01 42.21 203.0
relative* CIELAB *lab*
*lab*lab* 0.25 −0.459 −0.194
*lab*tch* 0.25 0.5 0.564
*lab*nch* 0.5 0.5 0.564
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.416 −0.275
*lab*tce* 0.25 0.5 0.593
*lab*ncE* 0.5 0.5 g37b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

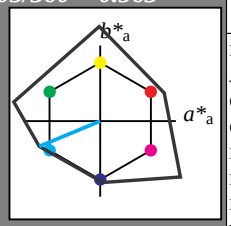
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 203/360 = 0.564 (right)

Input: Colorimetric Reflective System NCS11
for hue *h = *lab*h* = 203/360 = 0.563**
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

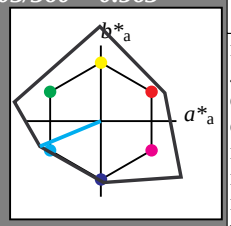
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 203/360 = 0.563 (left)

Output: Colorimetric Reflective System NCS11
for hue *h = *lab*h* = 203/360 = 0.563**
lab*tch* and *lab*nch

D65: hue G50B
LCH*Ma: 59 87 203
olv*Ma: 0.0 1.0 1.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 1.0 (1.0)
*cmyn3** 0.5 0.0 0.0 (0.0)
*olvi4** 0.5 1.0 1.0 1.0
*cmyn4** 0.5 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 77.43 −40.26 −16.71
*LAB*LABa* 77.43 −40.29 −16.72
*LAB*TCHa* 75.0 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.787 −0.461 −0.191
*lab*tch* 0.75 0.5 0.563
*lab*nch* 0.0 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.787 −0.418 −0.272
*lab*tce* 0.75 0.5 0.592
*lab*ncE* 0.0 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 1.0 (1.0)
*cmyn3** 1.0 0.0 0.0 (0.0)
*olvi4** 0.0 1.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 59.47 −80.55 −33.44
*LAB*LABa* 59.47 −80.59 −33.44
*LAB*TCHa* 50.0 87.26 202.54
relative* CIELAB *lab*
*lab*lab* 0.574 −0.922 −0.382
*lab*tch* 0.5 1.0 0.563
*lab*nch* 0.0 1.0 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.574 −0.836 −0.546
*lab*tce* 0.5 1.0 0.592
*lab*ncE* 0.0 1.0 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.5 (1.0)
*cmyn3** 1.0 0.5 0.5 (0.0)
*olvi4** 0.5 1.0 1.0 0.5
*cmyn4** 0.5 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.23 −40.23 −16.7
*LAB*LABa* 35.23 −40.29 −16.72
*LAB*TCHa* 25.01 43.63 202.54
relative* CIELAB *lab*
*lab*lab* 0.287 −0.461 −0.191
*lab*tch* 0.25 0.5 0.563
*lab*nch* 0.5 0.5 0.563
***relative* Natural Colour (NC)**
*lab*lrj* 0.287 −0.418 −0.272
*lab*tce* 0.25 0.5 0.592
*lab*ncE* 0.5 0.5 g36b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

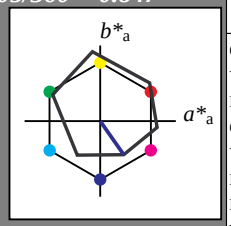
3 step scales for constant CIELAB hue 203/360 = 0.563 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

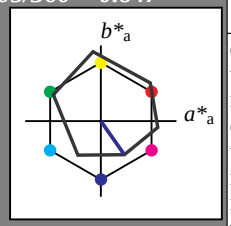
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

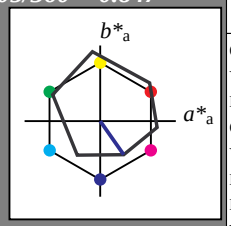
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

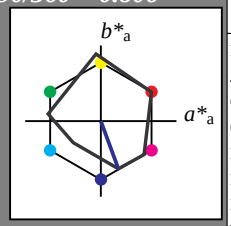
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

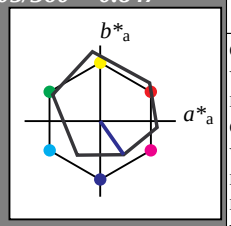
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

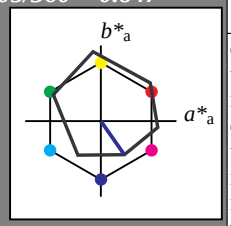
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

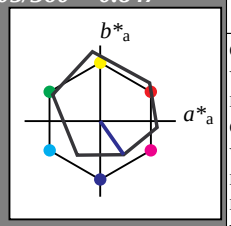
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

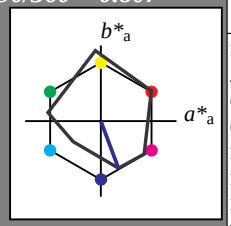
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

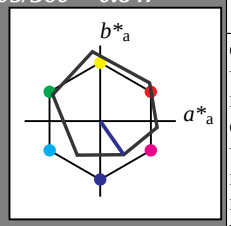
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

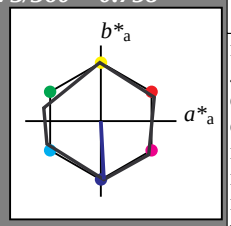
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

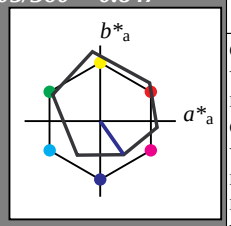
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

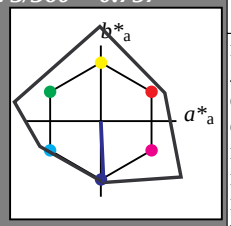
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

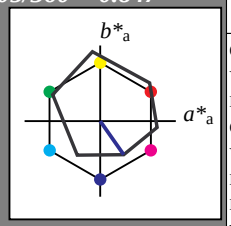
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

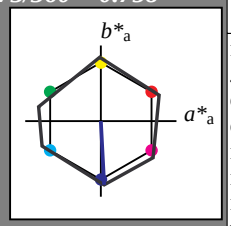
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

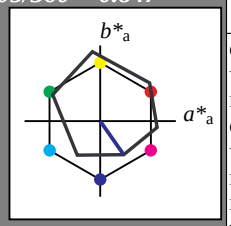
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

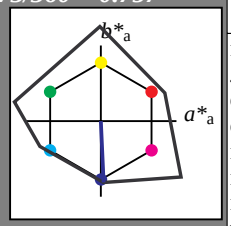
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

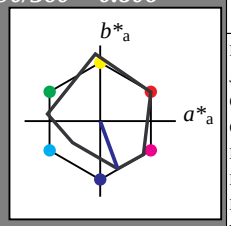
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System MRS18

for hue *h* = lab*h = 290/360 = 0.806*
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

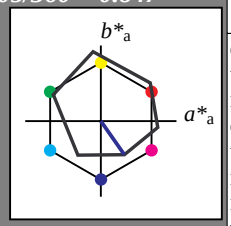
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System ORS18

for hue *h* = lab*h = 305/360 = 0.847*
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

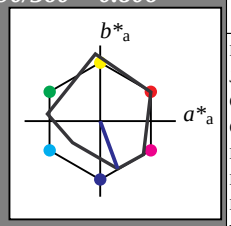
*n** = 1,0

3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System MRS18
for hue *h = *lab*h* = 290/360 = 0.806**
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

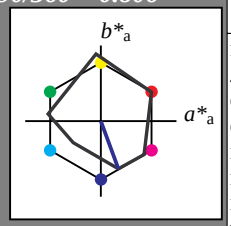
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System MRS18
for hue *h = *lab*h* = 290/360 = 0.806**
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

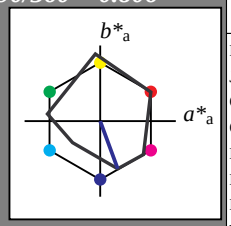
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

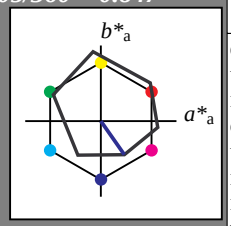
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

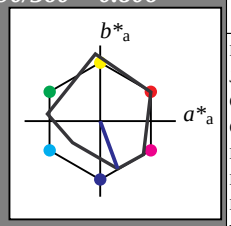
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

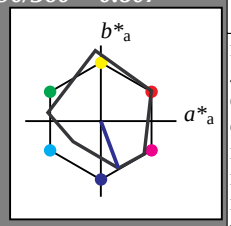
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

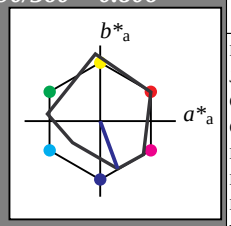
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

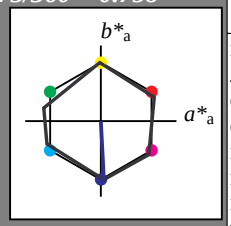
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

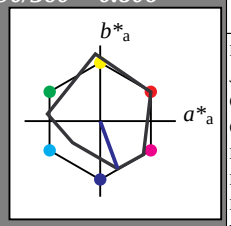
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

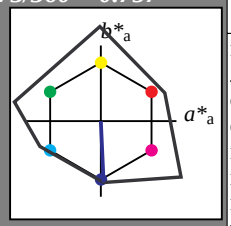
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

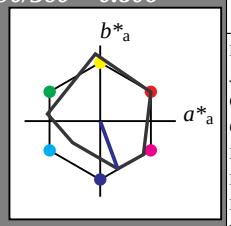
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

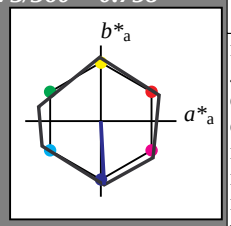
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

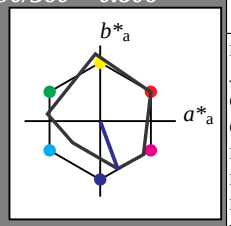
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

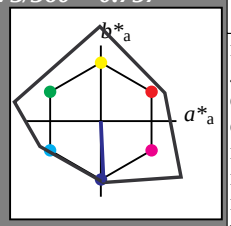
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.806 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

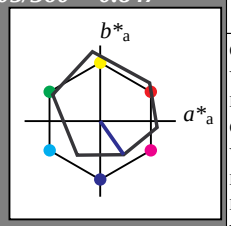
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

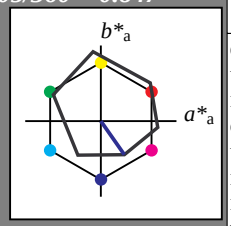
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

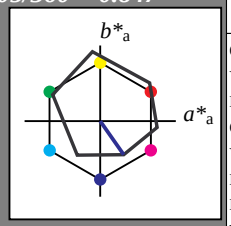
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

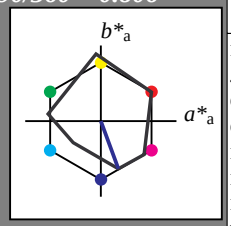
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

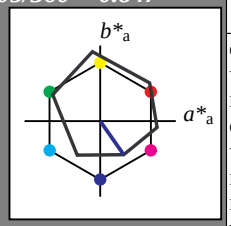
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System TRS18
for hue *h = *lab*h* = 305/360 = 0.847**
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

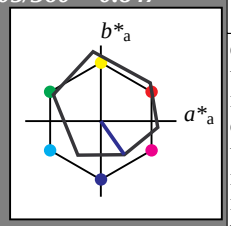
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System TRS18
for hue *h = *lab*h* = 305/360 = 0.847**
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

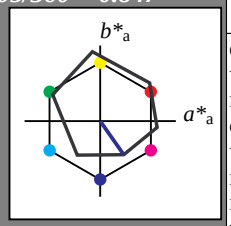
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

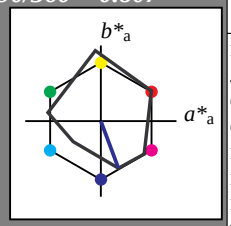
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

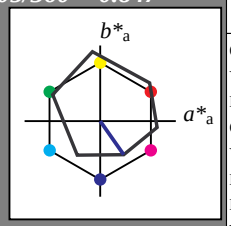
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

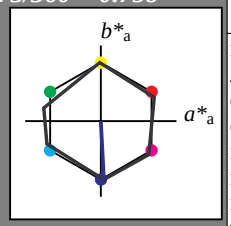
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

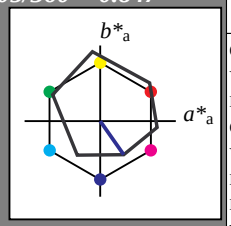
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
lab*tch* and *lab*nch

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

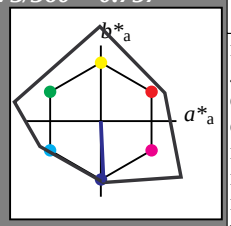
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

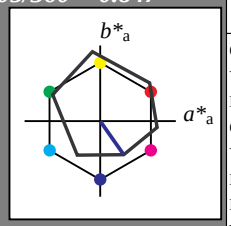
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

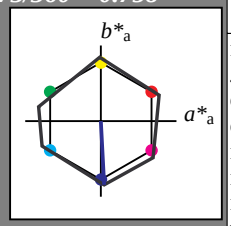
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

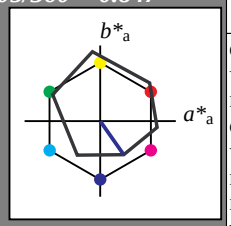
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

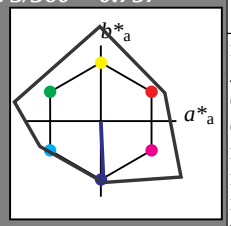
UE100−7, 3 step scales for constant CIELAB hue 305/360 = 0.847 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

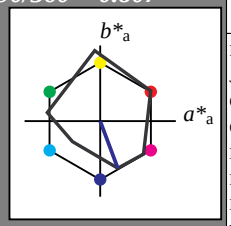
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

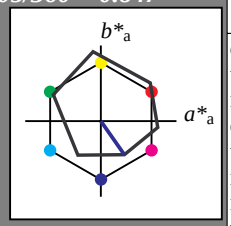
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

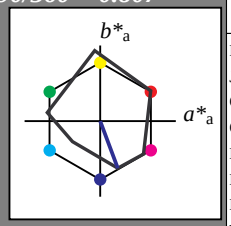
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

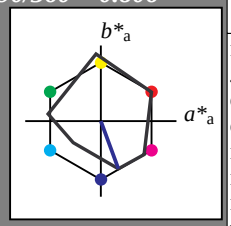
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

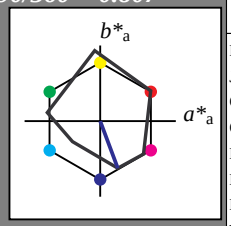
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

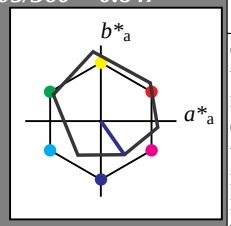
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

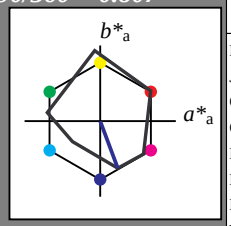
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

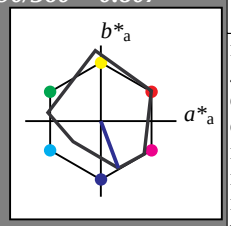
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

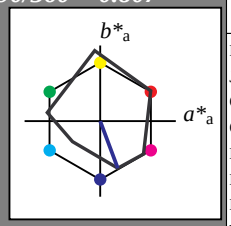
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

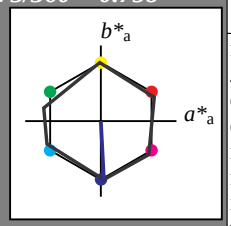
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

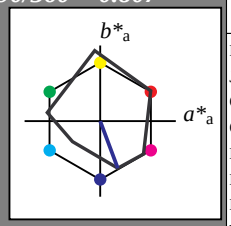
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

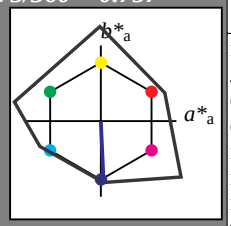
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

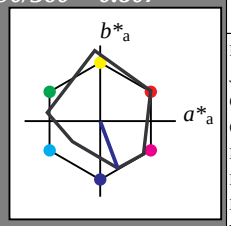
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

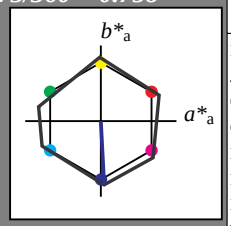
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

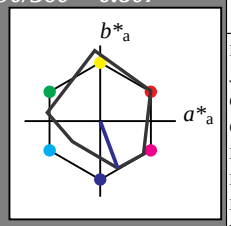
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

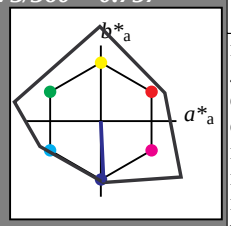
UE100−7, 3 step scales for constant CIELAB hue 290/360 = 0.807 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

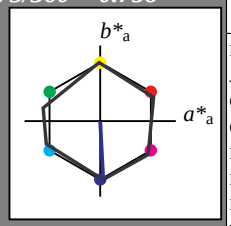
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

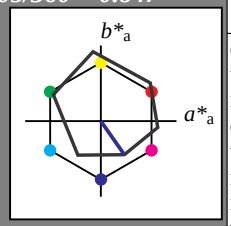
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

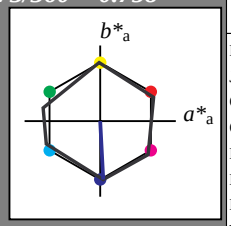
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

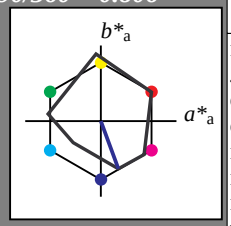
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

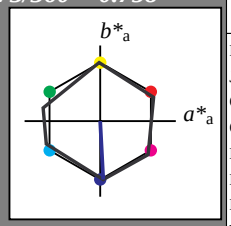
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

blackness *n**

0,25 0,50 0,75 1,00

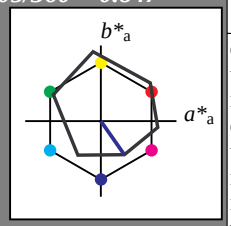
chromaticness *c**

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0 *n** = 0,50 *n** = 0,00

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

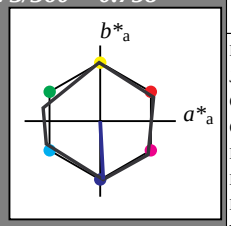
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

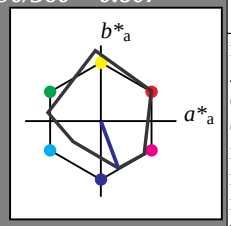
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

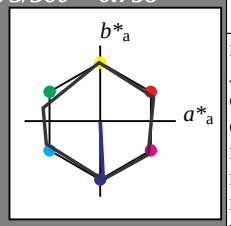
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 273/360 = 0.758$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

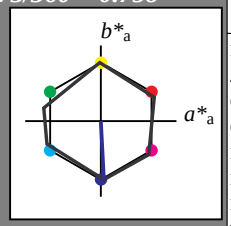
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 273/360 = 0.758$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

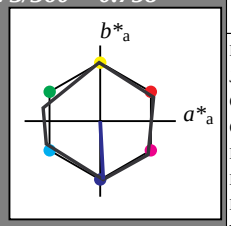
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

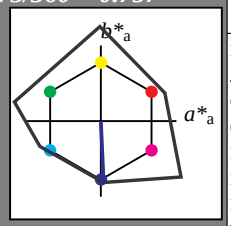
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

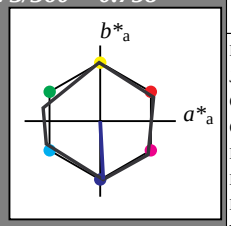
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

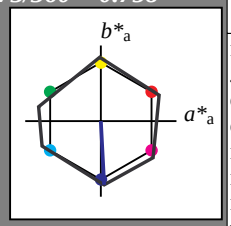
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

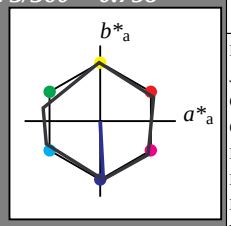
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

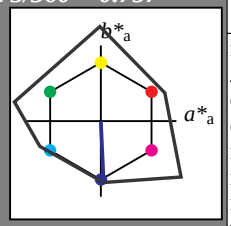
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

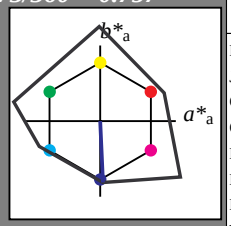
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

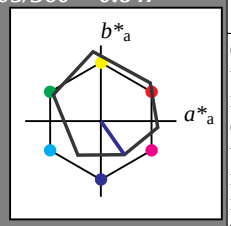
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

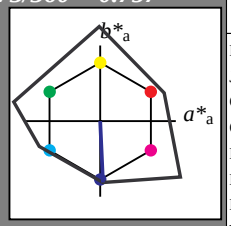
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

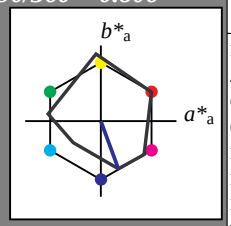
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

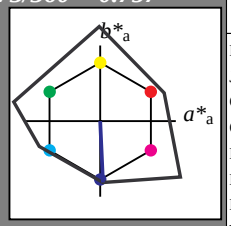
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

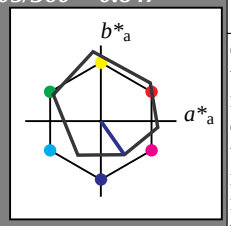
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

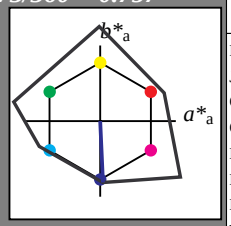
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

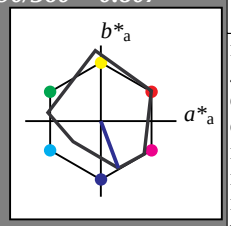
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

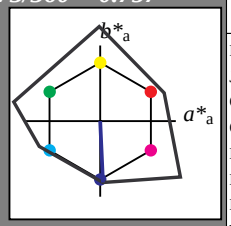
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

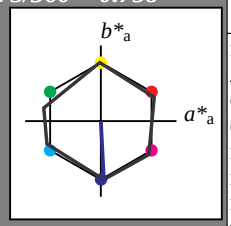
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

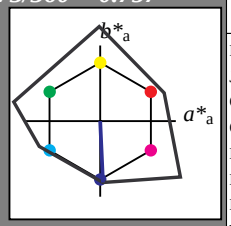
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

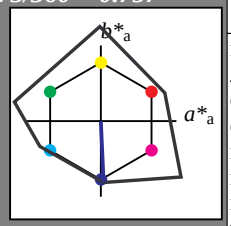
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

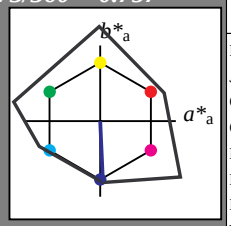
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

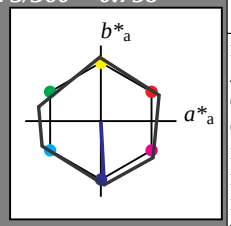
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

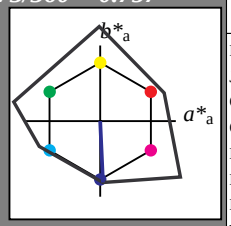
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

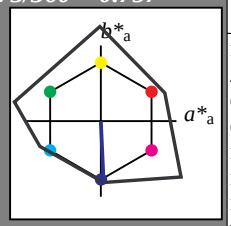
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

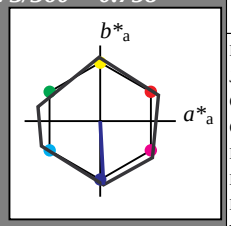
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

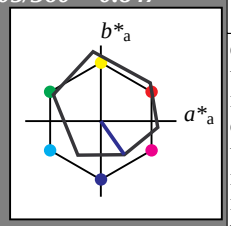
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

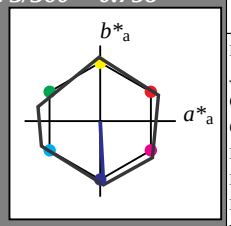
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

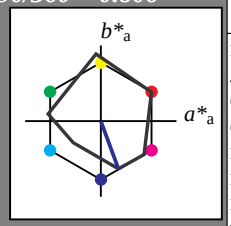
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

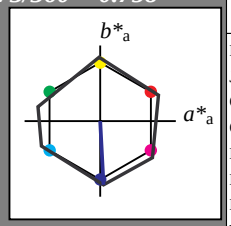
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

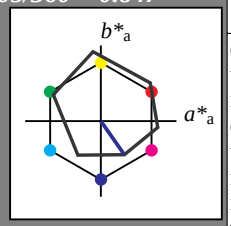
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

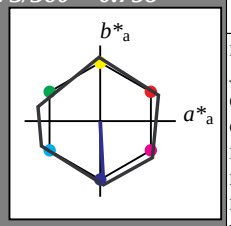
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

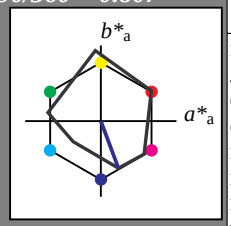
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 66 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.67 −31.12
*LAB*LABa* 66.03 11.63 −31.13
*LAB*TCHa* 75.0 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.62 0.175 −0.467
*lab*tch* 0.75 0.5 0.807
*lab*nch* 0.0 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.128 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.25 −62.26
*LAB*TCHa* 50.0 66.47 290.48
relative* CIELAB *lab*
*lab*lab* 0.241 0.35 −0.936
*lab*tch* 0.5 1.0 0.807
*lab*nch* 0.0 1.0 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.71 −31.1
*LAB*LABa* 27.34 11.63 −31.13
*LAB*TCHa* 25.01 33.24 290.48
relative* CIELAB *lab*
*lab*lab* 0.12 0.175 −0.467
*lab*tch* 0.25 0.5 0.807
*lab*nch* 0.5 0.5 0.807
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.128 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

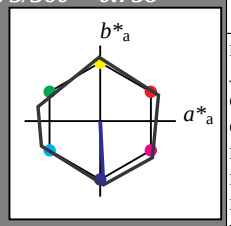
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

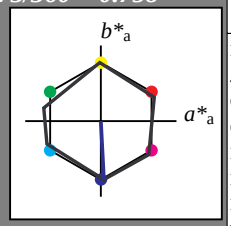
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

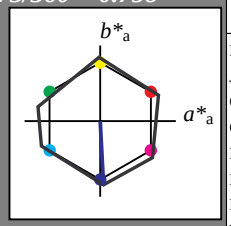
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

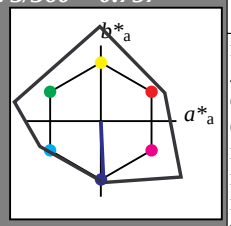
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

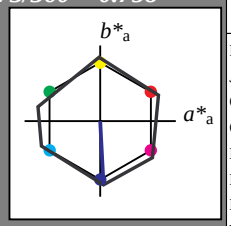
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NRS11
for hue *h = *lab*h* = 273/360 = 0.758**
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

*n** = 0,00
blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**

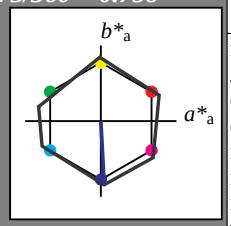
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

Output: Colorimetric Reflective System NRS11
for hue *h = *lab*h* = 273/360 = 0.758**
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

*n** = 0,00
blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**

*n** = 1,0

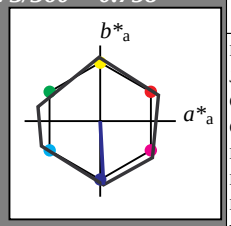
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
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$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

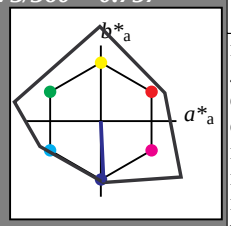
*n** = 1,0

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.758 (left)

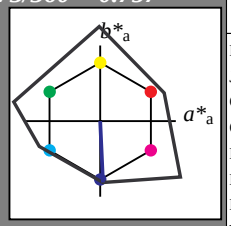
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

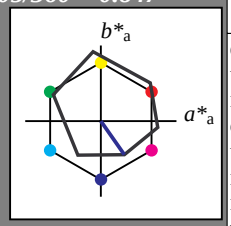
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

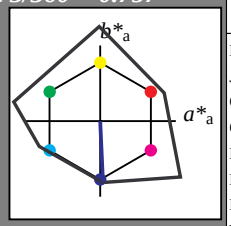
3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

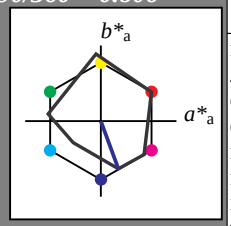
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 290/360 = 0.806$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 37 67 290
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 66.03 11.17 −28.74
*LAB*LABa* 66.03 11.59 −31.51
*LAB*TCHa* 75.0 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.62 0.173 −0.468
*lab*tch* 0.75 0.5 0.806
*lab*nch* 0.0 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.62 0.129 −0.482
*lab*tce* 0.75 0.5 0.791
*lab*ncE* 0.0 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.34 11.92 −31.35
*LAB*LABa* 27.34 11.59 −31.51
*LAB*TCHa* 25.01 33.59 290.19
relative* CIELAB *lab*
*lab*lab* 0.12 0.173 −0.468
*lab*tch* 0.25 0.5 0.806
*lab*nch* 0.5 0.5 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.12 0.129 −0.482
*lab*tce* 0.25 0.5 0.791
*lab*ncE* 0.5 0.5 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 36.65 23.33 −62.24
*LAB*LABa* 36.65 23.18 −63.03
*LAB*TCHa* 50.0 67.17 290.19
relative* CIELAB *lab*
*lab*lab* 0.241 0.345 −0.937
*lab*tch* 0.5 1.0 0.806
*lab*nch* 0.0 1.0 0.806
***relative* Natural Colour (NC)**
*lab*lrj* 0.241 0.257 −0.965
*lab*tce* 0.5 1.0 0.791
*lab*ncE* 0.0 1.0 b16r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

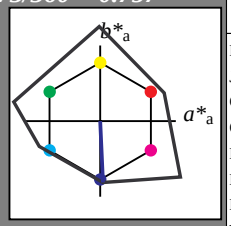
3 step scales for constant CIELAB hue 290/360 = 0.806 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

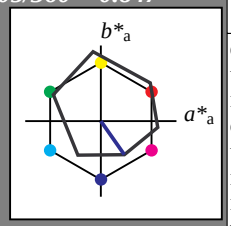
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 305/360 = 0.847$
*lab*tch* and *lab*nch*

D65: hue V
LCH*Ma: 26 54 305
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 60.56 15.24 −19.79
*LAB*LABa* 60.56 15.55 −22.2
*LAB*TCHa* 75.0 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.55 0.287 −0.408
*lab*tch* 0.75 0.5 0.847
*lab*nch* 0.0 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.55 0.225 −0.446
*lab*tce* 0.75 0.5 0.824
*lab*ncE* 0.0 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 25.72 31.46 −44.36
*LAB*LABa* 25.72 31.1 −44.41
*LAB*TCHa* 50.0 54.23 305.0
relative* CIELAB *lab*
*lab*lab* 0.1 0.573 −0.818
*lab*tch* 0.5 1.0 0.847
*lab*nch* 0.0 1.0 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.1 0.449 −0.892
*lab*tce* 0.5 1.0 0.824
*lab*ncE* 0.0 1.0 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 21.87 15.98 −22.4
*LAB*LABa* 21.87 15.55 −22.2
*LAB*TCHa* 25.01 27.11 305.0
relative* CIELAB *lab*
*lab*lab* 0.05 0.287 −0.408
*lab*tch* 0.25 0.5 0.847
*lab*nch* 0.5 0.5 0.847
***relative* Natural Colour (NC)**
*lab*lrj* 0.05 0.225 −0.446
*lab*tce* 0.25 0.5 0.824
*lab*ncE* 0.5 0.5 b29r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

3 step scales for constant CIELAB hue 305/360 = 0.847 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$

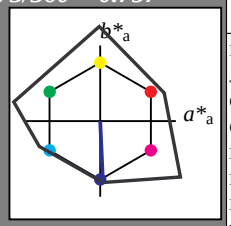
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 49 81 273

olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut

u^*_{rel} = 149

%Regularity

$g^*_{H,rel}$ = 46

$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	1.0	(1.0)
*cmyn3**	0.5	0.5	0.0	(0.0)
*olvi4**	0.5	0.5	1.0	1.0
*cmyn4**	0.5	0.5	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	72.21	1.85	−40.58
*LAB*LABa*	72.21	1.82	−40.58
*LAB*TCHa*	75.0	40.63	272.57

relative* CIELAB *lab*

*lab*lab*	0.725	0.022	−0.498
*lab*tch*	0.75	0.5	0.757
*lab*nch*	0.0	0.5	0.757

***relative* Natural Colour (NC)**

*lab*lrj*	0.725	0.006	−0.499
*lab*tce*	0.75	0.5	0.752
*lab*ncE*	0.0	0.5	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	1.0	(1.0)
*cmyn3**	1.0	1.0	0.0	(0.0)
*olvi4**	0.0	0.0	1.0	1.0
*cmyn4**	1.0	1.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	49.02	3.7	−81.16
*LAB*LABa*	49.02	3.65	−81.18
*LAB*TCHa*	50.0	81.27	272.57

relative* CIELAB *lab*

*lab*lab*	0.45	0.045	−0.998
*lab*tch*	0.5	1.0	0.757
*lab*nch*	0.0	1.0	0.757

***relative* Natural Colour (NC)**

*lab*lrj*	0.45	0.013	−0.999
*lab*tce*	0.5	1.0	0.752
*lab*ncE*	0.0	1.0	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.21	0.04	0.0
*LAB*LABa*	53.21	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.5	(1.0)
*cmyn3**	1.0	1.0	0.5	(0.0)
*olvi4**	0.5	0.5	1.0	0.5
*cmyn4**	0.5	0.5	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	30.01	1.89	−40.56
*LAB*LABa*	30.01	1.82	−40.58
*LAB*TCHa*	25.01	40.63	272.57

relative* CIELAB *lab*

*lab*lab*	0.225	0.022	−0.498
*lab*tch*	0.25	0.5	0.757
*lab*nch*	0.5	0.5	0.757

***relative* Natural Colour (NC)**

*lab*lrj*	0.225	0.006	−0.499
*lab*tce*	0.25	0.5	0.752
*lab*ncE*	0.5	0.5	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	11.01	0.07	0.01
*LAB*LABa*	11.01	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 290/360 = 0.807$

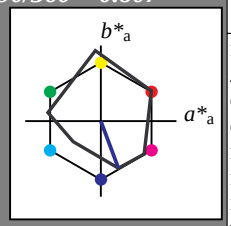
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 37 66 290

olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut

u^*_{rel} = 92

%Regularity

$g^*_{H,rel}$ = 42

$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.01	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	1.0	(1.0)
*cmyn3**	0.5	0.5	0.0	(0.0)
*olvi4**	0.5	0.5	1.0	1.0
*cmyn4**	0.5	0.5	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	66.03	11.67	−31.12
*LAB*LABa*	66.03	11.63	−31.13
*LAB*TCHa*	75.0	33.24	290.48

relative* CIELAB *lab*

*lab*lab*	0.62	0.175	−0.467
*lab*tch*	0.75	0.5	0.807
*lab*nch*	0.0	0.5	0.807

***relative* Natural Colour (NC)**

*lab*lrj*	0.62	0.128	−0.482
*lab*tce*	0.75	0.5	0.791
*lab*ncE*	0.0	0.5	b16r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	1.0	(1.0)
*cmyn3**	1.0	1.0	0.0	(0.0)
*olvi4**	0.0	0.0	1.0	1.0
*cmyn4**	1.0	1.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	36.65	23.33	−62.24
*LAB*LABa*	36.65	23.25	−62.26
*LAB*TCHa*	50.0	66.47	290.48

relative* CIELAB *lab*

*lab*lab*	0.241	0.35	−0.936
*lab*tch*	0.5	1.0	0.807
*lab*nch*	0.0	1.0	0.807

***relative* Natural Colour (NC)**

*lab*lrj*	0.241	0.257	−0.965
*lab*tce*	0.5	1.0	0.791
*lab*ncE*	0.0	1.0	b16r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	0.05	0.0
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.5	(1.0)
*cmyn3**	1.0	1.0	0.5	(0.0)
*olvi4**	0.5	0.5	1.0	0.5
*cmyn4**	0.5	0.5	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	27.34	11.71	−31.1
*LAB*LABa*	27.34	11.63	−31.13
*LAB*TCHa*	25.01	33.24	290.48

relative* CIELAB *lab*

*lab*lab*	0.12	0.175	−0.467
*lab*tch*	0.25	0.5	0.807
*lab*nch*	0.5	0.5	0.807

***relative* Natural Colour (NC)**

*lab*lrj*	0.12	0.128	−0.482
*lab*tce*	0.25	0.5	0.791
*lab*ncE*	0.5	0.5	b16r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.1	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

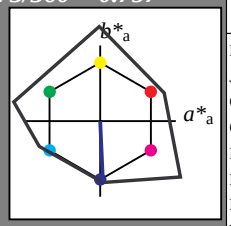
3 step scales for constant CIELAB hue 290/360 = 0.807 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

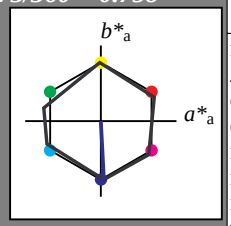
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 273/360 = 0.758$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 77 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 2.03 −38.63
*LAB*LABa* 76.05 2.0 −38.64
*LAB*TCHa* 75.0 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 4.05 −77.27
*LAB*LABa* 56.7 4.0 −77.28
*LAB*TCHa* 50.0 77.4 272.96
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 2.07 −38.61
*LAB*LABa* 37.36 2.0 −38.64
*LAB*TCHa* 25.01 38.7 272.96
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

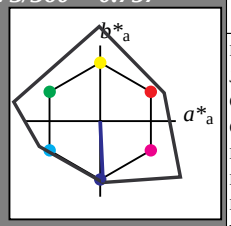
3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

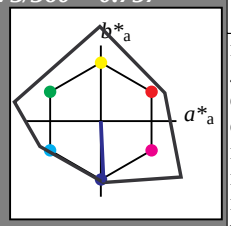
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.59
*LAB*TCHa* 75.0 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.7 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.7 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.63 −81.18
*LAB*TCHa* 50.0 81.27 272.56
relative* CIELAB *lab*
*lab*lab* 0.401 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.401 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.52 1.9 −40.56
*LAB*LABa* 33.52 1.82 −40.59
*LAB*TCHa* 25.01 40.64 272.56
relative* CIELAB *lab*
*lab*lab* 0.2 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.2 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

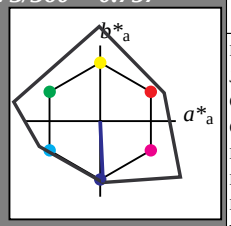
3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

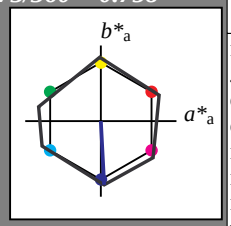
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 273/360 = 0.758$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 53 84 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 2.21 −42.13
*LAB*LABa* 74.3 2.19 −42.13
*LAB*TCHa* 75.0 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.026 −0.498
*lab*tch* 0.75 0.5 0.758
*lab*nch* 0.0 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.009 −0.499
*lab*tce* 0.75 0.5 0.753
*lab*ncE* 0.0 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 4.42 −84.26
*LAB*LABa* 53.2 4.37 −84.27
*LAB*TCHa* 50.0 84.39 272.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.052 −0.997
*lab*tch* 0.5 1.0 0.758
*lab*nch* 0.0 1.0 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.018 −0.999
*lab*tce* 0.5 1.0 0.753
*lab*ncE* 0.0 1.0 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 2.25 −42.11
*LAB*LABa* 32.1 2.19 −42.13
*LAB*TCHa* 25.01 42.2 272.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.026 −0.498
*lab*tch* 0.25 0.5 0.758
*lab*nch* 0.5 0.5 0.758
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.009 −0.499
*lab*tce* 0.25 0.5 0.753
*lab*ncE* 0.5 0.5 b01r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

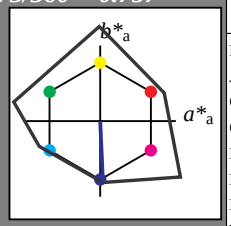
UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

3 step scales for constant CIELAB hue 273/360 = 0.758 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

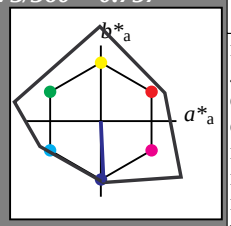
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 273/360 = 0.757 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 273/360 = 0.757$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 81 273
olv*Ma: 0.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 1.0 (1.0)
*cmyn3** 0.5 0.5 0.0 (0.0)
*olvi4** 0.5 0.5 1.0 1.0
*cmyn4** 0.5 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.21 1.85 −40.58
*LAB*LABa* 72.21 1.82 −40.58
*LAB*TCHa* 75.0 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.725 0.022 −0.498
*lab*tch* 0.75 0.5 0.757
*lab*nch* 0.0 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 0.006 −0.499
*lab*tce* 0.75 0.5 0.752
*lab*ncE* 0.0 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 1.0 (1.0)
*cmyn3** 1.0 1.0 0.0 (0.0)
*olvi4** 0.0 0.0 1.0 1.0
*cmyn4** 1.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.02 3.7 −81.16
*LAB*LABa* 49.02 3.65 −81.18
*LAB*TCHa* 50.0 81.27 272.57
relative* CIELAB *lab*
*lab*lab* 0.45 0.045 −0.998
*lab*tch* 0.5 1.0 0.757
*lab*nch* 0.0 1.0 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 0.013 −0.999
*lab*tce* 0.5 1.0 0.752
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.5 (1.0)
*cmyn3** 1.0 1.0 0.5 (0.0)
*olvi4** 0.5 0.5 1.0 0.5
*cmyn4** 0.5 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.01 1.89 −40.56
*LAB*LABa* 30.01 1.82 −40.58
*LAB*TCHa* 25.01 40.63 272.57
relative* CIELAB *lab*
*lab*lab* 0.225 0.022 −0.498
*lab*tch* 0.25 0.5 0.757
*lab*nch* 0.5 0.5 0.757
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 0.006 −0.499
*lab*tce* 0.25 0.5 0.752
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

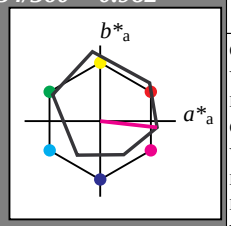
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 273/360 = 0.757 (right)

Input: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

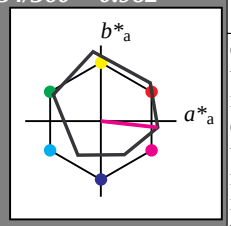
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

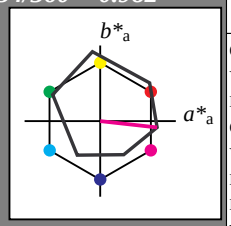
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

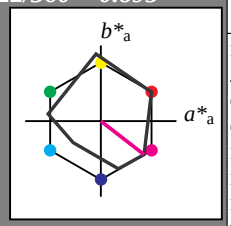
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

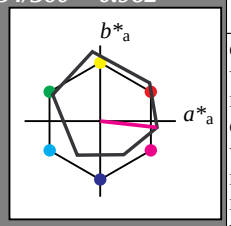
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

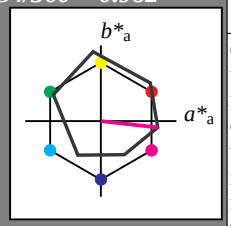
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

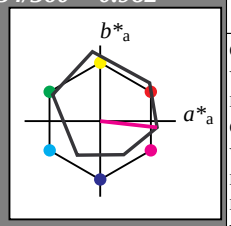
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

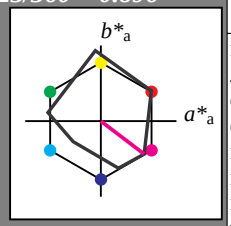
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

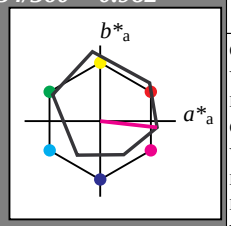
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

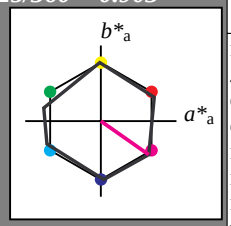
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

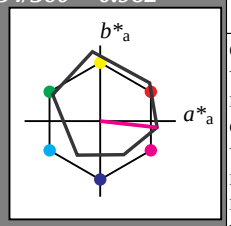
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

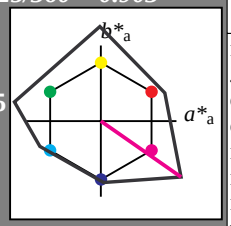
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

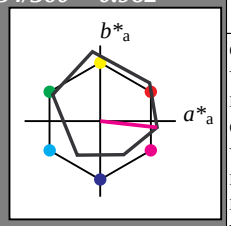
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

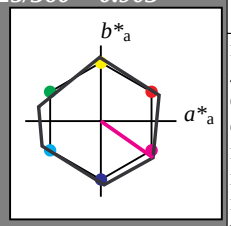
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

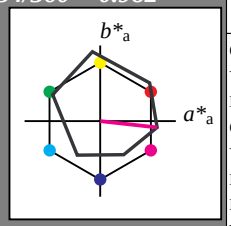
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System ORS18
for hue *h* = lab*h = 354/360 = 0.982*
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

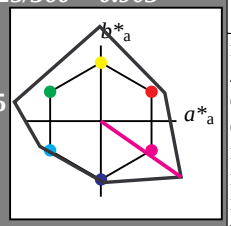
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NCS11
for hue *h* = lab*h = 325/360 = 0.903*
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

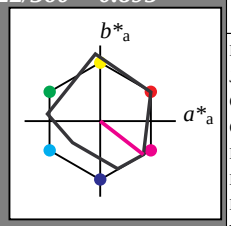
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

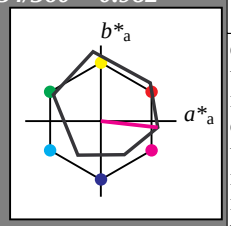
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

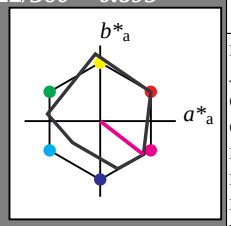
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 322/360 = 0.895$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

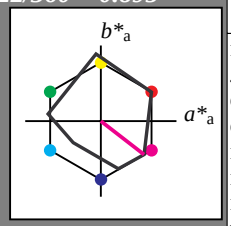
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 322/360 = 0.895$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

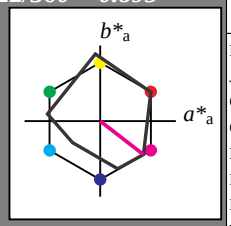
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

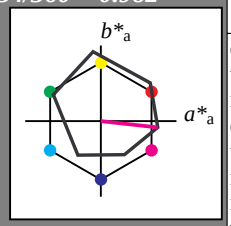
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

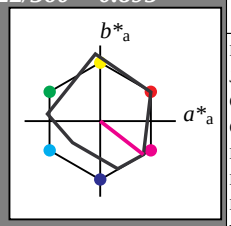
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

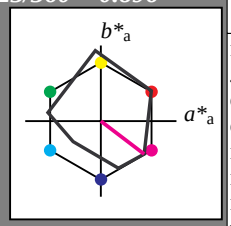
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

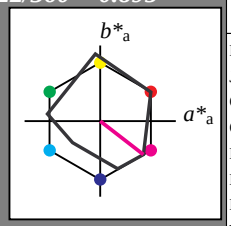
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

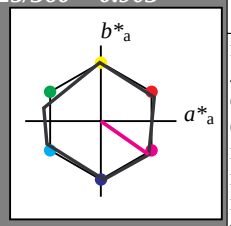
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

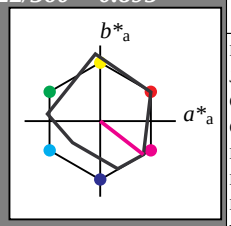
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

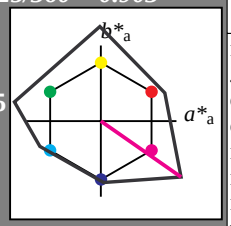
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

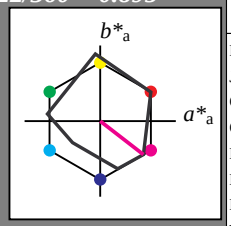
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

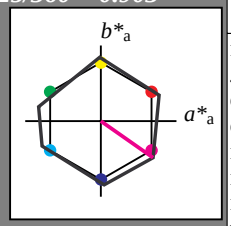
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

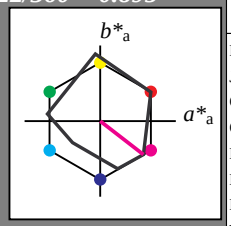
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

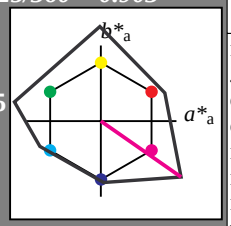
UE100−7, 3 step scales for constant CIELAB hue 322/360 = 0.895 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

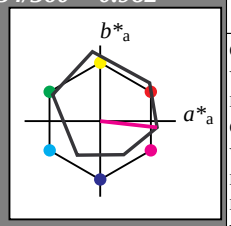
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

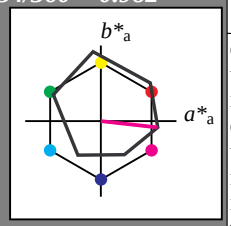
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

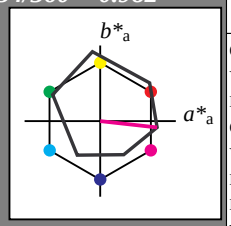
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

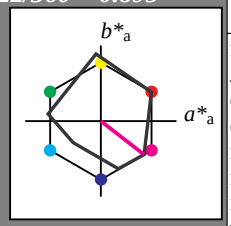
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

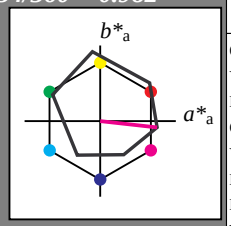
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

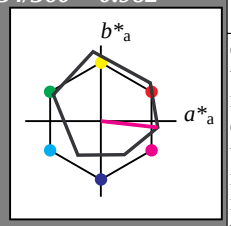
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

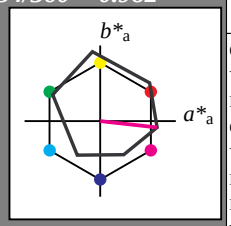
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

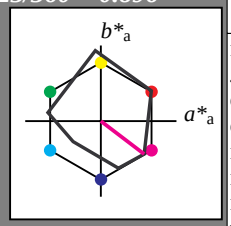
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

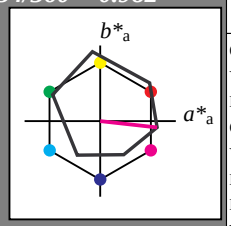
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

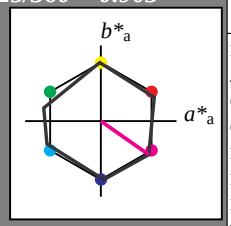
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

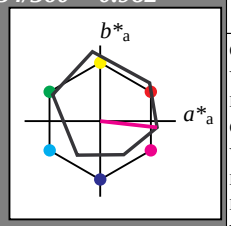
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

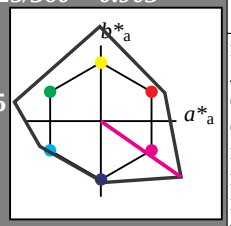
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

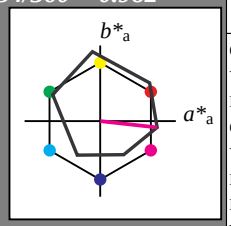
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

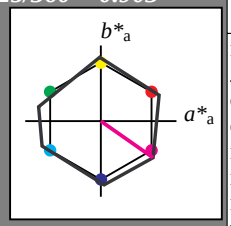
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

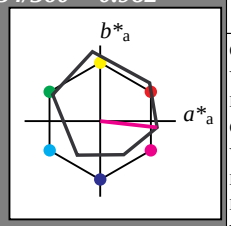
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

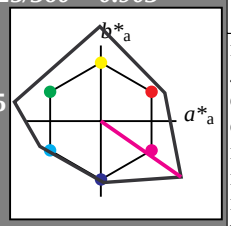
UE100−7, 3 step scales for constant CIELAB hue 354/360 = 0.982 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

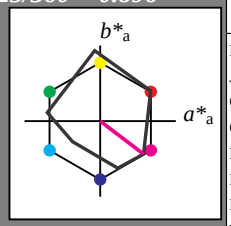
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

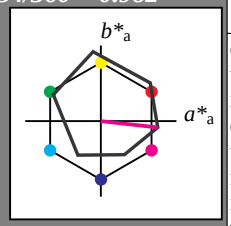
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

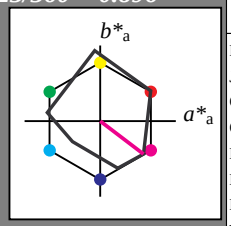
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

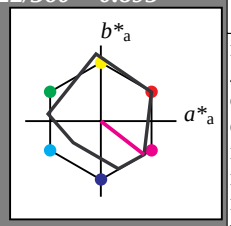
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

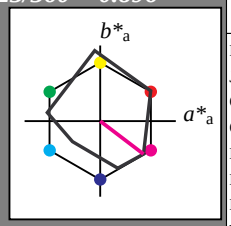
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

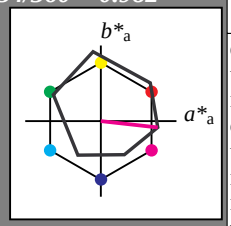
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

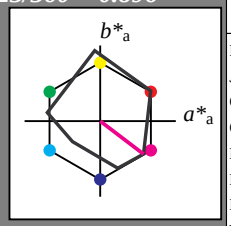
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 323/360 = 0.896$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

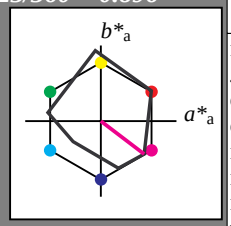
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 323/360 = 0.896$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

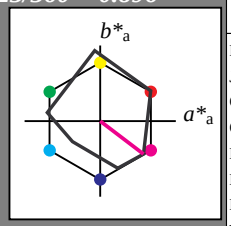
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

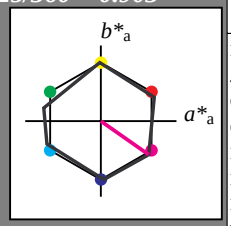
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

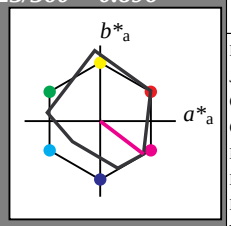
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

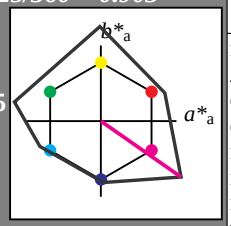
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

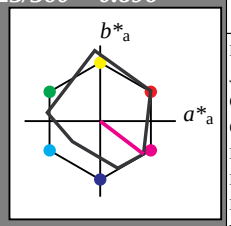
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

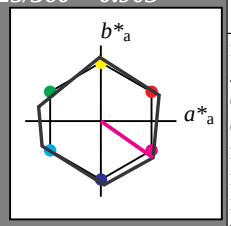
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

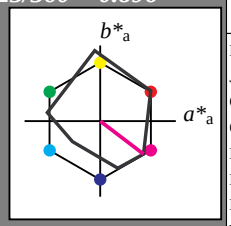
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

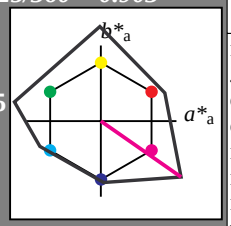
UE100−7, 3 step scales for constant CIELAB hue 323/360 = 0.896 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

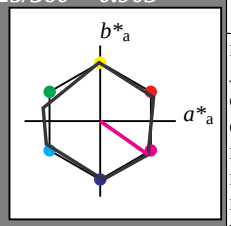
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

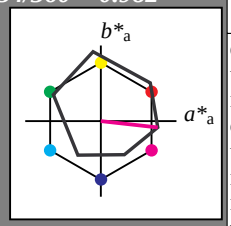
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

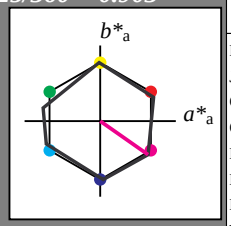
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

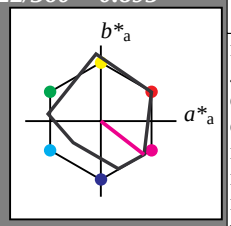
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

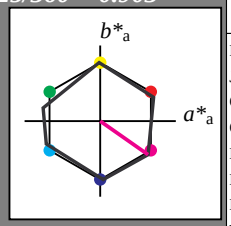
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	1.0	(1.0)
*cmyn3**	0.0	0.5	0.0	(0.0)
*olvi4**	1.0	0.5	1.0	1.0
*cmyn4**	0.0	0.5	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	31.7	−22.18
*LAB*LABa*	76.05	31.67	−22.19
*LAB*TCHa*	75.0	38.67	324.97

relative* CIELAB *lab*

*lab*lab*	0.75	0.409	−0.286
*lab*tch*	0.75	0.5	0.903
*lab*nch*	0.0	0.5	0.903

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.336	−0.37
*lab*tce*	0.75	0.5	0.867
*lab*ncE*	0.0	0.5	b46r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	1.0	(1.0)
*cmyn3**	0.0	1.0	0.0	(0.0)
*olvi4**	1.0	0.0	1.0	1.0
*cmyn4**	0.0	1.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	63.39	−44.38
*LAB*LABa*	56.7	63.34	−44.39
*LAB*TCHa*	50.0	77.35	324.97

relative* CIELAB *lab*

*lab*lab*	0.5	0.819	−0.573
*lab*tch*	0.5	1.0	0.903
*lab*nch*	0.0	1.0	0.903

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.671	−0.74
*lab*tce*	0.5	1.0	0.867
*lab*ncE*	0.0	1.0	b46r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.5	(1.0)
*cmyn3**	0.5	1.0	0.5	(0.0)
*olvi4**	1.0	0.5	1.0	0.5
*cmyn4**	0.0	0.5	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	31.74	−22.17
*LAB*LABa*	37.36	31.67	−22.19
*LAB*TCHa*	25.01	38.67	324.97

relative* CIELAB *lab*

*lab*lab*	0.25	0.409	−0.286
*lab*tch*	0.25	0.5	0.903
*lab*nch*	0.5	0.5	0.903

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.336	−0.37
*lab*tce*	0.25	0.5	0.867
*lab*ncE*	0.5	0.5	b46r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

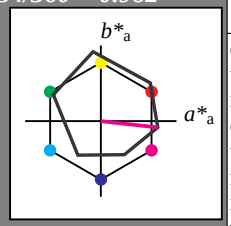
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	1.0	(1.0)
*cmyn3**	0.0	0.5	0.0	(0.0)
*olvi4**	1.0	0.5	1.0	1.0
*cmyn4**	0.0	0.5	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	71.77	37.1	−1.01
*LAB*LABa*	71.77	37.63	−4.17
*LAB*TCHa*	75.0	37.86	353.66

relative* CIELAB *lab*

*lab*lab*	0.695	0.497	−0.054
*lab*tch*	0.75	0.5	0.982
*lab*nch*	0.0	0.5	0.982

***relative* Natural Colour (NC)**

*lab*lrj*	0.695	0.454	−0.208
*lab*tce*	0.75	0.5	0.932
*lab*ncE*	0.0	0.5	b72r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	1.0	(1.0)
*cmyn3**	0.0	1.0	0.0	(0.0)
*olvi4**	1.0	0.0	1.0	1.0
*cmyn4**	0.0	1.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	48.14	75.18	−6.78
*LAB*LABa*	48.14	75.25	−8.35
*LAB*TCHa*	50.0	75.71	353.66

relative* CIELAB *lab*

*lab*lab*	0.389	0.994	−0.109
*lab*tch*	0.5	1.0	0.982
*lab*nch*	0.0	1.0	0.982

***relative* Natural Colour (NC)**

*lab*lrj*	0.389	0.909	−0.416
*lab*tce*	0.5	1.0	0.932
*lab*ncE*	0.0	1.0	b72r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.5	(1.0)
*cmyn3**	0.5	1.0	0.5	(0.0)
*olvi4**	1.0	0.5	1.0	0.5
*cmyn4**	0.0	0.5	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.08	37.84	−3.62
*LAB*LABa*	33.08	37.63	−4.17
*LAB*TCHa*	25.01	37.86	353.66

relative* CIELAB *lab*

*lab*lab*	0.195	0.497	−0.054
*lab*tch*	0.25	0.5	0.982
*lab*nch*	0.5	0.5	0.982

***relative* Natural Colour (NC)**

*lab*lrj*	0.195	0.454	−0.208
*lab*tce*	0.25	0.5	0.932
*lab*ncE*	0.5	0.5	b72r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

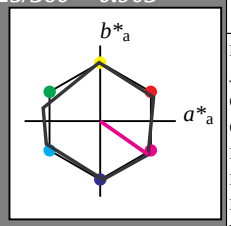
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

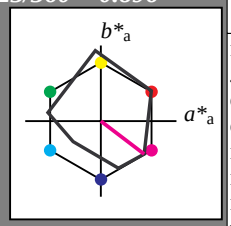
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 1.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

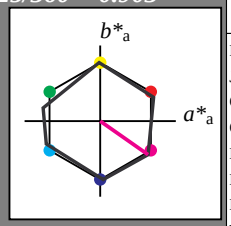
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

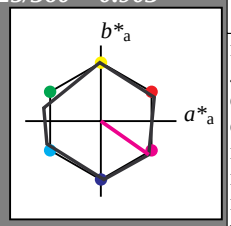
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

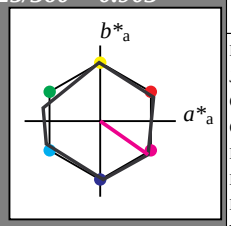
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

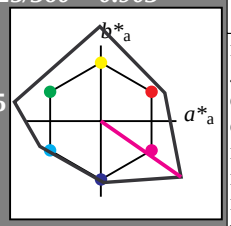
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

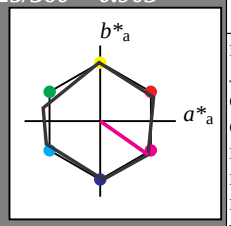
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

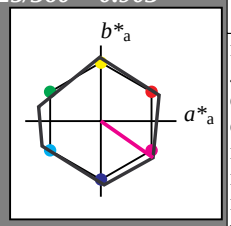
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

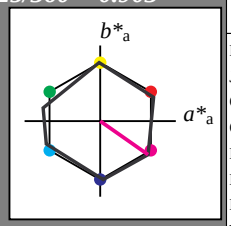
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

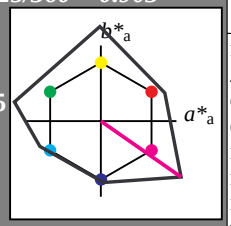
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

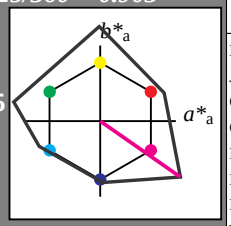
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	1.0	(1.0)
*cmyn3**	0.0	0.5	0.0	(0.0)
*olvi4**	1.0	0.5	1.0	1.0
*cmyn4**	0.0	0.5	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	69.73	53.06	−36.95
*LAB*LABa*	69.73	53.03	−36.96
*LAB*TCHa*	75.0	64.64	325.12

relative* CIELAB *lab*

*lab*lab*	0.668	0.41	−0.285
*lab*tch*	0.75	0.5	0.903
*lab*nch*	0.0	0.5	0.903

***relative* Natural Colour (NC)**

*lab*lrj*	0.668	0.336	−0.369
*lab*tce*	0.75	0.5	0.867
*lab*ncE*	0.0	0.5	b46r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	1.0	(1.0)
*cmyn3**	0.0	1.0	0.0	(0.0)
*olvi4**	1.0	0.0	1.0	1.0
*cmyn4**	0.0	1.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	44.06	106.12	−73.91
*LAB*LABa*	44.06	106.05	−73.93
*LAB*TCHa*	50.0	129.28	325.12

relative* CIELAB *lab*

*lab*lab*	0.337	0.82	−0.571
*lab*tch*	0.5	1.0	0.903
*lab*nch*	0.0	1.0	0.903

***relative* Natural Colour (NC)**

*lab*lrj*	0.337	0.673	−0.739
*lab*tce*	0.5	1.0	0.867
*lab*ncE*	0.0	1.0	b46r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.5	(1.0)
*cmyn3**	0.5	1.0	0.5	(0.0)
*olvi4**	1.0	0.5	1.0	0.5
*cmyn4**	0.0	0.5	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	31.04	53.11	−36.93
*LAB*LABa*	31.04	53.03	−36.96
*LAB*TCHa*	25.01	64.64	325.12

relative* CIELAB *lab*

*lab*lab*	0.168	0.41	−0.285
*lab*tch*	0.25	0.5	0.903
*lab*nch*	0.5	0.5	0.903

***relative* Natural Colour (NC)**

*lab*lrj*	0.168	0.336	−0.369
*lab*tce*	0.25	0.5	0.867
*lab*ncE*	0.5	0.5	b46r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

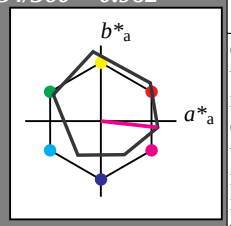
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	1.0	(1.0)
*cmyn3**	0.0	0.5	0.0	(0.0)
*olvi4**	1.0	0.5	1.0	1.0
*cmyn4**	0.0	0.5	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	71.77	37.1	−1.01
*LAB*LABa*	71.77	37.63	−4.17
*LAB*TCHa*	75.0	37.86	353.66

relative* CIELAB *lab*

*lab*lab*	0.695	0.497	−0.054
*lab*tch*	0.75	0.5	0.982
*lab*nch*	0.0	0.5	0.982

***relative* Natural Colour (NC)**

*lab*lrj*	0.695	0.454	−0.208
*lab*tce*	0.75	0.5	0.932
*lab*ncE*	0.0	0.5	b72r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	1.0	(1.0)
*cmyn3**	0.0	1.0	0.0	(0.0)
*olvi4**	1.0	0.0	1.0	1.0
*cmyn4**	0.0	1.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	48.14	75.18	−6.78
*LAB*LABa*	48.14	75.25	−8.35
*LAB*TCHa*	50.0	75.71	353.66

relative* CIELAB *lab*

*lab*lab*	0.389	0.994	−0.109
*lab*tch*	0.5	1.0	0.982
*lab*nch*	0.0	1.0	0.982

***relative* Natural Colour (NC)**

*lab*lrj*	0.389	0.909	−0.416
*lab*tce*	0.5	1.0	0.932
*lab*ncE*	0.0	1.0	b72r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.5	(1.0)
*cmyn3**	0.5	1.0	0.5	(0.0)
*olvi4**	1.0	0.5	1.0	0.5
*cmyn4**	0.0	0.5	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.08	37.84	−3.62
*LAB*LABa*	33.08	37.63	−4.17
*LAB*TCHa*	25.01	37.86	353.66

relative* CIELAB *lab*

*lab*lab*	0.195	0.497	−0.054
*lab*tch*	0.25	0.5	0.982
*lab*nch*	0.5	0.5	0.982

***relative* Natural Colour (NC)**

*lab*lrj*	0.195	0.454	−0.208
*lab*tce*	0.25	0.5	0.932
*lab*ncE*	0.5	0.5	b72r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

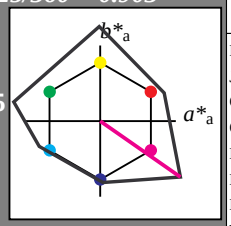
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

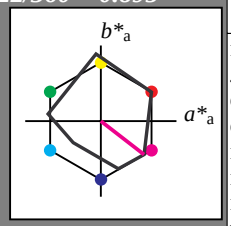
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

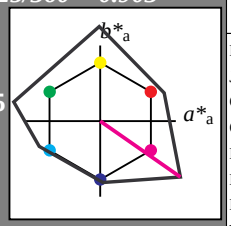
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

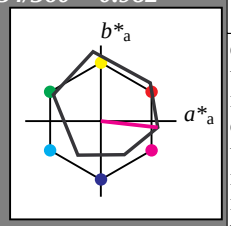
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

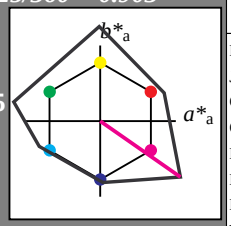
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

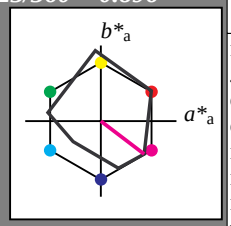
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

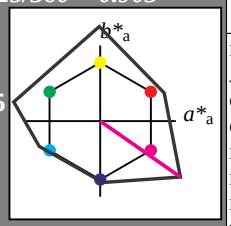
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

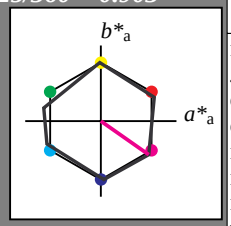
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

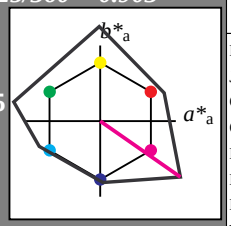
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS18
for hue *h = *lab*h* = 325/360 = 0.903**
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

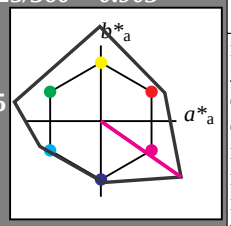
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS18
for hue *h = *lab*h* = 325/360 = 0.903**
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

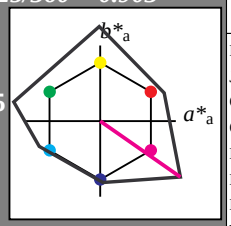
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

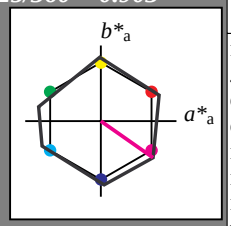
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

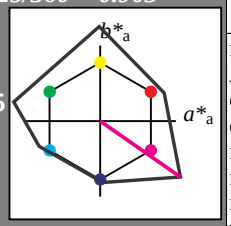
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

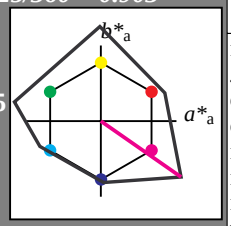
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

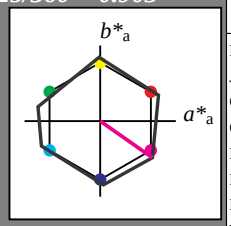
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

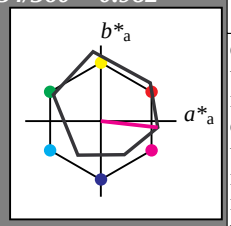
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

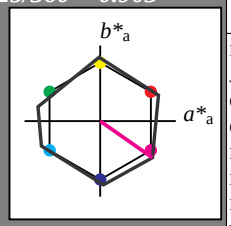
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

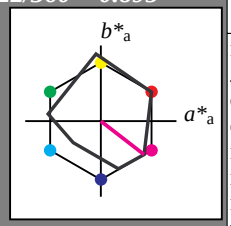
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

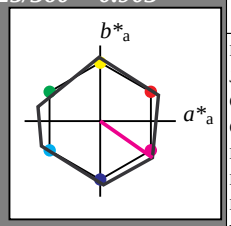
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

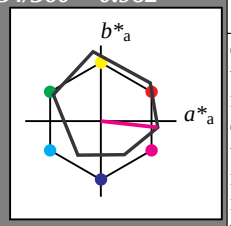
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

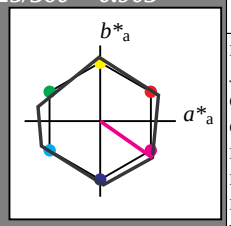
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

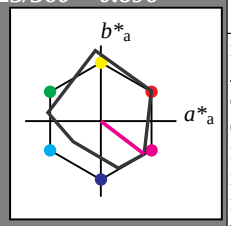
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

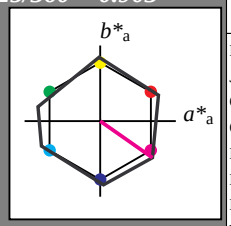
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

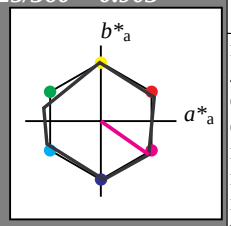
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

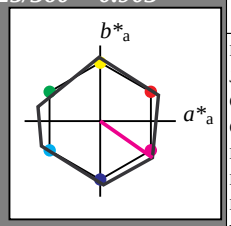
chromaticness c^*

3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

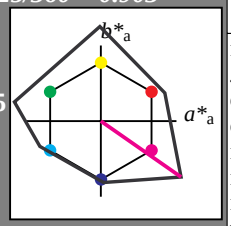
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

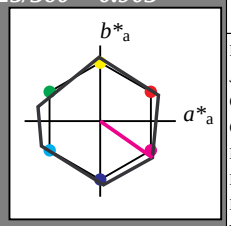
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS11
for hue *h = *lab*h* = 325/360 = 0.903**
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

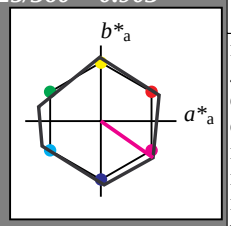
chromaticness *c**

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS11
for hue *h = *lab*h* = 325/360 = 0.903**
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

chromaticness *c**

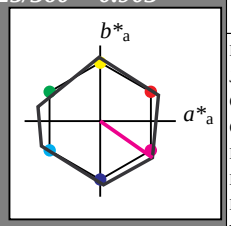
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

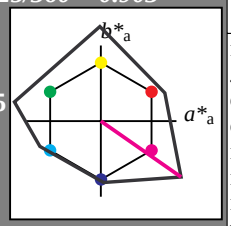
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

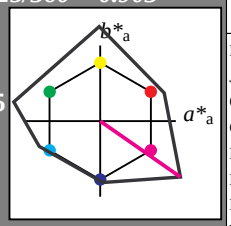
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

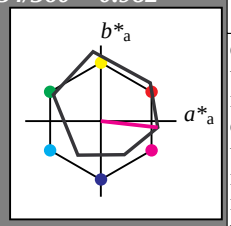
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 354/360 = 0.982$
*lab*tch* and *lab*nch*

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

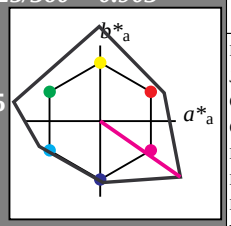
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

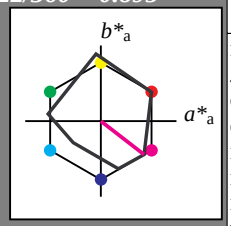
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 322/360 = 0.895$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 322
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.18 −19.4
*LAB*LABa* 65.17 28.58 −22.12
*LAB*TCHa* 75.0 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.609 0.395 −0.305
*lab*tch* 0.75 0.5 0.895
*lab*nch* 0.0 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.16 −44.25
*LAB*TCHa* 50.0 72.29 322.25
relative* CIELAB *lab*
*lab*lab* 0.219 0.791 −0.611
*lab*tch* 0.5 1.0 0.895
*lab*nch* 0.0 1.0 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.76
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.92 −22.01
*LAB*LABa* 26.48 28.58 −22.12
*LAB*TCHa* 25.01 36.15 322.25
relative* CIELAB *lab*
*lab*lab* 0.109 0.395 −0.305
*lab*tch* 0.25 0.5 0.895
*lab*nch* 0.5 0.5 0.895
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

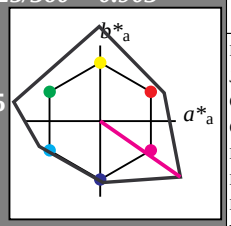
3 step scales for constant CIELAB hue 322/360 = 0.895 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

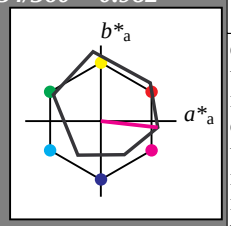
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 354/360 = 0.982$
lab*tch* and *lab*nch

D65: hue M
LCH*Ma: 48 76 354
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.77 37.1 −1.01
*LAB*LABa* 71.77 37.63 −4.17
*LAB*TCHa* 75.0 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.695 0.497 −0.054
*lab*tch* 0.75 0.5 0.982
*lab*nch* 0.0 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.454 −0.208
*lab*tce* 0.75 0.5 0.932
*lab*ncE* 0.0 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.14 75.18 −6.78
*LAB*LABa* 48.14 75.25 −8.35
*LAB*TCHa* 50.0 75.71 353.66
relative* CIELAB *lab*
*lab*lab* 0.389 0.994 −0.109
*lab*tch* 0.5 1.0 0.982
*lab*nch* 0.0 1.0 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 0.909 −0.416
*lab*tce* 0.5 1.0 0.932
*lab*ncE* 0.0 1.0 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.08 37.84 −3.62
*LAB*LABa* 33.08 37.63 −4.17
*LAB*TCHa* 25.01 37.86 353.66
relative* CIELAB *lab*
*lab*lab* 0.195 0.497 −0.054
*lab*tch* 0.25 0.5 0.982
*lab*nch* 0.5 0.5 0.982
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.454 −0.208
*lab*tce* 0.25 0.5 0.932
*lab*ncE* 0.5 0.5 b72r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

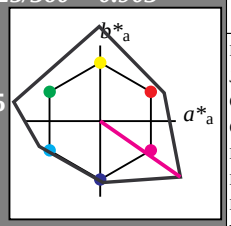
3 step scales for constant CIELAB hue 354/360 = 0.982 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

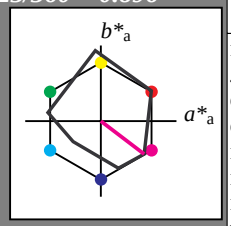
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 323/360 = 0.896$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 35 72 323
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.17 28.68 −21.78
*LAB*LABa* 65.17 28.63 −21.79
*LAB*TCHa* 75.0 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.609 0.398 −0.302
*lab*tch* 0.75 0.5 0.896
*lab*nch* 0.0 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.609 0.324 −0.38
*lab*tce* 0.75 0.5 0.862
*lab*ncE* 0.0 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 34.95 57.34 −43.57
*LAB*LABa* 34.95 57.26 −43.59
*LAB*TCHa* 50.0 71.98 322.71
relative* CIELAB *lab*
*lab*lab* 0.219 0.795 −0.605
*lab*tch* 0.5 1.0 0.896
*lab*nch* 0.0 1.0 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.219 0.648 −0.761
*lab*tce* 0.5 1.0 0.862
*lab*ncE* 0.0 1.0 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 26.48 28.72 −21.77
*LAB*LABa* 26.48 28.63 −21.79
*LAB*TCHa* 25.01 35.99 322.71
relative* CIELAB *lab*
*lab*lab* 0.109 0.398 −0.302
*lab*tch* 0.25 0.5 0.896
*lab*nch* 0.5 0.5 0.896
***relative* Natural Colour (NC)**
*lab*lrj* 0.109 0.324 −0.38
*lab*tce* 0.25 0.5 0.862
*lab*ncE* 0.5 0.5 b44r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

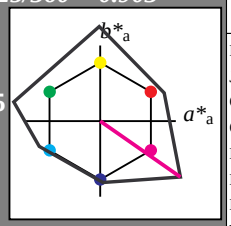
3 step scales for constant CIELAB hue 323/360 = 0.896 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

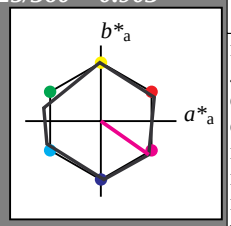
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 57 77 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 31.7 −22.18
*LAB*LABa* 76.05 31.67 −22.19
*LAB*TCHa* 75.0 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 63.39 −44.38
*LAB*LABa* 56.7 63.34 −44.39
*LAB*TCHa* 50.0 77.35 324.97
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 31.74 −22.17
*LAB*LABa* 37.36 31.67 −22.19
*LAB*TCHa* 25.01 38.67 324.97
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

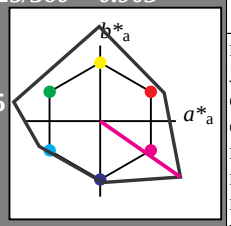
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

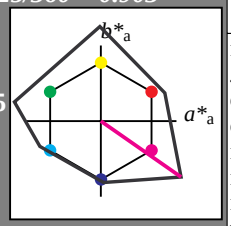
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.96
*LAB*TCHa* 75.0 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.668 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.668 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.05 −73.93
*LAB*TCHa* 50.0 129.28 325.12
relative* CIELAB *lab*
*lab*lab* 0.337 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.337 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 31.04 53.11 −36.93
*LAB*LABa* 31.04 53.03 −36.96
*LAB*TCHa* 25.01 64.64 325.12
relative* CIELAB *lab*
*lab*lab* 0.168 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.168 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

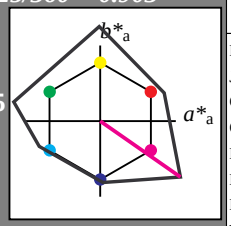
3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

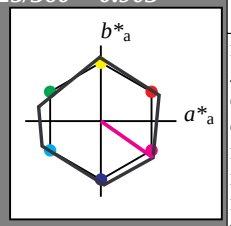
UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 325/360 = 0.903$
*lab*tch* and *lab*nch*

D65: hue B50R
LCH*Ma: 53 84 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 34.57 −24.19
*LAB*LABa* 74.3 34.54 −24.2
*LAB*TCHa* 75.0 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.75 0.409 −0.286
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.336 −0.37
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 34.6 −24.18
*LAB*LABa* 32.1 34.54 −24.2
*LAB*TCHa* 25.01 42.18 324.98
relative* CIELAB *lab*
*lab*lab* 0.25 0.409 −0.286
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.336 −0.37
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 69.12 −48.39
*LAB*LABa* 53.2 69.08 −48.4
*LAB*TCHa* 50.0 84.35 324.98
relative* CIELAB *lab*
*lab*lab* 0.5 0.819 −0.573
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.671 −0.74
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

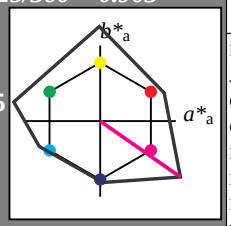
chromaticness c^*

3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

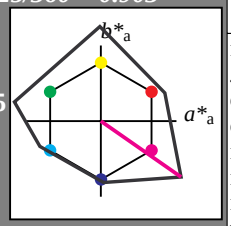
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 325/360 = 0.903 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 325/360 = 0.903$
lab*tch* and *lab*nch

D65: hue B50R
LCH*Ma: 44 129 325
olv*Ma: 1.0 0.0 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 1.0 (1.0)
*cmyn3** 0.0 0.5 0.0 (0.0)
*olvi4** 1.0 0.5 1.0 1.0
*cmyn4** 0.0 0.5 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 69.73 53.06 −36.95
*LAB*LABa* 69.73 53.03 −36.95
*LAB*TCHa* 75.0 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.696 0.41 −0.285
*lab*tch* 0.75 0.5 0.903
*lab*nch* 0.0 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.696 0.336 −0.369
*lab*tce* 0.75 0.5 0.867
*lab*ncE* 0.0 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 1.0 (1.0)
*cmyn3** 0.0 1.0 0.0 (0.0)
*olvi4** 1.0 0.0 1.0 1.0
*cmyn4** 0.0 1.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 44.06 106.12 −73.91
*LAB*LABa* 44.06 106.07 −73.92
*LAB*TCHa* 50.0 129.29 325.12
relative* CIELAB *lab*
*lab*lab* 0.392 0.82 −0.571
*lab*tch* 0.5 1.0 0.903
*lab*nch* 0.0 1.0 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.392 0.673 −0.739
*lab*tce* 0.5 1.0 0.867
*lab*ncE* 0.0 1.0 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.5 (1.0)
*cmyn3** 0.5 1.0 0.5 (0.0)
*olvi4** 1.0 0.5 1.0 0.5
*cmyn4** 0.0 0.5 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 27.53 53.1 −36.94
*LAB*LABa* 27.53 53.03 −36.95
*LAB*TCHa* 25.01 64.65 325.12
relative* CIELAB *lab*
*lab*lab* 0.196 0.41 −0.285
*lab*tch* 0.25 0.5 0.903
*lab*nch* 0.5 0.5 0.903
***relative* Natural Colour (NC)**
*lab*lrj* 0.196 0.336 −0.369
*lab*tce* 0.25 0.5 0.867
*lab*ncE* 0.5 0.5 b46r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

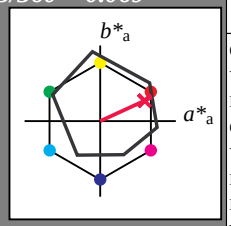
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 325/360 = 0.903 (right)

Input: Colorimetric Reflective System ORS18
for hue *h = *lab*h* = 25/360 = 0.069**
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

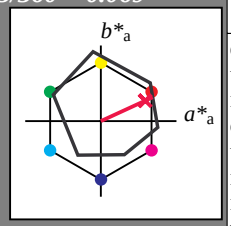
*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System ORS18
for hue *h = *lab*h* = 25/360 = 0.069**
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
0,25 0,50 *n** = 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

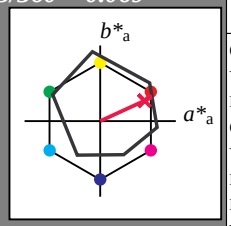
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

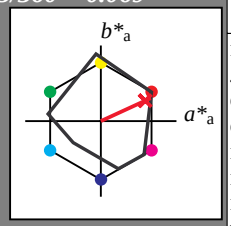
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

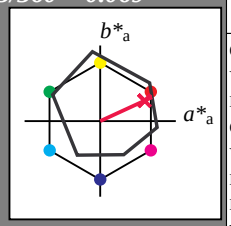
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

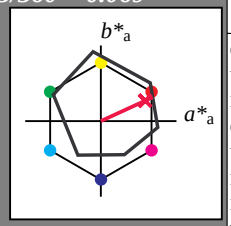
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

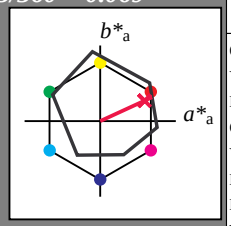
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

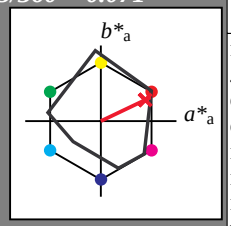
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

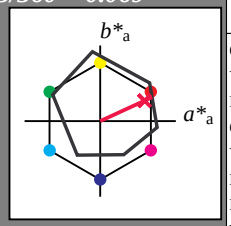
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

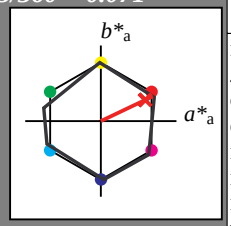
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

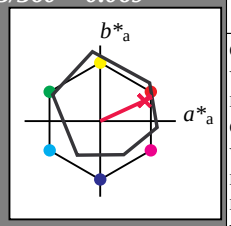
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

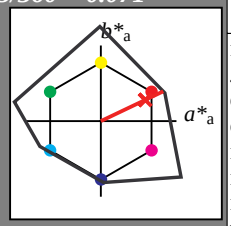
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

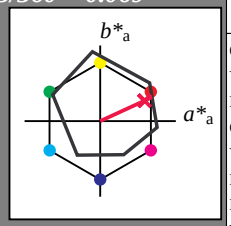
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

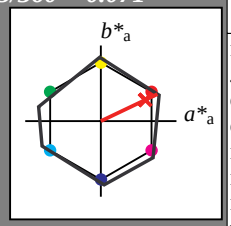
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

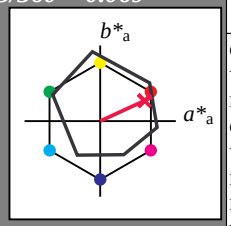
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

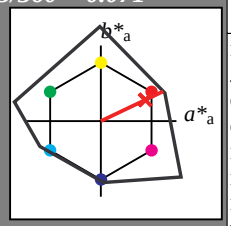
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

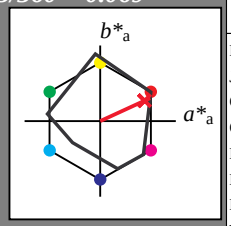
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

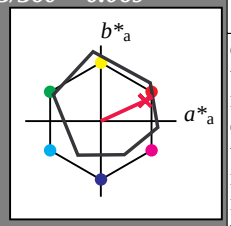
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

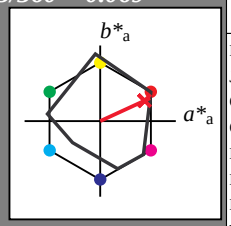
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 25/360 = 0.069$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

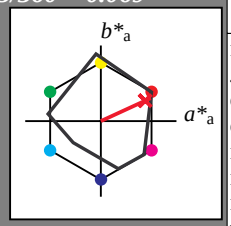
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 25/360 = 0.069$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

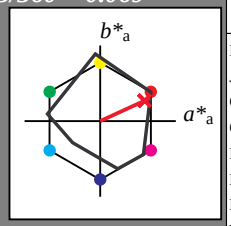
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

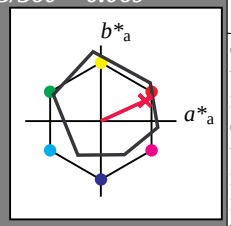
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

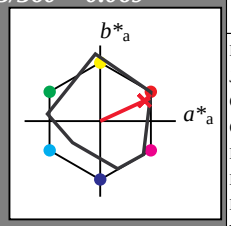
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

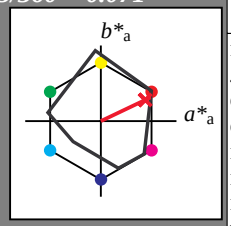
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

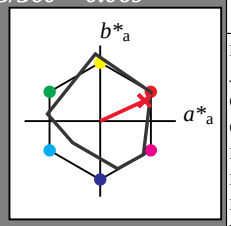
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

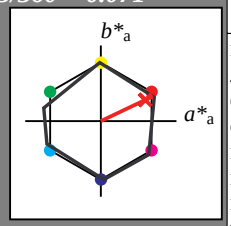
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

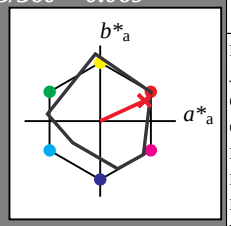
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

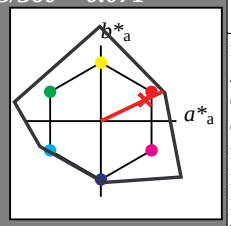
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

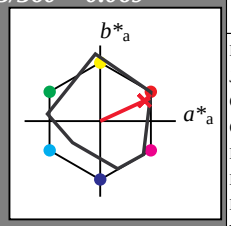
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

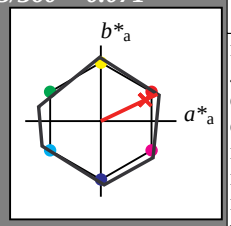
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

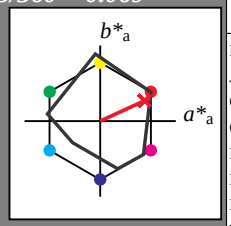
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

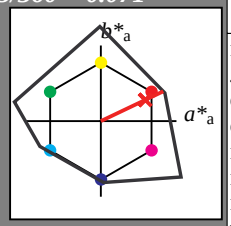
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

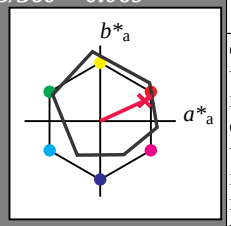
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

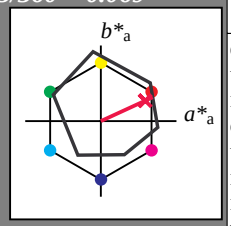
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

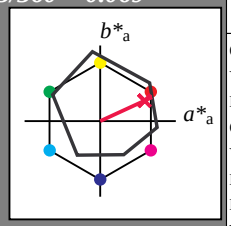
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 25/360 = 0.069$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

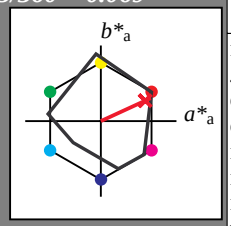
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 25/360 = 0.069$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

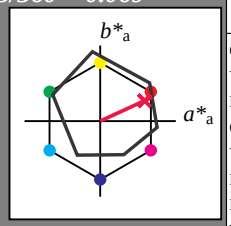
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System TRS18
for hue *h = *lab*h* = 25/360 = 0.069**
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***n** = 0,00*

blackness *n**

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

0,25 0,50 ***n** = 0,50* 0,75 1,00

chromaticness *c**

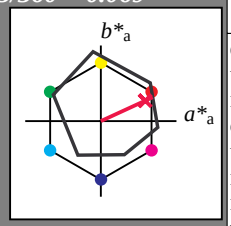
***n** = 1,0*

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System TRS18
for hue *h = *lab*h* = 25/360 = 0.069**
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***n** = 0,00*

blackness *n**

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

0,25 0,50 ***n** = 0,50* 0,75 1,00

chromaticness *c**

***n** = 1,0*

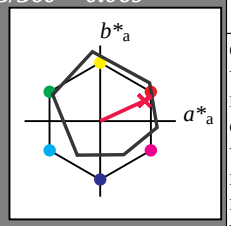
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

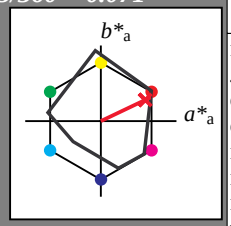
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

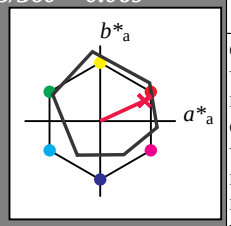
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

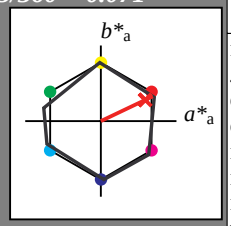
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

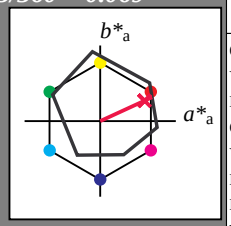
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

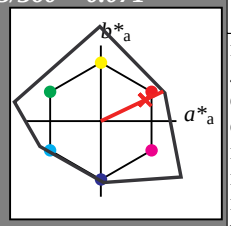
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

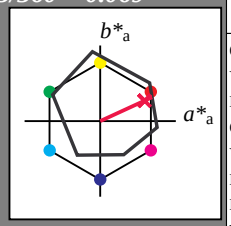
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

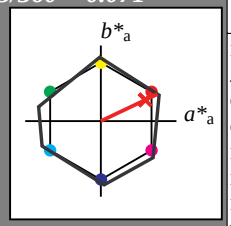
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

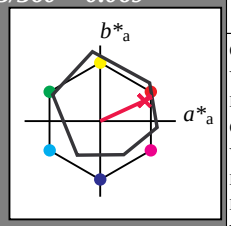
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

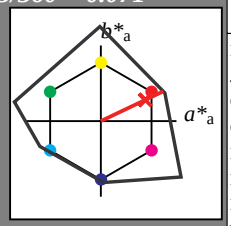
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.069 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

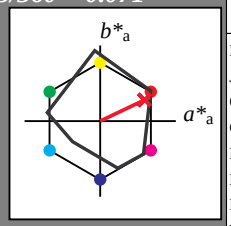
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

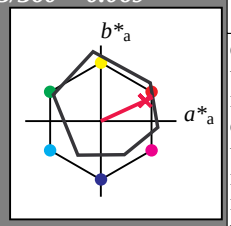
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

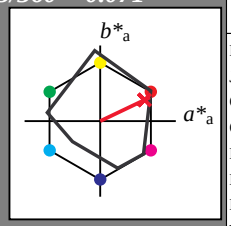
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

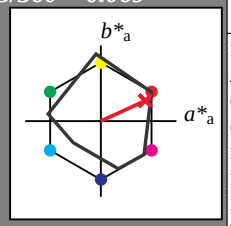
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

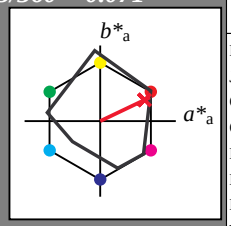
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

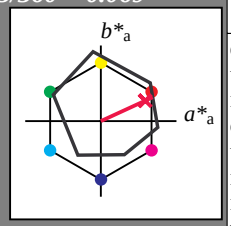
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

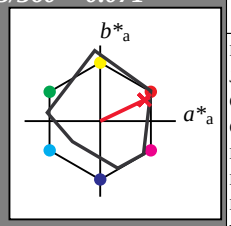
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

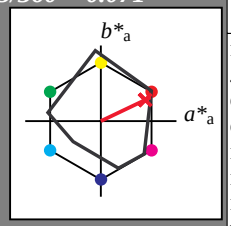
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

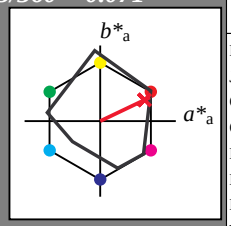
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

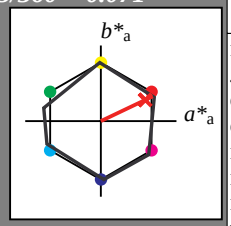
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

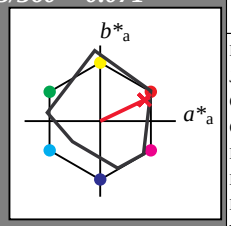
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

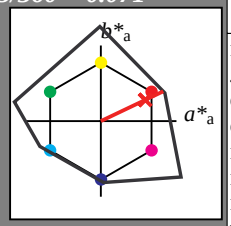
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

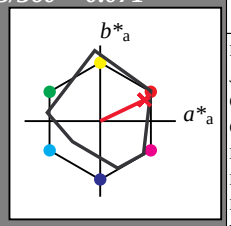
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

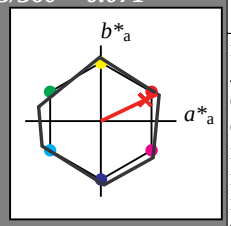
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

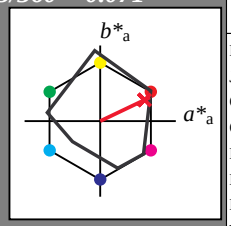
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

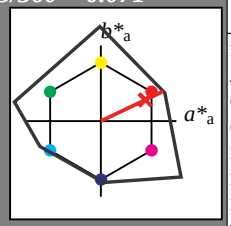
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

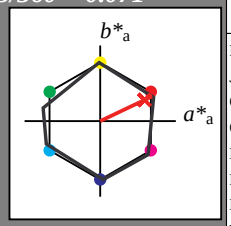
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.514	0.5	(1.0)
*cmyn3**	0.0	0.486	0.5	(0.0)
*olvi4**	1.0	0.514	0.5	1.0
*cmyn4**	0.0	0.486	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	34.36	16.37
*LAB*LABa*	76.05	34.33	16.36
*LAB*TCHa*	75.0	38.03	25.49

relative* CIELAB *lab*

*lab*lab*	0.75	0.451	0.215
*lab*tch*	0.75	0.5	0.071
*lab*nch*	0.0	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.5	0.0
*lab*tce*	0.75	0.5	0.0
*lab*ncE*	0.0	0.5	r00j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.028	0.0	(1.0)
*cmyn3**	0.0	0.972	1.0	(0.0)
*olvi4**	1.0	0.028	0.0	1.0
*cmyn4**	0.0	0.972	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	68.71	32.74
*LAB*LABa*	56.7	68.66	32.72
*LAB*TCHa*	50.0	76.06	25.48

relative* CIELAB *lab*

*lab*lab*	0.5	0.903	0.43
*lab*tch*	0.5	1.0	0.071
*lab*nch*	0.0	1.0	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	1.0	0.0
*lab*tce*	0.5	1.0	1.0
*lab*ncE*	0.0	1.0	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.014	0.0	(1.0)
*cmyn3**	0.5	0.986	1.0	(0.0)
*olvi4**	1.0	0.514	0.5	0.5
*cmyn4**	0.0	0.486	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	34.41	16.38
*LAB*LABa*	37.36	34.33	16.36
*LAB*TCHa*	25.01	38.03	25.48

relative* CIELAB *lab*

*lab*lab*	0.25	0.451	0.215
*lab*tch*	0.25	0.5	0.071
*lab*nch*	0.5	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.5	0.0
*lab*tce*	0.25	0.5	1.0
*lab*ncE*	0.5	0.5	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

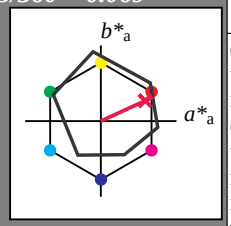
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	0.661	(1.0)
*cmyn3**	0.0	0.5	0.339	(0.0)
*olvi4**	1.0	0.5	0.661	1.0
*cmyn4**	0.0	0.5	0.339	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	71.7	33.75	18.92
*LAB*LABa*	71.7	34.27	15.76
*LAB*TCHa*	75.0	37.72	24.69

relative* CIELAB *lab*

*lab*lab*	0.694	0.454	0.209
*lab*tch*	0.75	0.5	0.069
*lab*nch*	0.0	0.5	0.069

***relative* Natural Colour (NC)**

*lab*lrj*	0.694	0.5	0.0
*lab*tce*	0.75	0.5	1.0
*lab*ncE*	0.0	0.5	b99r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	0.322	(1.0)
*cmyn3**	0.0	1.0	0.678	(0.0)
*olvi4**	1.0	0.0	0.323	1.0
*cmyn4**	0.0	1.0	0.677	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	48.01	68.48	33.09
*LAB*LABa*	48.01	68.55	31.53
*LAB*TCHa*	50.0	75.45	24.7

relative* CIELAB *lab*

*lab*lab*	0.388	0.908	0.418
*lab*tch*	0.5	1.0	0.069
*lab*nch*	0.0	1.0	0.069

***relative* Natural Colour (NC)**

*lab*lrj*	0.388	1.0	0.0
*lab*tce*	0.5	1.0	0.0
*lab*ncE*	0.0	1.0	r00j

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.161	(1.0)
*cmyn3**	0.5	1.0	0.839	(0.0)
*olvi4**	1.0	0.5	0.661	0.5
*cmyn4**	0.0	0.5	0.339	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.01	34.49	16.31
*LAB*LABa*	33.01	34.27	15.77
*LAB*TCHa*	25.01	37.73	24.7

relative* CIELAB *lab*

*lab*lab*	0.194	0.454	0.209
*lab*tch*	0.25	0.5	0.069
*lab*nch*	0.5	0.5	0.069

***relative* Natural Colour (NC)**

*lab*lrj*	0.194	0.5	0.0
*lab*tce*	0.25	0.5	0.0
*lab*ncE*	0.5	0.5	r00j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

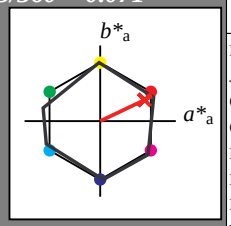
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

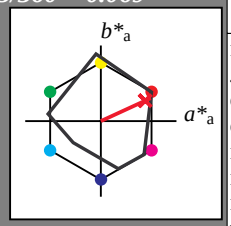
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

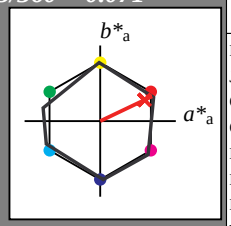
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.514	0.5	(1.0)
*cmyn3**	0.0	0.486	0.5	(0.0)
*olvi4**	1.0	0.514	0.5	1.0
*cmyn4**	0.0	0.486	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	34.36	16.37
*LAB*LABa*	76.05	34.33	16.36
*LAB*TCHa*	75.0	38.03	25.49

relative* CIELAB *lab*

*lab*lab*	0.75	0.451	0.215
*lab*tch*	0.75	0.5	0.071
*lab*nch*	0.0	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.5	0.0
*lab*tce*	0.75	0.5	0.0
*lab*ncE*	0.0	0.5	r00j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.028	0.0	(1.0)
*cmyn3**	0.0	0.972	1.0	(0.0)
*olvi4**	1.0	0.028	0.0	1.0
*cmyn4**	0.0	0.972	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	68.71	32.74
*LAB*LABa*	56.7	68.66	32.72
*LAB*TCHa*	50.0	76.06	25.48

relative* CIELAB *lab*

*lab*lab*	0.5	0.903	0.43
*lab*tch*	0.5	1.0	0.071
*lab*nch*	0.0	1.0	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	1.0	0.0
*lab*tce*	0.5	1.0	1.0
*lab*ncE*	0.0	1.0	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.014	0.0	(1.0)
*cmyn3**	0.5	0.986	1.0	(0.0)
*olvi4**	1.0	0.514	0.5	0.5
*cmyn4**	0.0	0.486	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	34.41	16.38
*LAB*LABa*	37.36	34.33	16.36
*LAB*TCHa*	25.01	38.03	25.48

relative* CIELAB *lab*

*lab*lab*	0.25	0.451	0.215
*lab*tch*	0.25	0.5	0.071
*lab*nch*	0.5	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.5	0.0
*lab*tce*	0.25	0.5	1.0
*lab*ncE*	0.5	0.5	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

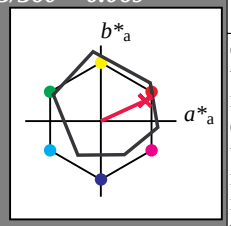
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.5	0.661	(1.0)
*cmyn3**	0.0	0.5	0.339	(0.0)
*olvi4**	1.0	0.5	0.661	1.0
*cmyn4**	0.0	0.5	0.339	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	71.7	33.75	18.92
*LAB*LABa*	71.7	34.27	15.76
*LAB*TCHa*	75.0	37.72	24.69

relative* CIELAB *lab*

*lab*lab*	0.694	0.454	0.209
*lab*tch*	0.75	0.5	0.069
*lab*nch*	0.0	0.5	0.069

***relative* Natural Colour (NC)**

*lab*lrj*	0.694	0.5	0.0
*lab*tce*	0.75	0.5	1.0
*lab*ncE*	0.0	0.5	b99r

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.0	0.322	(1.0)
*cmyn3**	0.0	1.0	0.678	(0.0)
*olvi4**	1.0	0.0	0.323	1.0
*cmyn4**	0.0	1.0	0.677	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	48.01	68.48	33.09
*LAB*LABa*	48.01	68.55	31.53
*LAB*TCHa*	50.0	75.45	24.7

relative* CIELAB *lab*

*lab*lab*	0.388	0.908	0.418
*lab*tch*	0.5	1.0	0.069
*lab*nch*	0.0	1.0	0.069

***relative* Natural Colour (NC)**

*lab*lrj*	0.388	1.0	0.0
*lab*tce*	0.5	1.0	0.0
*lab*ncE*	0.0	1.0	r00j

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.0	0.161	(1.0)
*cmyn3**	0.5	1.0	0.839	(0.0)
*olvi4**	1.0	0.5	0.661	0.5
*cmyn4**	0.0	0.5	0.339	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.01	34.49	16.31
*LAB*LABa*	33.01	34.27	15.77
*LAB*TCHa*	25.01	37.73	24.7

relative* CIELAB *lab*

*lab*lab*	0.194	0.454	0.209
*lab*tch*	0.25	0.5	0.069
*lab*nch*	0.5	0.5	0.069

***relative* Natural Colour (NC)**

*lab*lrj*	0.194	0.5	0.0
*lab*tce*	0.25	0.5	0.0
*lab*ncE*	0.5	0.5	r00j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

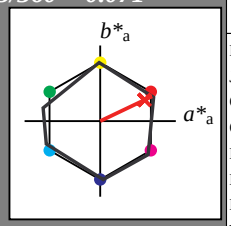
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

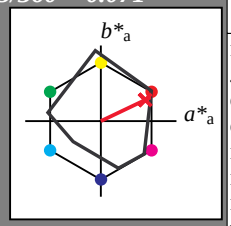
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

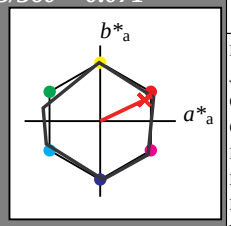
*n** = 1,0

3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

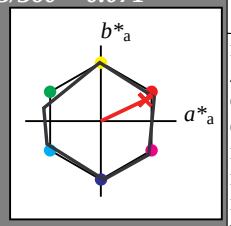
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

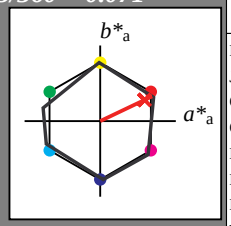
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

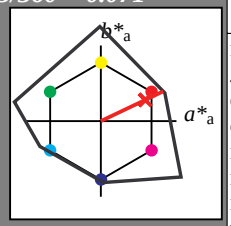
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

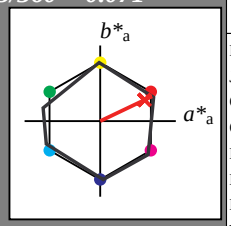
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

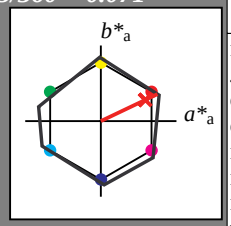
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

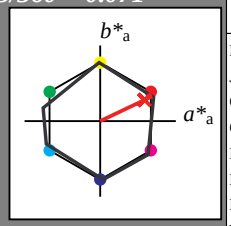
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

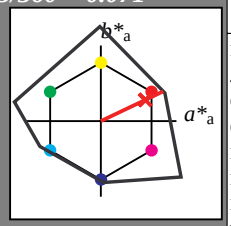
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

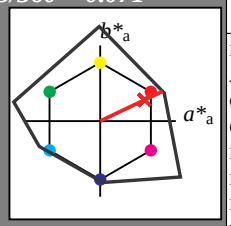
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

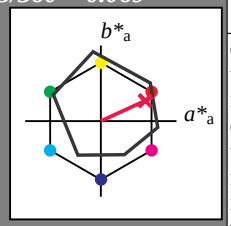
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

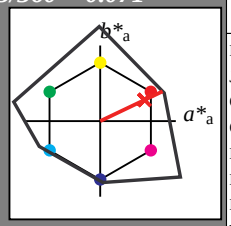
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

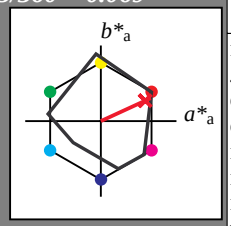
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

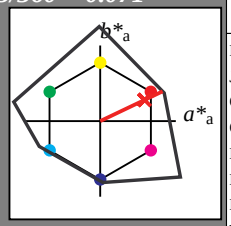
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

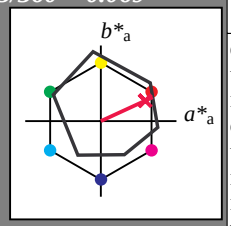
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

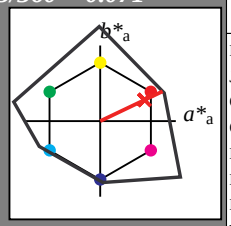
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

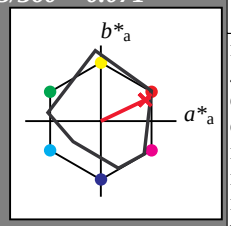
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

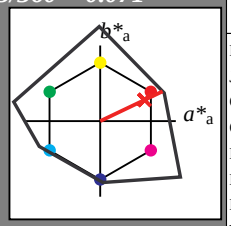
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

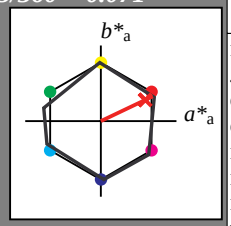
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

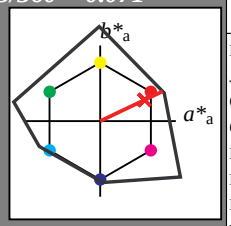
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS18
for hue *h = *lab*h* = 25/360 = 0.071**
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

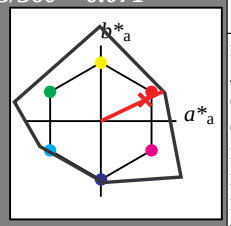
*n** = 0,00
blackness *n**
*n** = 0,50
0,25 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS18
for hue *h = *lab*h* = 25/360 = 0.071**
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00
blackness *n**
*n** = 0,50
0,25 0,50 0,75 1,00
chromaticness *c**
*n** = 1,0

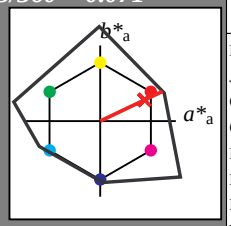
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

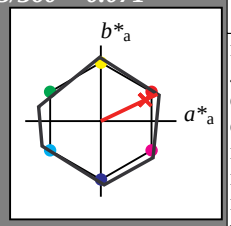
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

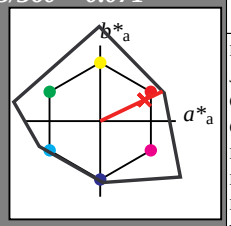
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

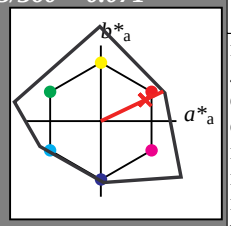
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

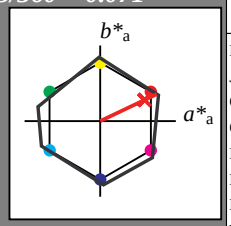
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

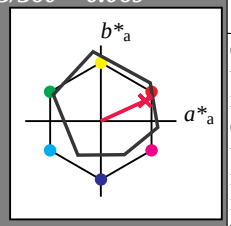
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

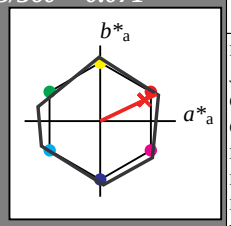
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

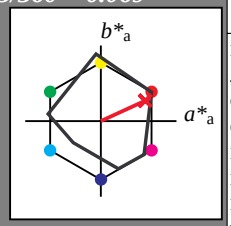
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

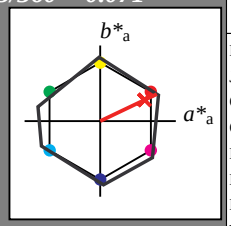
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

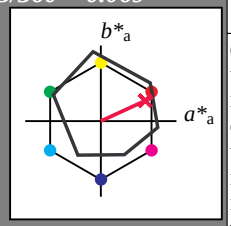
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

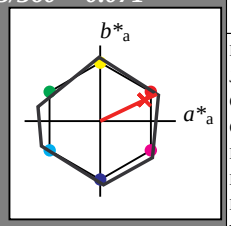
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

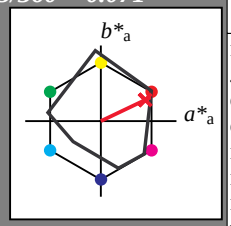
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

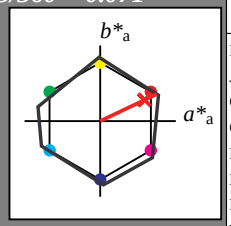
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

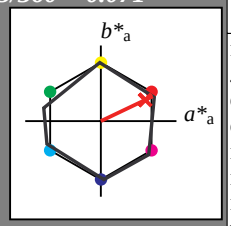
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

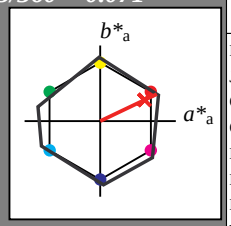
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.514	0.5	(1.0)
*cmyn3**	0.0	0.486	0.5	(0.0)
*olvi4**	1.0	0.514	0.5	1.0
*cmyn4**	0.0	0.486	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	74.3	37.46	17.85
*LAB*LABa*	74.3	37.44	17.85
*LAB*TCHa*	75.0	41.47	25.49

relative* CIELAB *lab*

*lab*lab*	0.75	0.451	0.215
*lab*tch*	0.75	0.5	0.071
*lab*nch*	0.0	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.5	0.0
*lab*tce*	0.75	0.5	0.0
*lab*ncE*	0.0	0.5	r00j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.028	0.0	(1.0)
*cmyn3**	0.0	0.972	1.0	(0.0)
*olvi4**	1.0	0.028	0.0	1.0
*cmyn4**	0.0	0.972	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.2	74.93	35.7
*LAB*LABa*	53.2	74.88	35.69
*LAB*TCHa*	50.0	82.95	25.48

relative* CIELAB *lab*

*lab*lab*	0.5	0.903	0.43
*lab*tch*	0.5	1.0	0.071
*lab*nch*	0.0	1.0	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	1.0	0.0
*lab*tce*	0.5	1.0	1.0
*lab*ncE*	0.0	1.0	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.21	0.04	0.0
*LAB*LABa*	53.21	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.014	0.0	(1.0)
*cmyn3**	0.5	0.986	1.0	(0.0)
*olvi4**	1.0	0.514	0.5	0.5
*cmyn4**	0.0	0.486	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	32.1	37.51	17.86
*LAB*LABa*	32.1	37.45	17.84
*LAB*TCHa*	25.01	41.48	25.48

relative* CIELAB *lab*

*lab*lab*	0.25	0.451	0.215
*lab*tch*	0.25	0.5	0.071
*lab*nch*	0.5	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.5	0.0
*lab*tce*	0.25	0.5	1.0
*lab*ncE*	0.5	0.5	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	11.01	0.07	0.01
*LAB*LABa*	11.01	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

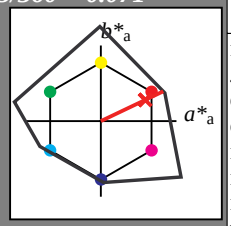
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.512	0.5	(1.0)
*cmyn3**	0.0	0.488	0.5	(0.0)
*olvi4**	1.0	0.512	0.5	1.0
*cmyn4**	0.0	0.488	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	71.81	41.31	19.68
*LAB*LABa*	71.81	41.27	19.68
*LAB*TCHa*	75.0	45.72	25.49

relative* CIELAB *lab*

*lab*lab*	0.695	0.451	0.215
*lab*tch*	0.75	0.5	0.071
*lab*nch*	0.0	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.695	0.5	0.0
*lab*tce*	0.75	0.5	0.0
*lab*ncE*	0.0	0.5	r00j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.024	0.0	(1.0)
*cmyn3**	0.0	0.976	1.0	(0.0)
*olvi4**	1.0	0.024	0.0	1.0
*cmyn4**	0.0	0.976	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	48.21	82.61	39.36
*LAB*LABa*	48.21	82.55	39.34
*LAB*TCHa*	50.0	91.45	25.48

relative* CIELAB *lab*

*lab*lab*	0.39	0.903	0.43
*lab*tch*	0.5	1.0	0.071
*lab*nch*	0.0	1.0	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.39	1.0	0.0
*lab*tce*	0.5	1.0	1.0
*lab*ncE*	0.0	1.0	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.012	0.0	(1.0)
*cmyn3**	0.5	0.988	1.0	(0.0)
*olvi4**	1.0	0.512	0.5	0.5
*cmyn4**	0.0	0.488	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.11	41.36	19.69
*LAB*LABa*	33.11	41.28	19.67
*LAB*TCHa*	25.01	45.73	25.47

relative* CIELAB *lab*

*lab*lab*	0.195	0.451	0.215
*lab*tch*	0.25	0.5	0.071
*lab*nch*	0.5	0.5	0.071

***relative* Natural Colour (NC)**

*lab*lrj*	0.195	0.5	0.0
*lab*tce*	0.25	0.5	1.0
*lab*ncE*	0.5	0.5	b99r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

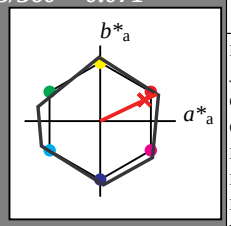
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

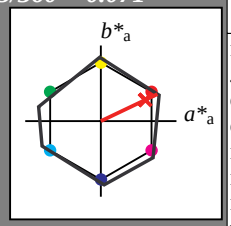
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

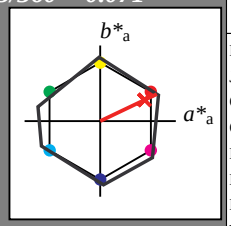
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

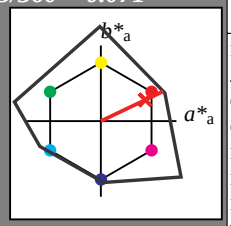
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

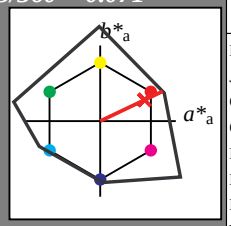
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

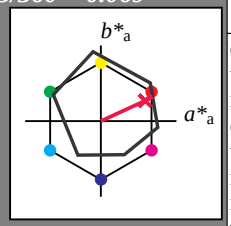
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

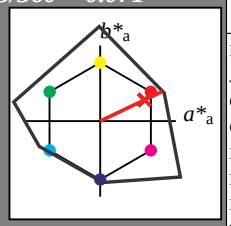
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

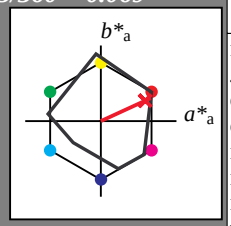
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.548 (1.0)
*cmyn3** 0.0 0.5 0.452 (0.0)
*olvi4** 1.0 0.5 0.549 1.0
*cmyn4** 0.0 0.5 0.451 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.8 32.47 18.34
*LAB*LABa* 71.8 33.0 15.17
*LAB*TCHa* 75.0 36.32 24.7
relative* CIELAB *lab*
*lab*lab* 0.695 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.097 (1.0)
*cmyn3** 0.0 1.0 0.903 (0.0)
*olvi4** 1.0 0.0 0.097 1.0
*cmyn4** 0.0 1.0 0.903 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 65.92 31.93
*LAB*LABa* 48.21 66.0 30.36
*LAB*TCHa* 50.0 72.65 24.7
relative* CIELAB *lab*
*lab*lab* 0.39 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.048 (1.0)
*cmyn3** 0.5 1.0 0.952 (0.0)
*olvi4** 1.0 0.5 0.548 0.5
*cmyn4** 0.0 0.5 0.452 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 33.21 15.74
*LAB*LABa* 33.11 33.0 15.18
*LAB*TCHa* 25.01 36.33 24.71
relative* CIELAB *lab*
*lab*lab* 0.195 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

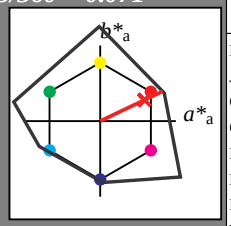
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

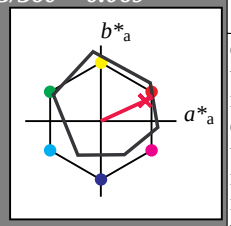
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 25/360 = 0.069$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 75 25
olv*Ma: 1.0 0.0 0.32

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.661 (1.0)
*cmyn3** 0.0 0.5 0.339 (0.0)
*olvi4** 1.0 0.5 0.661 1.0
*cmyn4** 0.0 0.5 0.339 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.7 33.75 18.92
*LAB*LABa* 71.7 34.27 15.76
*LAB*TCHa* 75.0 37.72 24.69
relative* CIELAB *lab*
*lab*lab* 0.694 0.454 0.209
*lab*tch* 0.75 0.5 0.069
*lab*nch* 0.0 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.161 (1.0)
*cmyn3** 0.5 1.0 0.839 (0.0)
*olvi4** 1.0 0.5 0.661 0.5
*cmyn4** 0.0 0.5 0.339 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.01 34.49 16.31
*LAB*LABa* 33.01 34.27 15.77
*LAB*TCHa* 25.01 37.73 24.7
relative* CIELAB *lab*
*lab*lab* 0.194 0.454 0.209
*lab*tch* 0.25 0.5 0.069
*lab*nch* 0.5 0.5 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.194 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.322 (1.0)
*cmyn3** 0.0 1.0 0.678 (0.0)
*olvi4** 1.0 0.0 0.323 1.0
*cmyn4** 0.0 1.0 0.677 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.01 68.48 33.09
*LAB*LABa* 48.01 68.55 31.53
*LAB*TCHa* 50.0 75.45 24.7
relative* CIELAB *lab*
*lab*lab* 0.388 0.908 0.418
*lab*tch* 0.5 1.0 0.069
*lab*nch* 0.0 1.0 0.069
***relative* Natural Colour (NC)**
*lab*lrj* 0.388 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

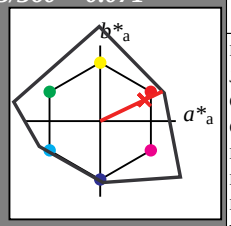
3 step scales for constant CIELAB hue 25/360 = 0.069 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

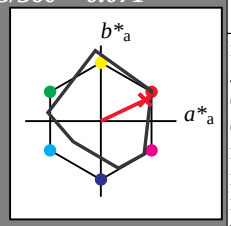
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 73 25
olv*Ma: 1.0 0.0 0.1

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.5 0.552 (1.0)
*cmyn3** 0.0 0.5 0.448 (0.0)
*olvi4** 1.0 0.5 0.552 1.0
*cmyn4** 0.0 0.5 0.448 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.76 32.94 15.69
*LAB*LABa* 71.76 32.9 15.68
*LAB*TCHa* 75.0 36.45 25.49
relative* CIELAB *lab*
*lab*lab* 0.694 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.694 0.5 0.0
*lab*tce* 0.75 0.5 1.0
*lab*ncE* 0.0 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.0 0.103 (1.0)
*cmyn3** 0.0 1.0 0.897 (0.0)
*olvi4** 1.0 0.0 0.104 1.0
*cmyn4** 0.0 1.0 0.896 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.11 65.86 31.39
*LAB*LABa* 48.11 65.8 31.37
*LAB*TCHa* 50.0 72.9 25.49
relative* CIELAB *lab*
*lab*lab* 0.389 0.902 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.389 1.0 0.0
*lab*tce* 0.5 1.0 0.0
*lab*ncE* 0.0 1.0 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.0 0.052 (1.0)
*cmyn3** 0.5 1.0 0.948 (0.0)
*olvi4** 1.0 0.5 0.552 0.5
*cmyn4** 0.0 0.5 0.448 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.07 32.98 15.72
*LAB*LABa* 33.07 32.9 15.69
*LAB*TCHa* 25.01 36.45 25.5
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 0.0
*lab*ncE* 0.5 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

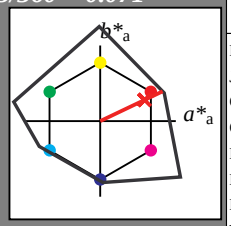
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

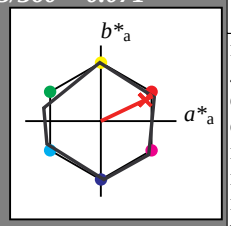
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 57 76 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 34.36 16.37
*LAB*LABa* 76.05 34.33 16.36
*LAB*TCHa* 75.0 38.03 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 68.71 32.74
*LAB*LABa* 56.7 68.66 32.72
*LAB*TCHa* 50.0 76.06 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 34.41 16.38
*LAB*LABa* 37.36 34.33 16.36
*LAB*TCHa* 25.01 38.03 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

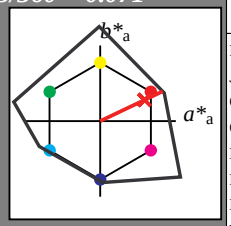
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

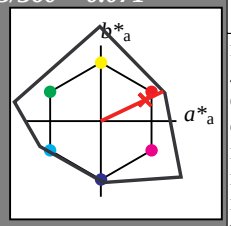
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.27 19.68
*LAB*TCHa* 75.0 45.72 25.49
relative* CIELAB *lab*
*lab*lab* 0.695 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.695 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.55 39.34
*LAB*TCHa* 50.0 91.45 25.48
relative* CIELAB *lab*
*lab*lab* 0.39 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.39 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.11 41.36 19.69
*LAB*LABa* 33.11 41.28 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.195 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.195 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

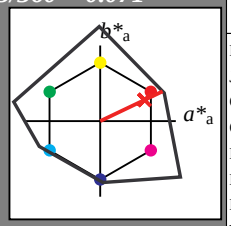
3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

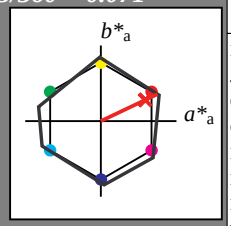
UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 25/360 = 0.071$
*lab*tch* and *lab*nch*

D65: hue R
LCH*Ma: 53 83 25
olv*Ma: 1.0 0.03 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.514 0.5 (1.0)
*cmyn3** 0.0 0.486 0.5 (0.0)
*olvi4** 1.0 0.514 0.5 1.0
*cmyn4** 0.0 0.486 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 37.46 17.85
*LAB*LABa* 74.3 37.44 17.85
*LAB*TCHa* 75.0 41.47 25.49
relative* CIELAB *lab*
*lab*lab* 0.75 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.014 0.0 (1.0)
*cmyn3** 0.5 0.986 1.0 (0.0)
*olvi4** 1.0 0.514 0.5 0.5
*cmyn4** 0.0 0.486 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 37.51 17.86
*LAB*LABa* 32.1 37.45 17.84
*LAB*TCHa* 25.01 41.48 25.48
relative* CIELAB *lab*
*lab*lab* 0.25 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.028 0.0 (1.0)
*cmyn3** 0.0 0.972 1.0 (0.0)
*olvi4** 1.0 0.028 0.0 1.0
*cmyn4** 0.0 0.972 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 74.93 35.7
*LAB*LABa* 53.2 74.88 35.69
*LAB*TCHa* 50.0 82.95 25.48
relative* CIELAB *lab*
*lab*lab* 0.5 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

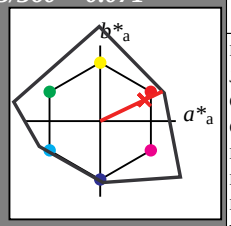
$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

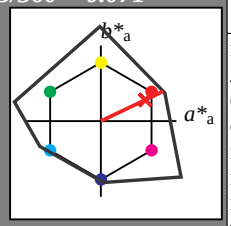
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 25/360 = 0.071 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 25/360 = 0.071$
lab*tch* and *lab*nch

D65: hue R
LCH*Ma: 48 91 25
olv*Ma: 1.0 0.02 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.512 0.5 (1.0)
*cmyn3** 0.0 0.488 0.5 (0.0)
*olvi4** 1.0 0.512 0.5 1.0
*cmyn4** 0.0 0.488 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 71.81 41.31 19.68
*LAB*LABa* 71.81 41.28 19.68
*LAB*TCHa* 75.0 45.73 25.49
relative* CIELAB *lab*
*lab*lab* 0.72 0.451 0.215
*lab*tch* 0.75 0.5 0.071
*lab*nch* 0.0 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.72 0.5 0.0
*lab*tce* 0.75 0.5 0.0
*lab*ncE* 0.0 0.5 r00j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.024 0.0 (1.0)
*cmyn3** 0.0 0.976 1.0 (0.0)
*olvi4** 1.0 0.024 0.0 1.0
*cmyn4** 0.0 0.976 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 48.21 82.61 39.36
*LAB*LABa* 48.21 82.57 39.35
*LAB*TCHa* 50.0 91.46 25.48
relative* CIELAB *lab*
*lab*lab* 0.441 0.903 0.43
*lab*tch* 0.5 1.0 0.071
*lab*nch* 0.0 1.0 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.441 1.0 0.0
*lab*tce* 0.5 1.0 1.0
*lab*ncE* 0.0 1.0 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.012 0.0 (1.0)
*cmyn3** 0.5 0.988 1.0 (0.0)
*olvi4** 1.0 0.512 0.5 0.5
*cmyn4** 0.0 0.488 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.6 41.35 19.69
*LAB*LABa* 29.6 41.29 19.67
*LAB*TCHa* 25.01 45.73 25.47
relative* CIELAB *lab*
*lab*lab* 0.22 0.451 0.215
*lab*tch* 0.25 0.5 0.071
*lab*nch* 0.5 0.5 0.071
***relative* Natural Colour (NC)**
*lab*lrj* 0.22 0.5 0.0
*lab*tce* 0.25 0.5 1.0
*lab*ncE* 0.5 0.5 b99r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

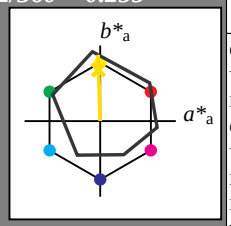
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 25/360 = 0.071 (right)

Input: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

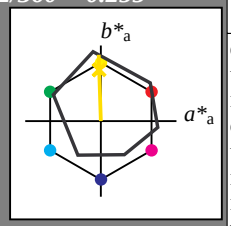
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

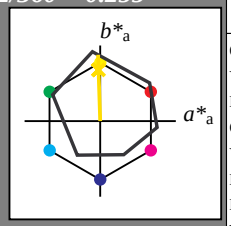
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

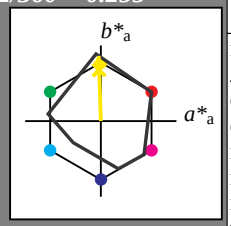
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

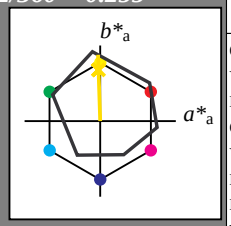
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

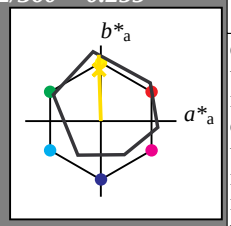
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

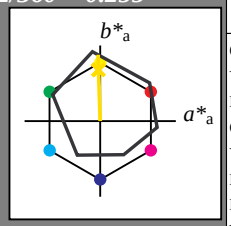
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

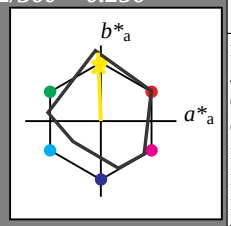
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

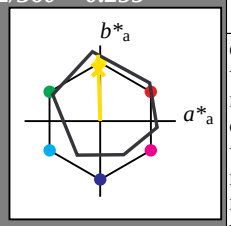
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

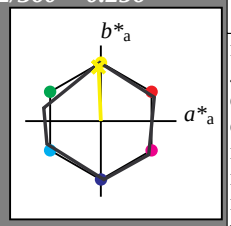
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

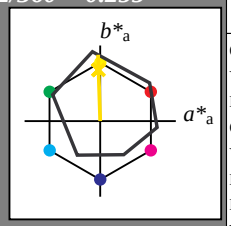
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

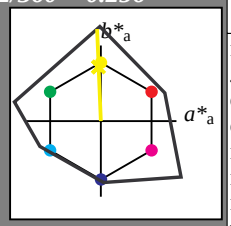
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

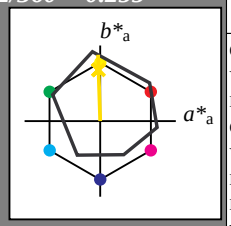
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

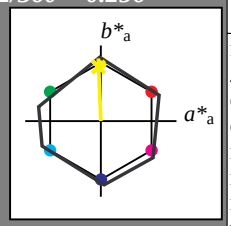
chromaticness c^*

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

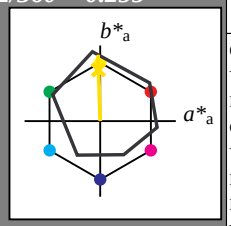
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

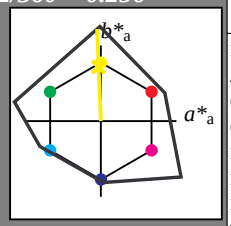
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

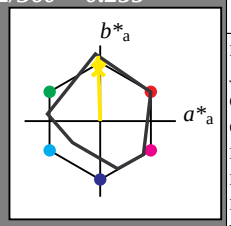
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

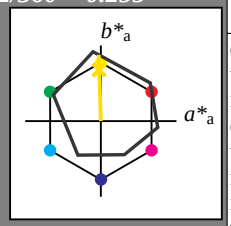
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

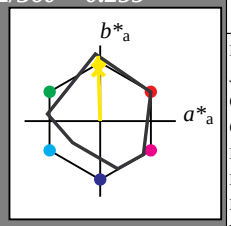
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

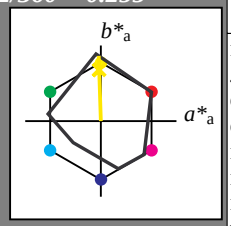
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

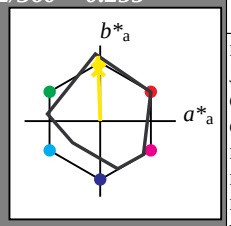
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

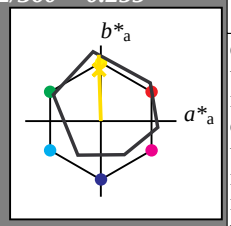
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

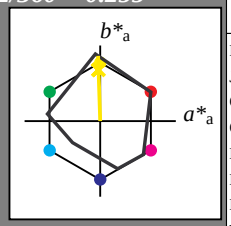
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

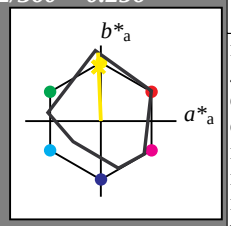
*n** = 1,0

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

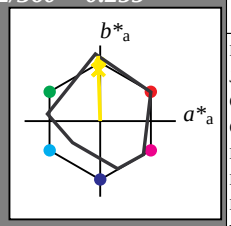
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

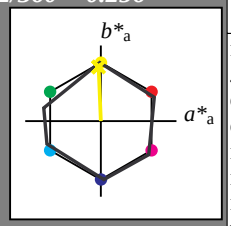
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

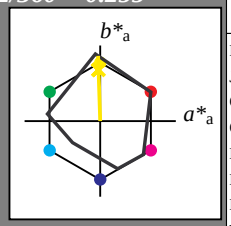
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.976 0.5 (1.0)
*cmyn3** 0.024 0.5 (0.0)
*olvi4** 0.976 0.5 1.0
*cmyn4** 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.951 0.0 (1.0)
*cmyn3** 0.049 1.0 (0.0)
*olvi4** 0.951 0.0 1.0
*cmyn4** 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.476 0.0 (1.0)
*cmyn3** 0.524 1.0 (0.0)
*olvi4** 0.976 0.5 0.5
*cmyn4** 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

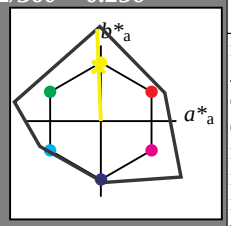
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

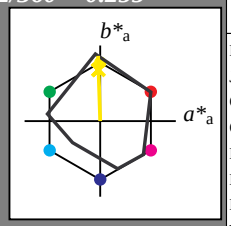
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

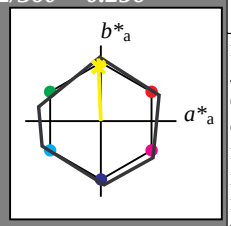
chromaticness *c**

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

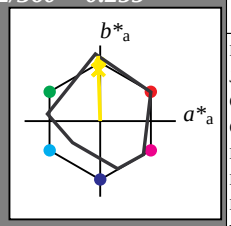
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

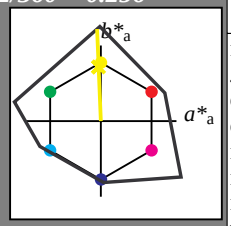
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

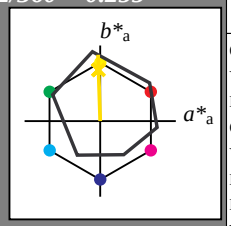
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

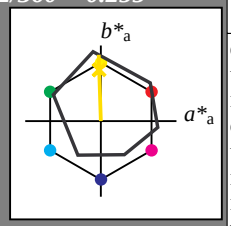
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

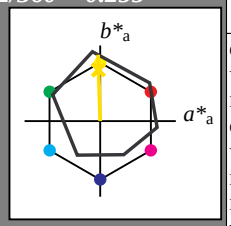
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.951	0.5	(1.0)
*cmyn3**	0.0	0.049	0.5	(0.0)
*olvi4**	1.0	0.951	0.5	1.0
*cmyn4**	0.0	0.049	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	90.8	−2.3	48.29
*LAB*LABa*	90.8	−1.41	43.85
*LAB*TCHa*	75.0	43.87	91.85

relative* CIELAB *lab*

*lab*lab*	0.94	−0.015	0.5
*lab*tch*	0.75	0.5	0.255
*lab*nch*	0.0	0.5	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.94	0.0	0.5
*lab*tce*	0.75	0.5	0.25
*lab*ncE*	0.0	0.5	j00g

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.901	0.0	(1.0)
*cmyn3**	0.0	0.099	1.0	(0.0)
*olvi4**	1.0	0.902	0.0	1.0
*cmyn4**	0.0	0.098	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	86.19	−3.62	91.83
*LAB*LABa*	86.19	−2.82	87.69
*LAB*TCHa*	50.0	87.73	91.85

relative* CIELAB *lab*

*lab*lab*	0.881	−0.031	0.999
*lab*tch*	0.5	1.0	0.255
*lab*nch*	0.0	1.0	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.881	0.0	1.0
*lab*tce*	0.5	1.0	0.25
*lab*ncE*	0.0	1.0	j00g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.451	0.0	(1.0)
*cmyn3**	0.5	0.549	1.0	(0.0)
*olvi4**	1.0	0.951	0.5	0.5
*cmyn4**	0.0	0.049	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	52.1	−1.55	45.68
*LAB*LABa*	52.1	−1.4	43.84
*LAB*TCHa*	25.01	43.87	91.84

relative* CIELAB *lab*

*lab*lab*	0.44	−0.015	0.5
*lab*tch*	0.25	0.5	0.255
*lab*nch*	0.5	0.5	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.44	0.0	0.5
*lab*tce*	0.25	0.5	0.25
*lab*ncE*	0.5	0.5	r99j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

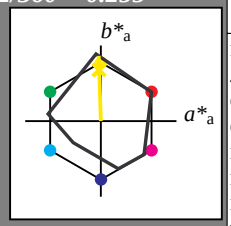
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.976	0.5	(1.0)
*cmyn3**	0.0	0.024	0.5	(0.0)
*olvi4**	1.0	0.976	0.5	1.0
*cmyn4**	0.0	0.024	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	92.04	−2.3	47.67
*LAB*LABa*	92.04	−1.39	43.14
*LAB*TCHa*	75.0	43.16	91.85

relative* CIELAB *lab*

*lab*lab*	0.957	−0.015	0.5
*lab*tch*	0.75	0.5	0.255
*lab*nch*	0.0	0.5	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.957	0.0	0.5
*lab*tce*	0.75	0.5	0.25
*lab*ncE*	0.0	0.5	j00g

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.951	0.0	(1.0)
*cmyn3**	0.0	0.049	1.0	(0.0)
*olvi4**	1.0	0.951	0.0	1.0
*cmyn4**	0.0	0.049	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	88.68	−3.62	90.58
*LAB*LABa*	88.68	−2.77	86.27
*LAB*TCHa*	50.0	86.32	91.85

relative* CIELAB *lab*

*lab*lab*	0.913	−0.031	0.999
*lab*tch*	0.5	1.0	0.255
*lab*nch*	0.0	1.0	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.913	0.0	1.0
*lab*tce*	0.5	1.0	0.25
*lab*ncE*	0.0	1.0	j00g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.476	0.0	(1.0)
*cmyn3**	0.5	0.524	1.0	(0.0)
*olvi4**	1.0	0.976	0.5	0.5
*cmyn4**	0.0	0.024	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.35	−1.55	45.05
*LAB*LABa*	53.35	−1.38	43.13
*LAB*TCHa*	25.01	43.16	91.84

relative* CIELAB *lab*

*lab*lab*	0.457	−0.015	0.5
*lab*tch*	0.25	0.5	0.255
*lab*nch*	0.5	0.5	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.457	0.0	0.5
*lab*tce*	0.25	0.5	0.25
*lab*ncE*	0.5	0.5	r99j

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

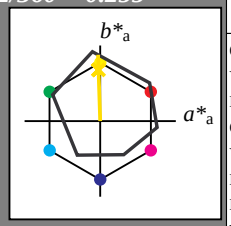
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

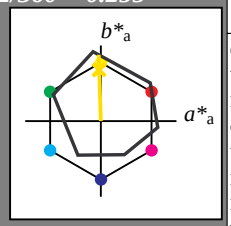
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 92/360 = 0.255$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

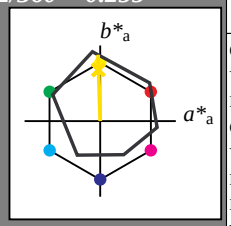
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

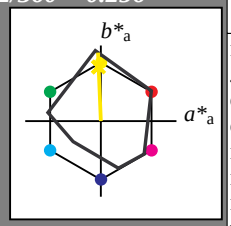
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

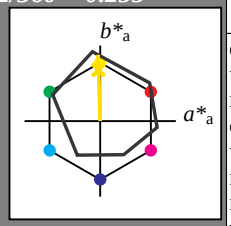
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

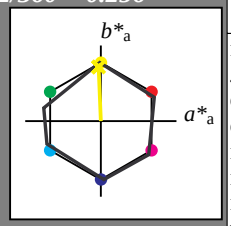
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

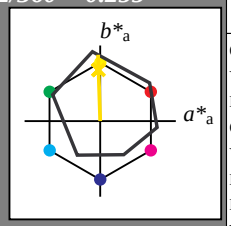
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

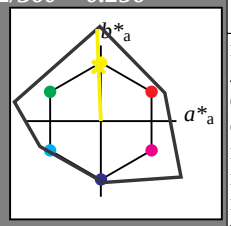
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

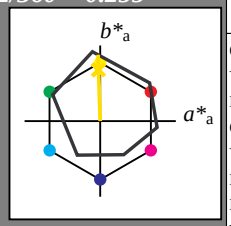
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

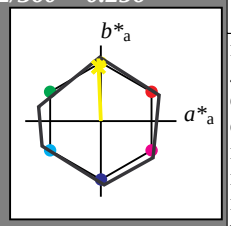
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

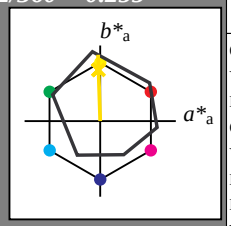
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

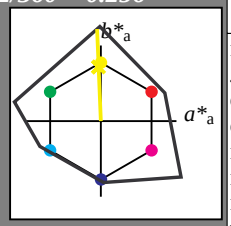
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.255 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

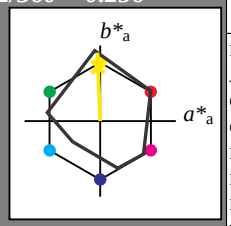
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

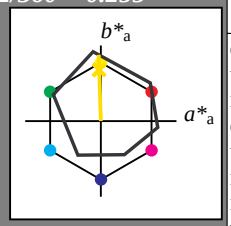
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

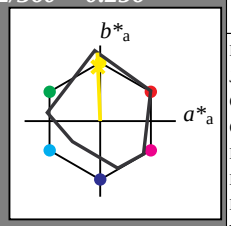
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

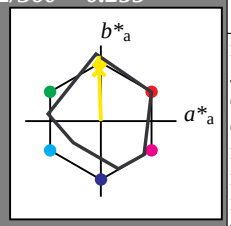
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

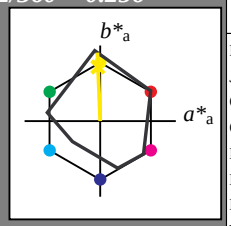
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

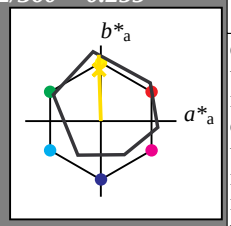
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

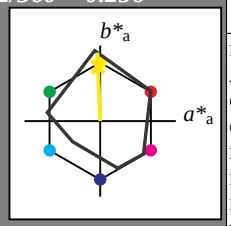
chromaticness c^*

3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

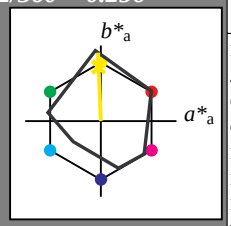
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18a
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

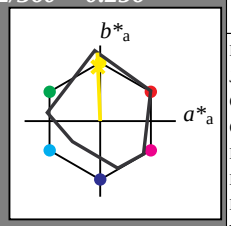
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

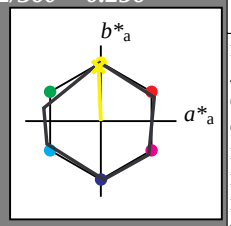
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

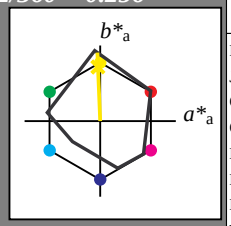
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

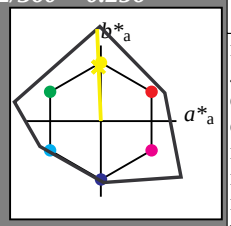
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

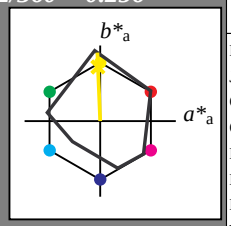
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

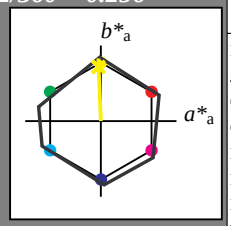
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

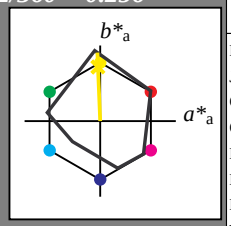
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

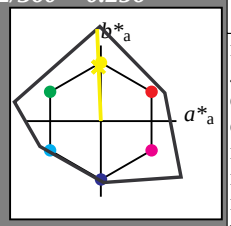
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

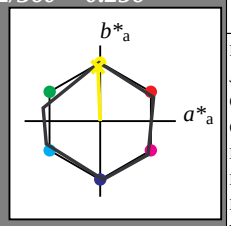
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	0.0
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**

*olvi3**	0.989	1.0	0.5	(1.0)
*cmyn3**	0.011	0.0	0.5	(0.0)
*olvi4**	0.989	1.0	0.5	1.0
*cmyn4**	0.011	0.0	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	76.05	−1.5	38.01
*LAB*LABa*	76.05	−1.53	38.0
*LAB*TCHa*	75.0	38.03	92.32

relative* CIELAB *lab*

*lab*lab*	0.75	−0.019	0.499
*lab*tch*	0.75	0.5	0.256
*lab*nch*	0.0	0.5	0.256

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.0	0.5
*lab*tce*	0.75	0.5	0.25
*lab*ncE*	0.0	0.5	r99j

***relative* Inform. Technology (IT)**

*olvi3**	0.489	0.5	0.0	(1.0)
*cmyn3**	0.511	0.5	1.0	(0.0)
*olvi4**	0.989	1.0	0.5	0.5
*cmyn4**	0.011	0.0	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	37.36	−1.46	38.02
*LAB*LABa*	37.36	−1.54	37.99
*LAB*TCHa*	25.01	38.03	92.33

relative* CIELAB *lab*

*lab*lab*	0.25	−0.019	0.499
*lab*tch*	0.25	0.5	0.256
*lab*nch*	0.5	0.5	0.256

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.0	0.5
*lab*tce*	0.25	0.5	0.25
*lab*ncE*	0.5	0.5	j00g

***relative* Inform. Technology (IT)**

*olvi3**	0.977	1.0	0.0	(1.0)
*cmyn3**	0.023	0.0	1.0	(0.0)
*olvi4**	0.977	1.0	0.0	1.0
*cmyn4**	0.023	0.0	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.7	−3.03	76.01
*LAB*LABa*	56.7	−3.08	75.99
*LAB*TCHa*	50.0	76.06	92.33

relative* CIELAB *lab*

*lab*lab*	0.5	−0.04	0.999
*lab*tch*	0.5	1.0	0.256
*lab*nch*	0.0	1.0	0.256

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	1.0
*lab*tce*	0.5	1.0	0.25
*lab*ncE*	0.0	1.0	r99j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

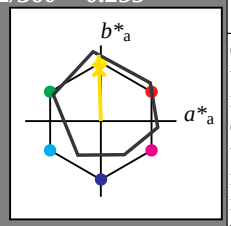
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.951	0.5	(1.0)
*cmyn3**	0.0	0.049	0.5	(0.0)
*olvi4**	1.0	0.951	0.5	1.0
*cmyn4**	0.0	0.049	0.5	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	90.8	−2.3	48.29
*LAB*LABa*	90.8	−1.41	43.85
*LAB*TCHa*	75.0	43.87	91.85

relative* CIELAB *lab*

*lab*lab*	0.94	−0.015	0.5
*lab*tch*	0.75	0.5	0.255
*lab*nch*	0.0	0.5	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.94	0.0	0.5
*lab*tce*	0.75	0.5	0.25
*lab*ncE*	0.0	0.5	j00g

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.451	0.0	(1.0)
*cmyn3**	0.5	0.549	1.0	(0.0)
*olvi4**	1.0	0.951	0.5	0.5
*cmyn4**	0.0	0.049	0.5	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	52.1	−1.55	45.68
*LAB*LABa*	52.1	−1.4	43.84
*LAB*TCHa*	25.01	43.87	91.84

relative* CIELAB *lab*

*lab*lab*	0.44	−0.015	0.5
*lab*tch*	0.25	0.5	0.255
*lab*nch*	0.5	0.5	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.44	0.0	0.5
*lab*tce*	0.25	0.5	0.25
*lab*ncE*	0.5	0.5	r99j

***relative* Inform. Technology (IT)**

*olvi3**	1.0	0.901	0.0	(1.0)
*cmyn3**	0.0	0.099	1.0	(0.0)
*olvi4**	1.0	0.902	0.0	1.0
*cmyn4**	0.0	0.098	1.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	86.19	−3.62	91.83
*LAB*LABa*	86.19	−2.82	87.69
*LAB*TCHa*	50.0	87.73	91.85

relative* CIELAB *lab*

*lab*lab*	0.881	−0.031	0.999
*lab*tch*	0.5	1.0	0.255
*lab*nch*	0.0	1.0	0.255

***relative* Natural Colour (NC)**

*lab*lrj*	0.881	0.0	1.0
*lab*tce*	0.5	1.0	0.25
*lab*ncE*	0.0	1.0	j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

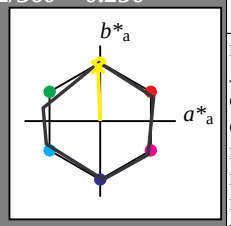
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

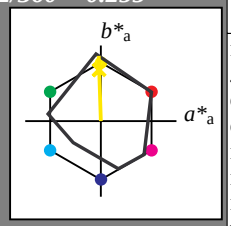
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

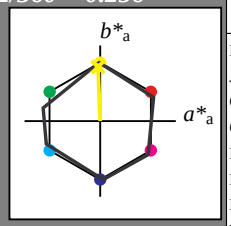
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

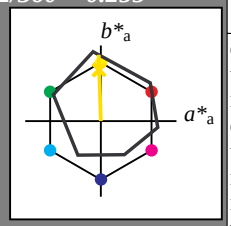
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

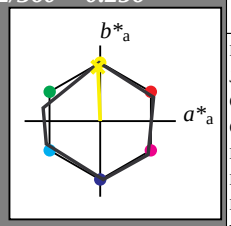
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

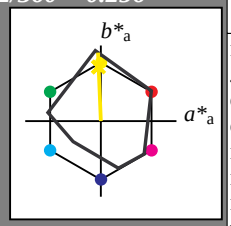
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

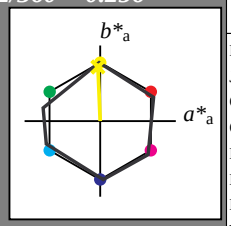
chromaticness c^*

3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

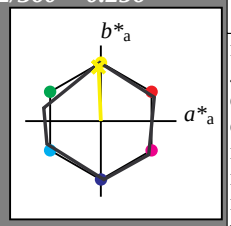
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

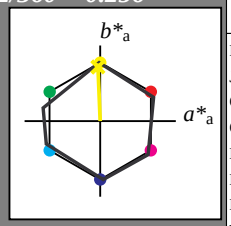
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
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B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
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R_{CIE}	39.92	58.67	27.97	64.99	25
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G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

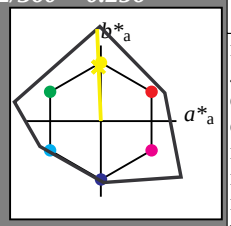
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

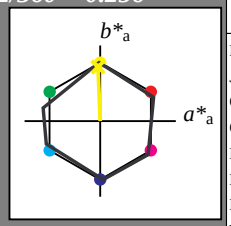
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

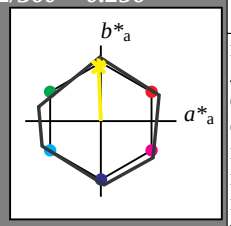
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

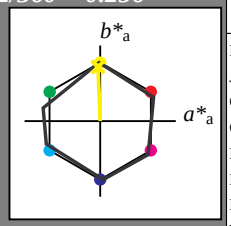
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

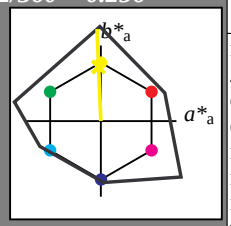
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

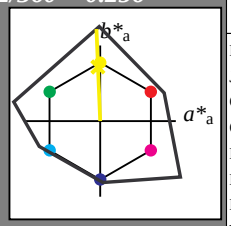
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

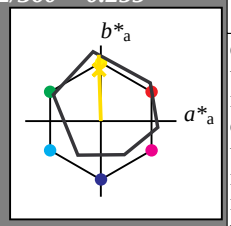
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

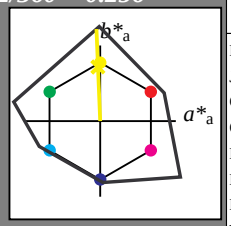
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

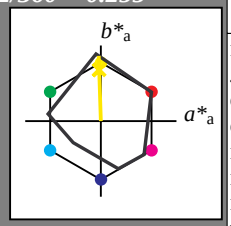
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

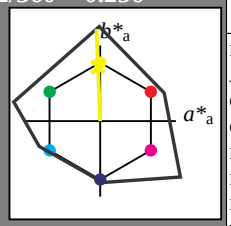
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

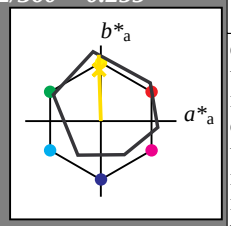
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

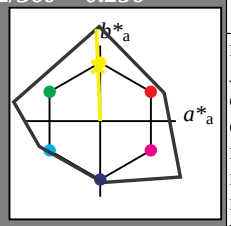
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

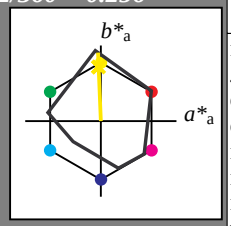
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

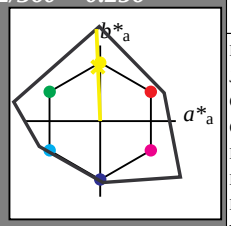
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

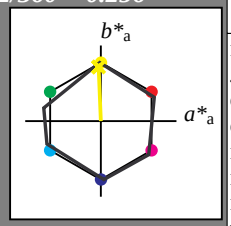
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

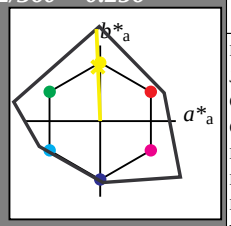
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

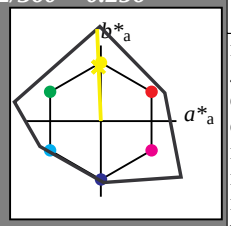
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

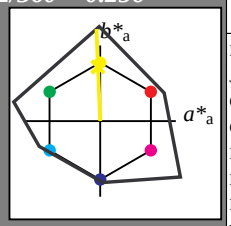
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

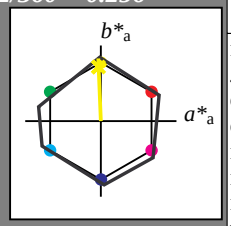
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

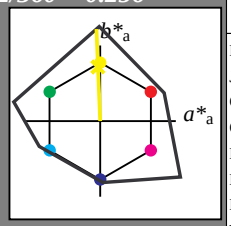
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

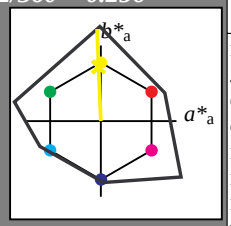
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

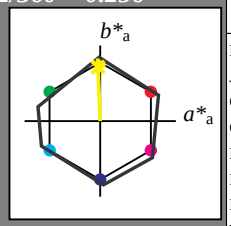
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

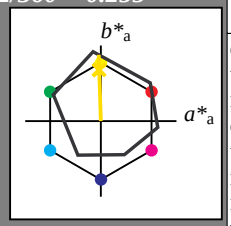
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

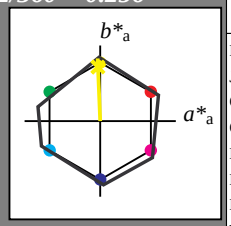
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

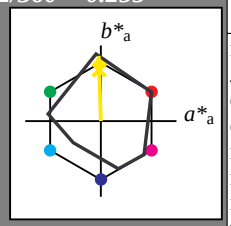
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

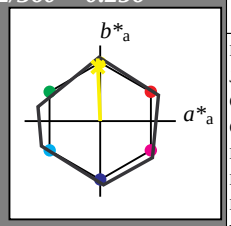
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

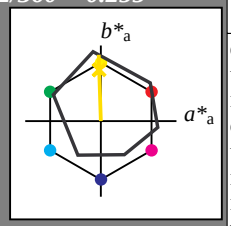
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

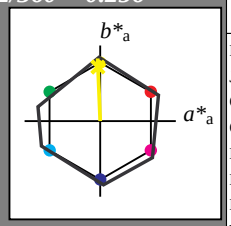
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

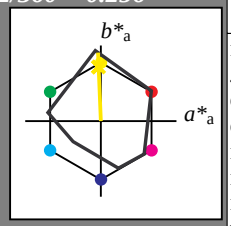
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

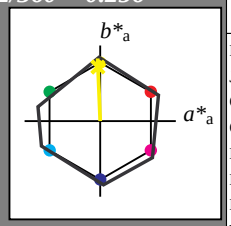
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

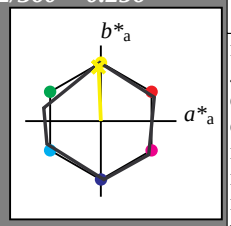
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

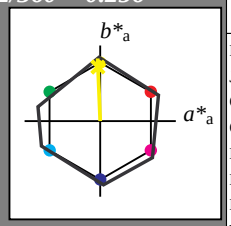
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

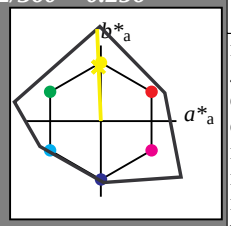
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

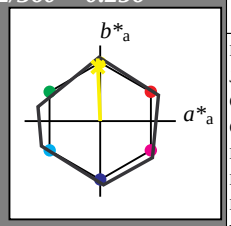
*n** = 1,0

3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

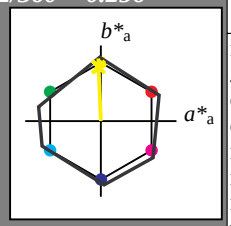
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

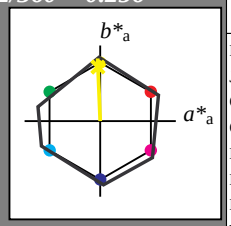
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

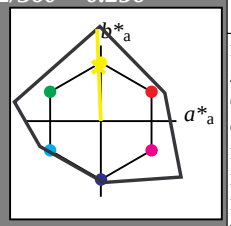
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

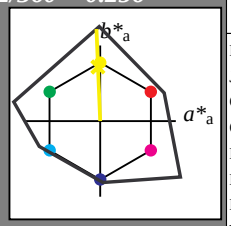
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

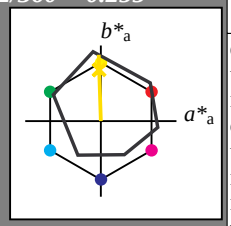
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

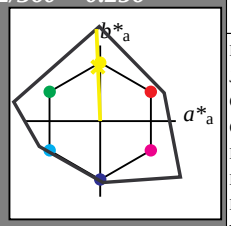
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

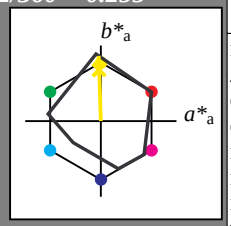
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 86 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.04 −2.3 47.67
*LAB*LABa* 92.04 −1.39 43.14
*LAB*TCHa* 75.0 43.16 91.85
relative* CIELAB *lab*
*lab*lab* 0.957 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.0 (1.0)
*cmyn3** 0.0 0.049 1.0 (0.0)
*olvi4** 1.0 0.951 0.0 1.0
*cmyn4** 0.0 0.049 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.68 −3.62 90.58
*LAB*LABa* 88.68 −2.77 86.27
*LAB*TCHa* 50.0 86.32 91.85
relative* CIELAB *lab*
*lab*lab* 0.913 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.35 −1.55 45.05
*LAB*LABa* 53.35 −1.38 43.13
*LAB*TCHa* 25.01 43.16 91.84
relative* CIELAB *lab*
*lab*lab* 0.457 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

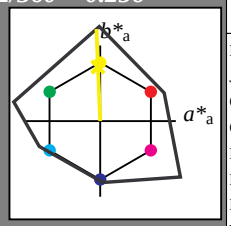
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

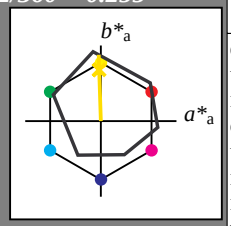
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 92/360 = 0.255$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 86 88 92
olv*Ma: 1.0 0.9 0.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.951 0.5 (1.0)
*cmyn3** 0.0 0.049 0.5 (0.0)
*olvi4** 1.0 0.951 0.5 1.0
*cmyn4** 0.0 0.049 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.8 −2.3 48.29
*LAB*LABa* 90.8 −1.41 43.85
*LAB*TCHa* 75.0 43.87 91.85
relative* CIELAB *lab*
*lab*lab* 0.94 −0.015 0.5
*lab*tch* 0.75 0.5 0.255
*lab*nch* 0.0 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.94 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.901 0.0 (1.0)
*cmyn3** 0.0 0.099 1.0 (0.0)
*olvi4** 1.0 0.902 0.0 1.0
*cmyn4** 0.0 0.098 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 86.19 −3.62 91.83
*LAB*LABa* 86.19 −2.82 87.69
*LAB*TCHa* 50.0 87.73 91.85
relative* CIELAB *lab*
*lab*lab* 0.881 −0.031 0.999
*lab*tch* 0.5 1.0 0.255
*lab*nch* 0.0 1.0 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.881 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.451 0.0 (1.0)
*cmyn3** 0.5 0.549 1.0 (0.0)
*olvi4** 1.0 0.951 0.5 0.5
*cmyn4** 0.0 0.049 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.1 −1.55 45.68
*LAB*LABa* 52.1 −1.4 43.84
*LAB*TCHa* 25.01 43.87 91.84
relative* CIELAB *lab*
*lab*lab* 0.44 −0.015 0.5
*lab*tch* 0.25 0.5 0.255
*lab*nch* 0.5 0.5 0.255
***relative* Natural Colour (NC)**
*lab*lrj* 0.44 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

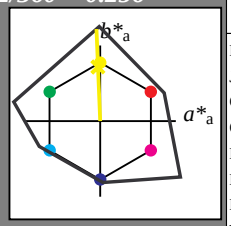
3 step scales for constant CIELAB hue 92/360 = 0.255 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

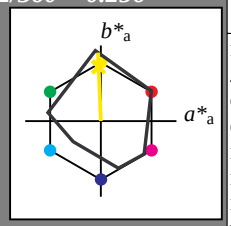
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 89 91 92
olv*Ma: 1.0 0.95 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.976 0.5 (1.0)
*cmyn3** 0.0 0.024 0.5 (0.0)
*olvi4** 1.0 0.976 0.5 1.0
*cmyn4** 0.0 0.024 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.06 −1.83 45.31
*LAB*LABa* 92.06 −1.84 45.31
*LAB*TCHa* 75.0 45.35 92.34
relative* CIELAB *lab*
*lab*lab* 0.957 −0.019 0.499
*lab*tch* 0.75 0.5 0.257
*lab*nch* 0.0 0.5 0.257
***relative* Natural Colour (NC)**
*lab*lrj* 0.957 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 1.0 0.952 0.0 (1.0)
*cmyn3** 0.0 0.048 1.0 (0.0)
*olvi4** 1.0 0.952 0.0 1.0
*cmyn4** 0.0 0.048 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 88.71 −3.67 90.61
*LAB*LABa* 88.71 −3.69 90.61
*LAB*TCHa* 50.0 90.68 92.34
relative* CIELAB *lab*
*lab*lab* 0.913 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.913 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.476 0.0 (1.0)
*cmyn3** 0.5 0.524 1.0 (0.0)
*olvi4** 1.0 0.976 0.5 0.5
*cmyn4** 0.0 0.024 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.36 −1.78 45.32
*LAB*LABa* 53.36 −1.84 45.3
*LAB*TCHa* 25.01 45.34 92.33
relative* CIELAB *lab*
*lab*lab* 0.457 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.457 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

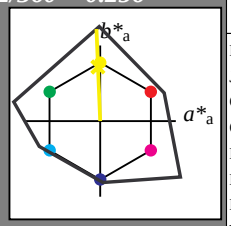
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

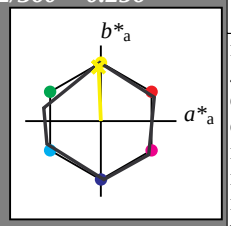
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 57 76 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −1.5 38.01
*LAB*LABa* 76.05 −1.53 38.0
*LAB*TCHa* 75.0 38.03 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −3.03 76.01
*LAB*LABa* 56.7 −3.08 75.99
*LAB*TCHa* 50.0 76.06 92.33
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −1.46 38.02
*LAB*LABa* 37.36 −1.54 37.99
*LAB*TCHa* 25.01 38.03 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

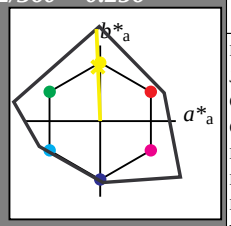
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

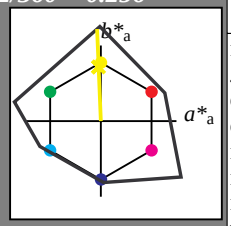
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.45 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.968 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.968 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.93 121.76
*LAB*LABa* 90.45 −4.94 121.77
*LAB*TCHa* 50.0 121.87 92.33
relative* CIELAB *lab*
*lab*lab* 0.936 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.936 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 54.23 −2.41 60.89
*LAB*LABa* 54.23 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.468 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.468 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

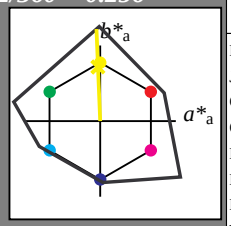
3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

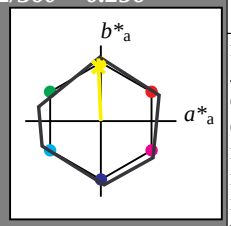
UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 92/360 = 0.256$
*lab*tch* and *lab*nch*

D65: hue J
LCH*Ma: 53 83 92
olv*Ma: 0.98 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.989 1.0 0.5 (1.0)
*cmyn3** 0.011 0.0 0.5 (0.0)
*olvi4** 0.989 1.0 0.5 1.0
*cmyn4** 0.011 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −1.64 41.44
*LAB*LABa* 74.3 −1.67 41.44
*LAB*TCHa* 75.0 41.47 92.32
relative* CIELAB *lab*
*lab*lab* 0.75 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.977 1.0 0.0 (1.0)
*cmyn3** 0.023 0.0 1.0 (0.0)
*olvi4** 0.977 1.0 0.0 1.0
*cmyn4** 0.023 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −3.31 82.87
*LAB*LABa* 53.2 −3.35 82.86
*LAB*TCHa* 50.0 82.93 92.32
relative* CIELAB *lab*
*lab*lab* 0.5 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.489 0.5 0.0 (1.0)
*cmyn3** 0.511 0.5 1.0 (0.0)
*olvi4** 0.989 1.0 0.5 0.5
*cmyn4** 0.011 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −1.62 41.45
*LAB*LABa* 32.1 −1.68 41.43
*LAB*TCHa* 25.01 41.46 92.33
relative* CIELAB *lab*
*lab*lab* 0.25 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

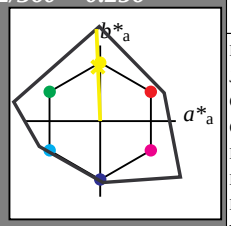
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

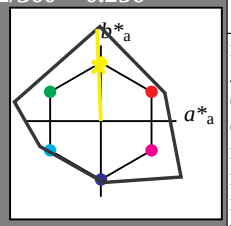
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 92/360 = 0.256 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 92/360 = 0.256$
lab*tch* and *lab*nch

D65: hue J
LCH*Ma: 90 122 92
olv*Ma: 0.97 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.984 1.0 0.5 (1.0)
*cmyn3** 0.016 0.0 0.5 (0.0)
*olvi4** 0.984 1.0 0.5 1.0
*cmyn4** 0.016 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 92.92 −2.44 60.89
*LAB*LABa* 92.92 −2.46 60.89
*LAB*TCHa* 75.0 60.94 92.32
relative* CIELAB *lab*
*lab*lab* 0.971 −0.019 0.499
*lab*tch* 0.75 0.5 0.256
*lab*nch* 0.0 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.971 0.0 0.5
*lab*tce* 0.75 0.5 0.25
*lab*ncE* 0.0 0.5 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.967 1.0 0.0 (1.0)
*cmyn3** 0.033 0.0 1.0 (0.0)
*olvi4** 0.968 1.0 0.0 1.0
*cmyn4** 0.032 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 90.45 −4.92 121.77
*LAB*LABa* 90.45 −4.93 121.77
*LAB*TCHa* 50.0 121.87 92.32
relative* CIELAB *lab*
*lab*lab* 0.941 −0.04 0.999
*lab*tch* 0.5 1.0 0.256
*lab*nch* 0.0 1.0 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.941 0.0 1.0
*lab*tce* 0.5 1.0 0.25
*lab*ncE* 0.0 1.0 r99j

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.484 0.5 0.0 (1.0)
*cmyn3** 0.516 0.5 1.0 (0.0)
*olvi4** 0.984 1.0 0.5 0.5
*cmyn4** 0.016 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 50.72 −2.42 60.89
*LAB*LABa* 50.72 −2.47 60.88
*LAB*TCHa* 25.01 60.93 92.33
relative* CIELAB *lab*
*lab*lab* 0.471 −0.019 0.499
*lab*tch* 0.25 0.5 0.256
*lab*nch* 0.5 0.5 0.256
***relative* Natural Colour (NC)**
*lab*lrj* 0.471 0.0 0.5
*lab*tce* 0.25 0.5 0.25
*lab*ncE* 0.5 0.5 j00g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

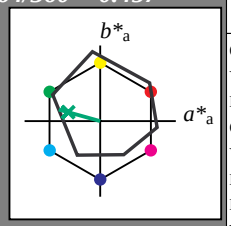
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 92/360 = 0.256 (right)

Input: Colorimetric Reflective System ORS18
for hue *h* = lab*h = 164/360 = 0.457*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

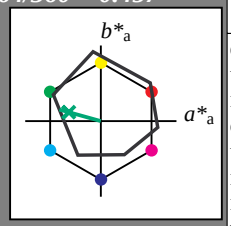
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System ORS18
for hue *h* = lab*h = 164/360 = 0.457*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

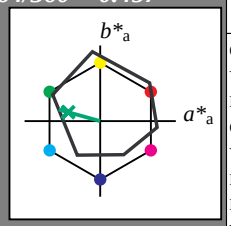
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

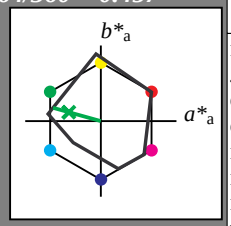
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

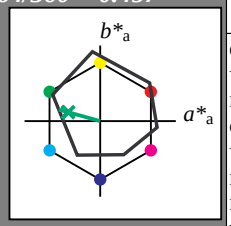
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

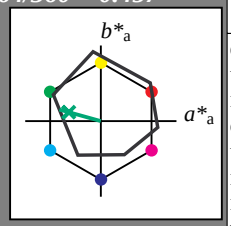
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

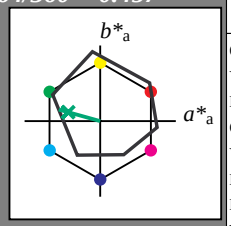
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System ORS18

for hue *h* = lab*h = 164/360 = 0.457*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness *t**



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

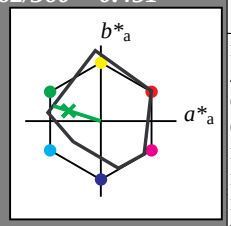
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System MRS18a

for hue *h* = lab*h = 162/360 = 0.451*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 1,0

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

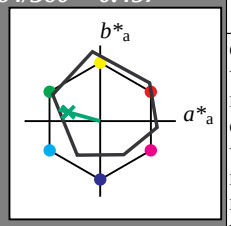
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

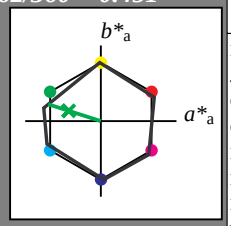
chromaticness c^*

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

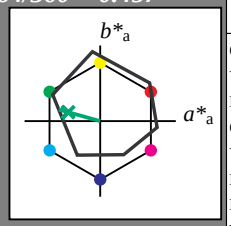
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

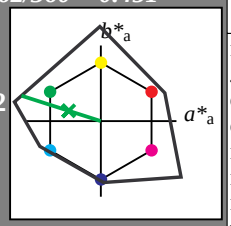
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

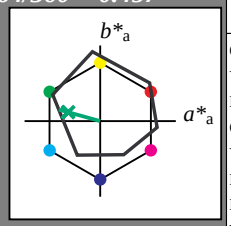
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

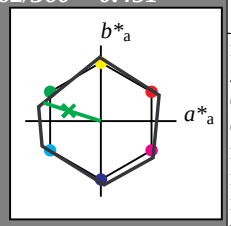
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

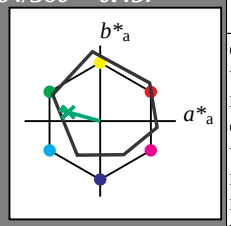
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

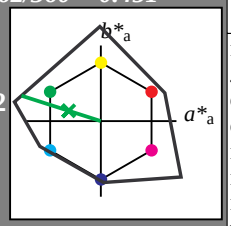
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

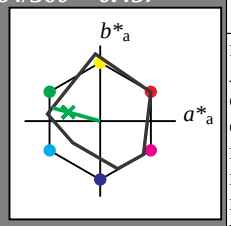
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

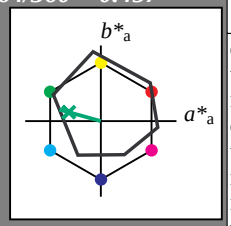
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

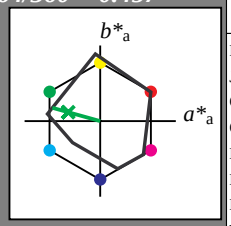
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System MRS18
for hue *h* = lab*h = 164/360 = 0.457*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness *n**

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness *c**

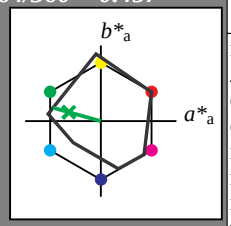
n^* = 1,0

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System MRS18
for hue *h* = lab*h = 164/360 = 0.457*
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness *n**

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness *c**

n^* = 1,0

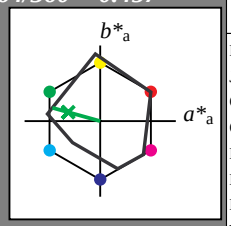
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

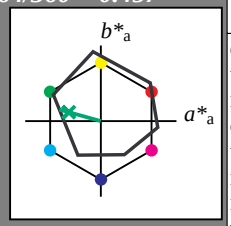
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

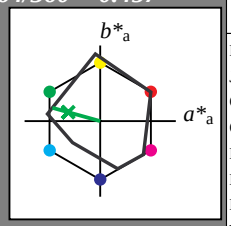
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

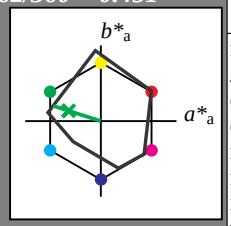
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

$n^* = 1{,}0$

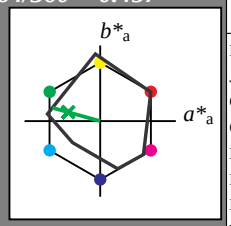
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

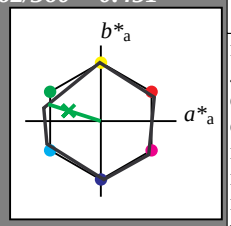
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

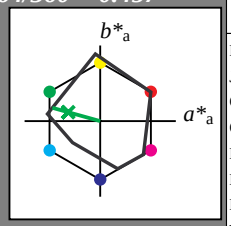
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

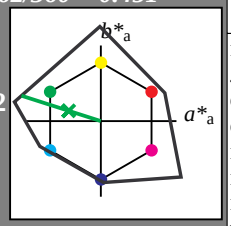
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

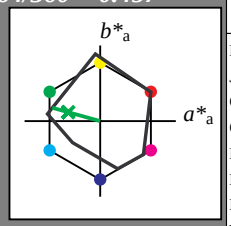
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

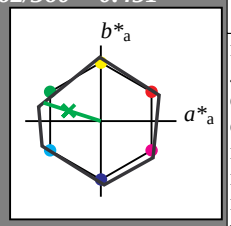
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

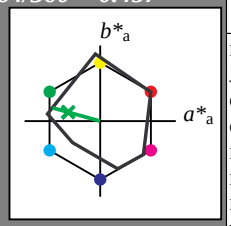
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

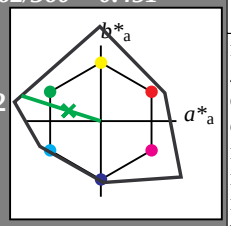
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

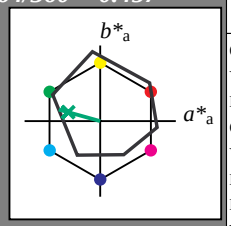
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

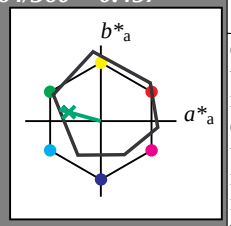
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

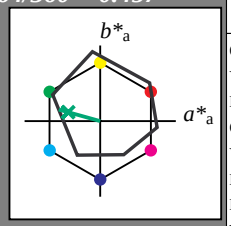
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

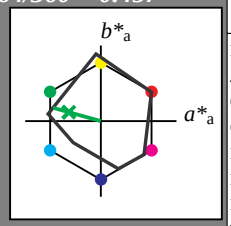
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

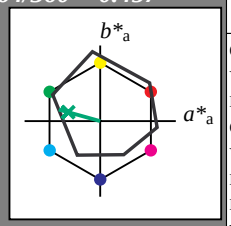
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 164/360 = 0.457$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

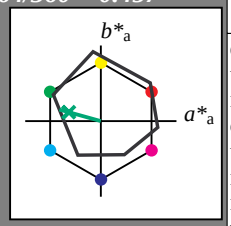
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 164/360 = 0.457$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

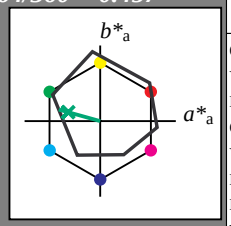
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

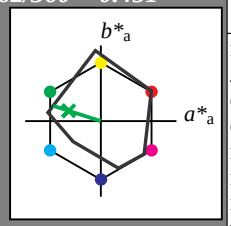
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

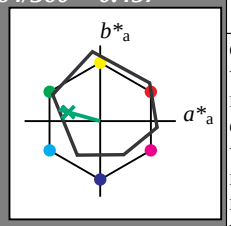
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

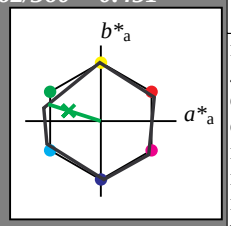
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

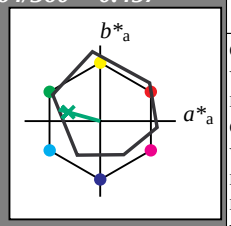
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

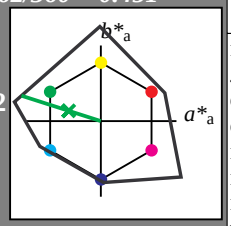
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

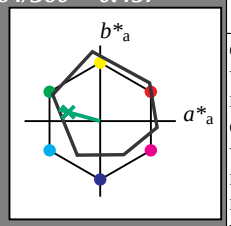
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

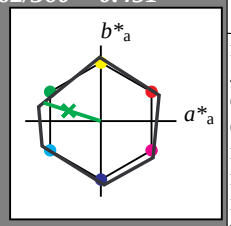
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

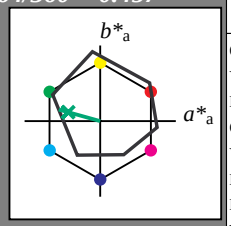
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

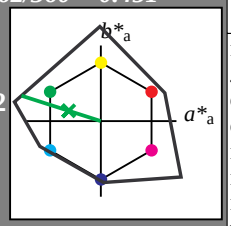
UE100−7, 3 step scales for constant CIELAB hue 164/360 = 0.457 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

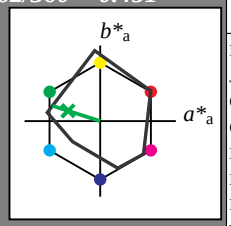
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.946 0.5 1.0 (0.0)
*cmyn3** 0.054 0.5 0.0 (1.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

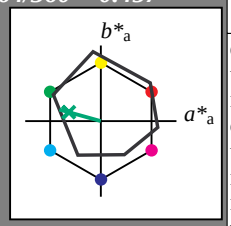
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

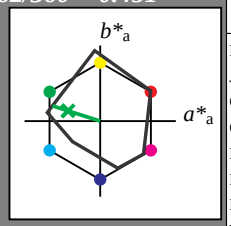
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

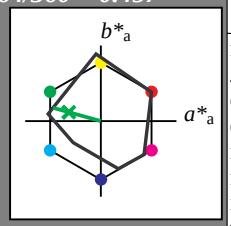
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

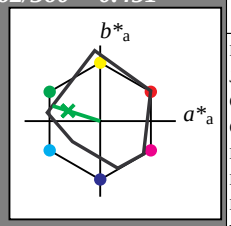
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

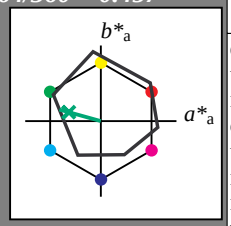
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

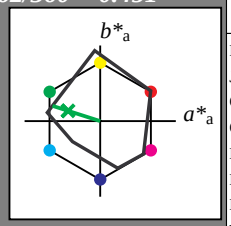
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

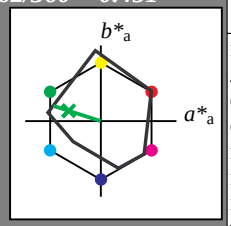
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

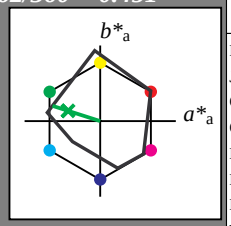
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

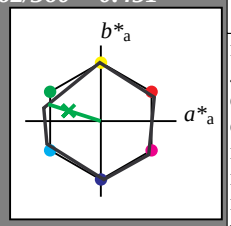
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

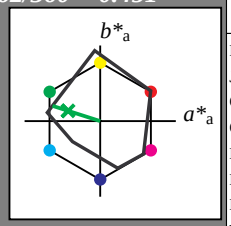
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

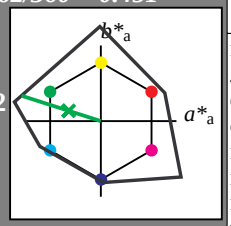
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

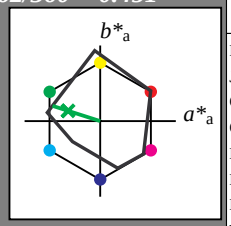
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

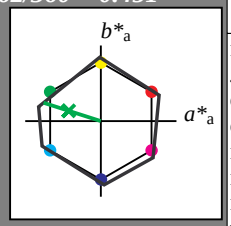
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

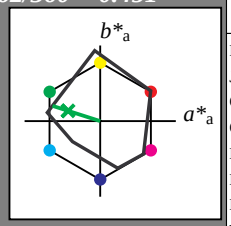
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

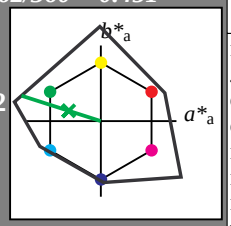
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

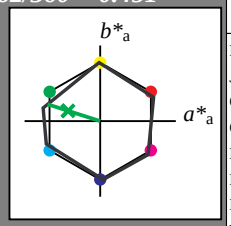
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

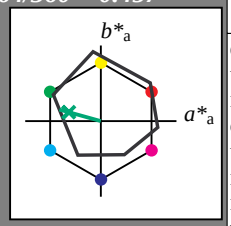
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

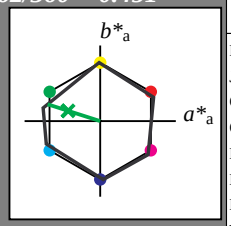
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

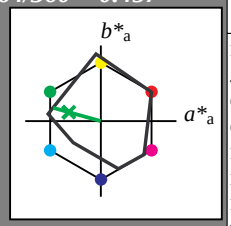
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

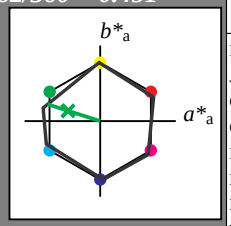
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

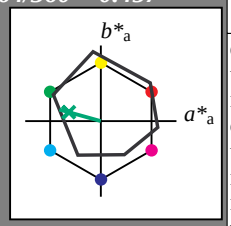
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

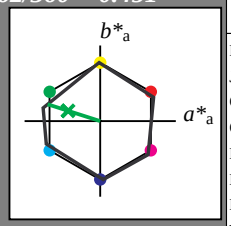
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

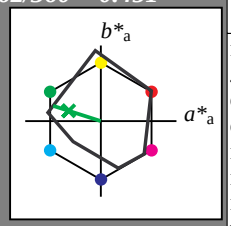
$n^* = 1{,}0$

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

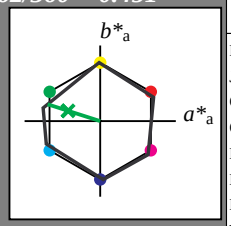
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS18
for hue *h = *lab*h* = 162/360 = 0.451**
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

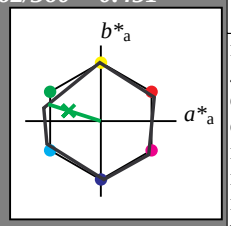
*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS18
for hue *h = *lab*h* = 162/360 = 0.451**
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

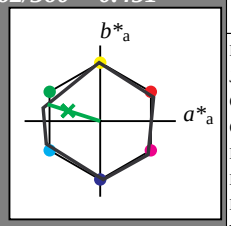
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

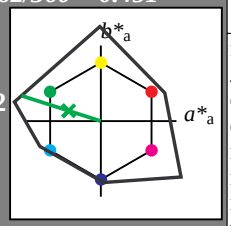
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

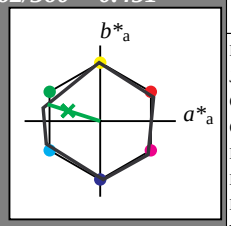
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

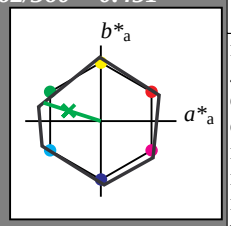
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

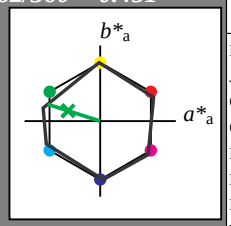
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

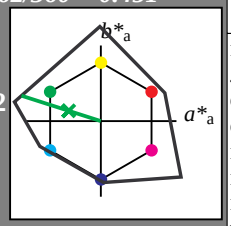
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

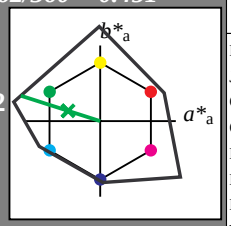
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

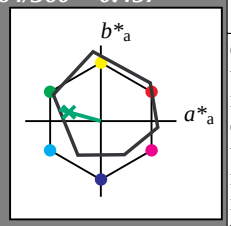
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

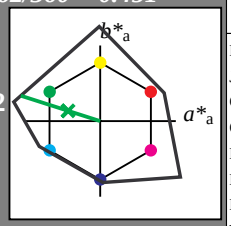
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

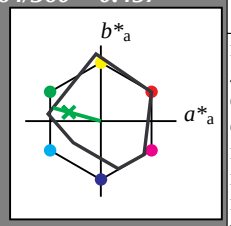
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

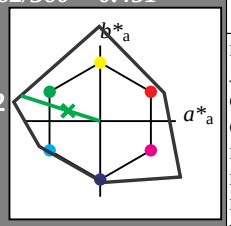
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

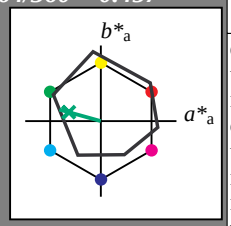
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

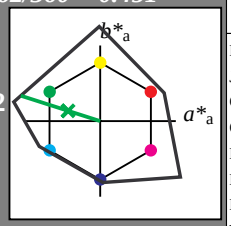
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

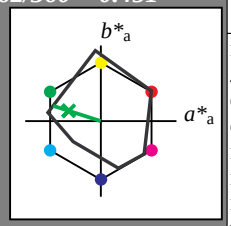
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

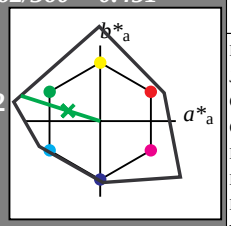
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

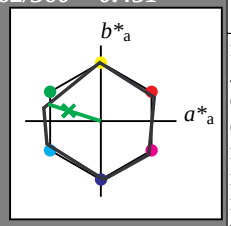
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

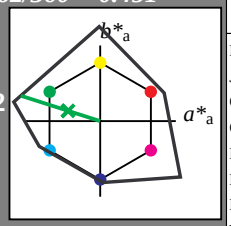
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS18
for hue *h = lab*h = 162/360 = 0.451**
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

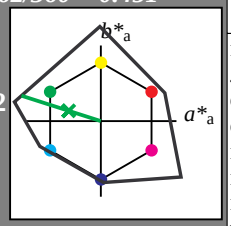
chromaticness *c**

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS18
for hue *h = lab*h = 162/360 = 0.451**
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

chromaticness *c**

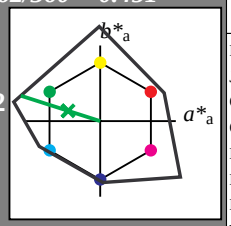
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

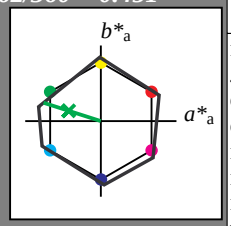
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

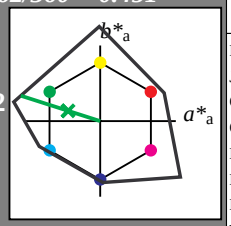
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

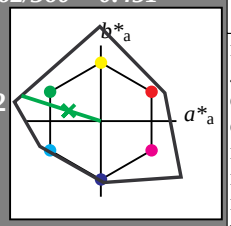
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

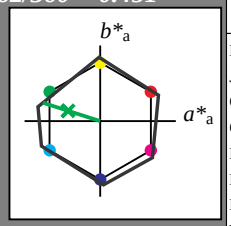
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

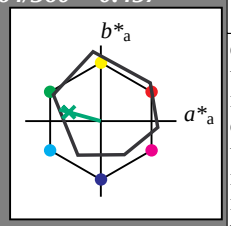
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

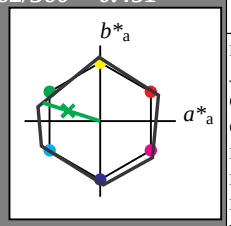
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

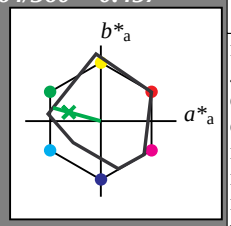
chromaticness c^*

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$ $n^* = 0{,}50$ $n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

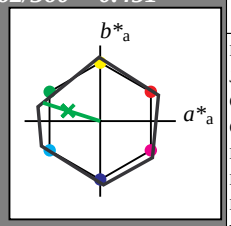
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

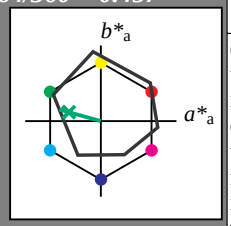
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

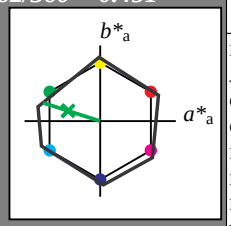
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

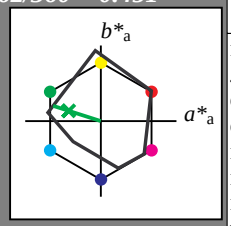
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

n^* = 1,0

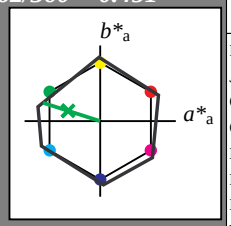
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

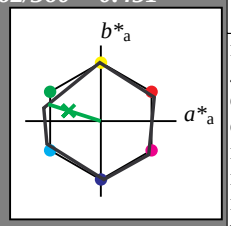
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

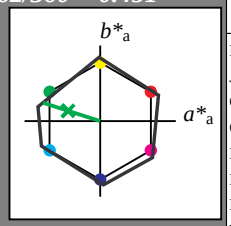
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

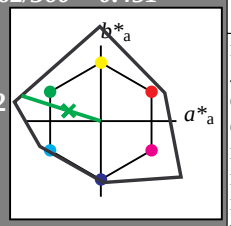
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

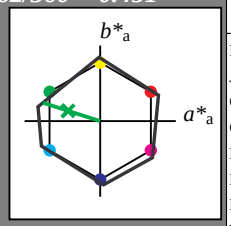
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 162/360 = 0.451$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

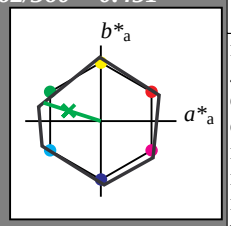
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 162/360 = 0.451$
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

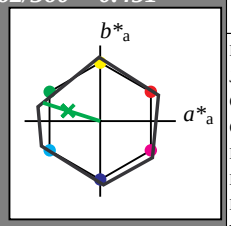
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

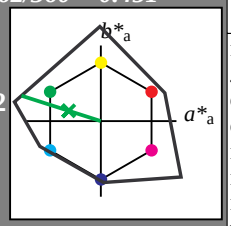
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

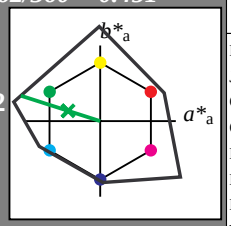
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

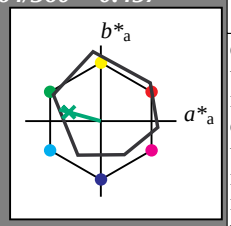
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

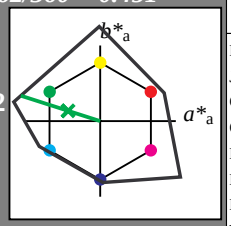
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

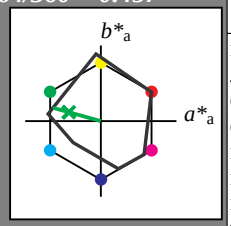
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 164
olv*Ma: 0.1 1.0 0.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.551 1.0 0.5 (1.0)
*cmyn3** 0.449 0.0 0.5 (0.0)
*olvi4** 0.551 1.0 0.5 1.0
*cmyn4** 0.449 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.74 −32.2 12.22
*LAB*LABa* 75.74 −31.6 8.79
*LAB*TCHa* 75.0 32.81 164.46
relative* CIELAB *lab*
*lab*lab* 0.746 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.746 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.103 1.0 0.0 (1.0)
*cmyn3** 0.897 0.0 1.0 (0.0)
*olvi4** 0.103 1.0 0.0 1.0
*cmyn4** 0.897 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.07 −63.44 19.68
*LAB*LABa* 56.07 −63.21 17.58
*LAB*TCHa* 50.0 65.62 164.46
relative* CIELAB *lab*
*lab*lab* 0.492 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.492 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.051 0.5 0.0 (1.0)
*cmyn3** 0.949 0.5 1.0 (0.0)
*olvi4** 0.551 1.0 0.5 0.5
*cmyn4** 0.449 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.04 −31.47 9.6
*LAB*LABa* 37.04 −31.6 8.78
*LAB*TCHa* 25.01 32.81 164.47
relative* CIELAB *lab*
*lab*lab* 0.246 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.246 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

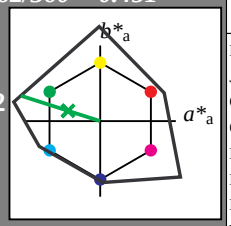
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

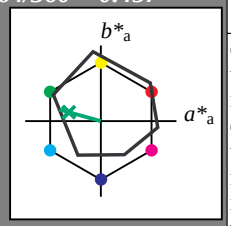
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 164/360 = 0.457$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 57 164
olv*Ma: 0.0 1.0 0.25

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 1.0 0.623 (1.0)
*cmyn3** 0.5 0.0 0.377 (0.0)
*olvi4** 0.5 1.0 0.623 1.0
*cmyn4** 0.5 0.0 0.377 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.1 −27.96 10.94
*LAB*LABa* 74.1 −27.39 7.62
*LAB*TCHa* 75.0 28.44 164.46
relative* CIELAB *lab*
*lab*lab* 0.725 −0.481 0.134
*lab*tch* 0.75 0.5 0.457
*lab*nch* 0.0 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.725 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 1.0 0.246 (1.0)
*cmyn3** 1.0 0.0 0.754 (0.0)
*olvi4** 0.0 1.0 0.246 1.0
*cmyn4** 1.0 0.0 0.754 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 52.8 −54.95 17.13
*LAB*LABa* 52.8 −54.79 15.24
*LAB*TCHa* 50.0 56.88 164.45
relative* CIELAB *lab*
*lab*lab* 0.45 −0.962 0.268
*lab*tch* 0.5 1.0 0.457
*lab*nch* 0.0 1.0 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.45 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.5 0.123 (1.0)
*cmyn3** 1.0 0.5 0.877 (0.0)
*olvi4** 0.5 1.0 0.623 0.5
*cmyn4** 0.5 0.0 0.377 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 35.41 −27.22 8.34
*LAB*LABa* 35.41 −27.39 7.63
*LAB*TCHa* 25.01 28.44 164.45
relative* CIELAB *lab*
*lab*lab* 0.225 −0.481 0.134
*lab*tch* 0.25 0.5 0.457
*lab*nch* 0.5 0.5 0.457
***relative* Natural Colour (NC)**
*lab*lrj* 0.225 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

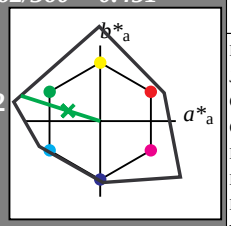
3 step scales for constant CIELAB hue 164/360 = 0.457 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

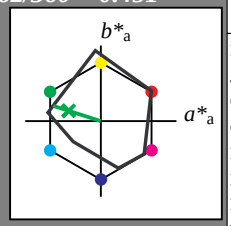
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 56 66 162
olv*Ma: 0.11 1.0 0.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.554 1.0 0.5 (1.0)
*cmyn3** 0.446 0.0 0.5 (0.0)
*olvi4** 0.555 1.0 0.5 1.0
*cmyn4** 0.445 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 75.86 −31.51 10.1
*LAB*LABa* 75.86 −31.54 10.09
*LAB*TCHa* 75.0 33.13 162.26
relative* CIELAB *lab*
*lab*lab* 0.747 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.747 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.109 1.0 0.0 (1.0)
*cmyn3** 0.891 0.0 1.0 (0.0)
*olvi4** 0.109 1.0 0.0 1.0
*cmyn4** 0.891 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.31 −63.05 20.19
*LAB*LABa* 56.31 −63.1 20.18
*LAB*TCHa* 50.0 66.26 162.27
relative* CIELAB *lab*
*lab*lab* 0.495 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.495 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.054 0.5 0.0 (1.0)
*cmyn3** 0.946 0.5 1.0 (0.0)
*olvi4** 0.554 1.0 0.5 0.5
*cmyn4** 0.446 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.16 −31.47 10.11
*LAB*LABa* 37.16 −31.55 10.08
*LAB*TCHa* 25.01 33.13 162.28
relative* CIELAB *lab*
*lab*lab* 0.247 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.247 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

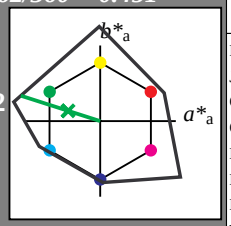
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

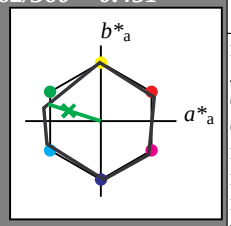
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 57 73 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 −34.7 11.12
*LAB*LABa* 76.05 −34.73 11.11
*LAB*TCHa* 75.0 36.48 162.26
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 −69.43 22.23
*LAB*LABa* 56.7 −69.49 22.22
*LAB*TCHa* 50.0 72.96 162.27
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 −34.67 11.13
*LAB*LABa* 37.36 −34.74 11.11
*LAB*TCHa* 25.01 36.48 162.28
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

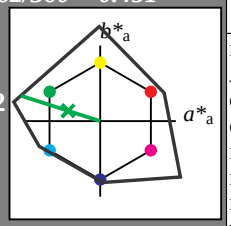
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

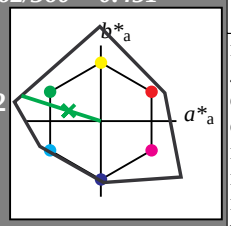
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.44 16.79
*LAB*LABa* 80.4 −52.46 16.78
*LAB*TCHa* 75.0 55.09 162.26
relative* CIELAB *lab*
*lab*lab* 0.806 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.806 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.4 −104.9 33.56
*LAB*LABa* 65.4 −104.95 33.55
*LAB*TCHa* 50.0 110.19 162.27
relative* CIELAB *lab*
*lab*lab* 0.612 −0.951 0.304
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.612 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.71 −52.4 16.79
*LAB*LABa* 41.71 −52.47 16.77
*LAB*TCHa* 25.01 55.1 162.28
relative* CIELAB *lab*
*lab*lab* 0.306 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.306 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

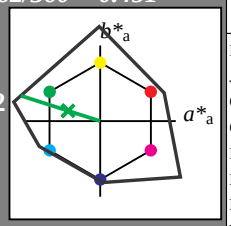
3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.959 0.5 1.0 (0.0)
*cmyn3** 0.041 0.5 0.0 (1.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

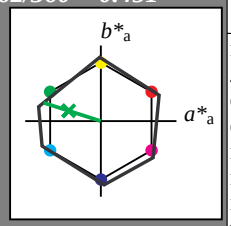
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 162/360 = 0.451$
*lab*tch* and *lab*nch*

D65: hue G
LCH*Ma: 53 80 162
olv*Ma: 0.08 1.0 0.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.54 1.0 0.5 (1.0)
*cmyn3** 0.46 0.0 0.5 (0.0)
*olvi4** 0.54 1.0 0.5 1.0
*cmyn4** 0.46 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 −37.84 12.13
*LAB*LABa* 74.3 −37.87 12.12
*LAB*TCHa* 75.0 39.77 162.25
relative* CIELAB *lab*
*lab*lab* 0.75 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.081 1.0 0.0 (1.0)
*cmyn3** 0.919 0.0 1.0 (0.0)
*olvi4** 0.081 1.0 0.0 1.0
*cmyn4** 0.919 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 −75.71 24.25
*LAB*LABa* 53.2 −75.75 24.24
*LAB*TCHa* 50.0 79.54 162.26
relative* CIELAB *lab*
*lab*lab* 0.5 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.04 0.5 0.0 (1.0)
*cmyn3** 0.96 0.5 1.0 (0.0)
*olvi4** 0.54 1.0 0.5 0.5
*cmyn4** 0.46 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 −37.81 12.13
*LAB*LABa* 32.1 −37.87 12.12
*LAB*TCHa* 25.01 39.77 162.27
relative* CIELAB *lab*
*lab*lab* 0.25 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

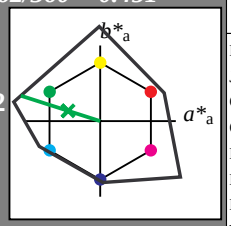
UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System NCS11
for hue *h = lab*h = 162/360 = 0.451**
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

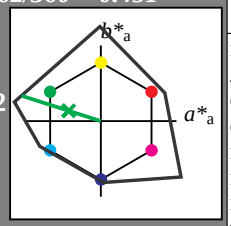
chromaticness *c**

UE100−7, 3 step scales for constant CIELAB hue 162/360 = 0.451 (left)

Output: Colorimetric Reflective System NCS11
for hue *h = lab*h = 162/360 = 0.451**
lab*tch* and *lab*nch

D65: hue G
LCH*Ma: 65 110 162
olv*Ma: 0.08 1.0 0.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 0.541 1.0 0.5 (1.0)
*cmyn3** 0.459 0.0 0.5 (0.0)
*olvi4** 0.541 1.0 0.5 1.0
*cmyn4** 0.459 0.0 0.5 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 80.4 −52.43 16.79
*LAB*LABa* 80.4 −52.45 16.79
*LAB*TCHa* 75.0 55.08 162.25
relative* CIELAB *lab*
*lab*lab* 0.822 −0.475 0.152
*lab*tch* 0.75 0.5 0.451
*lab*nch* 0.0 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.822 −0.499 0.0
*lab*tce* 0.75 0.5 0.5
*lab*ncE* 0.0 0.5 j99g

***relative* Inform. Technology (IT)**
*olvi3** 0.041 0.5 0.0 (1.0)
*cmyn3** 0.959 0.5 1.0 (0.0)
*olvi4** 0.541 1.0 0.5 0.5
*cmyn4** 0.459 0.0 0.5 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 38.2 −52.41 16.8
*LAB*LABa* 38.2 −52.46 16.78
*LAB*TCHa* 25.01 55.09 162.27
relative* CIELAB *lab*
*lab*lab* 0.322 −0.475 0.152
*lab*tch* 0.25 0.5 0.451
*lab*nch* 0.5 0.5 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.322 −0.499 0.0
*lab*tce* 0.25 0.5 0.5
*lab*ncE* 0.5 0.5 g00b

***relative* Inform. Technology (IT)**
*olvi3** 0.083 1.0 0.0 (1.0)
*cmyn3** 0.917 0.0 1.0 (0.0)
*olvi4** 0.083 1.0 0.0 1.0
*cmyn4** 0.917 0.0 1.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 65.41 −104.89 33.58
*LAB*LABa* 65.41 −104.92 33.57
*LAB*TCHa* 50.0 110.17 162.26
relative* CIELAB *lab*
*lab*lab* 0.645 −0.951 0.305
*lab*tch* 0.5 1.0 0.451
*lab*nch* 0.0 1.0 0.451
***relative* Natural Colour (NC)**
*lab*lrj* 0.645 −0.999 0.0
*lab*tce* 0.5 1.0 0.5
*lab*ncE* 0.0 1.0 g00b

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

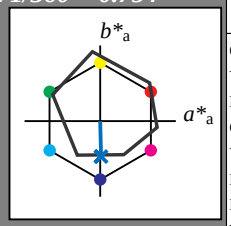
chromaticness *c**

3 step scales for constant CIELAB hue 162/360 = 0.451 (right)

Input: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

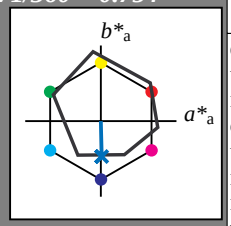
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System ORS18
for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

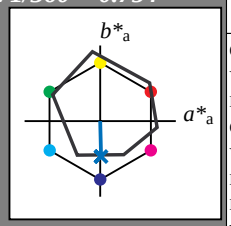
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

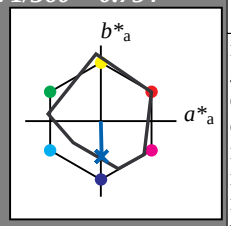
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

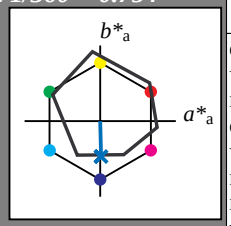
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

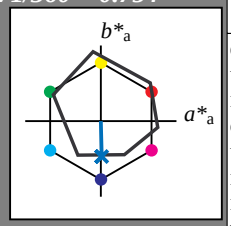
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

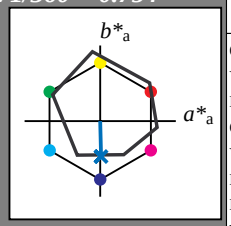
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

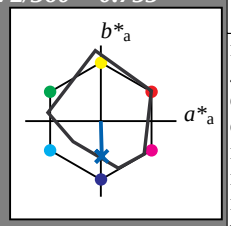
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

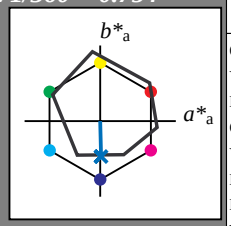
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

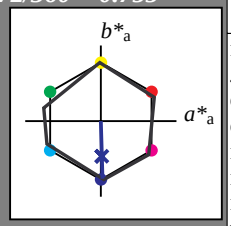
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

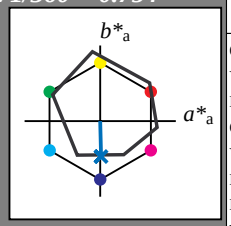
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

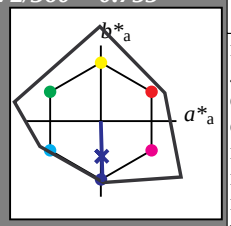
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

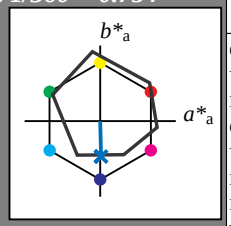
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

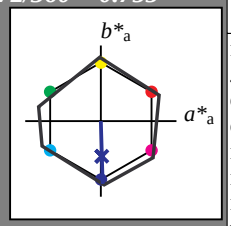
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

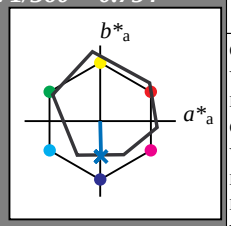
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

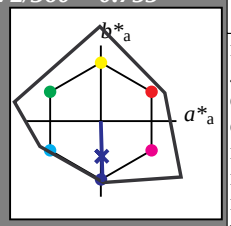
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

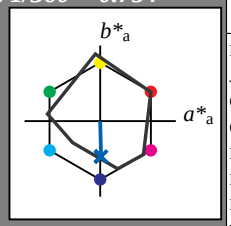
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

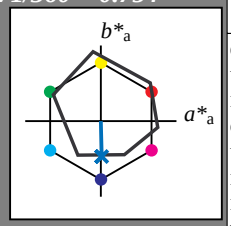
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

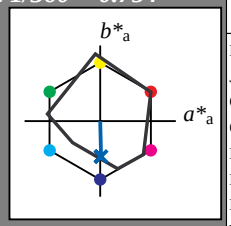
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

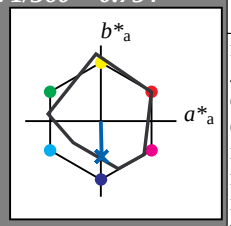
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System MRS18
for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

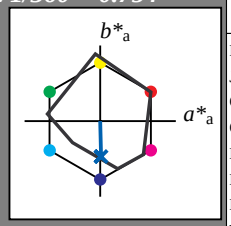
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

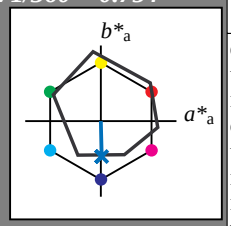
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

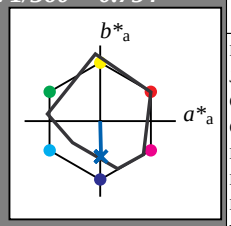
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***n** = 0,50**

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

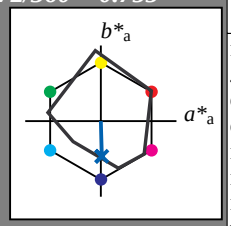
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***n** = 0,50**

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

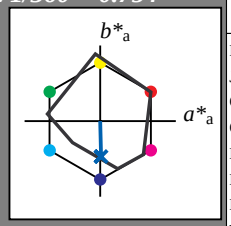
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

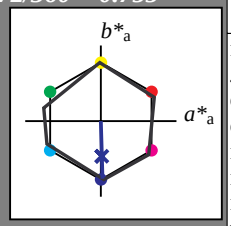
$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

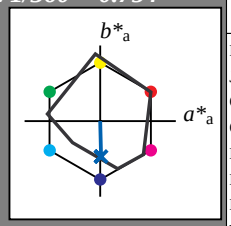
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

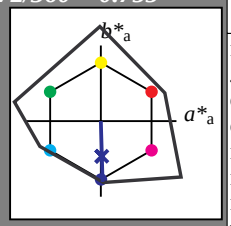
$n^* = 1{,}0$

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

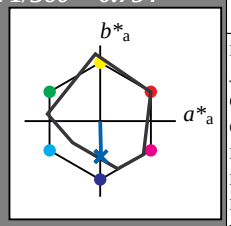
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

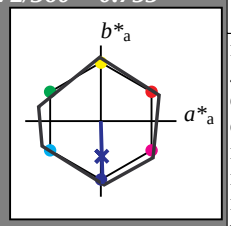
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

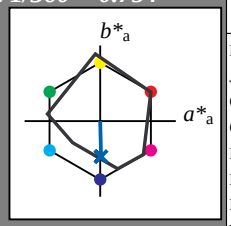
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

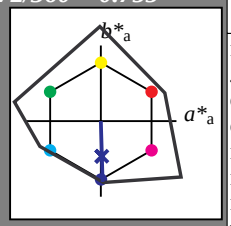
*n** = 1,0

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

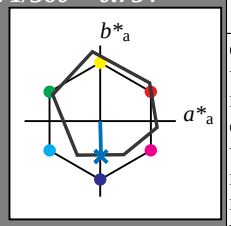
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

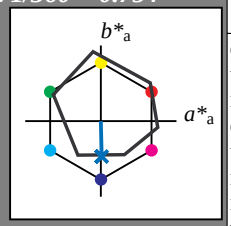
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

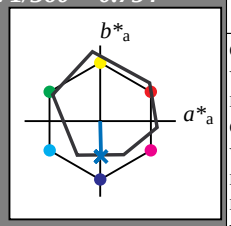
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

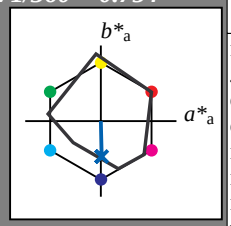
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

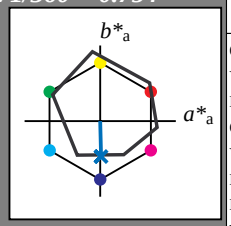
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

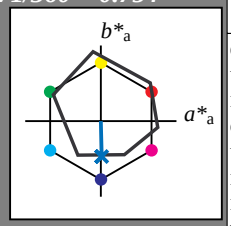
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System TRS18
for hue $h^* = lab^*h = 271/360 = 0.754$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

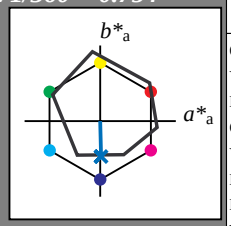
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

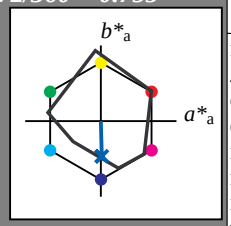
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

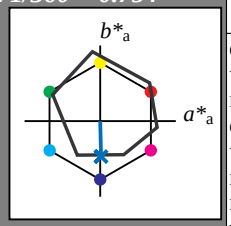
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

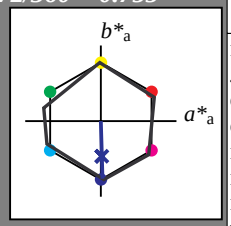
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

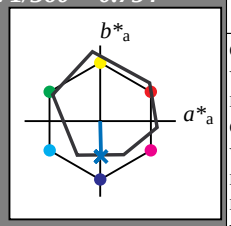
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

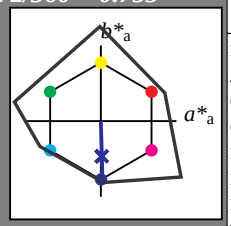
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$

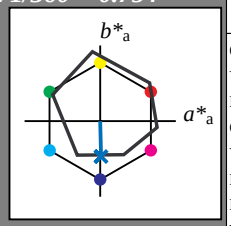
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 42 45 271

olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 93

%Regularity

$g^*_{H,rel}$ = 57

$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.744	1.0	(1.0)
*cmyn3**	0.5	0.256	0.0	(0.0)
*olvi4**	0.5	0.744	1.0	1.0
*cmyn4**	0.5	0.256	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	68.59	0.08	−19.4
*LAB*LABa*	68.59	0.54	−22.35
*LAB*TCHa*	75.0	22.36	271.4

relative* CIELAB *lab*

*lab*lab*	0.654	0.012	−0.499
*lab*tch*	0.75	0.5	0.754
*lab*nch*	0.0	0.5	0.754

***relative* Natural Colour (NC)**

*lab*lrj*	0.654	0.0	−0.499
*lab*tce*	0.75	0.5	0.75
*lab*ncE*	0.0	0.5	g99b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.244	0.5	(1.0)
*cmyn3**	1.0	0.756	0.5	(0.0)
*olvi4**	0.5	0.744	1.0	0.5
*cmyn4**	0.5	0.256	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	29.9	0.83	−22.01
*LAB*LABa*	29.9	0.55	−22.35
*LAB*TCHa*	25.01	22.36	271.41

relative* CIELAB *lab*

*lab*lab*	0.154	0.012	−0.499
*lab*tch*	0.25	0.5	0.754
*lab*nch*	0.5	0.5	0.754

***relative* Natural Colour (NC)**

*lab*lrj*	0.154	0.0	−0.499
*lab*tce*	0.25	0.5	0.75
*lab*ncE*	0.5	0.5	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.488	1.0	(1.0)
*cmyn3**	1.0	0.512	0.0	(0.0)
*olvi4**	0.0	0.488	1.0	1.0
*cmyn4**	1.0	0.512	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	41.79	1.14	−43.56
*LAB*LABa*	41.79	1.1	−44.7
*LAB*TCHa*	50.0	44.73	271.4

relative* CIELAB *lab*

*lab*lab*	0.307	0.024	−0.998
*lab*tch*	0.5	1.0	0.754
*lab*nch*	0.0	1.0	0.754

***relative* Natural Colour (NC)**

*lab*lrj*	0.307	0.0	−0.999
*lab*tce*	0.5	1.0	0.75
*lab*ncE*	0.0	1.0	b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$

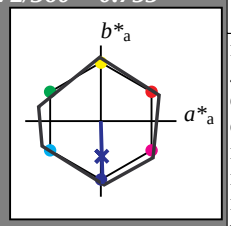
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 53 83 272

olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut

u^*_{rel} = 119

%Regularity

$g^*_{H,rel}$ = 47

$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.21	0.04	0.0
*LAB*LABa*	53.21	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	11.01	0.07	0.01
*LAB*LABa*	11.01	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.512	1.0	(1.0)
*cmyn3**	0.5	0.488	0.0	(0.0)
*olvi4**	0.5	0.512	1.0	1.0
*cmyn4**	0.5	0.488	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	74.3	1.23	−41.51
*LAB*LABa*	74.3	1.2	−41.52
*LAB*TCHa*	75.0	41.54	271.66

relative* CIELAB *lab*

*lab*lab*	0.75	0.014	−0.499
*lab*tch*	0.75	0.5	0.755
*lab*nch*	0.0	0.5	0.755

***relative* Natural Colour (NC)**

*lab*lrj*	0.75	0.0	−0.499
*lab*tce*	0.75	0.5	0.75
*lab*ncE*	0.0	0.5	g99b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.012	0.5	(1.0)
*cmyn3**	1.0	0.988	0.5	(0.0)
*olvi4**	0.5	0.512	1.0	0.5
*cmyn4**	0.5	0.488	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	32.1	1.27	−41.5
*LAB*LABa*	32.1	1.21	−41.52
*LAB*TCHa*	25.01	41.55	271.67

relative* CIELAB *lab*

*lab*lab*	0.25	0.015	−0.499
*lab*tch*	0.25	0.5	0.755
*lab*nch*	0.5	0.5	0.755

***relative* Natural Colour (NC)**

*lab*lrj*	0.25	0.0	−0.499
*lab*tce*	0.25	0.5	0.75
*lab*ncE*	0.5	0.5	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.024	1.0	(1.0)
*cmyn3**	1.0	0.976	0.0	(0.0)
*olvi4**	0.0	0.024	1.0	1.0
*cmyn4**	1.0	0.976	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	53.2	2.46	−83.04
*LAB*LABa*	53.2	2.42	−83.05
*LAB*TCHa*	50.0	83.09	271.67

relative* CIELAB *lab*

*lab*lab*	0.5	0.029	−0.998
*lab*tch*	0.5	1.0	0.755
*lab*nch*	0.0	1.0	0.755

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	−0.999
*lab*tce*	0.5	1.0	0.75
*lab*ncE*	0.0	1.0	b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

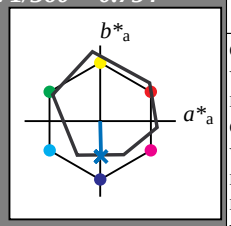
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

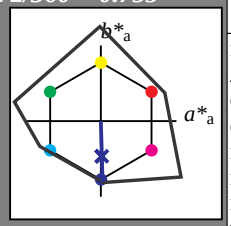
UE100−7, 3 step scales for constant CIELAB hue 271/360 = 0.754 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$
blackness n^*
0,25 0,50 $n^* = 0{,}50$ 0,75 1,00
chromaticness c^*
$n^* = 1{,}0$

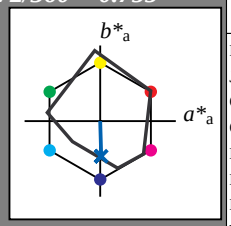
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

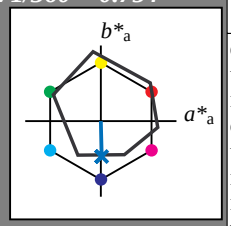
n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 0,00
blackness n^*
0,25 0,50 n^* = 0,50 0,75 1,00
chromaticness c^*
n^* = 1,0

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

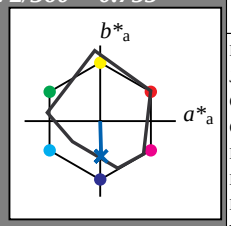
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

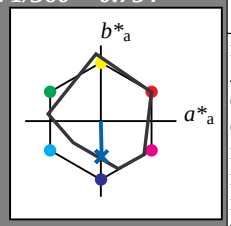
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

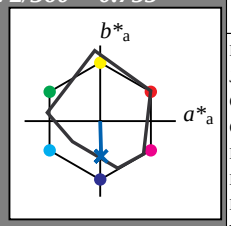
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

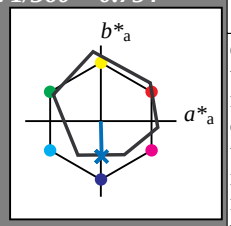
$n^* = 1{,}0$

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

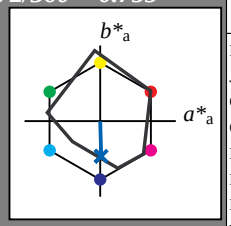
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System MRS18a
for hue *h = *lab*h* = 272/360 = 0.755**
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

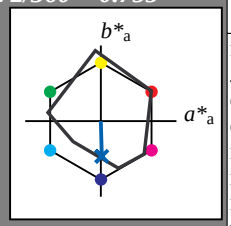
chromaticness *c**

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18a
for hue *h = *lab*h* = 272/360 = 0.755**
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0*

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00*

blackness *n**

0,25 0,50 ***n** = 0,50* 0,75 1,00

chromaticness *c**

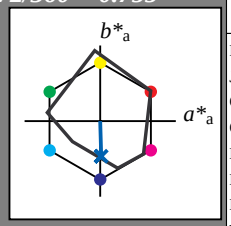
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

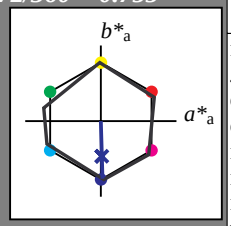
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

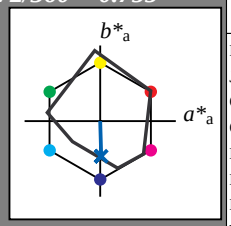
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

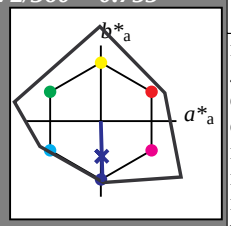
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

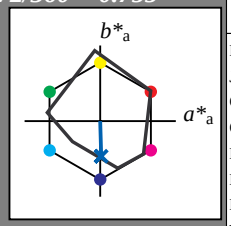
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

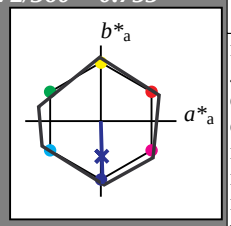
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

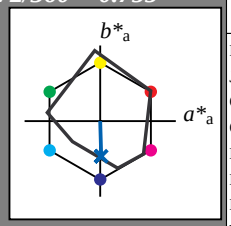
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

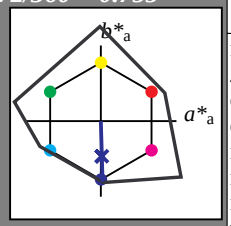
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

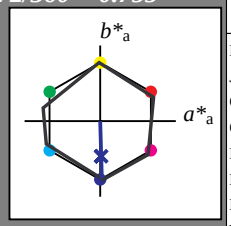
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

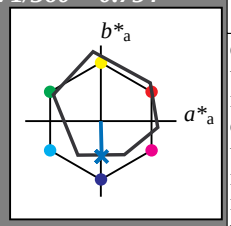
$n^* = 1{,}0$

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

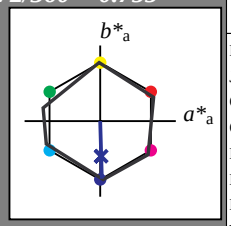
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

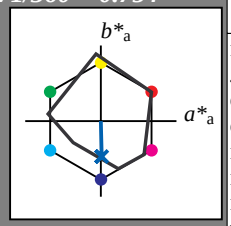
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 91$
%Regularity
$g^*_{H,rel} = 41$
$g^*_{C,rel} = 52$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

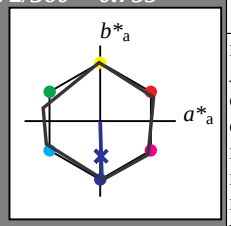
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

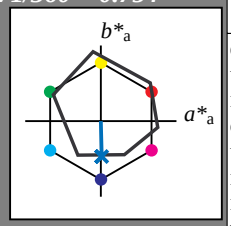
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
$u^*_{rel} = 93$
%Regularity
$g^*_{H,rel} = 57$
$g^*_{C,rel} = 59$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

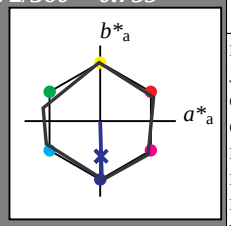
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

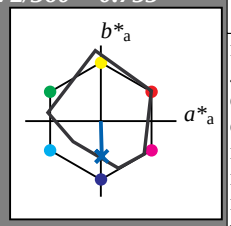
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 92$
%Regularity
$g^*_{H,rel} = 42$
$g^*_{C,rel} = 49$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

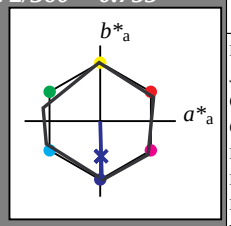
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

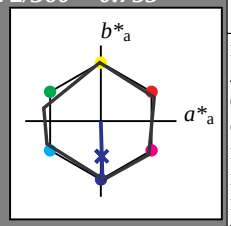
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS18
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

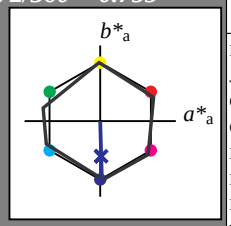
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

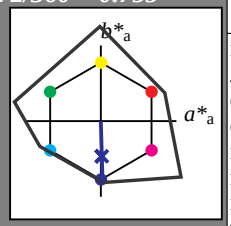
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

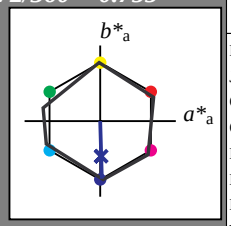
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

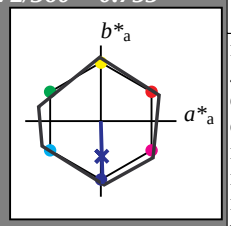
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

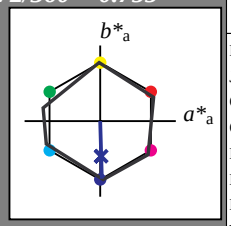
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

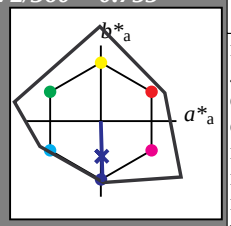
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

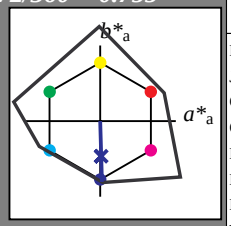
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

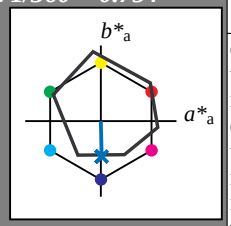
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

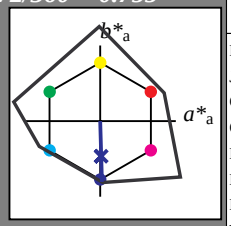
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

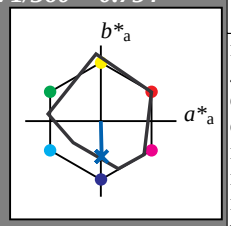
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness t^*



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$

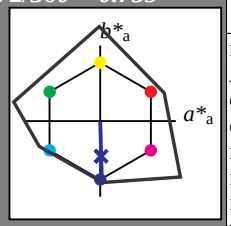
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 49 80 272

olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut

u^*_{rel} = 136

%Regularity

$g^*_{H,rel}$ = 46

$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	0.0	−0.01
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.72	0.05	0.0
*LAB*LABa*	56.72	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.09	0.02
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.508	1.0	(1.0)
*cmyn3**	0.5	0.492	0.0	(0.0)
*olvi4**	0.5	0.508	1.0	1.0
*cmyn4**	0.5	0.492	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	72.29	1.18	−40.2
*LAB*LABa*	72.29	1.15	−40.21
*LAB*TCHa*	75.0	40.23	271.64

relative* CIELAB *lab*

*lab*lab*	0.701	0.014	−0.499
*lab*tch*	0.75	0.5	0.755
*lab*nch*	0.0	0.5	0.755

***relative* Natural Colour (NC)**

*lab*lrj*	0.701	0.0	−0.499
*lab*tce*	0.75	0.5	0.75
*lab*ncE*	0.0	0.5	g99b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.008	0.5	(1.0)
*cmyn3**	1.0	0.992	0.5	(0.0)
*olvi4**	0.5	0.508	1.0	0.5
*cmyn4**	0.5	0.492	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	33.6	1.24	−40.19
*LAB*LABa*	33.6	1.16	−40.21
*LAB*TCHa*	25.01	40.24	271.65

relative* CIELAB *lab*

*lab*lab*	0.201	0.014	−0.499
*lab*tch*	0.25	0.5	0.755
*lab*nch*	0.5	0.5	0.755

***relative* Natural Colour (NC)**

*lab*lrj*	0.201	0.0	−0.499
*lab*tce*	0.25	0.5	0.75
*lab*ncE*	0.5	0.5	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.016	1.0	(1.0)
*cmyn3**	1.0	0.984	0.0	(0.0)
*olvi4**	0.0	0.016	1.0	1.0
*cmyn4**	1.0	0.984	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	49.18	2.37	−80.41
*LAB*LABa*	49.18	2.3	−80.43
*LAB*TCHa*	50.0	80.47	271.64

relative* CIELAB *lab*

*lab*lab*	0.403	0.029	−0.998
*lab*tch*	0.5	1.0	0.755
*lab*nch*	0.0	1.0	0.755

***relative* Natural Colour (NC)**

*lab*lrj*	0.403	0.0	−0.999
*lab*tce*	0.5	1.0	0.75
*lab*ncE*	0.0	1.0	b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$

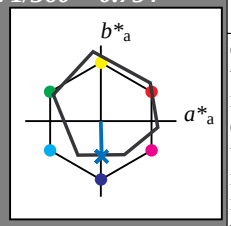
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 42 45 271

olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 93

%Regularity

$g^*_{H,rel}$ = 57

$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**

*olvi3**	1.0	1.0	1.0	(1.0)
*cmyn3**	0.0	0.0	0.0	(0.0)
*olvi4**	1.0	1.0	1.0	1.0
*cmyn4**	0.0	0.0	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	95.41	−0.97	4.75
*LAB*LABa*	95.41	0.0	0.0
*LAB*TCHa*	99.99	0.01	–

relative* CIELAB *lab*

*lab*lab*	1.0	0.0	0.0
*lab*tch*	1.0	0.0	–
*lab*nch*	0.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	1.0	0.0	0.0
*lab*tce*	1.0	0.0	–
*lab*ncE*	0.0	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.5	0.5	(1.0)
*cmyn3**	0.5	0.5	0.5	(0.0)
*olvi4**	1.0	1.0	1.0	0.5
*cmyn4**	0.0	0.0	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	56.71	−0.23	2.14
*LAB*LABa*	56.71	0.0	0.0
*LAB*TCHa*	50.0	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.5	0.0	0.0
*lab*tch*	0.5	0.0	–
*lab*nch*	0.5	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.5	0.0	0.0
*lab*tce*	0.5	0.0	–
*lab*ncE*	0.5	0.0	–

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.0	0.0	(1.0)
*cmyn3**	1.0	1.0	1.0	(0.0)
*olvi4**	1.0	1.0	1.0	0.0
*cmyn4**	0.0	0.0	0.0	1.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	18.02	0.5	−0.46
*LAB*LABa*	18.02	0.0	0.0
*LAB*TCHa*	0.01	0.01	–

relative* CIELAB *lab*

*lab*lab*	0.0	0.0	0.0
*lab*tch*	0.0	0.0	–
*lab*nch*	1.0	0.0	–

***relative* Natural Colour (NC)**

*lab*lrj*	0.0	0.0	0.0
*lab*tce*	0.0	0.0	–
*lab*ncE*	1.0	0.0	–

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**

*olvi3**	0.5	0.744	1.0	(1.0)
*cmyn3**	0.5	0.256	0.0	(0.0)
*olvi4**	0.5	0.744	1.0	1.0
*cmyn4**	0.5	0.256	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	68.59	0.08	−19.4
*LAB*LABa*	68.59	0.54	−22.35
*LAB*TCHa*	75.0	22.36	271.4

relative* CIELAB *lab*

*lab*lab*	0.654	0.012	−0.499
*lab*tch*	0.75	0.5	0.754
*lab*nch*	0.0	0.5	0.754

***relative* Natural Colour (NC)**

*lab*lrj*	0.654	0.0	−0.499
*lab*tce*	0.75	0.5	0.75
*lab*ncE*	0.0	0.5	g99b

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.244	0.5	(1.0)
*cmyn3**	1.0	0.756	0.5	(0.0)
*olvi4**	0.5	0.744	1.0	0.5
*cmyn4**	0.5	0.256	0.0	0.5

***standard* and *adapted* CIELAB**

*LAB*LAB*	29.9	0.83	−22.01
*LAB*LABa*	29.9	0.55	−22.35
*LAB*TCHa*	25.01	22.36	271.41

relative* CIELAB *lab*

*lab*lab*	0.154	0.012	−0.499
*lab*tch*	0.25	0.5	0.754
*lab*nch*	0.5	0.5	0.754

***relative* Natural Colour (NC)**

*lab*lrj*	0.154	0.0	−0.499
*lab*tce*	0.25	0.5	0.75
*lab*ncE*	0.5	0.5	b00r

***relative* Inform. Technology (IT)**

*olvi3**	0.0	0.488	1.0	(1.0)
*cmyn3**	1.0	0.512	0.0	(0.0)
*olvi4**	0.0	0.488	1.0	1.0
*cmyn4**	1.0	0.512	0.0	0.0

***standard* and *adapted* CIELAB**

*LAB*LAB*	41.79	1.14	−43.56
*LAB*LABa*	41.79	1.1	−44.7
*LAB*TCHa*	50.0	44.73	271.4

relative* CIELAB *lab*

*lab*lab*	0.307	0.024	−0.998
*lab*tch*	0.5	1.0	0.754
*lab*nch*	0.0	1.0	0.754

***relative* Natural Colour (NC)**

*lab*lrj*	0.307	0.0	−0.999
*lab*tce*	0.5	1.0	0.75
*lab*ncE*	0.0	1.0	b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

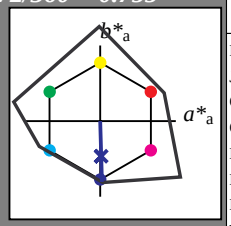
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 1,0

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

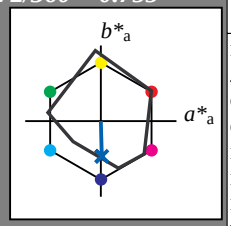
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness t^*



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

n^* = 1,0

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

n^* = 0,00

blackness n^*

0,25 0,50 n^* = 0,50 0,75 1,00

chromaticness c^*

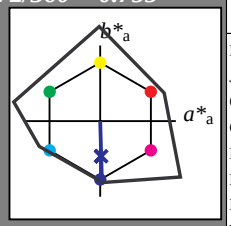
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness n^*

0,25 0,50 ***n** = 0,50** 0,75 1,00

chromaticness c^*

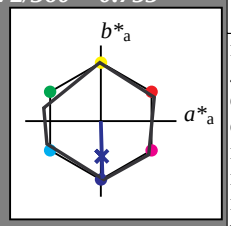
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness n^*

0,25 0,50 ***n** = 0,50** 0,75 1,00

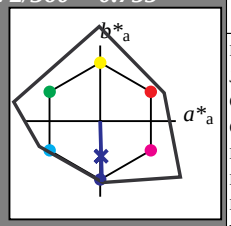
chromaticness c^*

3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

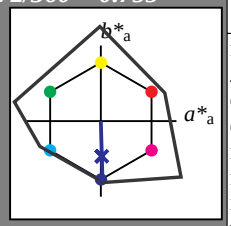
chromaticness c^*

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS18
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

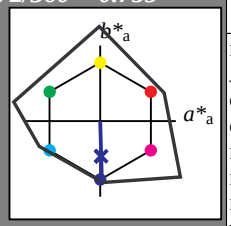
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

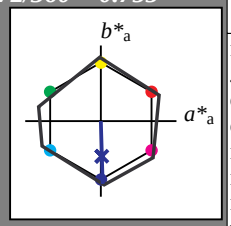
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

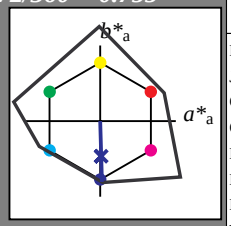
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 136$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

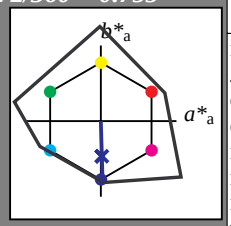
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 149$
%Regularity
$g^*_{H,rel} = 46$
$g^*_{C,rel} = 65$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

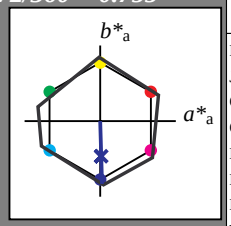
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

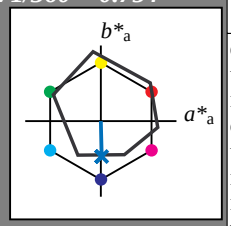
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

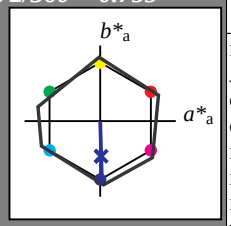
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***n** = 0,50**

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

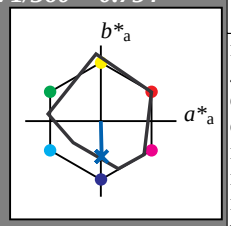
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***n** = 0,50**

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 0,75 1,00

chromaticness *c**

3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$

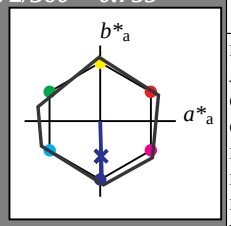
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 53 83 272

olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut

u^*_{rel} = 119

%Regularity

$g^*_{H,rel}$ = 47

$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$

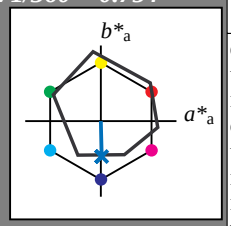
*lab*tch* and *lab*nch*

D65: hue B

LCH*Ma: 42 45 271

olv*Ma: 0.0 0.49 1.0

triangle lightness *t**



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut

u^*_{rel} = 93

%Regularity

$g^*_{H,rel}$ = 57

$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

*n** = 0,00

blackness *n**

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness *c**

*n** = 1,0

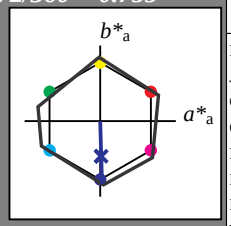
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

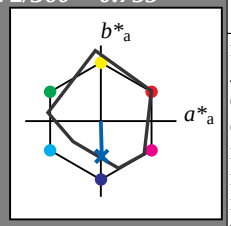
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness *n**

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness *c**

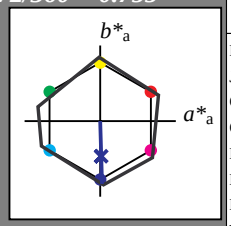
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
$u^*_{rel} = 119$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

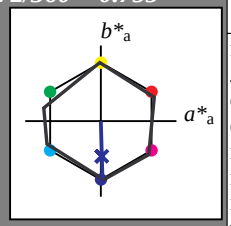
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
$u^*_{rel} = 100$
%Regularity
$g^*_{H,rel} = 47$
$g^*_{C,rel} = 100$

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

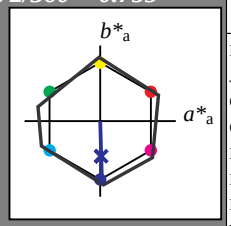
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

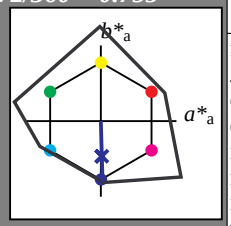
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

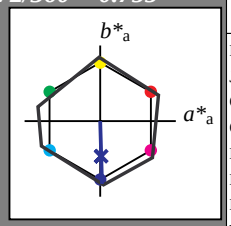
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

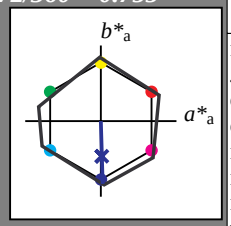
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS11
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

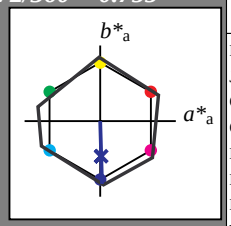
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
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B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

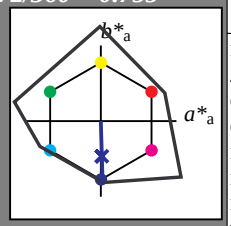
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

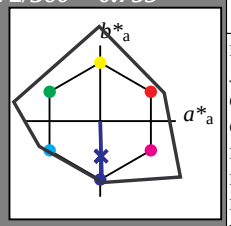
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

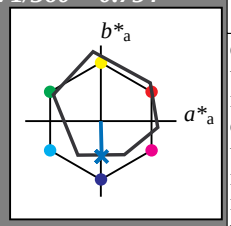
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System ORS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



ORS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

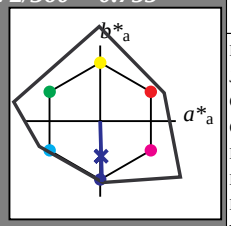
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 ***n** = 0,50** 0,75 1,00

chromaticness *c**

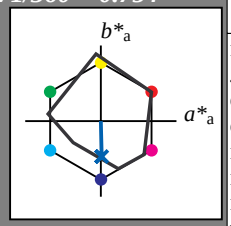
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 50 271
olv*Ma: 0.0 0.37 1.0

triangle lightness *t**



MRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.96	38.37	77.18	30
J_{Ma}	90.7	−6.36	88.75	88.98	94
G_{Ma}	52.11	−69.73	9.44	70.37	172
$G50B_{Ma}$	45.03	−36.57	−28.47	46.36	218
B_{Ma}	36.65	23.19	−63.05	67.18	290
$B50R_{Ma}$	34.94	57.17	−44.26	72.31	322
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 91
%Regularity
$g^*_{H,rel}$ = 41
$g^*_{C,rel}$ = 52

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.684 1.0 (1.0)
*cmyn3** 0.5 0.316 0.0 (0.0)
*olvi4** 0.5 0.684 1.0 1.0
*cmyn4** 0.5 0.316 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.57 0.17 −22.28
*LAB*LABa* 67.57 0.61 −25.16
*LAB*TCHa* 75.0 25.18 271.4
relative* CIELAB *lab*
*lab*lab* 0.64 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.184 0.5 (1.0)
*cmyn3** 1.0 0.816 0.5 (0.0)
*olvi4** 0.5 0.684 1.0 0.5
*cmyn4** 0.5 0.316 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.87 0.92 −24.9
*LAB*LABa* 28.87 0.62 −25.16
*LAB*TCHa* 25.01 25.18 271.41
relative* CIELAB *lab*
*lab*lab* 0.14 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.367 1.0 (1.0)
*cmyn3** 1.0 0.633 0.0 (0.0)
*olvi4** 0.0 0.367 1.0 1.0
*cmyn4** 1.0 0.633 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.73 1.32 −49.33
*LAB*LABa* 39.73 1.23 −50.34
*LAB*TCHa* 50.0 50.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.281 0.025 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.281 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 ***n** = 0,50** 0,75 1,00

chromaticness *c**

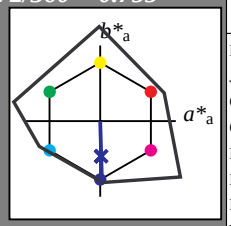
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

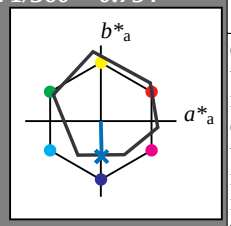
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System TRS18

for hue $h^* = lab^*h = 271/360 = 0.754$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 42 45 271
olv*Ma: 0.0 0.49 1.0

triangle lightness t^*



TRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
O_{Ma}	47.94	65.37	50.52	82.62	38
Y_{Ma}	90.37	−10.27	91.77	92.34	96
L_{Ma}	50.9	−62.79	34.95	71.87	151
C_{Ma}	58.62	−30.35	−45.01	54.3	236
V_{Ma}	25.71	31.11	−44.42	54.24	305
M_{Ma}	48.13	75.27	−8.35	75.73	354
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.66	26.98	64.56	25
J_{CIE}	81.26	−2.17	67.76	67.79	92
G_{CIE}	52.23	−42.26	11.75	43.87	164
B_{CIE}	30.57	1.15	−46.84	46.87	271

%Gamut
u^*_{rel} = 93
%Regularity
$g^*_{H,rel}$ = 57
$g^*_{C,rel}$ = 59

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 −0.97 4.75
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.744 1.0 (1.0)
*cmyn3** 0.5 0.256 0.0 (0.0)
*olvi4** 0.5 0.744 1.0 1.0
*cmyn4** 0.5 0.256 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 68.59 0.08 −19.4
*LAB*LABa* 68.59 0.54 −22.35
*LAB*TCHa* 75.0 22.36 271.4
relative* CIELAB *lab*
*lab*lab* 0.654 0.012 −0.499
*lab*tch* 0.75 0.5 0.754
*lab*nch* 0.0 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.654 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 −0.23 2.14
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.244 0.5 (1.0)
*cmyn3** 1.0 0.756 0.5 (0.0)
*olvi4** 0.5 0.744 1.0 0.5
*cmyn4** 0.5 0.256 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 29.9 0.83 −22.01
*LAB*LABa* 29.9 0.55 −22.35
*LAB*TCHa* 25.01 22.36 271.41
relative* CIELAB *lab*
*lab*lab* 0.154 0.012 −0.499
*lab*tch* 0.25 0.5 0.754
*lab*nch* 0.5 0.5 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.154 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.488 1.0 (1.0)
*cmyn3** 1.0 0.512 0.0 (0.0)
*olvi4** 0.0 0.488 1.0 1.0
*cmyn4** 1.0 0.512 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 41.79 1.14 −43.56
*LAB*LABa* 41.79 1.1 −44.7
*LAB*TCHa* 50.0 44.73 271.4
relative* CIELAB *lab*
*lab*lab* 0.307 0.024 −0.998
*lab*tch* 0.5 1.0 0.754
*lab*nch* 0.0 1.0 0.754
***relative* Natural Colour (NC)**
*lab*lrj* 0.307 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.5 −0.46
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

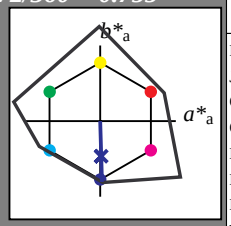
3 step scales for constant CIELAB hue 271/360 = 0.754 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness *t**



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 ***n** = 0,50** 0,75 1,00

chromaticness *c**

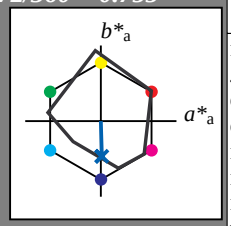
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System MRS18a

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 40 49 272
olv*Ma: 0.0 0.36 1.0

triangle lightness *t**



MRS18a; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	49.63	66.8	40.02	77.87	31
J_{Ma}	90.7	−7.27	93.19	93.48	94
G_{Ma}	52.11	−69.93	11.26	70.85	171
$G50B_{Ma}$	45.03	−36.65	−27.13	45.61	217
B_{Ma}	36.65	23.26	−62.27	66.49	290
$B50R_{Ma}$	34.94	57.27	−43.6	71.99	323
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 92
%Regularity
$g^*_{H,rel}$ = 42
$g^*_{C,rel}$ = 49

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.01 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.71 0.05 0.0
*LAB*LABa* 56.71 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.1 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***n** = 1,0**

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.682 1.0 (1.0)
*cmyn3** 0.5 0.318 0.0 (0.0)
*olvi4** 0.5 0.682 1.0 1.0
*cmyn4** 0.5 0.318 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 67.55 0.74 −24.71
*LAB*LABa* 67.55 0.7 −24.72
*LAB*TCHa* 75.0 24.74 271.63
relative* CIELAB *lab*
*lab*lab* 0.64 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.64 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.182 0.5 (1.0)
*cmyn3** 1.0 0.818 0.5 (0.0)
*olvi4** 0.5 0.682 1.0 0.5
*cmyn4** 0.5 0.318 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 28.86 0.79 −24.7
*LAB*LABa* 28.86 0.71 −24.72
*LAB*TCHa* 25.01 24.74 271.64
relative* CIELAB *lab*
*lab*lab* 0.14 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.14 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.365 1.0 (1.0)
*cmyn3** 1.0 0.635 0.0 (0.0)
*olvi4** 0.0 0.365 1.0 1.0
*cmyn4** 1.0 0.635 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 39.71 1.49 −49.43
*LAB*LABa* 39.71 1.41 −49.45
*LAB*TCHa* 50.0 49.48 271.64
relative* CIELAB *lab*
*lab*lab* 0.28 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.28 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***n** = 0,00**

blackness *n**

0,25 0,50 ***n** = 0,50** 0,75 1,00

chromaticness *c**

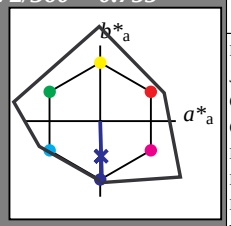
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

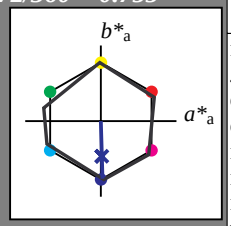
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS18

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 57 76 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	56.7	70.66	31.47	77.35	24
J_{Ma}	56.7	−1.39	77.37	77.39	91
G_{Ma}	56.7	−75.46	17.4	77.45	167
$G50B_{Ma}$	56.7	−71.29	−30.25	77.45	203
B_{Ma}	56.7	4.0	−77.3	77.41	273
$B50R_{Ma}$	56.7	63.35	−44.4	77.36	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 100
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 0.0
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 1{,}0$

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 76.05 1.12 −38.06
*LAB*LABa* 76.05 1.09 −38.07
*LAB*TCHa* 75.0 38.09 271.64
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 37.36 1.17 −38.05
*LAB*LABa* 37.36 1.09 −38.07
*LAB*TCHa* 25.01 38.1 271.65
relative* CIELAB *lab*
*lab*lab* 0.25 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

$n^* = 0{,}50$

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.7 2.23 −76.13
*LAB*LABa* 56.7 2.18 −76.15
*LAB*TCHa* 50.0 76.19 271.64
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 0,75 1,00

chromaticness c^*

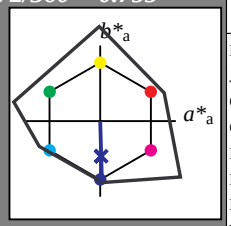
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

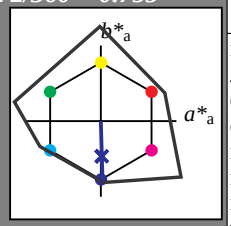
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS18

for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS18; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.63	37.24	92.46	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.29	25.34	117.07	167
$G50B_{Ma}$	59.47	−80.61	−33.45	87.29	203
B_{Ma}	49.01	3.63	−81.2	81.29	273
$B50R_{Ma}$	44.06	106.07	−73.94	129.31	325
N_{Ma}	18.01	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.67	27.97	64.99	25
J_{CIE}	81.26	−2.91	71.56	71.62	92
G_{CIE}	52.23	−42.47	13.58	44.6	162
B_{CIE}	30.57	1.33	−46.48	46.51	272

%Gamut
u^*_{rel} = 136
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.18 −40.2
*LAB*LABa* 72.29 1.15 −40.21
*LAB*TCHa* 75.0 40.23 271.64
relative* CIELAB *lab*
*lab*lab* 0.701 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.701 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 56.72 0.05 0.0
*LAB*LABa* 56.72 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 33.6 1.24 −40.19
*LAB*LABa* 33.6 1.16 −40.21
*LAB*TCHa* 25.01 40.24 271.65
relative* CIELAB *lab*
*lab*lab* 0.201 0.014 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.201 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.37 −80.41
*LAB*LABa* 49.18 2.3 −80.43
*LAB*TCHa* 50.0 80.47 271.64
relative* CIELAB *lab*
*lab*lab* 0.403 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.403 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 18.02 0.09 0.02
*LAB*LABa* 18.02 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

*n** = 0,00

blackness n^*

0,25 0,50 *n** = 0,50 0,75 1,00

chromaticness c^*

*n** = 1,0

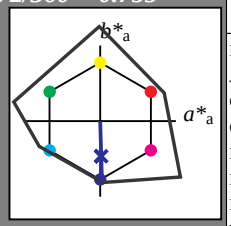
3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

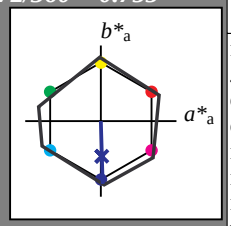
UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NRS11

for hue $h^* = lab^*h = 272/360 = 0.755$
*lab*tch* and *lab*nch*

D65: hue B
LCH*Ma: 53 83 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NRS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	53.2	77.06	34.32	84.36	24
J_{Ma}	53.2	−1.51	84.38	84.39	91
G_{Ma}	53.2	−82.27	18.98	84.44	167
$G50B_{Ma}$	53.2	−77.72	−32.98	84.44	203
B_{Ma}	53.2	4.37	−84.28	84.41	273
$B50R_{Ma}$	53.2	69.09	−48.41	84.37	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 119
%Regularity
$g^*_{H,rel}$ = 47
$g^*_{C,rel}$ = 100

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.512 1.0 (1.0)
*cmyn3** 0.5 0.488 0.0 (0.0)
*olvi4** 0.5 0.512 1.0 1.0
*cmyn4** 0.5 0.488 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 74.3 1.23 −41.51
*LAB*LABa* 74.3 1.2 −41.52
*LAB*TCHa* 75.0 41.54 271.66
relative* CIELAB *lab*
*lab*lab* 0.75 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.75 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.012 0.5 (1.0)
*cmyn3** 1.0 0.988 0.5 (0.0)
*olvi4** 0.5 0.512 1.0 0.5
*cmyn4** 0.5 0.488 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 32.1 1.27 −41.5
*LAB*LABa* 32.1 1.21 −41.52
*LAB*TCHa* 25.01 41.55 271.67
relative* CIELAB *lab*
*lab*lab* 0.25 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.25 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.024 1.0 (1.0)
*cmyn3** 1.0 0.976 0.0 (0.0)
*olvi4** 0.0 0.024 1.0 1.0
*cmyn4** 1.0 0.976 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.2 2.46 −83.04
*LAB*LABa* 53.2 2.42 −83.05
*LAB*TCHa* 50.0 83.09 271.67
relative* CIELAB *lab*
*lab*lab* 0.5 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

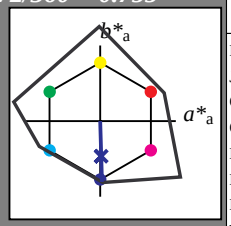
$n^* = 1{,}0$

3 step scales for constant CIELAB hue 272/360 = 0.755 (right)

Input: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

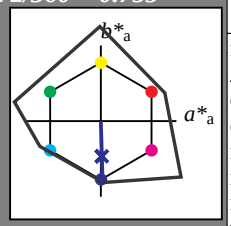
$n^* = 1{,}0$

UE100−7, 3 step scales for constant CIELAB hue 272/360 = 0.755 (left)

Output: Colorimetric Reflective System NCS11
for hue $h^* = lab^*h = 272/360 = 0.755$
lab*tch* and *lab*nch

D65: hue B
LCH*Ma: 49 80 272
olv*Ma: 0.0 0.02 1.0

triangle lightness t^*



NCS11; adapted (a) CIELAB data

	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R_{Ma}	47.15	84.64	37.25	92.48	24
J_{Ma}	91.37	−1.27	125.03	125.03	91
G_{Ma}	63.07	−114.28	25.35	117.06	167
$G50B_{Ma}$	59.47	−80.6	−33.45	87.28	203
B_{Ma}	49.01	3.65	−81.19	81.28	273
$B50R_{Ma}$	44.06	106.09	−73.93	129.32	325
N_{Ma}	10.99	0.0	0.0	0.0	0
W_{Ma}	95.41	0.0	0.0	0.0	0
R_{CIE}	39.92	58.69	27.98	65.01	25
J_{CIE}	81.26	−2.9	71.56	71.62	92
G_{CIE}	52.23	−42.45	13.59	44.59	162
B_{CIE}	30.57	1.35	−46.48	46.51	272

%Gamut
u^*_{rel} = 149
%Regularity
$g^*_{H,rel}$ = 46
$g^*_{C,rel}$ = 65

***relative* Inform. Technology (IT)**
*olvi3** 1.0 1.0 1.0 (1.0)
*cmyn3** 0.0 0.0 0.0 (0.0)
*olvi4** 1.0 1.0 1.0 1.0
*cmyn4** 0.0 0.0 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 95.41 0.0 −0.01
*LAB*LABa* 95.41 0.0 0.0
*LAB*TCHa* 99.99 0.01 –
relative* CIELAB *lab*
*lab*lab* 1.0 0.0 0.0
*lab*tch* 1.0 0.0 –
*lab*nch* 0.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 1.0 0.0 0.0
*lab*tce* 1.0 0.0 –
*lab*ncE* 0.0 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.508 1.0 (1.0)
*cmyn3** 0.5 0.492 0.0 (0.0)
*olvi4** 0.5 0.508 1.0 1.0
*cmyn4** 0.5 0.492 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 72.29 1.2 −40.21
*LAB*LABa* 72.29 1.17 −40.21
*LAB*TCHa* 75.0 40.24 271.66
relative* CIELAB *lab*
*lab*lab* 0.726 0.014 −0.499
*lab*tch* 0.75 0.5 0.755
*lab*nch* 0.0 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.726 0.0 −0.499
*lab*tce* 0.75 0.5 0.75
*lab*ncE* 0.0 0.5 g99b

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.016 1.0 (1.0)
*cmyn3** 1.0 0.984 0.0 (0.0)
*olvi4** 0.0 0.016 1.0 1.0
*cmyn4** 1.0 0.984 0.0 0.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 49.18 2.39 −80.42
*LAB*LABa* 49.18 2.34 −80.43
*LAB*TCHa* 50.0 80.48 271.67
relative* CIELAB *lab*
*lab*lab* 0.452 0.029 −0.998
*lab*tch* 0.5 1.0 0.755
*lab*nch* 0.0 1.0 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.452 0.0 −0.999
*lab*tce* 0.5 1.0 0.75
*lab*ncE* 0.0 1.0 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.5 0.5 0.5 (1.0)
*cmyn3** 0.5 0.5 0.5 (0.0)
*olvi4** 1.0 1.0 1.0 0.5
*cmyn4** 0.0 0.0 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 53.21 0.04 0.0
*LAB*LABa* 53.21 0.0 0.0
*LAB*TCHa* 50.0 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.5 0.0 0.0
*lab*tch* 0.5 0.0 –
*lab*nch* 0.5 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.5 0.0 0.0
*lab*tce* 0.5 0.0 –
*lab*ncE* 0.5 0.0 –

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.008 0.5 (1.0)
*cmyn3** 1.0 0.992 0.5 (0.0)
*olvi4** 0.5 0.508 1.0 0.5
*cmyn4** 0.5 0.492 0.0 0.5
***standard* and *adapted* CIELAB**
*LAB*LAB* 30.09 1.24 −40.2
*LAB*LABa* 30.09 1.18 −40.21
*LAB*TCHa* 25.01 40.24 271.67
relative* CIELAB *lab*
*lab*lab* 0.226 0.015 −0.499
*lab*tch* 0.25 0.5 0.755
*lab*nch* 0.5 0.5 0.755
***relative* Natural Colour (NC)**
*lab*lrj* 0.226 0.0 −0.499
*lab*tce* 0.25 0.5 0.75
*lab*ncE* 0.5 0.5 b00r

***relative* Inform. Technology (IT)**
*olvi3** 0.0 0.0 0.0 (1.0)
*cmyn3** 1.0 1.0 1.0 (0.0)
*olvi4** 1.0 1.0 1.0 0.0
*cmyn4** 0.0 0.0 0.0 1.0
***standard* and *adapted* CIELAB**
*LAB*LAB* 11.01 0.07 0.01
*LAB*LABa* 11.01 0.0 0.0
*LAB*TCHa* 0.01 0.01 –
relative* CIELAB *lab*
*lab*lab* 0.0 0.0 0.0
*lab*tch* 0.0 0.0 –
*lab*nch* 1.0 0.0 –
***relative* Natural Colour (NC)**
*lab*lrj* 0.0 0.0 0.0
*lab*tce* 0.0 0.0 –
*lab*ncE* 1.0 0.0 –

$n^* = 0{,}00$

blackness n^*

0,25 0,50 $n^* = 0{,}50$ 0,75 1,00

chromaticness c^*

$n^* = 1{,}0$

3 step scales for constant CIELAB hue 272/360 = 0.755 (right)