

Input and Output: Television Luminous System TLS00a

Data for any device (d) or
elementary (e) colour:

HIC^*_d

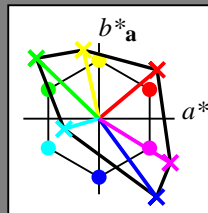
hue text for the colours

of this page:

$H^*_d R00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data

H^*_d	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 158$

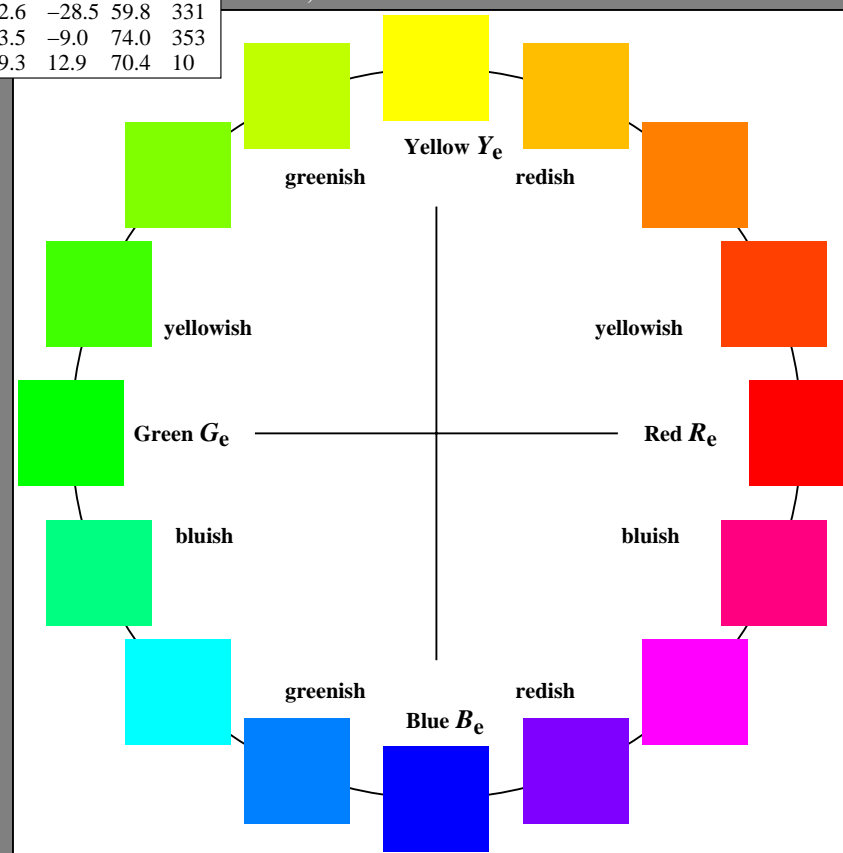
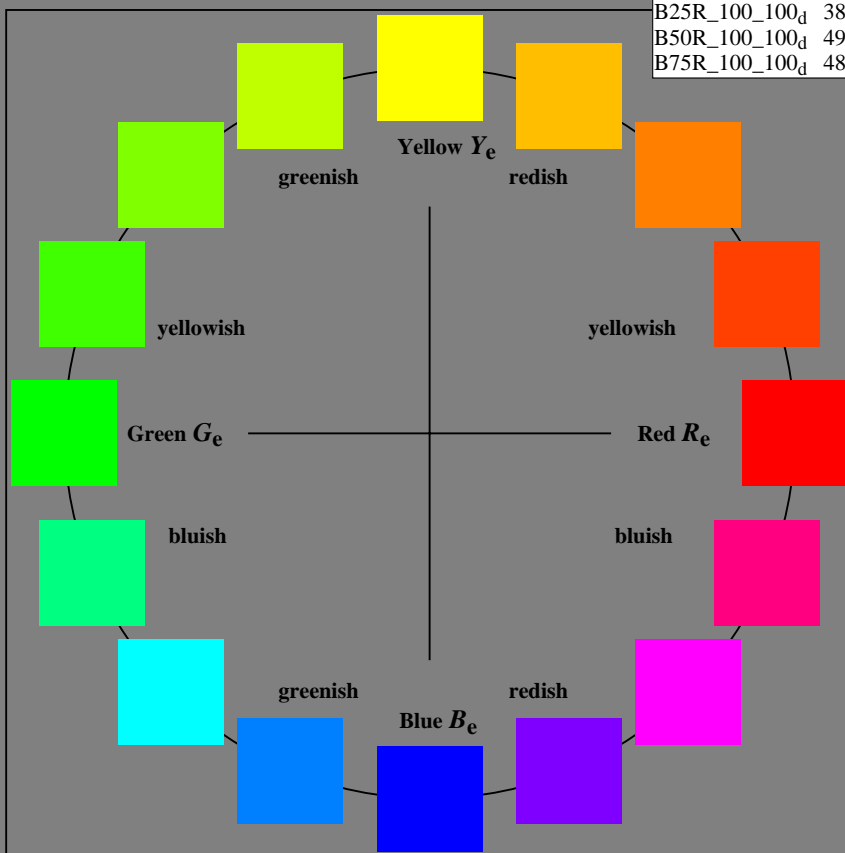
%Regularity

$g^*H_{rel} = 19$

$g^*C_{rel} = 37$

TLS00a; adapted (a) CIELAB data

name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R _{d, Ma}	50.5	76.9	64.5	100.4	40
Y _{d, Ma}	92.6	-20.6	90.7	93.0	102
G _{d, Ma}	83.6	-82.7	79.9	115.0	136
C _{d, Ma}	86.8	-46.1	-13.5	48.0	196
B _{d, Ma}	30.3	76.0	-103.6	128.5	306
M _{d, Ma}	57.3	94.3	-58.4	110.9	328
N _{d, Ma}	0.0	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



1-100000-L0 cmyn6*

AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

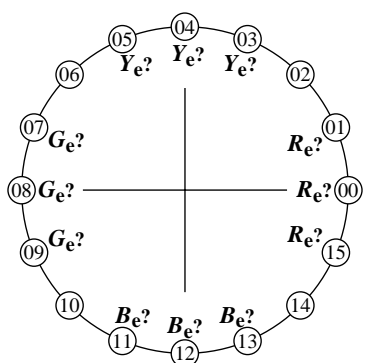
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01001

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY8_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY8_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY8_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY8_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

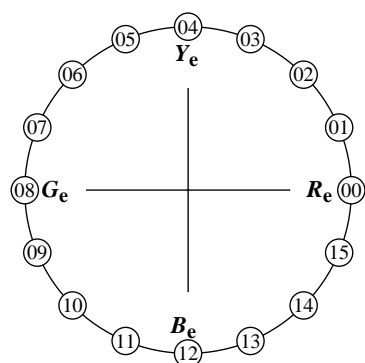
.....
.....
.....

part 3,

AE690-7dd: 01001

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01001

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY8_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY8_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY8_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY8_3.PS

or underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF

Exchange of CIELAB data in file http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01001

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=th4ta

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 3/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	0,00	0,00	0,00	0,00	0,01
2	6,36	0,00	0,06	0,00	0,01
3	12,72	0,00	0,13	0,00	0,01
4	19,08	0,00	0,20	0,00	0,01
5	25,44	0,00	0,26	0,00	0,01
6	31,80	0,00	0,33	0,00	0,01
7	38,16	0,00	0,40	0,00	0,01
8	44,52	0,00	0,46	0,00	0,01
9	50,88	0,00	0,53	0,00	0,01
10	57,24	0,00	0,60	0,00	0,01
11	63,60	0,00	0,66	0,00	0,01
12	69,96	0,00	0,73	0,00	0,01
13	76,32	0,00	0,80	0,00	0,01
14	82,68	0,00	0,86	0,00	0,01
15	89,04	0,00	0,93	0,00	0,01
16	95,41	0,00	1,00	0,00	0,01
17	0,00	0,00	0,00	0,00	0,01
18	23,85	0,00	0,25	0,00	0,01
19	47,70	0,00	0,50	0,00	0,01
20	71,55	0,00	0,75	0,00	0,01
21	95,41	0,00	1,00	0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

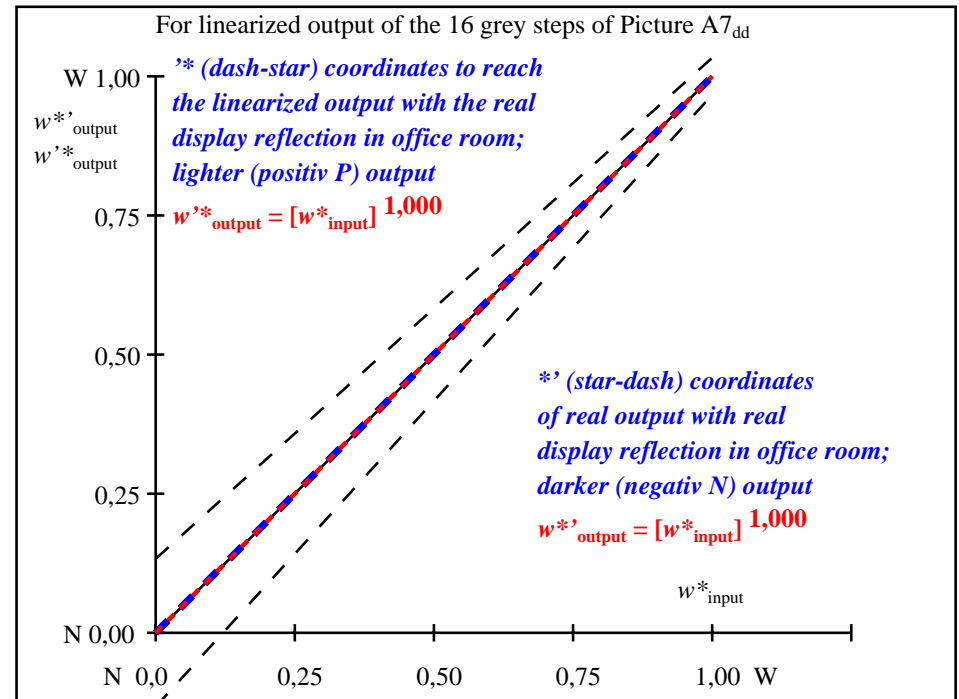
Mean lightness difference
(16 steps)
ΔE*_{CIELAB} = 0,0

Mean lightness difference
(5 steps)
ΔL*_{CIELAB} = 0,0

Mean colour reproduction index: R*_{ab,m} = 99,9

part 1,

AE690-3dd: 01002



part 2,

AE691-3dd: 01002

L*/Y _{intended} (absolute)	0,0/0,0	6,3/0,7	12,7/1,5	19,0/2,7	25,4/4,5	31,8/6,9	38,1/10,1	44,5/14,2	50,8/19,1	57,2/25,1	63,6/32,3	69,9/40,7	76,3/50,4	82,6/61,5	89,0/74,2	95,4/88,5
0 0 0 n* setcmyk gp=1,000 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
w* = l* CIELAB, r (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w* _{intended}	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w* _{output}	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000

part 3, picture A7_{dd}: 16 visual equidistant L*-grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01002

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast Y_W:Y_N=88,9:0,31; Y_N-range 0,0 to <0,46

input: rgb/cmy0/000n/w set...
output: ->rgb_{dd} setrgbcolor

Input and Output: Television Luminous System TLS06a

Data for any device (d) or
elementary (e) colour:

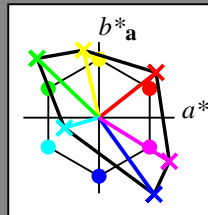
HIC^*_d

hue text for the colours

of this page:

$H^*_d R00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data					
H^*_d	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut

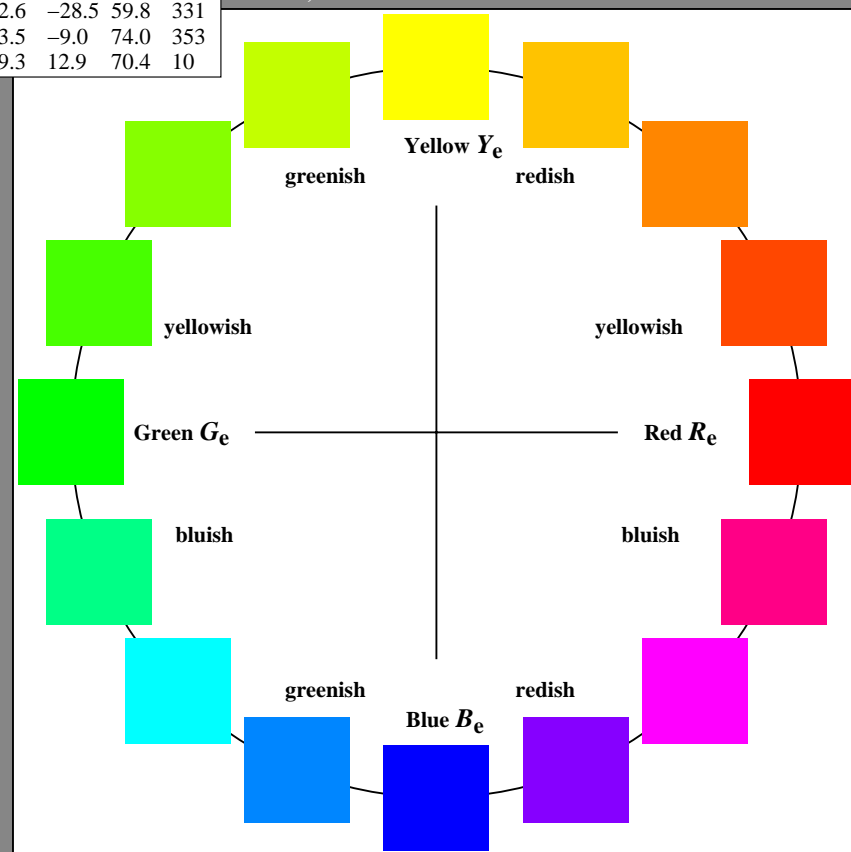
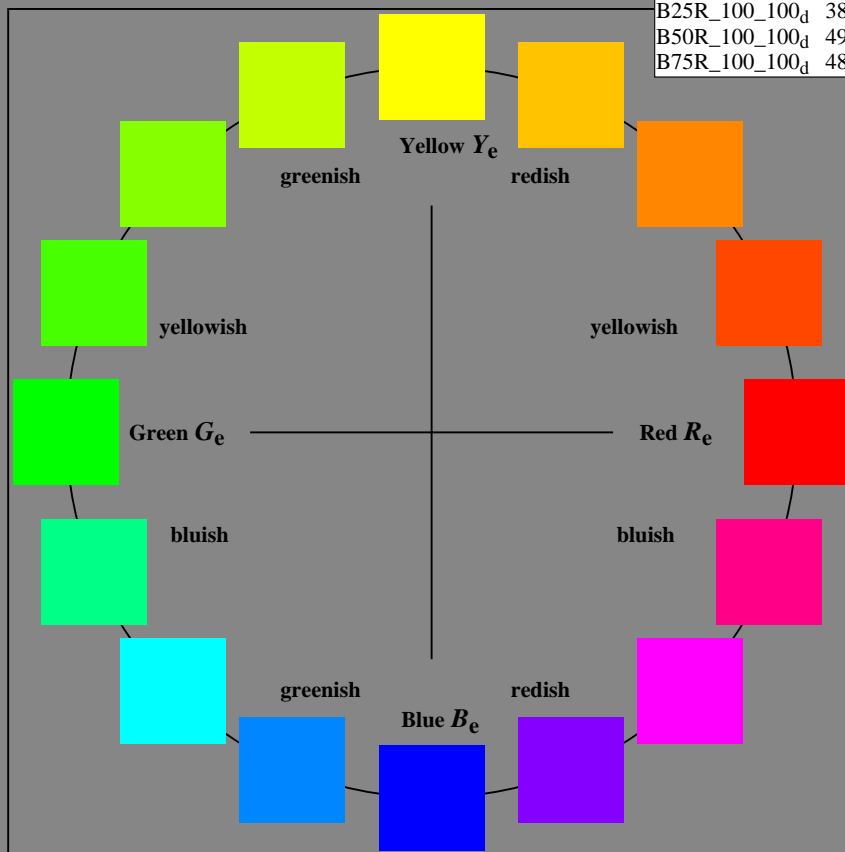
$u^*_{rel} = 145$

%Regularity

$g^*H_{rel} = 20$

$g^*C_{rel} = 38$

TLS06a; adapted (a) CIELAB data					
name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R _{d, Ma}	51.0	75.5	59.6	96.2	38
Y _{d, Ma}	92.6	-20.5	89.2	91.5	102
G _{d, Ma}	83.7	-81.7	78.3	113.2	136
C _{d, Ma}	86.9	-45.7	-13.4	47.6	196
B _{d, Ma}	31.7	72.9	-101.3	124.8	305
M _{d, Ma}	57.7	93.0	-57.7	109.5	328
N _{d, Ma}	5.6	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



1-100000-L0 cmyn6*

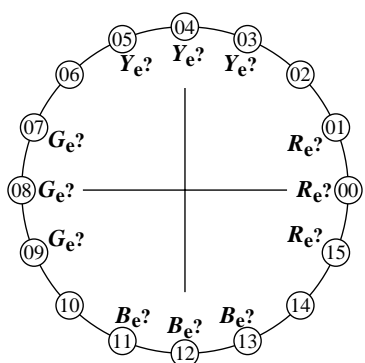
AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01011

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY7_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY7_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY7_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY7_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

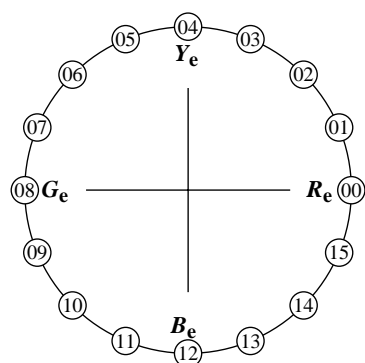
Special remarks: e. g. output of Landscape (L)

part 3,

AE690-7dd: 01011

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01011

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY7_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY7_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY7_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY7_3.PS

or underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01011

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 6/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	5,69 0,00 0,00	0,00	5,69 0,00 0,00	0,00 0,00 0,00	0,01
2	11,67 0,00 0,00	0,10	14,73 0,00 0,00	3,05 0,00 0,00	3,05
3	17,65 0,00 0,00	0,18	21,95 0,00 0,00	4,30 0,00 0,00	4,30
4	23,63 0,00 0,00	0,25	28,62 0,00 0,00	4,99 0,00 0,00	4,99
5	29,61 0,00 0,00	0,32	34,96 0,00 0,00	5,34 0,00 0,00	5,34
6	35,59 0,00 0,00	0,39	41,05 0,00 0,00	5,45 0,00 0,00	5,45
7	41,57 0,00 0,00	0,46	46,96 0,00 0,00	5,38 0,00 0,00	5,38
8	47,55 0,00 0,00	0,52	52,72 0,00 0,00	5,16 0,00 0,00	5,16
9	53,54 0,00 0,00	0,58	58,35 0,00 0,00	4,81 0,00 0,00	4,81
10	59,52 0,00 0,00	0,64	63,88 0,00 0,00	4,36 0,00 0,00	4,36
11	65,50 0,00 0,00	0,70	69,31 0,00 0,00	3,81 0,00 0,00	3,81
12	71,48 0,00 0,00	0,76	74,67 0,00 0,00	3,18 0,00 0,00	3,18
13	77,46 0,00 0,00	0,82	79,95 0,00 0,00	2,48 0,00 0,00	2,48
14	83,44 0,00 0,00	0,88	85,16 0,00 0,00	1,71 0,00 0,00	1,71
15	89,42 0,00 0,00	0,94	90,31 0,00 0,00	0,88 0,00 0,00	0,88
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	5,69 0,00 0,00	0,00	5,69 0,00 0,00	0,00 0,00 0,00	0,01
18	28,12 0,00 0,00	0,30	33,40 0,00 0,00	5,28 0,00 0,00	5,28
19	50,55 0,00 0,00	0,55	55,55 0,00 0,00	5,00 0,00 0,00	5,00
20	72,98 0,00 0,00	0,78	75,99 0,00 0,00	3,01 0,00 0,00	3,01
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

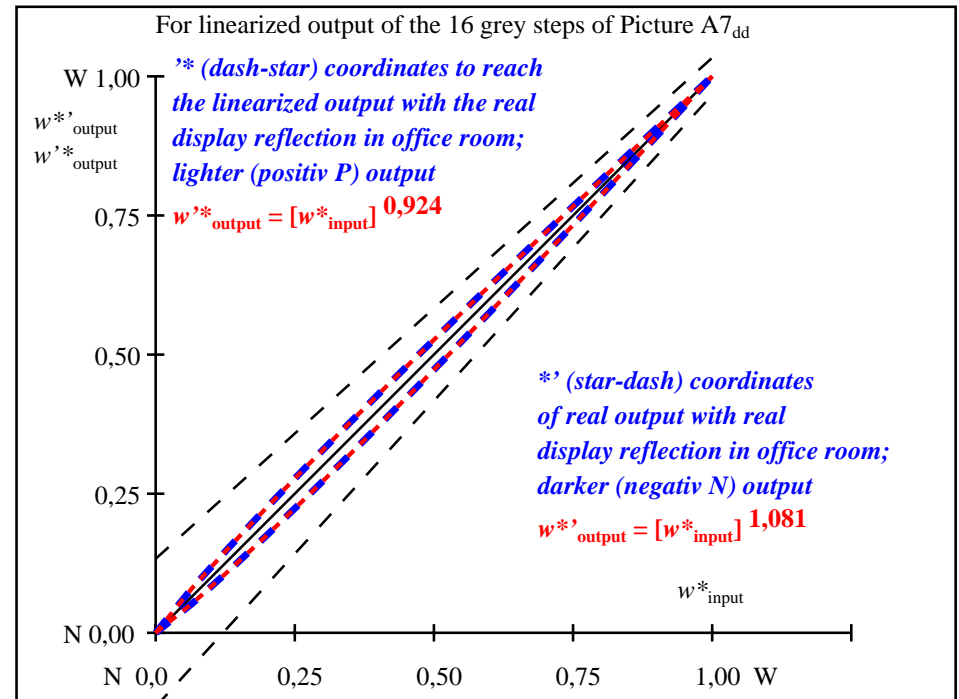
Mean lightness difference
(16 steps)
 $\Delta E^*_{CIELAB} = 3,4$

Mean lightness difference
(5 steps)
 $\Delta L^*_{CIELAB} = 2,6$

Mean colour reproduction index: $R^*_{ab,m} = 85,0$

part 1,

AE690-3dd: 01012



part 2,

AE691-3dd: 01012

$L^*/Y_{intended}$ (absolute)	5,6/0,6	11,6/1,3	17,6/2,4	23,6/3,9	29,6/6,0	35,5/8,8	41,5/12,2	47,5/16,4	53,5/21,5	59,5/27,5	65,5/34,6	71,4/42,8	77,4/52,3	83,4/63,0	89,4/75,0	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,924																
No. and																
Hex code																
$w^*=l^*_{CIELAB, r}$ (relative)																
$w^*_{intended}$	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,082	0,154	0,225	0,294	0,361	0,428	0,494	0,558	0,623	0,687	0,750	0,813	0,876	0,937	1,000

part 3, picture A7_{dd}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01012

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:0,62$; Y_N -range 0,46 to <0,93

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ setrgbcolor

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=rh4ta

Input and Output: Television Luminous System TLS11a

Data for any device (d) or
elementary (e) colour:

HIC^*_d

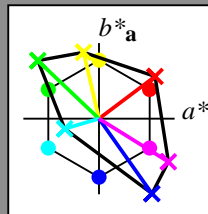
hue text for the colours

of this page:

$H^*_d R00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data

H^*_d	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 134$

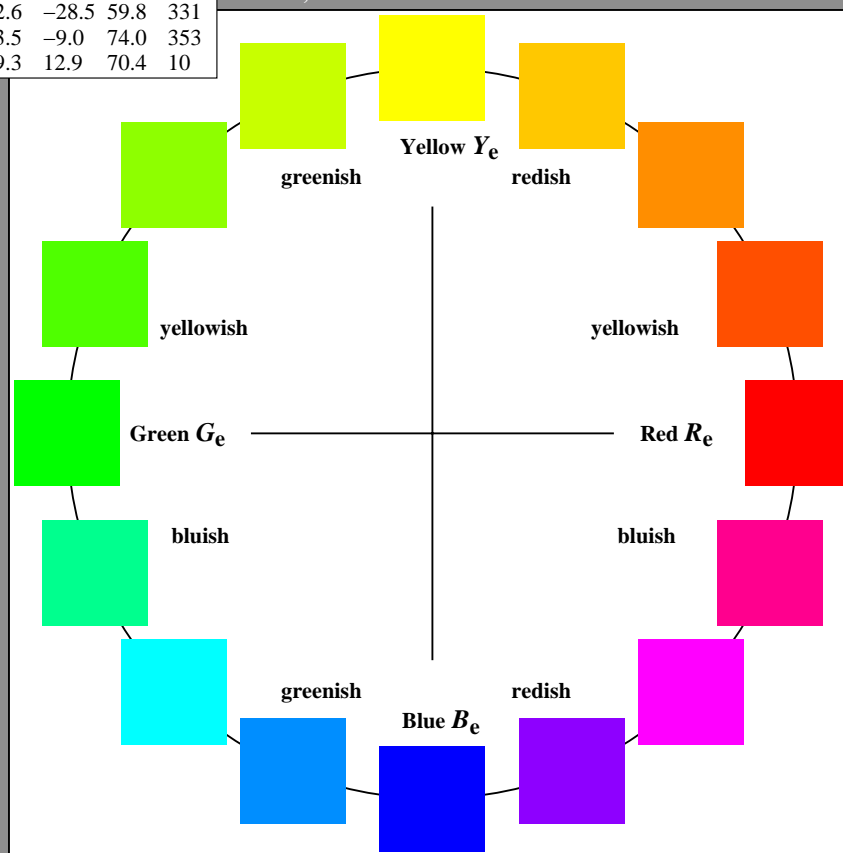
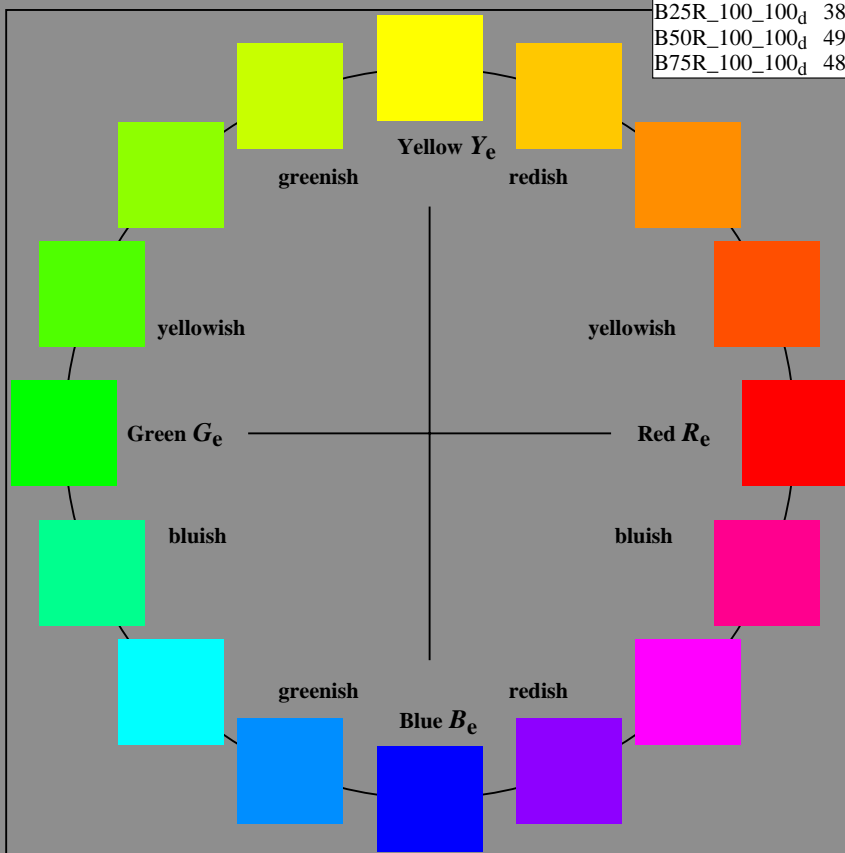
%Regularity

$g^*H_{rel} = 21$

$g^*C_{rel} = 38$

TLS11a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R _{d, Ma}	51.6	74.2	55.8	92.8	36
Y _{d, Ma}	92.7	-20.3	87.7	90.0	103
G _{d, Ma}	83.8	-80.8	76.8	111.5	136
C _{d, Ma}	87.0	-45.2	-13.3	47.2	196
B _{d, Ma}	33.0	70.0	-99.0	121.3	305
M _{d, Ma}	58.1	91.8	-57.0	108.0	328
N _{d, Ma}	10.9	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



1-100000-L0 cmyn6*

AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

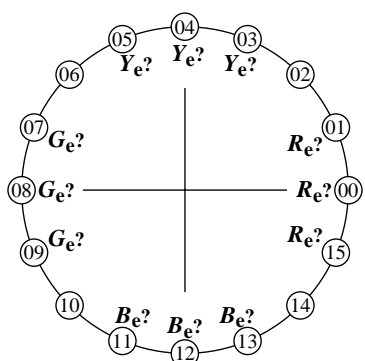
input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{dd}$ set $rgbc$ color

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01021

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY6_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY6_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY6_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY6_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

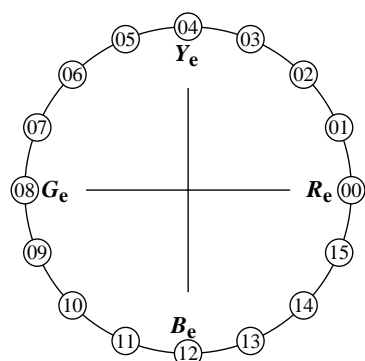
Special remarks: e. g. output of Landscape (L)

part 3,

AE690-7dd: 01021

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01021

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY6_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY6_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY6_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY6_3.PS

or underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01021

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rh4ta

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 9/24
technical information: <http://farbe.li.tu-berlin.de/> or <http://farbe.li.tu-berlin.de/AE69.HTM>

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	10,99 0,00 0,00	0,00	10,99 0,00 0,00	0,00 0,00 0,00	0,01
2	16,62 0,00 0,00	0,13	22,51 0,00 0,00	5,89 0,00 0,00	5,89
3	22,24 0,00 0,00	0,22	30,17 0,00 0,00	7,93 0,00 0,00	7,93
4	27,87 0,00 0,00	0,30	36,84 0,00 0,00	8,96 0,00 0,00	8,96
5	33,50 0,00 0,00	0,37	42,93 0,00 0,00	9,42 0,00 0,00	9,42
6	39,13 0,00 0,00	0,44	48,62 0,00 0,00	9,49 0,00 0,00	9,49
7	44,75 0,00 0,00	0,50	54,02 0,00 0,00	9,26 0,00 0,00	9,26
8	50,38 0,00 0,00	0,57	59,19 0,00 0,00	8,80 0,00 0,00	8,80
9	56,01 0,00 0,00	0,62	64,16 0,00 0,00	8,15 0,00 0,00	8,15
10	61,64 0,00 0,00	0,68	68,97 0,00 0,00	7,33 0,00 0,00	7,33
11	67,27 0,00 0,00	0,74	73,64 0,00 0,00	6,37 0,00 0,00	6,37
12	72,89 0,00 0,00	0,79	78,19 0,00 0,00	5,29 0,00 0,00	5,29
13	78,52 0,00 0,00	0,84	82,63 0,00 0,00	4,10 0,00 0,00	4,10
14	84,15 0,00 0,00	0,90	86,97 0,00 0,00	2,82 0,00 0,00	2,82
15	89,78 0,00 0,00	0,95	91,23 0,00 0,00	1,45 0,00 0,00	1,45
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	10,99 0,00 0,00	0,00	10,99 0,00 0,00	0,00 0,00 0,00	0,01
18	32,09 0,00 0,00	0,36	41,45 0,00 0,00	9,35 0,00 0,00	9,35
19	53,20 0,00 0,00	0,60	61,70 0,00 0,00	8,50 0,00 0,00	8,50
20	74,30 0,00 0,00	0,80	79,31 0,00 0,00	5,00 0,00 0,00	5,00
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Start output S1
Specification according to
ISO/IEC 15775 Annex G
and DIN 33866-1 Annex G

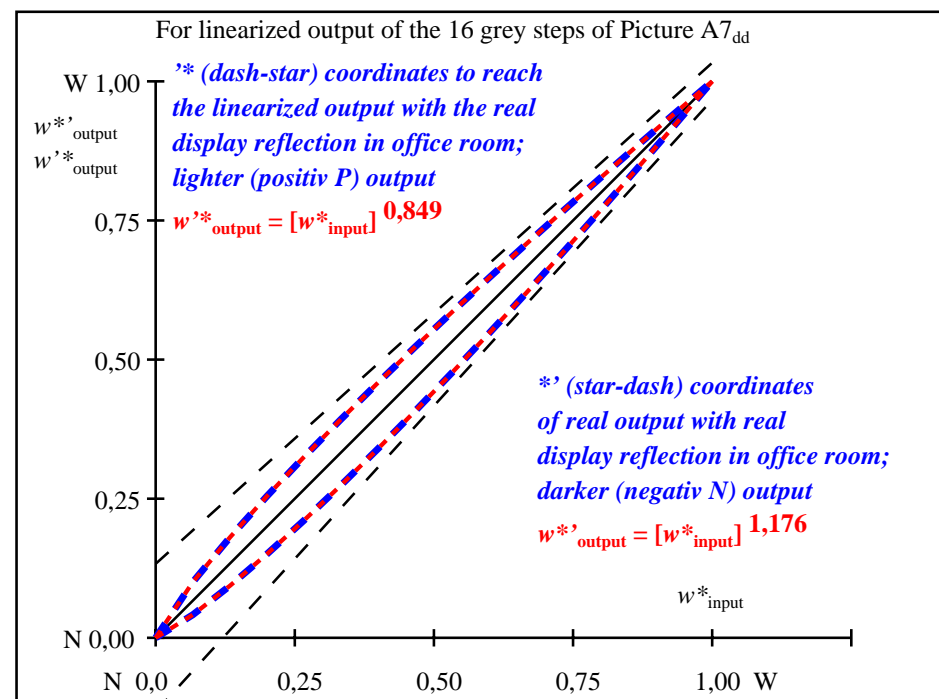
Mean lightness difference
(16 steps)
 $\Delta E^*_{CIELAB} = 5,9$

Mean lightness difference
(5 steps)
 $\Delta L^*_{CIELAB} = 4,5$

Mean colour reproduction index: $R^*_{ab,m} = 74,1$

part 1,

AE690-3dd: 01022



part 2,

AE691-3dd: 01022

$L^*/Y_{intended}$ (absolute)	10,9/1,2	16,6/2,2	22,2/3,5	27,8/5,4	33,5/7,7	39,1/10,7	44,7/14,3	50,3/18,7	56,0/23,9	61,6/29,9	67,2/36,9	72,8/45,0	78,5/54,1	84,1/64,3	89,7/75,8	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,849																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*_{CIELAB, r}$ (relative)																
$w^*_{intended}$	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,100	0,180	0,254	0,325	0,392	0,458	0,523	0,585	0,647	0,708	0,767	0,827	0,885	0,942	1,000

part 3, picture A7_{dd}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01022

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:1,25$; Y_N -range 0,93 to <1,87

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ setrgbcolor

Input and Output: Television Luminous System TLS18a

Data for any device (d) or
elementary (e) colour:

HIC^*_d

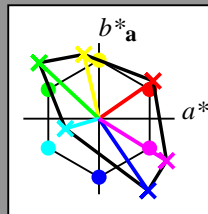
hue text for the colours

of this page:

$H^*_d R00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data

H^*_d	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 118$

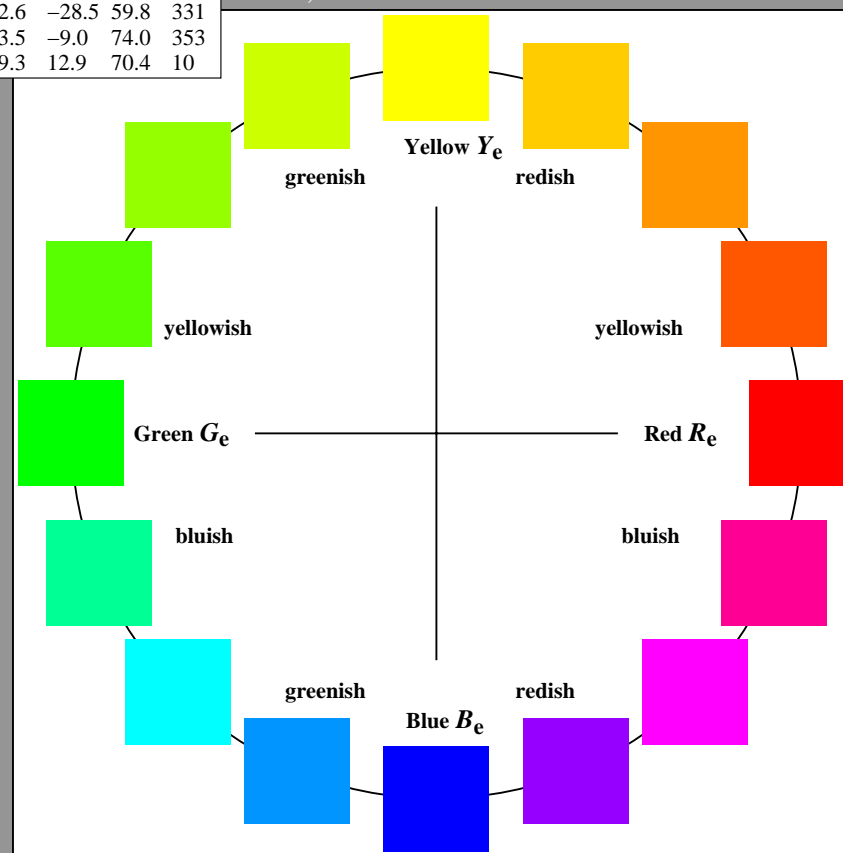
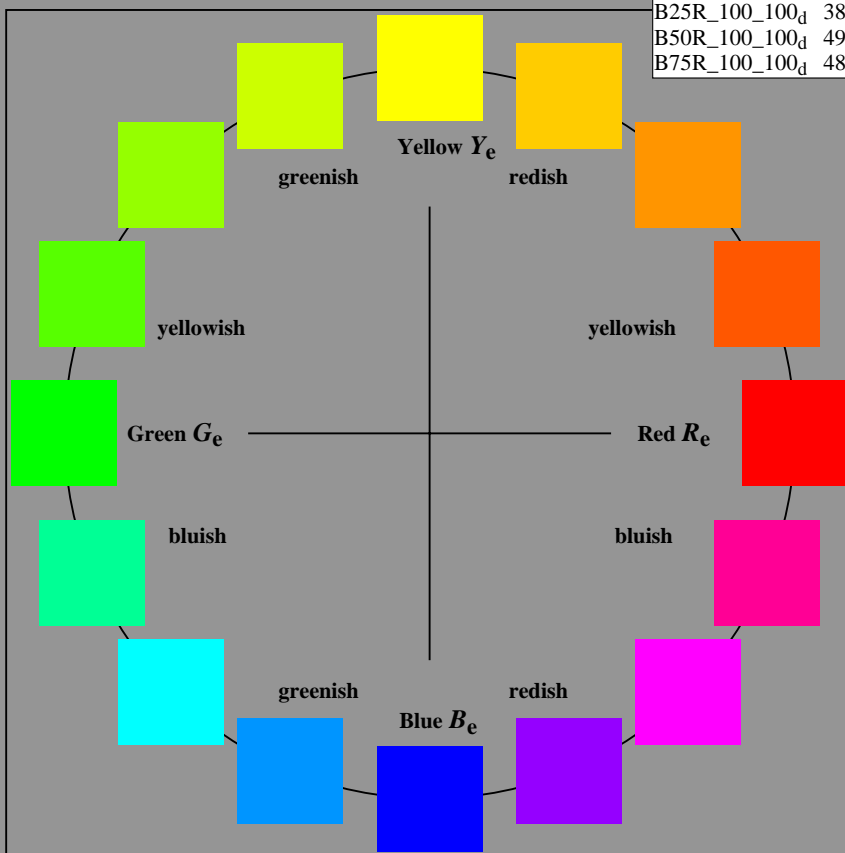
%Regularity

$g^*H_{rel} = 22$

$g^*C_{rel} = 40$

TLS18a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R _{d, Ma}	52.7	71.6	49.8	87.2	34
Y _{d, Ma}	92.7	-20.0	84.9	87.2	103
G _{d, Ma}	84.0	-78.9	73.9	108.1	136
C _{d, Ma}	87.1	-44.4	-13.1	46.3	196
B _{d, Ma}	35.4	64.9	-95.0	115.1	304
M _{d, Ma}	59.0	89.3	-55.6	105.2	328
N _{d, Ma}	18.0	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

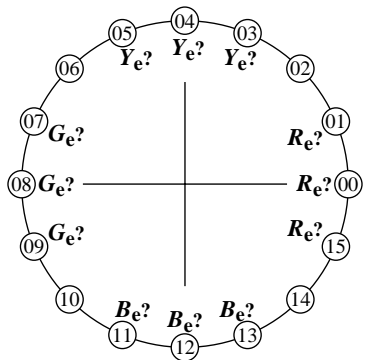
input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbc$ olor

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output

TUB material: code=rha4ta

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01031

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY5_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY5_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY5_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY5_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

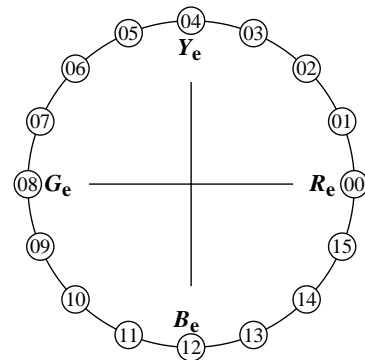
.....
.....
.....

part 3,

AE690-7dd: 01031

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01031

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY5_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY5_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY5_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY5_3.PS

underline: Yes/No

picture A7dd

underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01031

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: *rgb/cmy0/000n/w set...*
output: *->rgb_{dd} setrgbcolor*

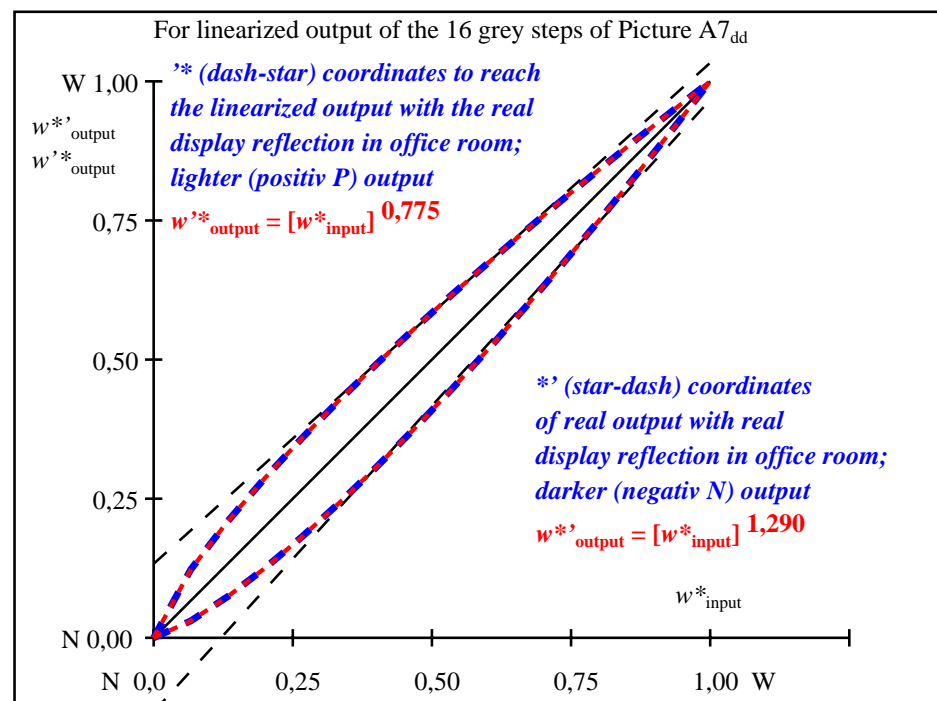
see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 12/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB [*] _{ref}	L [*] _{out}	LAB [*] _{out}	LAB [*] _{out-ref}	ΔE [*]	Start output S1
1	18,00 0,00 0,00	0,00	18,00 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	23,16 0,00 0,00	0,17	31,34 0,00 0,00	8,17 0,00 0,00	8,17	ISO/IEC 15775 Annex G
3	28,32 0,00 0,00	0,27	38,92 0,00 0,00	10,59 0,00 0,00	10,59	and DIN 33866-1 Annex G
4	33,48 0,00 0,00	0,35	45,22 0,00 0,00	11,73 0,00 0,00	11,73	
5	38,64 0,00 0,00	0,42	50,81 0,00 0,00	12,16 0,00 0,00	12,16	
6	43,80 0,00 0,00	0,48	55,93 0,00 0,00	12,12 0,00 0,00	12,12	
7	48,96 0,00 0,00	0,55	60,70 0,00 0,00	11,73 0,00 0,00	11,73	
8	54,12 0,00 0,00	0,60	65,19 0,00 0,00	11,06 0,00 0,00	11,06	
9	59,28 0,00 0,00	0,66	69,46 0,00 0,00	10,17 0,00 0,00	10,17	
10	64,44 0,00 0,00	0,71	73,55 0,00 0,00	9,11 0,00 0,00	9,11	
11	69,60 0,00 0,00	0,76	77,49 0,00 0,00	7,88 0,00 0,00	7,88	
12	74,76 0,00 0,00	0,81	81,29 0,00 0,00	6,52 0,00 0,00	6,52	
13	79,92 0,00 0,00	0,86	84,96 0,00 0,00	5,03 0,00 0,00	5,03	
14	85,08 0,00 0,00	0,91	88,54 0,00 0,00	3,45 0,00 0,00	3,45	Mean lightness difference
15	90,24 0,00 0,00	0,95	92,01 0,00 0,00	1,76 0,00 0,00	1,76	(16 steps)
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔE [*] _{CIELAB} = 7,5
17	18,00 0,00 0,00	0,00	18,00 0,00 0,00	0,00 0,00 0,00	0,01	
18	37,35 0,00 0,00	0,40	49,47 0,00 0,00	12,11 0,00 0,00	12,11	Mean lightness difference
19	56,70 0,00 0,00	0,63	67,35 0,00 0,00	10,64 0,00 0,00	10,64	(5 steps)
20	76,05 0,00 0,00	0,82	82,22 0,00 0,00	6,16 0,00 0,00	6,16	ΔL [*] _{CIELAB} = 5,7
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	Mean colour reproduction index: R [*] _{ab,m} = 67,0

part 1,

AE690-3dd: 01032



part 2,

AE691-3dd: 01032

L [*] /Y _{intended} (absolute)	18,0/2,5	23,1/3,8	28,3/5,5	33,4/7,7	38,6/10,4	43,8/13,7	48,9/17,5	54,1/22,0	59,2/27,3	64,4/33,3	69,6/40,1	74,7/47,9	79,9/56,5	85,0/66,1	90,2/76,8	95,4/88,5
0 0 0 n [*] setcmyk gp=0,775 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
w [*] =l [*] CIELAB, r (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w [*] _{intended}	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w [*] _{output}	0,000	0,123	0,209	0,287	0,359	0,426	0,491	0,554	0,614	0,673	0,730	0,786	0,841	0,895	0,947	1,000

part 3, picture A7_{dd}: 16 visual equidistant L^{*}-grey steps; PS operator: 0 0 0 n^{*} setcmykcolor

AE690-7dd: 01032

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast Y_W:Y_N=88,9:2,5; Y_N-range 1,87 to <3,75

input: rgb/cmy0/000n/w set...
output: ->rgb_{dd} setrgbcolor

Input and Output: Television Luminous System TLS27a

Data for any device (d) or
elementary (e) colour:

HIC^*_d

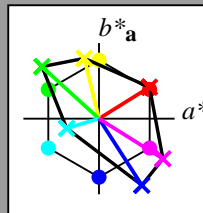
hue text for the colours

of this page:

$H^*_d R00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data

H^*_d	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 97$

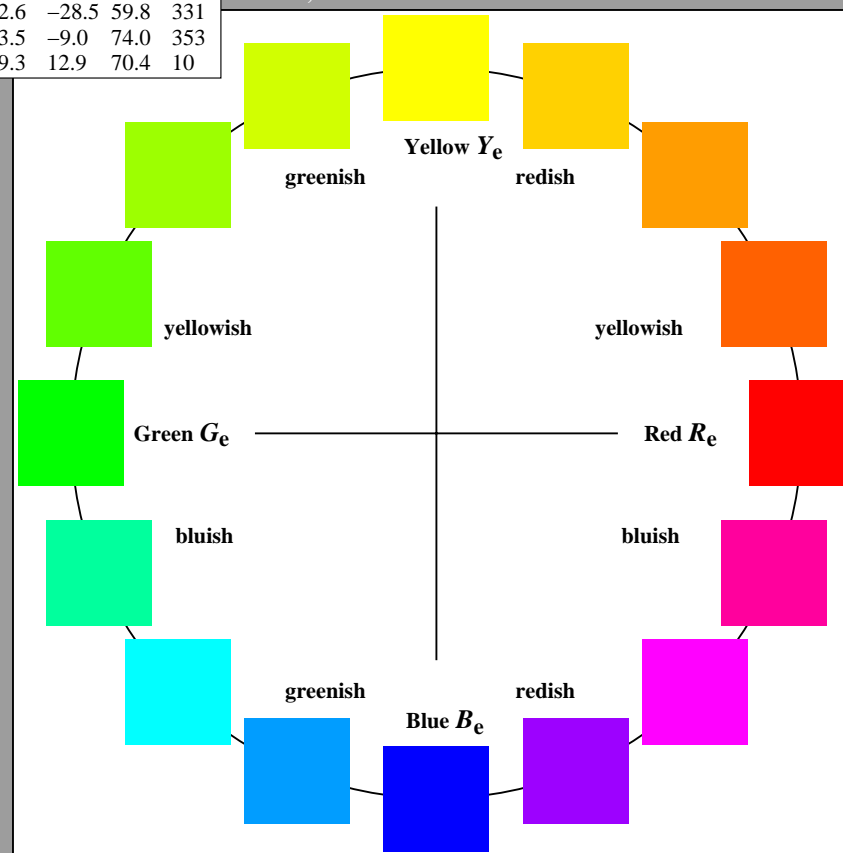
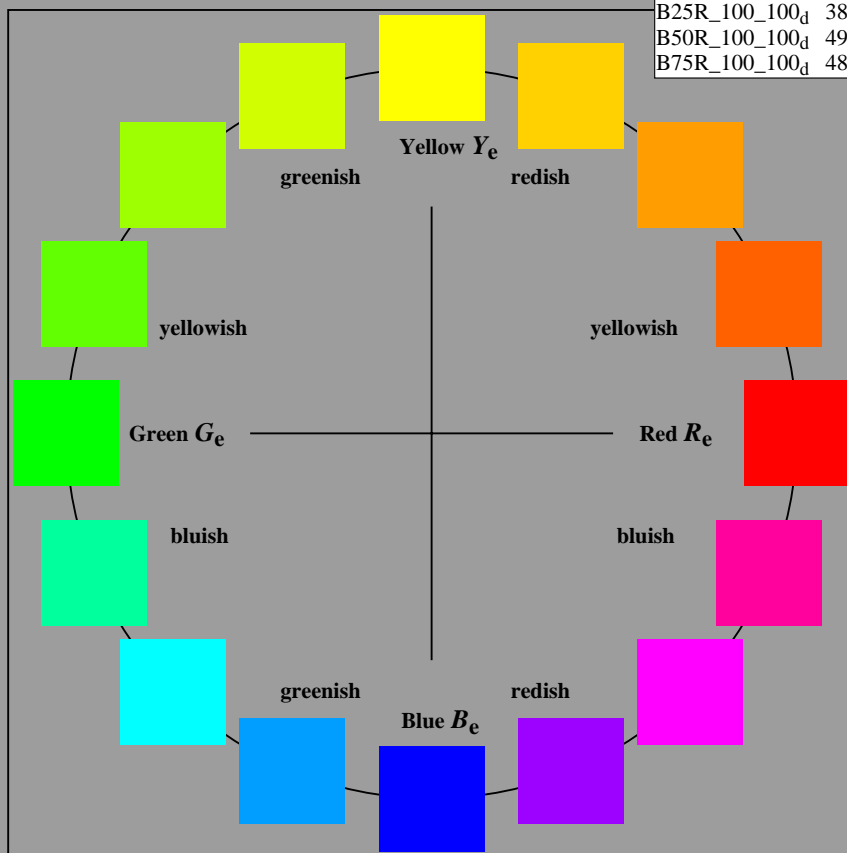
%Regularity

$g^*H_{rel} = 23$

$g^*C_{rel} = 42$

TLS27a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R _{d, Ma}	54.8	66.8	41.6	78.7	31
Y _{d, Ma}	92.8	-19.3	79.8	82.1	103
G _{d, Ma}	84.3	-75.3	68.7	102.0	137
C _{d, Ma}	87.4	-42.7	-12.7	44.5	196
B _{d, Ma}	39.7	56.6	-88.0	104.6	302
M _{d, Ma}	60.6	84.6	-53.0	99.8	327
N _{d, Ma}	26.8	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



1-100000-L0 cmyn6*

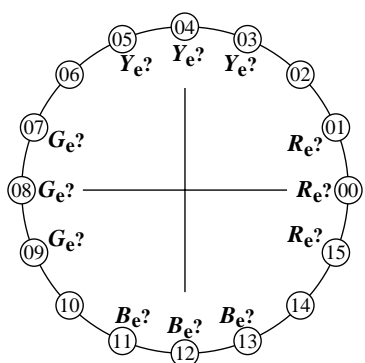
AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01041

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY4_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY4_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY4_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY4_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

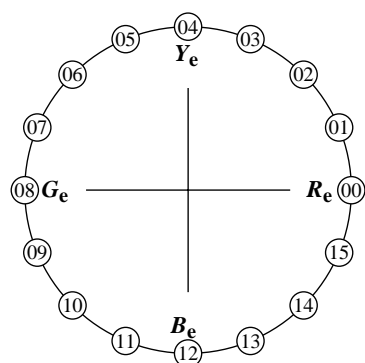
.....
.....
.....

part 3,

AE690-7dd: 01041

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01041

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY4_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY4_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY4_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY4_3.PS

underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01041

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 15/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

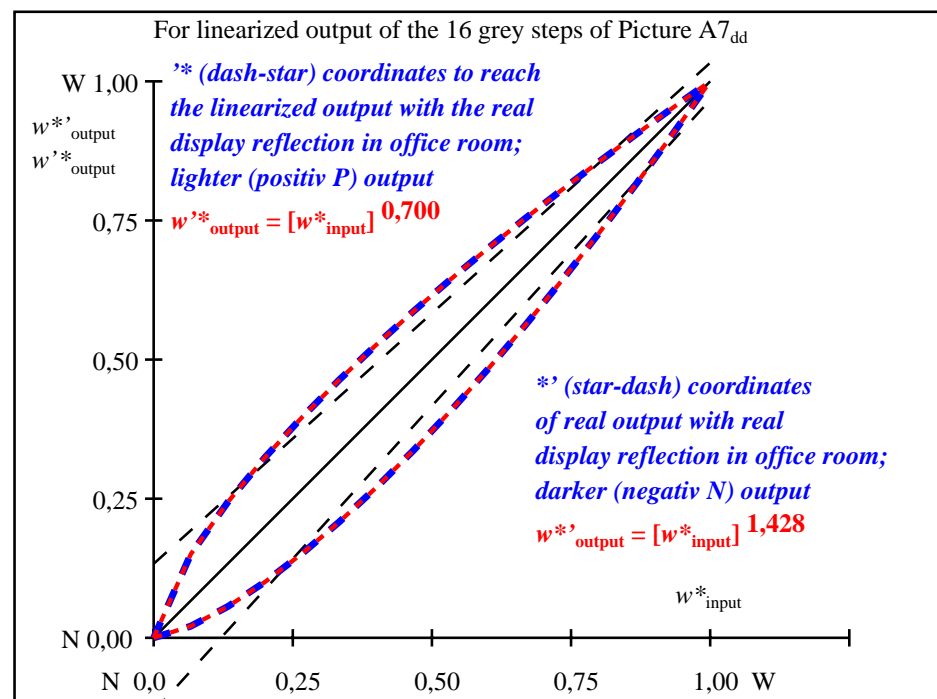
TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB [*] _{ref}	L [*] _{out}	LAB [*] _{out}	LAB [*] _{out-ref}	ΔE [*]	Start output S1
1	26,84 0,00 0,00	0,00	26,84 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	31,41 0,00 0,00	0,20	41,04 0,00 0,00	9,62 0,00 0,00	9,62	ISO/IEC 15775 Annex G
3	35,98 0,00 0,00	0,30	48,09 0,00 0,00	12,10 0,00 0,00	12,10	and DIN 33866-1 Annex G
4	40,56 0,00 0,00	0,39	53,74 0,00 0,00	13,18 0,00 0,00	13,18	
5	45,13 0,00 0,00	0,46	58,64 0,00 0,00	13,51 0,00 0,00	13,51	
6	49,70 0,00 0,00	0,52	63,04 0,00 0,00	13,34 0,00 0,00	13,34	
7	54,27 0,00 0,00	0,58	67,09 0,00 0,00	12,82 0,00 0,00	12,82	
8	58,84 0,00 0,00	0,64	70,86 0,00 0,00	12,02 0,00 0,00	12,02	
9	63,41 0,00 0,00	0,69	74,42 0,00 0,00	11,00 0,00 0,00	11,00	
10	67,98 0,00 0,00	0,74	77,79 0,00 0,00	9,80 0,00 0,00	9,80	
11	72,55 0,00 0,00	0,78	81,01 0,00 0,00	8,45 0,00 0,00	8,45	
12	77,12 0,00 0,00	0,83	84,09 0,00 0,00	6,97 0,00 0,00	6,97	
13	81,69 0,00 0,00	0,87	87,06 0,00 0,00	5,37 0,00 0,00	5,37	
14	86,26 0,00 0,00	0,92	89,93 0,00 0,00	3,66 0,00 0,00	3,66	Mean lightness difference
15	90,83 0,00 0,00	0,96	92,71 0,00 0,00	1,87 0,00 0,00	1,87	(16 steps)
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔE [*] _{CIELAB} = 8,3
17	26,84 0,00 0,00	0,00	26,84 0,00 0,00	0,00 0,00 0,00	0,01	
18	43,98 0,00 0,00	0,44	57,47 0,00 0,00	13,48 0,00 0,00	13,48	
19	61,12 0,00 0,00	0,66	72,66 0,00 0,00	11,54 0,00 0,00	11,54	Mean lightness difference
20	78,26 0,00 0,00	0,84	84,85 0,00 0,00	6,58 0,00 0,00	6,58	(5 steps)
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	ΔL [*] _{CIELAB} = 6,3

Mean colour reproduction index: $R^*_{ab,m} = 63,7$

part 1,

AE690-3dd: 01042



part 2,

AE691-3dd: 01042

$L^*/Y_{intended}$ (absolute)	26,8/5,0	31,4/6,8	35,9/9,0	40,5/11,5	45,1/14,6	49,7/18,1	54,2/22,2	58,8/26,8	63,4/32,0	67,9/37,9	72,5/44,4	77,1/51,7	81,6/59,7	86,2/68,5	90,8/78,1	95,4/88,5
0 0 0 n*																
setcmyk																
gp=0,700																
No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^*=l^*_{CIELAB,r}$ (relative)																
$w^*_{intended}$	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{output}	0,000	0,150	0,243	0,324	0,396	0,463	0,526	0,586	0,643	0,699	0,753	0,804	0,855	0,904	0,952	1,000

part 3, picture A7_{dd}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01042

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:5$; Y_N -range 3,75 to <7,5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ setrgbcolor

Input and Output: Television Luminous System TLS38a

Data for any device (d) or
elementary (e) colour:

HIC^*_d

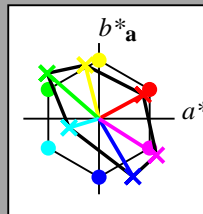
hue text for the colours

of this page:

$H^*_d R00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data

H^*_d	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut

$u^*_{rel} = 71$

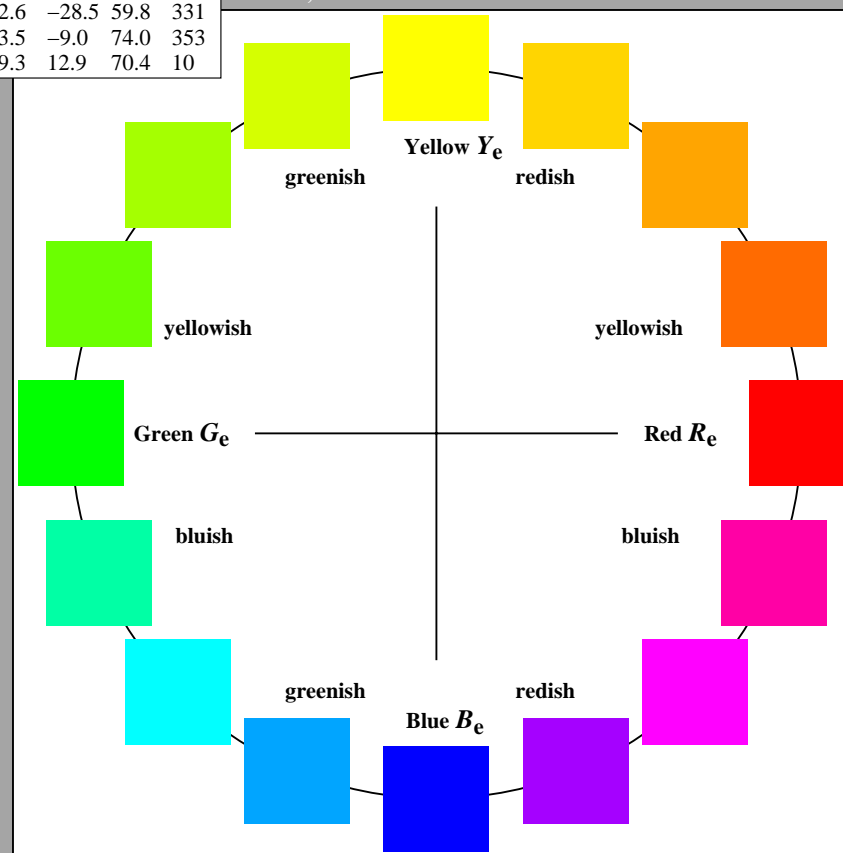
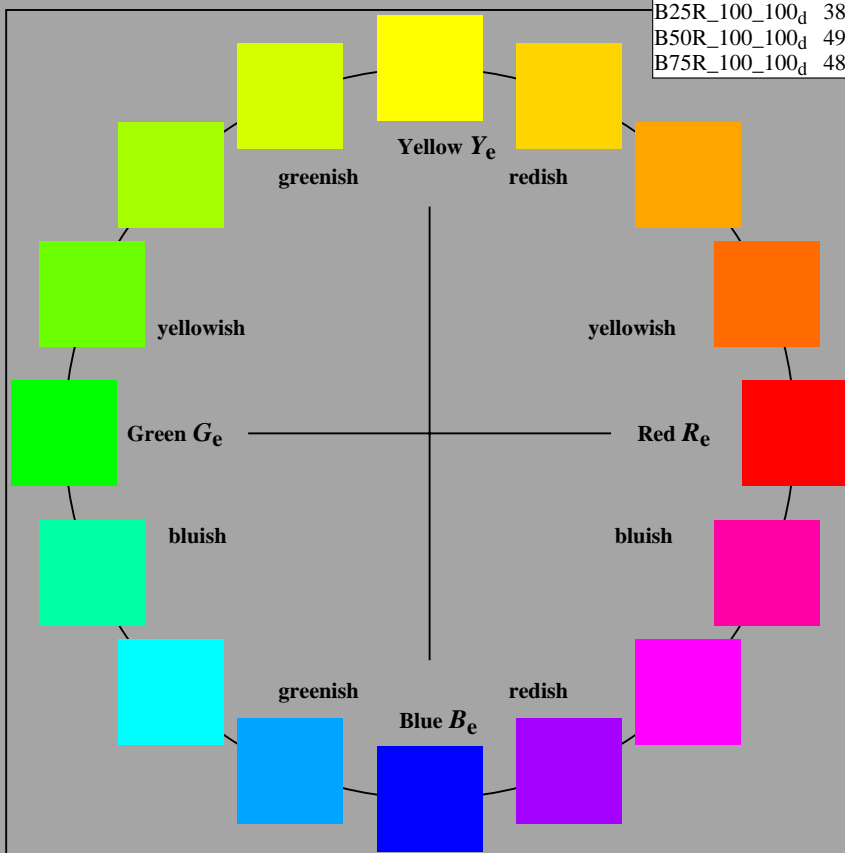
%Regularity

$g^*H_{rel} = 26$

$g^*C_{rel} = 45$

TLS38a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R _{d, Ma}	58.7	58.4	31.7	66.5	28
Y _{d, Ma}	92.9	-18.1	70.8	73.0	104
G _{d, Ma}	85.1	-68.5	60.0	91.1	138
C _{d, Ma}	87.9	-39.4	-11.8	41.1	196
B _{d, Ma}	46.6	44.9	-76.5	88.7	300
M _{d, Ma}	63.7	75.9	-48.2	89.9	327
N _{d, Ma}	37.9	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



1-100000-L0 cmyn6*

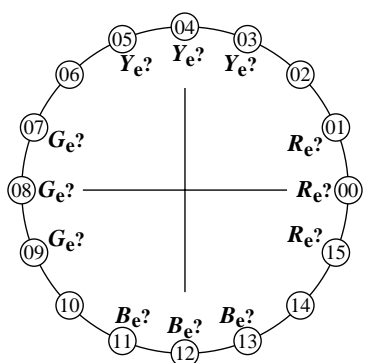
AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01051

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY3_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY3_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY3_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY3_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

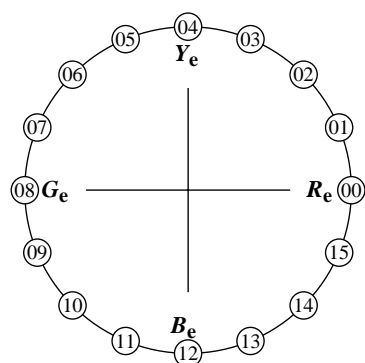
.....
.....
.....

part 3,

AE690-7dd: 01051

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01051

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:

underline: Yes/No

either according to DIN 6160:1996 with Anomaloskop of Nagel

underline: Yes/unknown

or with test charts using colour points according to Ishihara

underline: Yes/unknown

or tested with, please specify:

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY3_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY3_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY3_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY3_3.PS

underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01051

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 18/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	37,98 0,00 0,00	0,00	37,98 0,00 0,00	0,00 0,00 0,00	0,01
2	41,81 0,00 0,00	0,24	51,79 0,00 0,00	9,97 0,00 0,00	9,97
3	45,64 0,00 0,00	0,34	57,87 0,00 0,00	12,22 0,00 0,00	12,22
4	49,47 0,00 0,00	0,42	62,60 0,00 0,00	13,13 0,00 0,00	13,13
5	53,29 0,00 0,00	0,49	66,62 0,00 0,00	13,32 0,00 0,00	13,32
6	57,12 0,00 0,00	0,56	70,19 0,00 0,00	13,06 0,00 0,00	13,06
7	60,95 0,00 0,00	0,61	73,43 0,00 0,00	12,48 0,00 0,00	12,48
8	64,78 0,00 0,00	0,66	76,43 0,00 0,00	11,65 0,00 0,00	11,65
9	68,61 0,00 0,00	0,71	79,23 0,00 0,00	10,62 0,00 0,00	10,62
10	72,44 0,00 0,00	0,76	81,87 0,00 0,00	9,43 0,00 0,00	9,43
11	76,26 0,00 0,00	0,80	84,37 0,00 0,00	8,10 0,00 0,00	8,10
12	80,09 0,00 0,00	0,84	86,76 0,00 0,00	6,66 0,00 0,00	6,66
13	83,92 0,00 0,00	0,88	89,04 0,00 0,00	5,12 0,00 0,00	5,12
14	87,75 0,00 0,00	0,92	91,24 0,00 0,00	3,49 0,00 0,00	3,49
15	91,58 0,00 0,00	0,96	93,36 0,00 0,00	1,78 0,00 0,00	1,78
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	37,98 0,00 0,00	0,00	37,98 0,00 0,00	0,00 0,00 0,00	0,01
18	52,34 0,00 0,00	0,48	65,66 0,00 0,00	13,32 0,00 0,00	13,32
19	66,69 0,00 0,00	0,69	77,85 0,00 0,00	11,15 0,00 0,00	11,15
20	81,05 0,00 0,00	0,85	87,34 0,00 0,00	6,28 0,00 0,00	6,28
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G

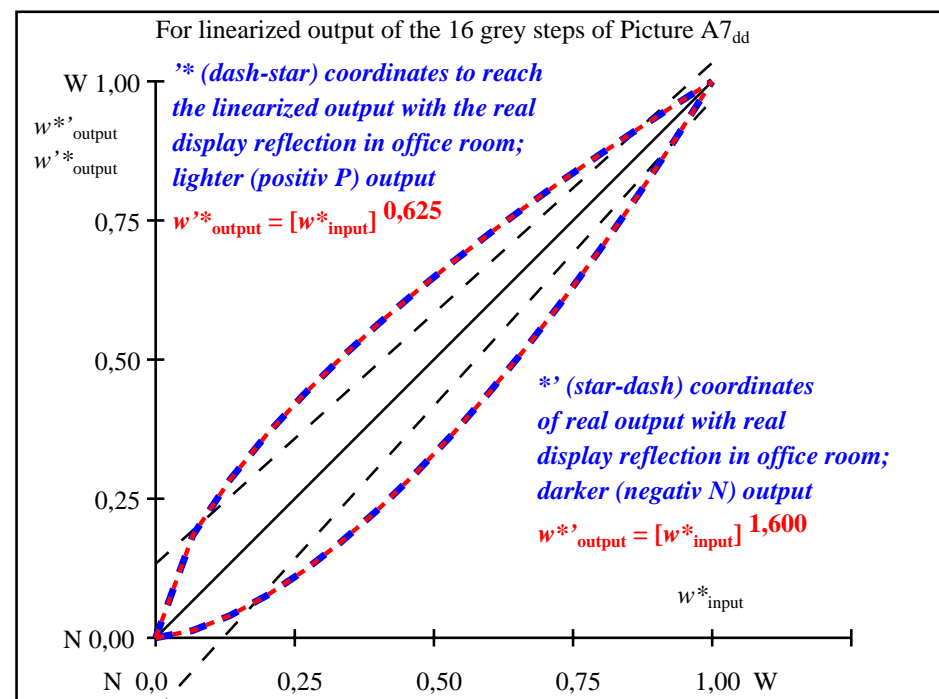
Mean lightness difference (16 steps)
 $\Delta E^*_{\text{CIELAB}} = 8,1$

Mean lightness difference (5 steps)
 $\Delta L^*_{\text{CIELAB}} = 6,1$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 64,5$

part 1,

AE690-3dd: 01052



part 2,

AE691-3dd: 01052

L^*/Y_{intended} (absolute)	37,9/10,0	41,8/12,3	45,6/15,0	49,4/17,9	53,2/21,3	57,1/25,0	60,9/29,1	64,7/33,7	68,6/38,8	72,4/44,3	76,2/50,3	80,0/56,8	83,9/63,9	87,7/71,5	91,5/79,7	95,4/88,5
0 0 0 n* setcmyk gp=0,625 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*_{\text{CIELAB}, r}$ (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{intended} w^*_{output}	0,000 0,000	0,067 0,184	0,133 0,283	0,200 0,365	0,267 0,438	0,333 0,502	0,400 0,564	0,467 0,621	0,533 0,674	0,600 0,726	0,667 0,776	0,733 0,823	0,800 0,869	0,867 0,914	0,933 0,957	1,000 1,000

part 3, picture A7_{dd}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01052

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:10$; Y_N -range 7,5 to <15

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ setrgbcolor

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

Input and Output: Television Luminous System TLS52a

Data for any device (d) or
elementary (e) colour:

HIC^*_d

hue text for the colours

of this page:

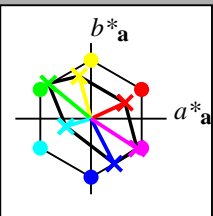
$H^*_dR00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data

H^*_d	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10

TLS52a; adapted (a) CIELAB data

name	$L^*=L^*_a a^*_a$	b^*_a	$C^*_{ab,a} h^*_{ab,a}$		
R _{d, Ma}	65.5	45.0	20.9	49.7	24
Y _{d, Ma}	93.3	-15.6	56.2	58.3	105
G _{d, Ma}	86.5	-56.3	46.5	73.0	140
C _{d, Ma}	88.9	-33.1	-10.2	34.7	197
B _{d, Ma}	57.1	30.6	-59.4	66.8	297
M _{d, Ma}	69.2	60.9	-39.5	72.6	327
N _{d, Ma}	52.0	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



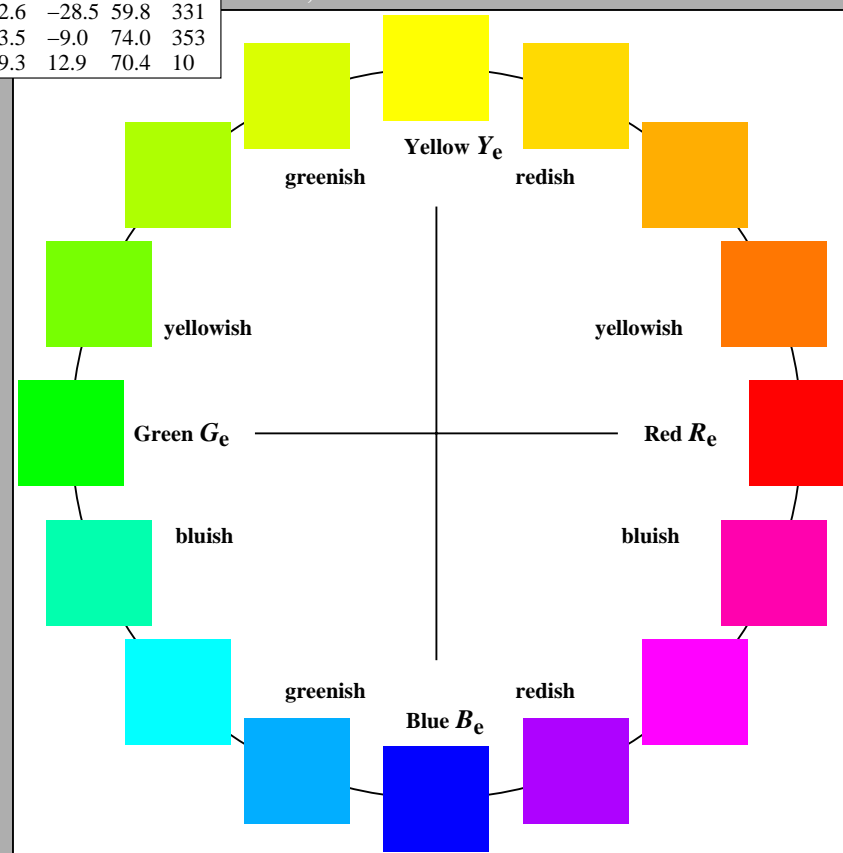
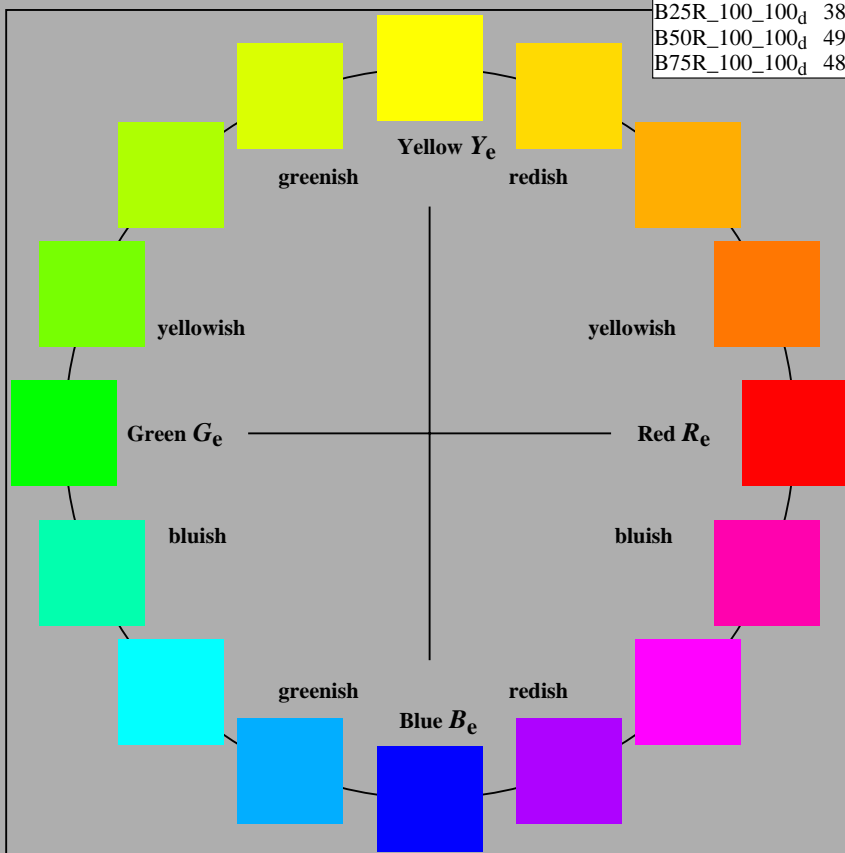
%Gamut

$u^*_{rel} = 42$

%Regularity

$g^*H_{rel} = 29$

$g^*C_{rel} = 47$



1-100000-L0 cmyn6*

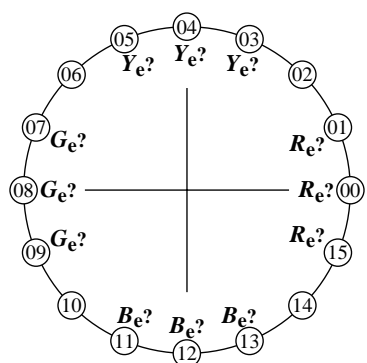
AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e
should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e
should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .
No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)
Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)
Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)
Elementary Blue B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01061

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY2_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY2_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY2_1.PDF

either PDF-file transfer "download, copy" to PDF device.....
or with computer system interpretation by "Display-PDF":.....
or with software e. g. Adobe-Reader/-Acrobat and version:.....
or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY2_1.PS

either PS-file transfer "download, copy" to PS device.....
or with computer system interpretation by "Display-PS":.....
or with software e. g. Ghostscript and version:.....
or with software e. g. Mac-Yap and version:.....

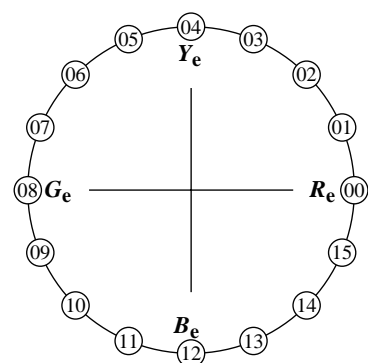
Special remarks: e. g. output of Landscape (L)

part 3,

AE690-7dd: 01061

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:
Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .
Input data 0 1 0 may produce: Green G_e .
Input data 0 0 1 may produce: Blue B_e .
Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e and Green G_e ,
Green G_e and Blue B_e , Blue B_e and Red R_e .

This test uses a hue circle with 16 hues.
All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.
2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.
The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.
The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.
List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01061

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:
either according to DIN 6160:1996 with Anomaloskop of Nagel
or with test charts using colour points according to Ishihara
or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY2_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY2_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY2_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY2_3.PS

or underline: Yes/No

picture A7dd

or underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF

Exchange of CIELAB data in file http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01061

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbc$ olor

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 21/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*	Start output S1
1	52,01 0,00 0,00	0,00	52,01 0,00 0,00	0,00 0,00 0,00	0,01	Specification according to
2	54,91 0,00 0,00	0,27	63,82 0,00 0,00	8,90 0,00 0,00	8,90	ISO/IEC 15775 Annex G
3	57,80 0,00 0,00	0,37	68,48 0,00 0,00	10,68 0,00 0,00	10,68	and DIN 33866-1 Annex G
4	60,69 0,00 0,00	0,46	72,03 0,00 0,00	11,33 0,00 0,00	11,33	
5	63,58 0,00 0,00	0,52	75,00 0,00 0,00	11,41 0,00 0,00	11,41	
6	66,48 0,00 0,00	0,58	77,60 0,00 0,00	11,12 0,00 0,00	11,12	
7	69,37 0,00 0,00	0,64	79,94 0,00 0,00	10,57 0,00 0,00	10,57	
8	72,26 0,00 0,00	0,69	82,09 0,00 0,00	9,83 0,00 0,00	9,83	
9	75,16 0,00 0,00	0,73	84,09 0,00 0,00	8,93 0,00 0,00	8,93	
10	78,05 0,00 0,00	0,78	85,96 0,00 0,00	7,90 0,00 0,00	7,90	
11	80,94 0,00 0,00	0,82	87,72 0,00 0,00	6,77 0,00 0,00	6,77	
12	83,83 0,00 0,00	0,86	89,39 0,00 0,00	5,56 0,00 0,00	5,56	
13	86,73 0,00 0,00	0,89	90,99 0,00 0,00	4,26 0,00 0,00	4,26	
14	89,62 0,00 0,00	0,93	92,52 0,00 0,00	2,90 0,00 0,00	2,90	
15	92,51 0,00 0,00	0,96	93,99 0,00 0,00	1,47 0,00 0,00	1,47	
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	
17	52,01 0,00 0,00	0,00	52,01 0,00 0,00	0,00 0,00 0,00	0,01	
18	62,86 0,00 0,00	0,51	74,30 0,00 0,00	11,43 0,00 0,00	11,43	
19	73,71 0,00 0,00	0,71	83,11 0,00 0,00	9,39 0,00 0,00	9,39	
20	84,56 0,00 0,00	0,87	89,80 0,00 0,00	5,24 0,00 0,00	5,24	
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01	

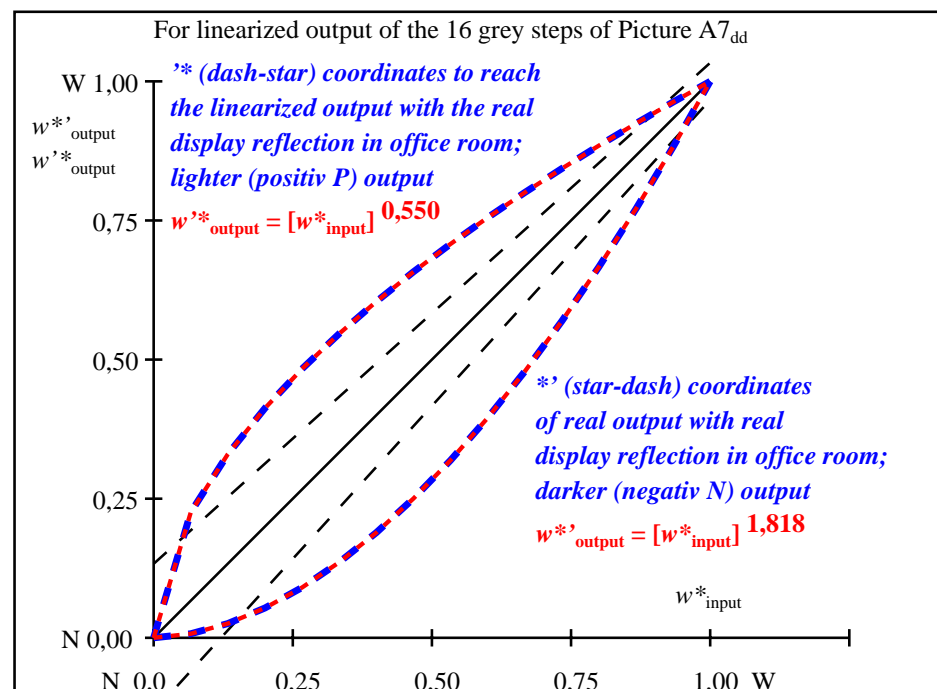
Mean lightness difference (16 steps)
 $\Delta E^*_{\text{CIELAB}} = 6,9$

Mean lightness difference (5 steps)
 $\Delta L^*_{\text{CIELAB}} = 5,2$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 69,8$

part 1,

AE690-3dd: 01062



part 2,

AE691-3dd: 01062

L^*/Y_{intended} (absolute)	52,0/20,1	54,9/22,8	57,8/25,7	60,6/28,9	63,5/32,2	66,4/35,9	69,3/39,8	72,2/44,0	75,1/48,5	78,0/53,3	80,9/58,3	83,8/63,7	86,7/69,4	89,6/75,4	92,5/81,8	95,4/88,5
0 0 0 n* setcmyk gp=0,550 No. and Hex code	00;F	01;E	02;D	03;C	04;B	05;A	06;9	07;8	08;7	09;6	10;5	11;4	12;3	13;2	14;1	15;0
$w^* = l^*_{\text{CIELAB}, r}$ (relative)	0,000	0,067	0,133	0,200	0,267	0,333	0,400	0,467	0,533	0,600	0,667	0,733	0,800	0,867	0,933	1,000
w^*_{intended} w^*_{output}	0,000 0,000	0,067 0,226	0,133 0,329	0,200 0,412	0,267 0,483	0,333 0,546	0,400 0,604	0,467 0,657	0,533 0,707	0,600 0,755	0,667 0,800	0,733 0,842	0,800 0,884	0,867 0,924	0,933 0,962	1,000 1,000

part 3, picture A7_{dd}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01062

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:20$; Y_N -range 15 to <30

input: $rgb/cmy0/000n/w$ set...
output: $\rightarrow rgb_{\text{dd}}$ setrgbcolor

Input and Output: Television Luminous System TLS70a

Data for any device (d) or
elementary (e) colour:

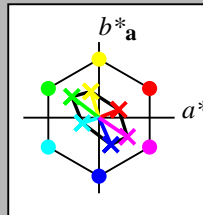
HIC^*_d

hue text for the colours

of this page:

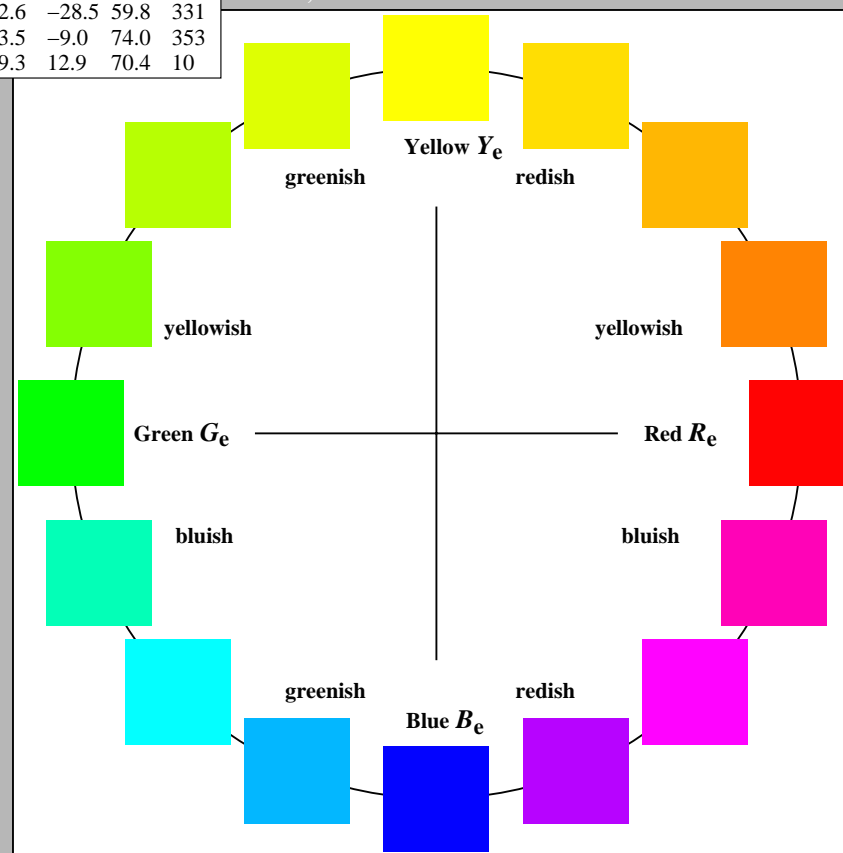
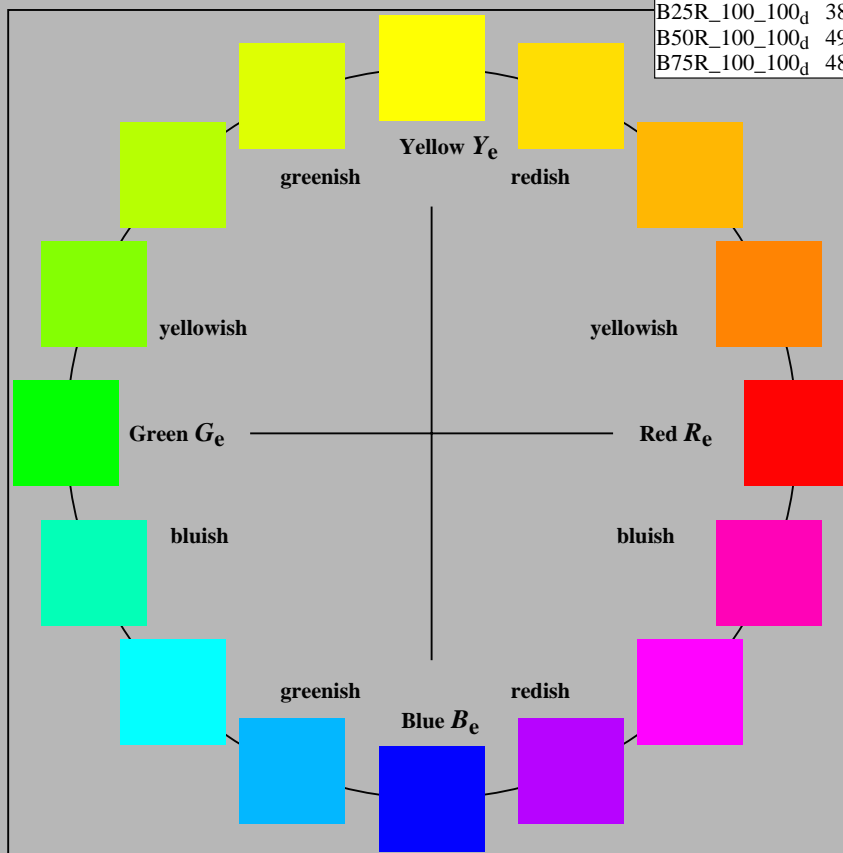
$H^*_dR00Y_d, R25Y_d, \dots, B75R_d$

ORS20a; adapted (a) CIELAB data					
H^*_d	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R00Y_100_100_d	48.4	66.1	40.2	77.3	31
R25Y_100_100_d	56.8	48.0	50.5	69.6	46
R50Y_100_100_d	68.6	25.0	63.9	68.6	68
R75Y_100_100_d	80.6	4.8	77.2	77.3	86
Y00G_100_100_d	90.2	-9.6	88.2	88.7	96
Y25G_100_100_d	83.2	-18.4	79.9	81.9	102
Y50G_100_100_d	73.3	-31.7	62.7	70.2	116
Y75G_100_100_d	62.0	-49.7	43.2	65.8	139
G00B_100_100_d	55.8	-65.2	33.8	73.4	152
G25B_100_100_d	59.3	-50.3	-9.0	51.0	190
G50B_100_100_d	63.0	-30.5	-42.0	51.9	234
G75B_100_100_d	45.7	-5.7	-44.6	44.9	262
B00R_100_100_d	27.5	25.9	-47.3	53.9	298
B25R_100_100_d	38.3	52.6	-28.5	59.8	331
B50R_100_100_d	49.5	73.5	-9.0	74.0	353
B75R_100_100_d	48.9	69.3	12.9	70.4	10



%Gamut
 $u^*_{rel} = 15$
%Regularity
 $g^*H_{rel} = 33$
 $g^*C_{rel} = 51$

TLS70a; adapted (a) CIELAB data					
name	$L^*=L^*_a$	a^*_a	b^*_a	$C^*_{ab,a}$	$h^*_{ab,a}$
R _{d, Ma}	76.4	26.2	10.5	28.3	21
Y _{d, Ma}	93.9	-10.7	34.6	36.2	107
G _{d, Ma}	89.3	-35.8	27.6	45.2	142
C _{d, Ma}	90.9	-21.9	-7.0	23.0	197
B _{d, Ma}	72.1	15.7	-35.6	38.9	293
M _{d, Ma}	78.5	37.5	-25.2	45.2	326
N _{d, Ma}	69.7	0.0	0.0	0.0	0
W _{d, Ma}	95.4	0.0	0.0	0.0	0
R _{d, CIE}	39.9	58.7	27.9	65.0	25
Y _{d, CIE}	81.2	-2.8	71.5	71.6	92
G _{d, CIE}	52.2	-42.4	13.6	44.5	162
B _{d, CIE}	30.5	1.4	-46.4	46.4	271



1-100000-L0 cmyn6*

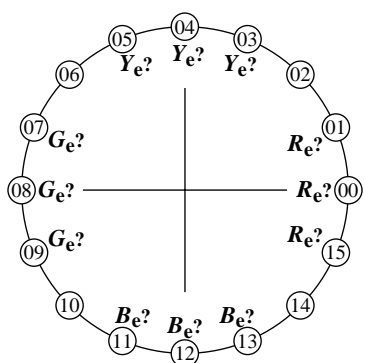
AE690-70

Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbc$ olor

Agreement with elementary hues (Yes/No decision)

Layout example: Agreement with elementary hues.



There are four elementary hues on each page:

Red R_e , Yellow Y_e , Green G_e , and Blue B_e

Input data 1 0 0 may produce: Red R_e .

Input data 0 1 0 may produce: Green G_e .

Input data 0 0 1 may produce: Blue B_e .

Input data 0 1 1 may produce: Yellow Y_e .

The elementary hues Red R_e and Green G_e should locate on the horizontal axis.

The elementary hues Yellow Y_e and Blue B_e should locate on the vertical axis.

This test uses a hue circle with 16 hues.

No. 00 and 08 should be Red R_e and Green G_e .

No. 04 and 12 should be Yellow Y_e and Blue B_e .

Are no. 00, 04, 08, and 12 the four elementary hues R_e , Y_e , G_e and B_e ? underline: Yes/No
Only in case of "No":

Elementary Red R_e is hue step no. (e. g. 00, 01, 15) (neither yellowish nor blueish)

Elementary Yellow Y_e is hue step no. (e. g. 04, 03, 05) (neither reddish nor greenish)

Elementary Green G_e is hue step no. (e. g. 08, 07, 09) (neither yellowish nor blueish)

Elementary Blau B_e is hue step no. (e. g. 12, 11, 13) (neither reddish nor greenish)

Result: Of the 4 elementary hues (e.g. three) are at the intended location.

part 1,

AE690-3dd: 01071

Documentation of file format, hardware and software for this test:

PDF file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY1_1.PDF

underline: Yes/No

PS file:

http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY1_1.PS

underline: Yes/No

Used computer operating system:

either one of Windows/Mac/Unix/other and version:.....

This evaluation is for the output: underline: monitor/data projector/printer

Device model, driver and version:.....

output with PDF/PS-file:

underline: PDF/PS file

For output with PDF file AE69F0PX_CY1_1.PDF

either PDF-file transfer "download, copy" to PDF device:.....

or with computer system interpretation by "Display-PDF":.....

or with software e. g. Adobe-Reader/-Acrobat and version:.....

or with software e. g. Ghostscript and version:.....

For output with PS file AE69F0PX_CY1_1.PS

either PS-file transfer "download, copy" to PS device:.....

or with computer system interpretation by "Display-PS":.....

or with software e. g. Ghostscript and version:.....

or with software e. g. Mac-Yap and version:.....

Special remarks: e. g. output of Landscape (L)

.....

.....

.....

.....

.....

.....

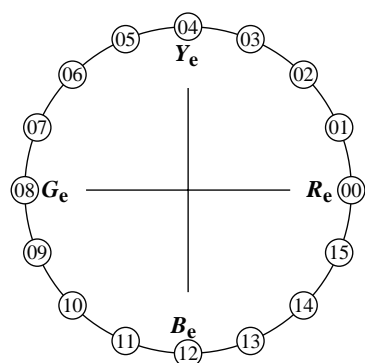
.....

.....

.....

Discriminability of colours with 16 hues (Yes/No decision)

Layout example: Discriminability of colours with 16 hues.



There are four elementary hues on each page:

Red R_e , Yellow Y_e , Green G_e , and Blue B_e .

Input data 1 0 0 may produce: Red R_e .

Input data 0 1 0 may produce: Green G_e .

Input data 0 0 1 may produce: Blue B_e .

Input data 0 1 1 may produce: Yellow Y_e .

Four hue steps are between:
Red R_e and Yellow Y_e , Yellow Y_e , and Green G_e .
Green G_e and Blue B_e , Blue B_e , and Red R_e .

This test uses a hue circle with 16 hues.

All 16 hues should be distinguishable.

For this test it is **not** necessary:

1. All 16 differences are visually equal.

2. Elementary hues locate at 00, 04, 08, and 12.

Are all 16 colours of the 16 hues distinguishable?

underline: Yes/No

Only in case of "No":

The colours of the two hue steps no. (e. g. 00 and 01)are not distinguishable.

The colours of the two hue steps no. (e. g. 11 and 12)are not distinguishable.

The colours of the two hue steps no. (e. g. 12 and 13)are not distinguishable.

List other pairs:

Result: Of the 16 hue differences are (e.g. 13) differences visible.

part 2,

AE691-3dd: 01071

Documentation of assessor colour-vision properties for visual assessment

The assessor has **normal** colour vision according to one test:

either according to DIN 6160:1996 with Anomaloskop of Nagel

or with test charts using colour points according to Ishihara

or tested with, please specify:

underline: Yes/No

underline: Yes/unknown

underline: Yes/unknown

underline: Yes/unknown

For visual evaluation of the display (Monitor, data projector) output

Office workplace illumination is daylight (clouded/north sky)

underline: Yes/No

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY1_3.PDF

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY1_3.PS

underline: Yes/No

picture A7dd contrast range: (>F:0) (F:0) (E:0) (D:0) (C:0) (A:0) (9:0) (7:0) (5:0) (3:0) (<3:0)

compare standard print output according to ISO/IEC 15775 with range F:0

underline: Yes/No

Remark: In daylighted offices the contrast range is in many cases:

on display between: >F:0 and E:0 (monitor), D:0 and 3:0 (data projector)

Only for optional colorimetric specification with PDF/PS file output

PDF file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY1_3.PDF

underline: Yes/No

picture A7dd

underline: Yes/No

PS file: http://farbe.li.tu-berlin.de/AE69/AE69F0PX_CY1_3.PS

underline: Yes/No

picture A7dd

underline: Yes/No

colour measurement and specification for:

CIE standard illuminant D65, 2 degree observer, CIE 45/0 geometry:

underline: Yes/No

If No, please give other parameters:

Colorimetric specification for 17 step colours of <http://farbe.li.tu-berlin.de/OE70/OE70L1NP.PDF>

Exchange of CIELAB data in file <http://farbe.li.tu-berlin.de/AE82/AE82L0NP.TXT> and transfer

of the PS file AE82L0NP.PS (= .TXT) to the PDF-file AE82L0NP.PDF

underline: Yes/No

If No, please describe other method:

part 4,

AE691-7dd: 01071

Form A: Test chart AE69 similar to test chart 1 of CIE R8-09
16 step elementary hue circle; Test chart according to DIN 33872-5

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ set $rgbcolor$

see similar files: <http://farbe.li.tu-berlin.de/AE69/AE69F0PX.PDF> / .PS; 3D-linearization, page 24/24
technical information: <http://farbe.li.tu-berlin.de/AE69/AE69LF0PX.PDF> / .PS in file (F)

TUB Registration: 20190301-AE69/AE69L0FA.TXT /.PS
application for measurement or viewing of display and print output
TUB material: code=th4ta

i	LAB* _{ref}	L* _{out}	LAB* _{out}	LAB* _{out-ref}	ΔE*
1	69,69 0,00 0,00	0,00	69,69 0,00 0,00	0,00 0,00 0,00	0,01
2	71,41 0,00 0,00	0,30	77,45 0,00 0,00	6,04 0,00 0,00	6,04
3	73,12 0,00 0,00	0,41	80,23 0,00 0,00	7,11 0,00 0,00	7,11
4	74,83 0,00 0,00	0,49	82,31 0,00 0,00	7,47 0,00 0,00	7,47
5	76,55 0,00 0,00	0,55	84,02 0,00 0,00	7,47 0,00 0,00	7,47
6	78,26 0,00 0,00	0,61	85,51 0,00 0,00	7,24 0,00 0,00	7,24
7	79,98 0,00 0,00	0,66	86,83 0,00 0,00	6,85 0,00 0,00	6,85
8	81,69 0,00 0,00	0,71	88,04 0,00 0,00	6,35 0,00 0,00	6,35
9	83,41 0,00 0,00	0,75	89,16 0,00 0,00	5,75 0,00 0,00	5,75
10	85,12 0,00 0,00	0,79	90,20 0,00 0,00	5,08 0,00 0,00	5,08
11	86,83 0,00 0,00	0,83	91,18 0,00 0,00	4,34 0,00 0,00	4,34
12	88,55 0,00 0,00	0,87	92,11 0,00 0,00	3,55 0,00 0,00	3,55
13	90,26 0,00 0,00	0,90	92,99 0,00 0,00	2,72 0,00 0,00	2,72
14	91,98 0,00 0,00	0,93	93,83 0,00 0,00	1,85 0,00 0,00	1,85
15	93,69 0,00 0,00	0,96	94,63 0,00 0,00	0,94 0,00 0,00	0,94
16	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01
17	69,69 0,00 0,00	0,00	69,69 0,00 0,00	0,00 0,00 0,00	0,01
18	76,12 0,00 0,00	0,54	83,62 0,00 0,00	7,49 0,00 0,00	7,49
19	82,55 0,00 0,00	0,73	88,61 0,00 0,00	6,06 0,00 0,00	6,06
20	88,98 0,00 0,00	0,88	92,33 0,00 0,00	3,35 0,00 0,00	3,35
21	95,41 0,00 0,00	1,00	95,41 0,00 0,00	0,00 0,00 0,00	0,01

Start output S1
Specification according to ISO/IEC 15775 Annex G and DIN 33866-1 Annex G

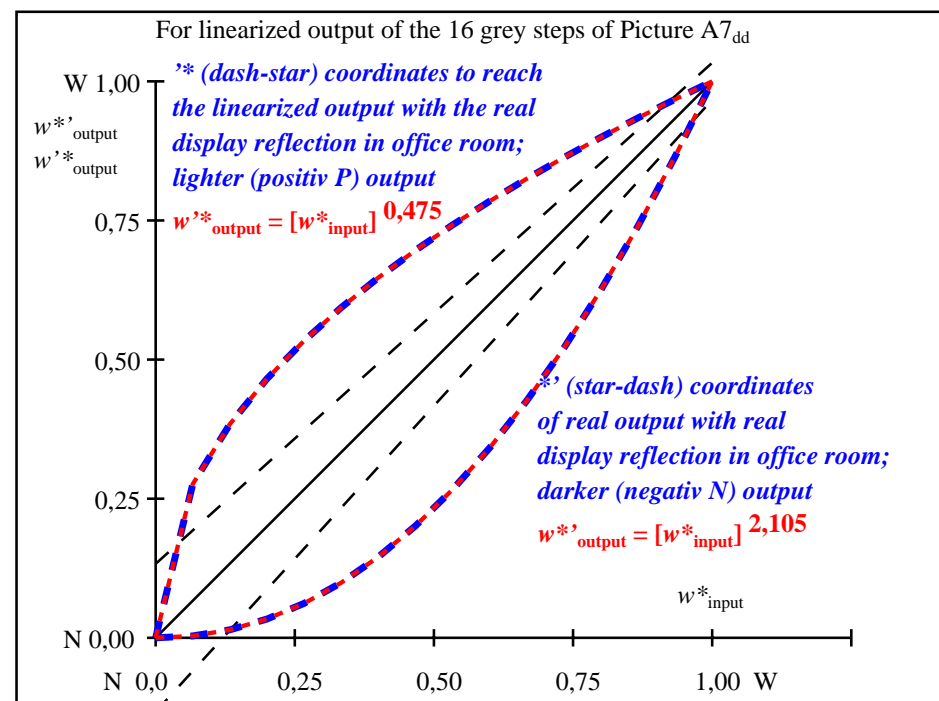
Mean lightness difference (16 steps)
 $\Delta E^*_{\text{CIELAB}} = 4,5$

Mean lightness difference (5 steps)
 $\Delta L^*_{\text{CIELAB}} = 3,3$

Mean colour reproduction index: $R^*_{\text{ab,m}} = 80,3$

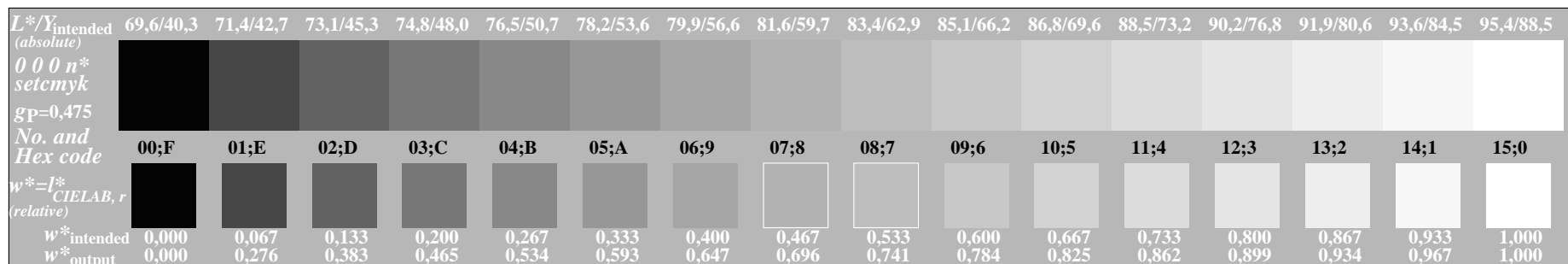
part 1,

AE690-3dd: 01072



part 2,

AE691-3dd: 01072



part 3, picture A7_{dd}: 16 visual equidistant L^* -grey steps; PS operator: 0 0 0 n* setcmykcolor

AE690-7dd: 01072

In-out: Test chart AE69 similar to test chart 1 of CIE R8-09
Viewing Y contrast $Y_W:Y_N=88,9:40$; Y_N -range 30 to <60

input: $rgb/cmy0/000n/w$ set...
output: $->rgb_{dd}$ setrgbcolor