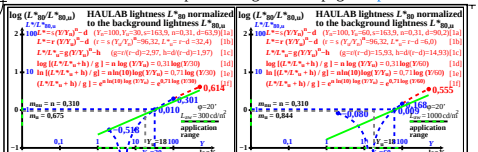
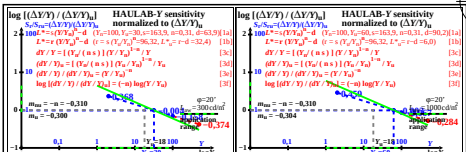
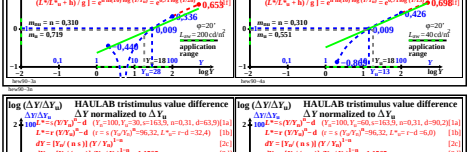
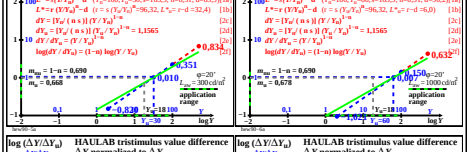
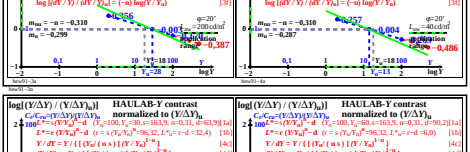
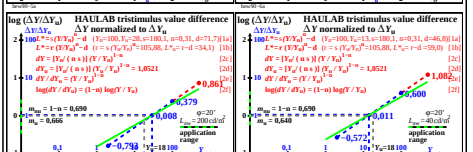

HAULAB lightness $L^*_{80,a}$ normalized to the background lightness $L^*_{80,a}$
HAULAB lightness L^*_{80} normalized to the background lightness $L^*_{80,a}$
HAULAB lightness L^*_{80} normalized to the background lightness $L^*_{80,a}$
$L^*a^*b^*_{80,a}$
$L^*a^*b^*_{80}$
$L^*a^*b^*_{80,a}$
$m_{00} = n - 0.310$
$m_0 = 0.675$
$m_{00} = n - 0.310$
$m_0 = 0.844$
$m_{00} = n - 0.310$
$m_0 = 0.719$
$m_{00} = n - 0.310$
$m_0 = 0.551$
0.614
0.301
0.010
0.516
0.555
0.080
0.009
0.636
0.009
0.440
0.426
0.009
0.653
0.008
0.010
0.009
φ=20°
L_{20}=300cd/m²
L_{20}=1000cd/m²
L_{20}=40cd/m²
application range
application range
application range
Y_{w}=30
Y_{w}=60
Y_{w}=13
Y_{w}=18
Y_{w}=18
Y_{w}=18
Y_{w}=28
Y_{w}=60
Y_{w}=13
lsrw90-1a
lsrw90-2a
lsrw90-3a
lsrw90-4a

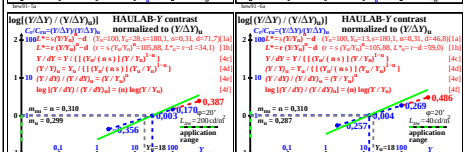

log [(ΔY/Y) / (ΔY/Y)ₐ] HAULAB-Y sensitivity normalized to (ΔY/Y)ₐ
$S_Y/S_{Y,a} = (Y/Y)_a^{1-d} \cdot (Y_a/Y)^{1-d}$ (Y=100, Y_a=30, c=163,9, n=0,31, d=63,9)[1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=96,32, L*_r=-2 d=-6,0) [1b]
$dY/Y = [(Y_a/(n\,s))\,/\,(Y/Y_n)^{1-d}]/Y_a$ [3a]
$(dY/Y)_a = [(Y_a/(n\,s))\,/\,(Y_a/Y_n)^{1-d}]/Y_a$ [3b]
$(dY/Y)\,/\,(dY/Y)_a = (Y/Y_n)^{1-d}$ [3c]
$\log[(dY/Y)\,/\,(dY/Y)_a] = (-n)\log(Y/Y_a)$ [3f]
$m_{00} = -n - 0.310$
$m_0 = -0.300$
$m_{00} = -n - 0.310$
$m_0 = -0.304$
0.574
0.004
0.284
0.004
φ=20°
L_{20}=300cd/m²
L_{20}=1000cd/m²
application range
application range
Y_{w}=30
Y_{w}=60
lsrw91-1a
lsrw91-2a
log [(ΔY/Y) / (ΔY/Y)ₐ] HAULAB-Y sensitivity normalized to (ΔY/Y)ₐ
$S_Y/S_{Y,a} = (Y/Y)_a^{1-d} \cdot (Y_a/Y)^{1-d}$ (Y=100, Y_a=105,88, L*_r=-59,0) [1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=105,88, L*_r=-59,0) [1b]
$dY/Y = [(Y_a/(n\,s))\,/\,(Y/Y_n)^{1-d}]/Y_a$ [3a]
$(dY/Y)_a = [(Y_a/(n\,s))\,/\,(Y_a/Y_n)^{1-d}]/Y_a$ [3b]
$(dY/Y)\,/\,(dY/Y)_a = (Y/Y_n)^{1-d}$ [3c]
$\log[(dY/Y)\,/\,(dY/Y)_a] = (-n)\log(Y/Y_a)$ [3f]
$m_{00} = -n - 0.310$
$m_0 = -0.299$
$m_{00} = -n - 0.310$
$m_0 = -0.287$
0.356
0.004
0.387
0.257
0.004
0.486
φ=20°
L_{20}=300cd/m²
L_{20}=1000cd/m²
application range
application range
Y_{w}=30
Y_{w}=60
lsrw91-3a
lsrw91-4a


HAULAB tristimulus value difference ΔY normalized to ΔYₐ
HAULAB tristimulus value difference ΔY normalized to ΔYₐ
HAULAB tristimulus value difference ΔY normalized to ΔYₐ
$\Delta Y/Y_a$
$\Delta Y/Y_a$
$\Delta Y/Y_a$
$L^*=z-(Y/Y_n)^{1-d}$ (Y=100, Y_a=30, c=163,9, n=0,31, d=63,9)[1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=96,32, L*_r=-2 d=-32,4) [1b]
$dY = [(Y_a/(n\,s))\,(Y/Y_n)^{1-d}]/Y_a = 1{,}1565$ [2d]
$dY_a = (Y_a/(n\,s))\,(Y_a/Y_n)^{1-d} = 1{,}1565$ [2e]
$\log(dY/dY_a) = (1-n)\log(Y/Y_a)$ [2f]
$m_{00} = 1-n = 0{,}690$
$m_0 = 0{,}668$
$m_{00} = 1-n = 0{,}690$
$m_0 = 0{,}678$
0.351
0.010
0.839
0.632
0.010
0.850
φ=20°
L_{20}=300cd/m²
L_{20}=1000cd/m²
application range
application range
Y_{w}=18
Y_{w}=60
lsrw90-5a
lsrw90-6a


HAULAB tristimulus value difference ΔY normalized to ΔYₐ
HAULAB tristimulus value difference ΔY normalized to ΔYₐ
$\Delta Y/Y_a$
$\Delta Y/Y_a$
$L^*=z-(Y/Y_n)^{1-d}$ (Y=100, Y_a=28,=180,1, n=0,31, d=71,7)[1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=105,88, L*_r=-d =34,1) [1b]
$dY = [(Y_a/(n\,s))\,(Y/Y_n)^{1-d}]/Y_a$ [2a]
$dY_a = [(Y_a/(n\,s))\,(Y_a/Y_n)^{1-d} = 1{,}0521$ [2b]
$\log(dY/dY_a) = (1-n)\log(Y/Y_a)$ [2f]
$m_{00} = 1-n = 0{,}690$
$m_0 = 0{,}666$
$m_{00} = 1-n = 0{,}690$
$m_0 = 0{,}640$
0.379
0.008
0.862
0.794
0.572
1.082
0.011
0.800
φ=20°
L_{20}=200cd/m²
L_{20}=40cd/m²
application range
application range
Y_{w}=28
Y_{w}=13
lsrw90-7a
lsrw90-8a


log [(Y/ΔY) / (Y/ΔY)ₐ] HAULAB-Y contrast normalized to (Y/ΔY)ₐ
$C_Y/C_{Y,a} = (Y/Y)_a^{1-d} \cdot (Y_a/Y)^{1-d}$ (Y=100, Y_a=30,=163,9, n=0,31, d=63,9)[1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=96,32, L*_r=-2 d=-32,4) [1b]
$dY/Y = [(Y_a/(n\,s))\,/\,(Y/Y_n)^{1-d}]/Y_a$ [4a]
$(Y/Y)_a = Y_a/[(Y_a/(n\,s))\,/\,(Y_a/Y_n)^{1-d}]$ [4b]
$(Y/dY)\,/\,(Y/dY)_a = (Y/Y_a)^{1-d}$ [4c]
$\log[(Y/dY)\,/\,(Y/dY)_a] = (n)\log(Y/Y_a)$ [4f]
$m_{00} = n - 0.310$
$m_0 = 0.300$
$m_{00} = n - 0.310$
$m_0 = 0.304$
0.574
0.004
0.158
0.284
0.004
0.459
φ=20°
L_{20}=300cd/m²
L_{20}=1000cd/m²
application range
application range
Y_{w}=30
Y_{w}=60
lsrw91-1a
lsrw91-2a
log [(Y/ΔY) / (Y/ΔY)ₐ] HAULAB-Y contrast normalized to (Y/ΔY)ₐ
$C_Y/C_{Y,a} = (Y/Y)_a^{1-d} \cdot (Y_a/Y)^{1-d}$ (Y=100, Y_a=105,88, L*_r=-59,0) [1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=105,88, L*_r=-59,0) [1b]
$dY/Y = [(Y_a/(n\,s))\,/\,(Y/Y_n)^{1-d}]/Y_a$ [4a]
$(Y/Y)_a = Y_a/[(Y_a/(n\,s))\,/\,(Y_a/Y_n)^{1-d}]$ [4b]
$(Y/dY)\,/\,(Y/dY)_a = (Y/Y_a)^{1-d}$ [4c]
$\log[(Y/dY)\,/\,(Y/dY)_a] = (n)\log(Y/Y_a)$ [4f]
$m_{00} = n - 0.310$
$m_0 = 0.299$
$m_{00} = n - 0.310$
$m_0 = 0.287$
0.356
0.004
0.387
0.257
0.004
0.486
φ=20°
L_{20}=300cd/m²
L_{20}=1000cd/m²
application range
application range
Y_{w}=30
Y_{w}=60
lsrw91-3a
lsrw91-4a


HAULAB tristimulus value difference ΔY normalized to ΔYₐ
HAULAB tristimulus value difference ΔY normalized to ΔYₐ
$\Delta Y/Y_a$
$\Delta Y/Y_a$
$L^*=z-(Y/Y_n)^{1-d}$ (Y=100, Y_a=28,=180,1, n=0,31, d=71,7)[1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=105,88, L*_r=-d =34,1) [1b]
$dY = [(Y_a/(n\,s))\,(Y/Y_n)^{1-d}]/Y_a$ [2a]
$dY_a = [(Y_a/(n\,s))\,(Y_a/Y_n)^{1-d} = 1{,}0521$ [2b]
$\log(dY/dY_a) = (1-n)\log(Y/Y_a)$ [2f]
$m_{00} = 1-n = 0{,}690$
$m_0 = 0{,}666$
$m_{00} = 1-n = 0{,}690$
$m_0 = 0{,}640$
0.379
0.008
0.862
0.794
0.572
1.082
0.011
0.800
φ=20°
L_{20}=200cd/m²
L_{20}=40cd/m²
application range
application range
Y_{w}=28
Y_{w}=13
lsrw90-7a
lsrw90-8a


log [(Y/ΔY) / (Y/ΔY)ₐ] HAULAB-Y contrast normalized to (Y/ΔY)ₐ
$C_Y/C_{Y,a} = (Y/Y)_a^{1-d} \cdot (Y_a/Y)^{1-d}$ (Y=100, Y_a=28,=180,1, n=0,31, d=71,7)[1a]
$L^*=z-(Y/Y_n)^{1-d}$ (z = $(Y_a/Y_n)^{1-d}$=105,88, L*_r=-d =34,1) [1b]
$dY/Y = [(Y_a/(n\,s))\,/\,(Y/Y_n)^{1-d}]/Y_a$ [4a]
$(Y/Y)_a = Y_a/[(Y_a/(n\,s))\,/\,(Y_a/Y_n)^{1-d}]$ [4b]
$(Y/dY)\,/\,(Y/dY)_a = (Y/Y_a)^{1-d}$ [4c]
$\log[(Y/dY)\,/\,(Y/dY)_a] = (n)\log(Y/Y_a)$ [4f]
$m_{00} = n - 0.310$
$m_0 = 0.299$
$m_{00} = n - 0.310$
$m_0 = 0.287$
0.356
0.003
0.387
0.257
0.004
0.486
φ=20°
L_{20}=200cd/m²
L_{20}=40cd/m²
application range
application range
Y_{w}=28
Y_{w}=13
lsrw91-3a
lsrw91-4a