see similar files: http://farbe.li.tu-berlin.de/BEU6/BEU6.HTM
technical information: http://farbe.li.tu-berlin.de or http://farbe.li.tu-berlin.de

TUB registration: 20210501-BEU6/BEU6L0N1.TXT /.PS
application for measurement of display output

TUB material: code=ha4a

CIELAB lightness L^*, CIE tristimulus value discrimination $dY$and CIE contrast sensitivity (Y/dY)

CIELAB lightness for all colours $L^*{}_n$=100:

$L^* = 116\,(Y/Y_n)^{1/3} - 16 \qquad (Y_n{=}100,\ Y > 1)$

For the grey discrimination we get:

$dL^*/dY = (116/Y_n)\,(1/3)\,(Y/Y_n)^{-2/3}$

and for dL^*=1 (about 3 thresholds) we can write:

$dY = 3\,(Y_n/116)\,(Y/Y_n)^{2/3}$

or $\log(dY) = \log(3\,Y_n^{1/3}/116) + (2/3)\log(Y/Y_n)$

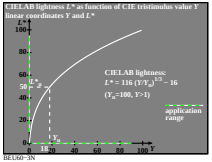
therefore in a log-log diagram the slope is (2/3).

for the CIE contrast sensitivity, and for dL^* = 1 it is valid:

$Y/dY = (1/3)\,(116/Y_n)\,(Y/Y_n)^{1/3}$

or $\log(Y/dY) = \log((1/3)\,(116/Y_n^{1/3})) + (1/3)\log(Y/Y_n)$

BEU60−1N



BEU60−1N

CIELAB lightness L^*, CIE tristimulus value discrimination $dY$and CIE contrast sensitivity (Y/dY)

CIELAB lightness for all colours $L^*{}_n$=100:

$L^* = 116\,(Y/Y_n)^{1/3} - 16 \qquad (Y_n{=}100,\ Y > 1)$

For the grey discrimination we get:

$dL^*/dY = (116/Y_n)\,(1/3)\,(Y/Y_n)^{-2/3}$

and for dL^*=1 (about 3 thresholds) we can write:

$dY = (3\,(Y_n^{1/3})/116)\,(Y)^{2/3}$

or $\log(dY) = \log(3\,(Y_n^{1/3})/116) + (2/3)\log(Y)$

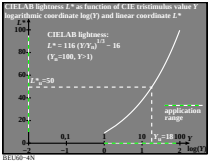
therefore in a log-log diagram the slope is (2/3).

for the CIE contrast sensitivity, and for dL^* = 1 it is valid:

$Y/dY = (1/3)\,(116/(Y_n^{1/3}))\,Y^{1/3}$

or $\log(Y/dY) = \log((1/3)\,(116/(Y_n^{1/3}))) + (1/3)\log(Y)$

BEU60−2N



BEU60−2N

sRGB-triangle lightness t^*, CIE tristimulus value discrimination dY and CIE contrast (Y/dY) *sRGB: see IEC 61966-2-1*

sRGB-triangle lightness for *achromatic* colours: W

$t^*{}_{sRGB,100} = 100\ (Y/Y_n)^{1/2,4} \qquad (Y_n{=}100)$

For the grey discrimination we get:

$dt^*{}_{sRGB,100}/dY = (1/2,4)\,(Y/Y_n)^{-1,4/2,4} = 0,42\ (Y/Y_n)^{-0,58}$

and for $dt^*{}_{sRGB,100}$=1 (about 3 thresholds) we can write:

$dY = 2,4\,(Y/Y_n)^{1,4/2,4}$

or $\log(dY) = \log(2,4) + (1,4/2,4)\,\log(Y/Y_n)$

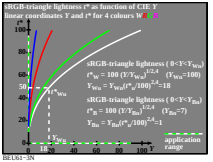
therefore in a log-log diagram the slope is 1,4/2,4.

for the CIE contrast sensitivity, and for $dt^*{}_{sRGB,100}$=1:

$Y/dY = (Y_n{}^{1,4/2,4})\,(2,4)\,(Y/Y_n)^{1,4/2,4}$

or $\log(Y/dY) = \log(Y_n{}^{1,4/2,4}/2,4) + 1/2,4\,\log(Y/Y_n)$

BEU61−1N



BEU61−1N

sRGB-triangle lightness t^*, CIE tristimulus value discrimination dY and CIE contrast (Y/dY) *sRGB: see IEC 61966-2-1*

sRGB-triangle lightness for *chromatic* colours: RGB

$t^*{}_{sRGB,100} = 100\ (Y/Y_n)^{1/2,4} \qquad (Y_n{=}22(R),\ {=}71(G),\ {=}07(B))$

For the discrimination we get:

$dt^*{}_{sRGB,100}/dY = (1/2,4)\,(Y/Y_n)^{-1,4/2,4} = 0,42\ (Y/Y_n)^{-0,58}$

and for $dt^*{}_{sRGB,100}$=2 (about 3 thresholds) we can write:

$dY = 2,4\,(Y/Y_n)^{1,4/2,4}$

or $\log(dY) = \log(2,4) + (1,4/2,4)\,\log(Y/Y_n)$

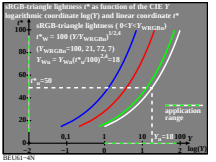
therefore in a log-log diagram the slope is 1,4/2,4.

for the CIE contrast sensitivity, and for $dt^*{}_{sRGB,100}$=1:

$Y/dY = (Y_n{}^{1,4/2,4})\,(2,4)\,(Y/Y_n)^{1,4/2,4}$

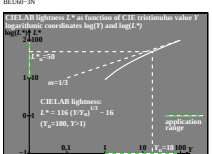
or $\log(Y/dY) = \log(Y_n{}^{1,4/2,4}/2,4) + 1/2,4\,\log(Y/Y_n)$

BEU61−2N



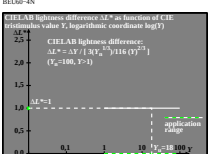
BEU61−2N

CIELAB lightness L^* as function of CIE tristimulus value Y linear coordinates Y and L^*



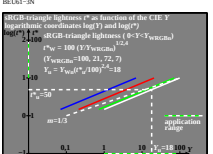
BEU60−3N

CIELAB lightness L^* as function of CIE tristimulus value Y logarithmic coordinate log(Y) and linear coordinate L^*



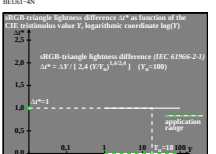
BEU60−4N

sRGB-triangle lightness t^* as function of CIE Y linear coordinate Y and t^* for 4 colours W R G B



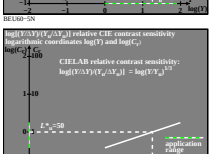
BEU61−3N

sRGB-triangle lightness t^* as function of the CIE Y logarithmic coordinate log(Y) and linear coordinate t^*



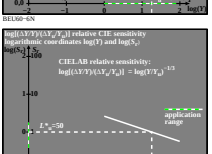
BEU61−4N

CIELAB lightness L^* as function of CIE tristimulus value Y logarithmic coordinates log(Y) and log(L^*)



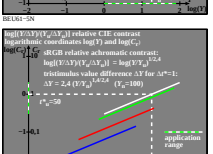
BEU60−5N

CIELAB lightness difference ΔL^* as function of CIE tristimulus value Y, logarithmic coordinate log(Y)



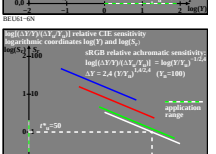
BEU60−6N

sRGB-triangle lightness t^* as function of the CIE Y logarithmic coordinates log(Y) and log(t^*)



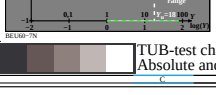
BEU61−5N

sRGB-triangle lightness difference Δt^* as function of the CIE tristimulus value Y, logarithmic coordinate log(Y)



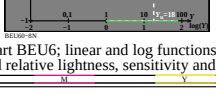
BEU61−6N

log(($\Delta Y/Y$)/($\Delta Y_n/Y_n$)) relative CIE contrast sensitivity logarithmic coordinates log(Y) and log(C_y)



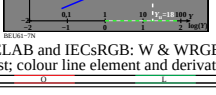
BEU60−7N

log(($\Delta Y/Y$)/($\Delta Y_n/Y_n$)) relative CIE sensitivity logarithmic coordinates log(Y) and log(S_y)



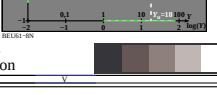
BEU60−8N

log(($\Delta Y/Y$)/($\Delta Y_n/Y_n$)) relative CIE contrast logarithmic coordinates log(Y) and log(C_y)



BEU61−7N

log(($\Delta Y/Y$)/($\Delta Y_n/Y_n$)) relative CIE sensitivity logarithmic coordinates log(Y) and log(S_y)



BEU61−8N