

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

CIELAB lightness for all colours $L^*_w=100$:
 $L^* = 116 (Y/Y_n)^{1/3} - 16$ ($Y_n=100, Y > 1$)

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

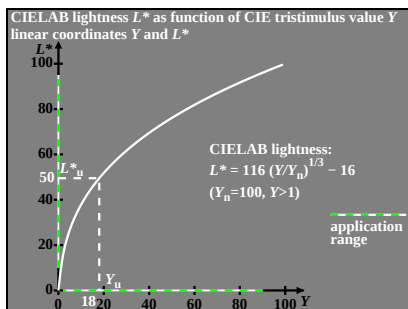
or $\log(dY) = \log(3 (Y_n/116)) + (2/3) \log(Y/Y_n)$

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

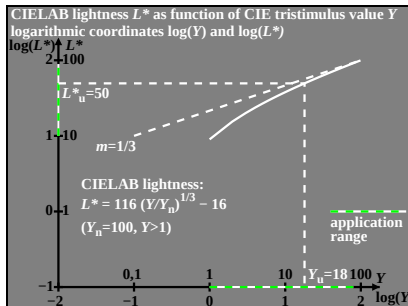
for the CIE contrast sensitivity, and for $dL^* = 1$ it is valid:
 $Y/dY = (1/3) (116/Y_n) (Y/Y_n)^{1/3}$

or $\log(Y/dY) = \log((1/3) (116/Y_n)) + (1/3) \log(Y/Y_n)$

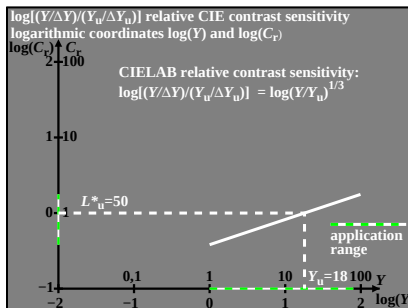
BEU60-1N



BEU60-3N



BEU60-5N



BEU60-7N

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

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

and for $dL^*=1$ (about 3 thresholds) we can write:
 $dY = (3(Y_n^{1/3}/116) (Y)^{2/3}$

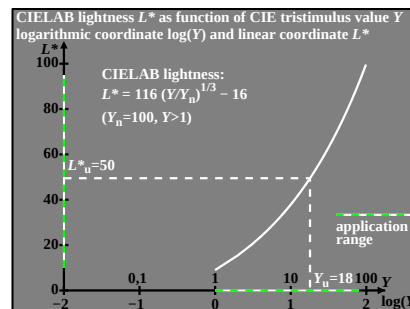
or $\log(dY) = \log(3(Y_n^{1/3}/116)) + (2/3) \log(Y)$

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

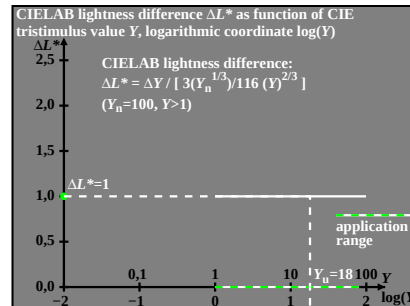
for the CIE contrast sensitivity, and for $dL^* = 1$ it is valid:
 $Y/dY = (1/3) (116(Y_n^{1/3})) Y^{1/3}$

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

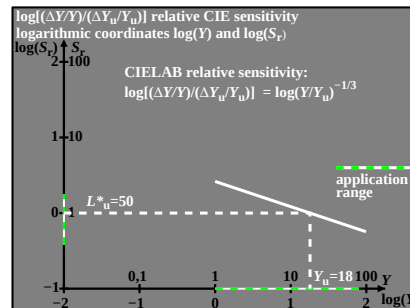
BEU60-2N



BEU60-4N



BEU60-6N



BEU60-8N

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

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

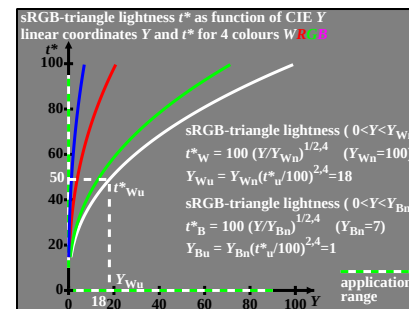
or $\log(dY) = \log(2,4) + (1,4/2,4) \log(Y/Y_n)$

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

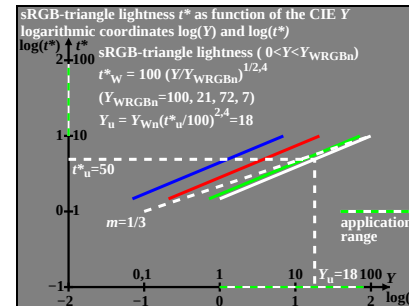
for the CIE contrast sensitivity, and for $dt^*_{sRGB,100}=1$:
 $Y/dY = (Y_n^{1,4/2,4}/2,4) (Y/Y_n)^{1/2,4}$

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

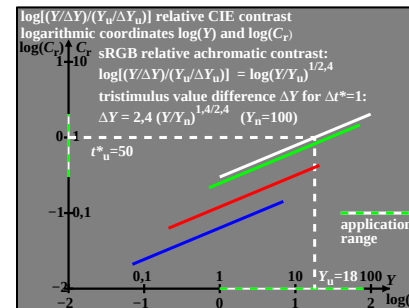
BEU61-1N



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BEU61-5N



BEU61-7N

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

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 $dt^*_{sRGB,100}=1$ (about 3 thresholds) we can write:
 $dY = 2,4 (Y/Y_n)^{1,4/2,4}$

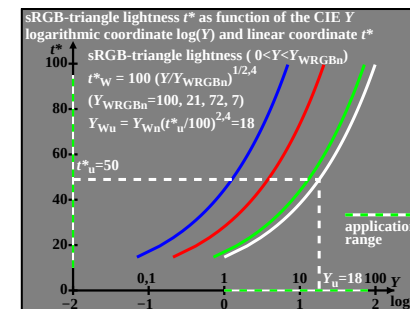
or $\log(dY) = \log(2,4) + (1,4/2,4) \log(Y/Y_n)$

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

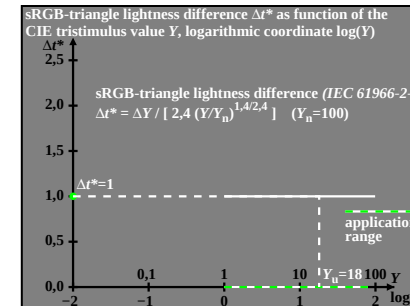
for the CIE contrast sensitivity, and for $dt^*_{sRGB,100}=1$:
 $Y/dY = (Y_n^{1,4/2,4}/2,4) (Y/Y_n)^{1/2,4}$

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

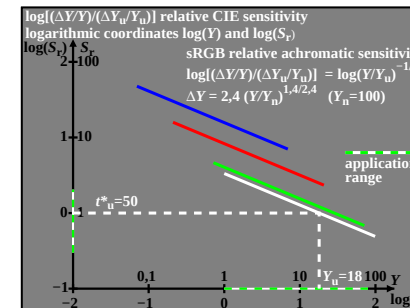
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