

**Colourimetric scaling of achromatic colours between peak white and black.
Relations between tristimulus value Y , luminance L , and lightness L^* of ISO-standards**

Colour (light or paper)	tristimulus values	HDR display luminance	relative luminance		IECsRGB _W lightness	TUBLOG _U lightness
Contrast W:N (25:1=100:4)	Y ($5^{0,5}=2,24$)	L [cd/m ²]	L_{rU} $=L/L_U$	L_{rW} $=L/L_W$	$L^*_{IECsRGBW}$ $=s_W L_{nW}^{1/2,4}$	$L^*_{TUBLOGU}$ $=t_U \log(L_{nU})+50$
White P2 (light)	450 $=18*25$	1000 $=40*25$	25	2,24	195=50+145 $=s(5,00)^{1/2,4}$	150=50+102 $=t \log(25,00)+50$
White P1 (light)	224 $=18*11,2$	448 $=40*11,2$	11,2	1,00	139=50+89 $=s(2,24)^{1/2,4}$	125=50+77 $=t \log(11,20)+50$
White W (fluorescent paper)	90 $=18*5$	200 $=40*5$	5	0,45	100=50+50 $=s(1,00)^{1/2,4}$	100=50+52 $=t \log(5,00)+50$
Grey U (paper)	18 $=18*1$	40 $=40*1$	1	0,20	51=50+1 $=s(0,20)^{1/2,4}$	50=50+2 $=t \log(1,00)+50$
Black N (paper)	3,6 $=18/5$	8 $=40/5$	0,20	0,09	26=50-23 $=s(0,04)^{1/2,4}$	0=50-48 $=t \log(0,20)+50$
Black p1 (glossy paper)	2,5 $=18/7$	5,7 $=40/7$	0,14	0,04	21=50-28 $=s(0,03)^{1/2,4}$	-14=50-62 $=t \log(0,13)+50$
Black p2 (glossy paper)	1,8 $=18/10$	4 $=40/10$	0,10	0,022	18=50-31 $=s(0,02)^{1/2,4}$	-24=50-72 $=t \log(0,09)+50$

It is valid: IECsRGB_W: $s_W=s=100$, TUBLOG_U: $t_U=t=50/\log(5)=72$