

**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=90:3,6)	Y	L [cd/m ²]	L_{rU} $=L/L_U$	L_{rW} $=L/L_W$	$L^*_{IECsRGBW}$ $=s_W L_{nW}^{1/2,4}$	$L^*_{TUBLOGU}$ $=t_U \log(L_{nU})+52$
White P2 (light)	360 $=18*20$	800 $=40*20$	25	2,24	170=50+120 $=s(4,00)^{1/2,4}$	141=50+91 $=t \log(20,00)+52$
White P1 (light)	180 $=18*10$	400 $=40*10$	20	1,00	127=50+77 $=s(2,00)^{1/2,4}$	120=50+70 $=t \log(10,00)+52$
White W (fluorescent paper)	90 $=18*5$	200 $=40*5$	5	0,45	95=50+45 $=s(1,00)^{1/2,4}$	98=50+48 $=t \log(5,00)+52$
Grey U (paper)	18 $=18*1$	40 $40*1$	1	0,20	48=50-1 $=s(0,20)^{1/2,4}$	48=50-1 $=t \log(1,00)+52$
Black N (paper)	3,6 $=18/5$	8 $40/5$	0,20	0,09	25=50-24 $=s(0,04)^{1/2,4}$	-1=50-51 $=t \log(0,20)+52$
Black p1 (glossy paper)	2,5 $=18/7$	5,7 $40/7$	0,14	0,04	21=50-28 $=s(0,03)^{1/2,4}$	-12=50-62 $=t \log(0,14)+52$
Black p2 (glossy paper)	1,8 $=18/10$	4 $40/10$	0,10	0,022	18=50-31 $=s(0,02)^{1/2,4}$	-22=50-72 $=t \log(0,10)+52$

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