

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

<b>Colour (light or paper)</b>	<b>tristimulus values</b>	<b>HDR display luminance</b>	<b>relative luminance</b>		<b>IECsRGB<sub>W</sub> lightness</b>	<b>TUBLOG<sub>U</sub> lightness</b>
<b>Contrast W:N (25:1=90:3,6)</b>	$Y$ ( $5^{0,5}=2,24$ )	$L$ [cd/m <sup>2</sup> ]	$L$ $=L/L_U$	$L_{rW}$ $=L/L_W$	$L^*_{IECsRGBW}$ $=s_W L_{rW}^{1/2,4}$	$L^*_{TUBLOGU}$ $=t_U \log(L_{rU})+50$
White P2 (light)	360 $=18*20$	800 $=40*20$	25	2,24	170=50+120 $=s(2,24)^{1/2,4}$	121=50+71 $=t \log(20)+50$
White P1 (light)	180 $=18*10$	400 $=40*10$	20	1,00	127=50+77 $=s(1,00)^{1/2,4}$	104=50+54 $=t \log(10)+50$
White W (fluorescent paper)	90 $=18*5$	200 $=40*5$	5	0,45	95=50+45 $=s(0,45)^{1/2,4}$	87=50+37 $=t \log(5,0)+50$
Grey U (paper)	18 $=18*1$	40 $40*1$	1	0,20	48=50-1 $=s(0,20)^{1/2,4}$	47=50-2 $=t \log(1)+50$
Black N (paper)	3,6 $=18/5$	8 $40/5$	0,20	0,09	25=50-24 $=s(0,09)^{1/2,4}$	7=50-42 $=t \log(0,20)+50$
Black p1 (glossy paper)	2,5 $=18/7$	5,7 $40/7$	0,14	0,04	21=50-28 $=s(0,04)^{1/2,4}$	-1=50-51 $=t \log(0,14)+50$
Black p2 (glossy paper)	1,8 $=18/10$	4 $40/10$	0,10	0,022	18=50-31 $=s(0,02)^{1/2,4}$	-9=50-59 $=t \log(0,10)+50$

It is valid: IECsRGB<sub>W</sub>:  $s_W=s=100$ , TUBLOG<sub>U</sub>:  $t_U=t=40/\log(5)=57$