

**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	IECsRGB <sub>W</sub> lightness	relative luminance		CIELAB <sub>W</sub> lightness	TUBLOG <sub>U</sub> lightness
<b>Contrast W:N (25:1=100:4)</b>	$Y$ ( $5^{0,5}=2,24$ )	$L^*_{IECsRGBW}$ $=s_W L_{rW}^{1/2,4}$	$L_{rU}$ $=L/L_U$	$L_{rW}$ $=L/L_W$	$L^*_{CIELABW}$ $=c_W L_{rW}^{1/3}-16$	$L^*_{TUBLOGU}$ $=t_U \log(L_{rU})+50$
White P2 (light)	500 $=20*25$	195=50+145 $=s(5,00)^{1/2,4}$	25	5,00	182=50+132 $=c(5,00)^{1/3}-16$	150=50+102 $=t \log(25,00)+50$
White W (fluorescent paper)	100 $=20*5$	100=50+50 $=s(1,00)^{1/2,4}$	5	1,00	100=50+50 $=c(1,00)^{1/3}-16$	100=50+52 $=t \log(5,00)+50$
light Grey H (paper)	44,8 $=20*2,24$	71=50+21 $=s(0,45)^{1/2,4}$	2,24	0,45	72=50+22 $=c(0,45)^{1/3}-16$	75=50+27 $=t \log(2,24)+50$
Grey U (paper)	20	51=50+1 $=s(0,20)^{1/2,4}$	1	0,20	51=50+1 $=c(0,20)^{1/3}-16$	50=50+2 $=t \log(1,00)+50$
dark Grey D (paper)	8,9 $=20/2,24$	36=50-13 $=s(0,09)^{1/2,4}$	0,45	0,09	35=50-14 $=c(0,09)^{1/3}-16$	24=50-23 $=t \log(0,45)+50$
Black N (paper)	4 $=20/5$	26=50-23 $=s(0,04)^{1/2,4}$	0,20	0,04	23=50-26 $=c(0,04)^{1/3}-16$	0=50-48 $=t \log(0,20)+50$
Black p1 (glossy paper)	1,9 $=20/11,2$	18=50-31 $=s(0,02)^{1/2,4}$	0,09	0,022	14=50-35 $=c(0,02)^{1/3}-16$	-24=50-72 $=t \log(0,09)+50$

It is valid: CIELAB<sub>W</sub>:  $c_W=c=116$ , IECsRGB<sub>W</sub>:  $s_W=s=100$ , TUBLOG<sub>U</sub>:  $t_U=t=50/\log(5)=72$