

see similar files of the whole serie: <http://farbe.li.tu-berlin.de/feos.htm>
 technical information: <http://farbe.li.tu-berlin.de> or <http://color.li.tu-berlin.de>

TUB registration: 20240201-feo1/feo110np.pdf / .ps
 application for evaluation and measurement of display or print output
 TUB material: code=rhata4

**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 _W lightness	relative luminance		CIELAB _W lightness	TUBLOG _U lightness
			L _{rU} = L/L _U	L _{rW} = L/L _W		
Contrast W:N (25:1=90:3,6)	Y (5 ^{0,5} =2,24)	L* _{IECsRGB_W} = s _W L _{NW} ^{1/2,4}	L_{rU}	L_{rW}	L* _{CIELAB_W} = c _W L _{NW} ^{1/3} -16	L* _{TUBLOG_U} = t _U log(L _{NU})+52
White P1 (light)	180 =18*10	127=50+77 =s(2,00) ^{1/2,4}	10	2,24	125=50+75 =c(2,00) ^{1/3} -16	120=50+70 =t log(10,00)+52
White W (fluorescent paper)	90 =18*5	95=50+45 =s(1,00) ^{1/2,4}	5	1,00	95=50+45 =c(1,00) ^{1/3} -16	98=50+48 =t log(5,00)+52
light Grey H (paper)	40 =18*2,24	68=50+18 =s(0,45) ^{1/2,4}	2,24	0,45	69=50+19 =c(0,45) ^{1/3} -16	73=50+23 =t log(2,24)+52
Grey U (paper)	18	48=50-1 =s(0,20) ^{1/2,4}	1	0,20	49=50-0 =c(0,20) ^{1/3} -16	48=50-1 =t log(1,00)+52
dark Grey D (paper)	8,0 =18/2,24	35=50-14 =s(0,09) ^{1/2,4}	0,45	0,09	34=50-15 =c(0,09) ^{1/3} -16	23=50-26 =t log(0,45)+52
Black N (paper)	3,6 =18/5	25=50-24 =s(0,04) ^{1/2,4}	0,20	0,04	22=50-27 =c(0,04) ^{1/3} -16	-1=50-51 =t log(0,20)+52
Black p1 (glossy paper)	1,8 =18/10	18=50-31 =s(0,02) ^{1/2,4}	0,10	0,022	14=50-35 =c(0,02) ^{1/3} -16	-22=50-72 =t log(0,10)+52

It is valid: CIELAB_W: c_W=c=116, IECsRGB_W: s_W=s=100, TUBLOG_U: t_U=t=50/log(5)=72

feo10-3n

**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		CIELAB _U lightness	TUBLOG _U lightness
			L _{rU} = L/L _U	L _{rW} = L/L _W		
Contrast W:N (25:1=90:3,6)	Y (5 ^{0,5} =2,24)	L [cd/m ²]	L_{rU}	L_{rW}	L* _{CIELAB_U} = d _U L _{NU} ^{1/3} -16	L* _{TUBLOG_U} = t _U log(L _{NU})+52
White P1 (light)	180 =18*10	400 =40*10	10	2,24	125=50+75 =c(10,00) ^{1/3} -16	120=50+70 =t log(10,00)+52
White W (fluorescent paper)	90 =18*5	200 =40*5	5	1,00	95=50+45 =c(5,00) ^{1/3} -16	98=50+48 =t log(5,00)+52
light Grey H (paper)	40 =18*2,24	89,6 =40*2,24	2,24	0,45	69=50+19 =c(2,24) ^{1/3} -16	73=50+23 =t log(2,24)+52
Grey U (paper)	18	40 =40*1	1	0,20	49=50-0 =c(1,00) ^{1/3} -16	48=50-1 =t log(1,00)+52
dark Grey D (paper)	8,0 =18/2,24	17,9	0,45	0,09	34=50-15 =c(0,45) ^{1/3} -16	23=50-26 =t log(0,45)+52
Black N (paper)	3,6 =18/5	8 =28,2/5	0,20	0,04	22=50-27 =c(0,20) ^{1/3} -16	-1=50-51 =t log(0,20)+52
Black p1 (glossy paper)	1,8 =18/10	4 =28,2/11,2	0,10	0,022	14=50-35 =c(0,10) ^{1/3} -16	-22=50-72 =t log(0,10)+52

It is valid: CIELAB_U: d_U=d=66, TUBLOG_U: t_U=t=50/log(5)=72

feo11-3n

**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		CIELAB _W lightness	TUBLOG _U lightness
			L _{rU} = L/L _U	L _{rW} = L/L _W		
Contrast W:N (25:1=90:3,6)	Y (5 ^{0,5} =2,24)	L [cd/m ²]	L_{rU}	L_{rW}	L* _{CIELAB_W} = c _W L _{NW} ^{1/3} -16	L* _{TUBLOG_U} = t _U log(L _{NU})+52
White P1 (light)	180 =18*10	400 =40*10	10	2,24	125=50+75 =c(2,00) ^{1/3} -16	120=50+70 =t log(10,00)+52
White W (fluorescent paper)	90 =18*5	200 =40*5	5	1,00	95=50+45 =c(1,00) ^{1/3} -16	98=50+48 =t log(5,00)+52
light Grey H (paper)	40 =18*2,24	89,6 =40*2,24	2,24	0,45	69=50+19 =c(0,45) ^{1/3} -16	73=50+23 =t log(2,24)+52
Grey U (paper)	18	40 =40*1	1	0,20	49=50-0 =c(0,20) ^{1/3} -16	48=50-1 =t log(1,00)+52
dark Grey D (paper)	8,0 =18/2,24	17,9	0,45	0,09	34=50-15 =c(0,09) ^{1/3} -16	23=50-26 =t log(0,45)+52
Black N (paper)	3,6 =18/5	8 =28,2/5	0,20	0,04	22=50-27 =c(0,04) ^{1/3} -16	-1=50-51 =t log(0,20)+52
Black p1 (glossy paper)	1,8 =18/10	4 =28,2/11,2	0,10	0,022	14=50-35 =c(0,02) ^{1/3} -16	-22=50-72 =t log(0,10)+52

It is valid: CIELAB_W: c_W=c=116, TUBLOG_U: t_U=t=50/log(5)=72

feo10-7n

**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
			L _{rU} = L/L _U	L _{rW} = L/L _W		
Contrast W:N (25:1=90:3,6)	Y (5 ^{0,5} =2,24)	L [cd/m ²]	L_{rU}	L_{rW}	L* _{IECsRGB_W} = s _W L _{NW} ^{1/2,4}	L* _{TUBLOG_U} = t _U log(L _{NU})+52
White P1 (light)	180 =18*10	400 =40*10	10	2,24	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	1,00	95=50+45 =s(1,00) ^{1/2,4}	98=50+48 =t log(5,00)+52
light Grey H (paper)	40 =18*2,24	89,6 =40*2,24	2,24	0,45	68=50+18 =s(0,45) ^{1/2,4}	73=50+23 =t log(2,24)+52
Grey U (paper)	18	40 =40*1	1	0,20	48=50-1 =s(0,20) ^{1/2,4}	48=50-1 =t log(1,00)+52
dark Grey D (paper)	8,0 =18/2,24	17,9	0,45	0,09	35=50-14 =s(0,09) ^{1/2,4}	23=50-26 =t log(0,45)+52
Black N (paper)	3,6 =18/5	8 =28,2/5	0,20	0,04	25=50-24 =s(0,04) ^{1/2,4}	-1=50-51 =t log(0,20)+52
Black p1 (glossy paper)	1,8 =18/10	4 =28,2/11,2	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

feo11-7n