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TUB registration: 20240201-feo9/feo910na.txt /.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=100:4)	Y (5 ^{0.5} =2,24)	L* _{IECsRGB_W} = s _W L _{rW} ^{1/2.4}	L _{rU}	L _{rW}	L* _{CIELAB_W} = c _W L _{rW} ^{1/3} -16	L* _{TUBLOG_U} = 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 P2 (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_W: c_W=c=116, IECsRGB_W: s_W=s=100, TUBLOG_U: t_U=t=50/log(5)=72
 feo90-3n

**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=100:4)	Y (5 ^{0.5} =2,24)	L [cd/m ²]	L _{rU}	L _{rW}	L* _{CIELAB_U} = d _U L _{rU} ^{1/3} -16	L* _{TUBLOG_U} = t _U log(L _{rU})+50
White P2 (light)	500 =20*25	1000 =40*25	25	5,00	182=50+132 =c(25,00) ^{1/3} -16	150=50+102 =t log(25,00)+50
White W (fluorescent paper)	100 =20*5	200 =40*5	5	1,00	100=50+50 =c(5,00) ^{1/3} -16	100=50+52 =t log(5,00)+50
light Grey H (paper)	44,8 =20*2,24	89,6 =40*2,24	2,24	0,45	72=50+22 =c(2,24) ^{1/3} -16	75=50+27 =t log(2,24)+50
Grey U (paper)	20	40 =40*1	1	0,20	51=50+1 =c(1,00) ^{1/3} -16	50=50+2 =t log(1,00)+50
dark Grey D (paper)	8,9 =20/2,24	17,8 =40/2,24	0,45	0,09	35=50-14 =c(0,45) ^{1/3} -16	24=50-23 =t log(0,45)+50
Black N (paper)	4 =20/5	8 =40/5	0,20	0,04	23=50-26 =c(0,20) ^{1/3} -16	0=50-48 =t log(0,20)+50
Black P2 (glossy paper)	1,9 =20/11,2	3,6 =40/11,2	0,09	0,022	14=50-35 =c(0,09) ^{1/3} -16	-24=50-72 =t log(0,09)+50

It is valid: CIELAB_U: d_U=d=66, TUBLOG_U: t_U=t=50/log(5)=72
 feo91-3n

**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=100:4)	Y (5 ^{0.5} =2,24)	L [cd/m ²]	L _{rU}	L _{rW}	L* _{CIELAB_W} = c _W L _{rW} ^{1/3} -16	L* _{TUBLOG_U} = t _U log(L _{rU})+50
White P2 (light)	500 =20*25	1000 =40*25	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	200 =40*5	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	89,6 =40*2,24	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	40 =40*1	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	17,8 =40/2,24	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	8 =40/5	0,20	0,04	23=50-26 =c(0,04) ^{1/3} -16	0=50-48 =t log(0,20)+50
Black P2 (glossy paper)	1,9 =20/11,2	3,6 =40/11,2	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_W: c_W=c=116, TUBLOG_U: t_U=t=50/log(5)=72
 feo90-7n

**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		ITU _s RGB _{P2} lightness	TUBLOG _U lightness
			L _{rU} = L/L _U	L _{rW} = L/L _W		
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24)	L [cd/m ²]	L _{rU}	L _{rW}	L* _{ITU_sRGB_{P2}} = j _W L _{rW} ^{0.45} -10	L* _{TUBLOG_U} = t _U log(L _{rU})+50
White P2 (light)	500 =20*25	1000 =40*25	25	5,00	161=50+111 =j(1,00) ^{0.45} -10	150=50+102 =t log(25,00)+50
White W (fluorescent paper)	100 =20*5	200 =40*5	5	1,00	73=50+23 =j(0,20) ^{0.45} -10	100=50+52 =t log(5,00)+50
light Grey H (paper)	44,8 =20*2,24	89,6 =40*2,24	2,24	0,45	48=50-1 =j(0,09) ^{0.45} -10	75=50+27 =t log(2,24)+50
Grey U (paper)	20	40 =40*1	1	0,20	30=50-19 =j(0,04) ^{0.45} -10	50=50+2 =t log(1,00)+50
dark Grey D (paper)	8,9 =20/2,24	17,8 =40/2,24	0,45	0,09	18=50-31 =j(0,02) ^{0.45} -10	24=50-23 =t log(0,45)+50
Black N (paper)	4 =20/5	8 =40/5	0,20	0,04	9=50-40 =j(0,01) ^{0.45} -10	0=50-48 =t log(0,20)+50
Black P2 (glossy paper)	1,9 =20/11,2	3,6 =40/11,2	0,09	0,022	4=50-45 =j(0,00) ^{0.45} -10	-24=50-72 =t log(0,09)+50

It is valid: ITUsRGB_W: j_W=j=110, TUBLOG_U: t_U=t=50/log(5)=72
 feo91-7n