

Chromometric 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
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24	L* IECsRGB _W = s W L _{an} ^{1/2,4}	L_{rel}U / L_{rel}W = L / L_W	L* CIELAB _W = c W L _{an} ^{1/3,16} - 16	L* TUBLOG _U = t _U log(L _{an} /5) + 50
White P2 (light)	450 =18*25	195=50+145 =s(5,00) ^{1/2,4}	2,24	182=50+132 =c(5,00) ^{1/3,16}	150=50+102 =t log(25,00)+50
White P1 (light)	224 =18*11,2	139=50+89 =s(2,24) ^{1/2,4}	11,2	135=50+85 =c(2,24) ^{1/3,16}	125=50+77 =t log(11,20)+50
White W (fluorescent paper)	90 =18*5	100=50+50 =s(1,00) ^{1/2,4}	5	100=50+50 =c(1,00) ^{1/3,16}	100=50+52 =t log(5,00)+50
Grey U (paper)	18 =18*1	51=50+1 =s(0,20) ^{1/2,4}	1	51=50+1 =c(0,20) ^{1/3,16}	50=50+2 =t log(1,00)+50
Black N (paper)	3,6 =18/5	26=50-23 =s(0,04) ^{1/2,4}	0,20	23=50-26 =c(0,04) ^{1/3,16}	0=50-48 =t log(0,20)+50
Black p1 (glossy paper)	2,5 =18/7	21=50-28 =s(0,03) ^{1/2,4}	0,14	17=50-32 =c(0,03) ^{1/3,16}	-14=50-62 =t log(0,13)+50
Black p2 (glossy paper)	1,8 =18/10	18=50-31 =s(0,02) ^{1/2,4}	0,10	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
 feo20-3n

Chromometric scaling of achromatic colours between peak white and black.
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Colour (light or paper)	tristimulus values	HDR display luminance	relative luminance	CIELAB _U lightness	TUBLOG _U lightness
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24	L [cd/m ²]	L_{rel}U / L_{rel}W = L / L_W	L* CIELAB _U = d _U L _{an} ^{1/3,16} - 16	L* TUBLOG _U = t _U log(L _{an} /5) + 50
White P2 (light)	450 =18*25	1000 =40*25	2,24	182=50+132 =c(25,00) ^{1/3,16}	150=50+102 =t log(25,00)+50
White P1 (light)	224 =18*11,2	448 =40*11,2	11,2	135=50+85 =c(11,20) ^{1/3,16}	125=50+77 =t log(11,20)+50
White W (fluorescent paper)	90 =18*5	200 =40*5	5	100=50+50 =c(5,00) ^{1/3,16}	100=50+52 =t log(5,00)+50
Grey U (paper)	18 =18*1	40 =40*1	1	51=50+1 =c(1,00) ^{1/3,16}	50=50+2 =t log(1,00)+50
Black N (paper)	3,6 =18/5	8 =40/5	0,20	23=50-26 =c(0,20) ^{1/3,16}	0=50-48 =t log(0,20)+50
Black p1 (glossy paper)	2,5 =18/7	5,7 =40/7	0,14	17=50-32 =c(0,13) ^{1/3,16}	-14=50-62 =t log(0,13)+50
Black p2 (glossy paper)	1,8 =18/10	4 =40/10	0,10	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
 feo21-3n

Chromometric scaling of achromatic colours between peak white and black.
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Colour (light or paper)	tristimulus values	HDR display luminance	relative luminance	CIELAB _W lightness	TUBLOG _U lightness
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24	L [cd/m ²]	L_{rel}U / L_{rel}W = L / L_W	L* CIELAB _W = c W L _{an} ^{1/3,16} - 16	L* TUBLOG _U = t _U log(L _{an} /5) + 50
White P2 (light)	450 =18*25	1000 =40*25	2,24	182=50+132 =c(5,00) ^{1/3,16}	150=50+102 =t log(25,00)+50
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White W (fluorescent paper)	90 =18*5	200 =40*5	5	100=50+50 =c(1,00) ^{1/3,16}	100=50+52 =t log(5,00)+50
Grey U (paper)	18 =18*1	40 =40*1	1	51=50+1 =c(0,20) ^{1/3,16}	50=50+2 =t log(1,00)+50
Black N (paper)	3,6 =18/5	8 =40/5	0,20	23=50-26 =c(0,04) ^{1/3,16}	0=50-48 =t log(0,20)+50
Black p1 (glossy paper)	2,5 =18/7	5,7 =40/7	0,14	17=50-32 =c(0,03) ^{1/3,16}	-14=50-62 =t log(0,13)+50
Black p2 (glossy paper)	1,8 =18/10	4 =40/10	0,10	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
 feo20-7n

Chromometric scaling of achromatic colours between peak white and black.
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Colour (light or paper)	tristimulus values	HDR display luminance	relative luminance	IECsRGB _W lightness	TUBLOG _U lightness
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24	L [cd/m ²]	L_{rel}U / L_{rel}W = L / L_W	L* IECsRGB _W = s W L _{an} ^{1/2,4}	L* TUBLOG _U = t _U log(L _{an} /5) + 50
White P2 (light)	450 =18*25	1000 =40*25	2,24	195=50+145 =s(5,00) ^{1/2,4}	150=50+102 =t log(25,00)+50
White P1 (light)	224 =18*11,2	448 =40*11,2	11,2	139=50+89 =s(2,24) ^{1/2,4}	125=50+77 =t log(11,20)+50
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Grey U (paper)	18 =18*1	40 =40*1	1	51=50+1 =s(0,20) ^{1/2,4}	50=50+2 =t log(1,00)+50
Black N (paper)	3,6 =18/5	8 =40/5	0,20	26=50-23 =s(0,04) ^{1/2,4}	0=50-48 =t log(0,20)+50
Black p1 (glossy paper)	2,5 =18/7	5,7 =40/7	0,14	21=50-28 =s(0,03) ^{1/2,4}	-14=50-62 =t log(0,13)+50
Black p2 (glossy paper)	1,8 =18/10	4 =40/10	0,10	18=50-31 =s(0,02) ^{1/2,4}	-24=50-72 =t log(0,09)+50

It is valid: IECsRGB_W: s_W=s=100, TUBLOG_U: t_U=t=50/log(5)=72
 feo21-7n

TUB-test chart feo2; Chromometric scaling of achromatic colours between white and black.

Contrast W:N=90:3,6, P2:p2=1000:4 with YnW, YnU. See ISO 2028-5, ISO/CIE 11664-4, CIE 230