

Colorimetric 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=90:3,6)	Y (5 ^{0,5} =2,24)	L* IECsRGB _W = s W/L _W ^{1/2,4}	L_U/L_W = L_r/L_w	L* CIELAB _W = c W/L _W ^{1/3} -16	L* TUBLOG _U = t _U /log(L _{at})+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(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(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(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(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(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(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(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

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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=90:3,6)	Y (5 ^{0,5} =2,24)	L [cd/m ²]	L_U/L_W = L_r/L_w	L* CIELAB _U = d _U /L _W ^{1/3} -16	L* TUBLOG _U = t _U /log(L _{at})+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(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(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(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(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(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(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(0,10)+52

It is valid: CIELAB_U: d_U=d=66, TUBLOG_U: t_U=t=50/log(5)=72
 feo11-3n

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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=90:3,6)	Y (5 ^{0,5} =2,24)	L [cd/m ²]	L_U/L_W = L_r/L_w	L* CIELAB _W = c W/L _W ^{1/3} -16	L* TUBLOG _U = t _U /log(L _{at})+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(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(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(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(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(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(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(0,10)+52

It is valid: CIELAB_W: c_W=c=116, TUBLOG_U: t_U=t=50/log(5)=72
 feo10-7n

Colorimetric 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
Contrast W:N (25:1=90:3,6)	Y (5 ^{0,5} =2,24)	L [cd/m ²]	L_U/L_W = L_r/L_w	L* IECsRGB _W = s W/L _W ^{1/2,4}	L* TUBLOG _U = t _U /log(L _{at})+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(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(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(2,24)+52
Grey U (paper)	18	40 40*1	1 0,20	48-50-1 =t(0,20) ^{1/2,4}	48-50-1 =t(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(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(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(0,10)+52

It is valid: IECsRGB_W: s_W=s=100, TUBLOG_U: t_U=t=50/log(5)=72
 feo11-7n

TUB-test chart feo1; Colorimetric scaling of achromatic colours between white and black.

Contrast W:N=90:3,6, P1:p1=400:4 with YnW, YnU. See ISO 22028-5, ISO/CIE 11664-4, CIE 230