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 application for evaluation and measurement of display or print output
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**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
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/L_U	L_{rW} = L/L_W	L* _{CIELAB_W} = c_WL_{rW} ^{1/3} -16	L* _{TUBLOG_U} = t_Ulog(L_{rU}) +50
White P2 (light)	450 =18*25	104=50+54 = s (2,24) ^{1/2,4}	25	2,24	104=50+54 = c (2,24) ^{1/3} -16	103=50+55 = t log(11,20)+50
White P1 (light)	224 =18*11,2	74=50+24 = s (1,00) ^{1/2,4}	11,2	1,00	76=50+26 = c (1,00) ^{1/3} -16	78=50+30 = t log(5,00)+50
White W (fluorescent paper)	90 =18*5	53=50+3 = s (0,45) ^{1/2,4}	5	0,45	54=50+4 = c (0,45) ^{1/3} -16	53=50+5 = t log(2,24)+50
Grey U (paper)	18 =18*1	38=50-11 = s (0,20) ^{1/2,4}	1	0,20	37=50-12 = c (0,20) ^{1/3} -16	28=50-19 = t log(1,00)+50
Black N (paper)	3,6 =18/5	27=50-22 = s (0,09) ^{1/2,4}	0,20	0,09	25=50-24 = c (0,09) ^{1/3} -16	3=50-44 = t log(0,45)+50
Black p1 (glossy paper)	2,5 =18/7	19=50-30 = s (0,04) ^{1/2,4}	0,14	0,04	15=50-34 = c (0,04) ^{1/3} -16	-21=50-69 = t log(0,20)+50
Black p2 (glossy paper)	1,8 =18/10	14=50-35 = s (0,02) ^{1/2,4}	0,10	0,022	8=50-41 = c (0,02) ^{1/3} -16	-46=50-94 = 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

feo60-3n

**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
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24)	L [cd/m ²]	L_{rU} = L/L_U	L_{rW} = L/L_W	L* _{CIELAB_U} = d_UL_{rU} ^{1/3} -16	L* _{TUBLOG_U} = t_Ulog(L_{rU}) +50
White P2 (light)	450 =18*25	1000 =40*25	25	2,24	104=50+54 = c (11,20) ^{1/3} -16	103=50+55 = t log(11,20)+50
White P1 (light)	224 =18*11,2	448 =40*11,2	11,2	1,00	76=50+26 = c (5,00) ^{1/3} -16	78=50+30 = t log(5,00)+50
White W (fluorescent paper)	90 =18*5	200 =40*5	5	0,45	54=50+4 = c (2,24) ^{1/3} -16	53=50+5 = t log(2,24)+50
Grey U (paper)	18 =18*1	40 40*1	1	0,20	37=50-12 = c (1,00) ^{1/3} -16	28=50-19 = t log(1,00)+50
Black N (paper)	3,6 =18/5	8 40/5	0,20	0,09	25=50-24 = c (0,45) ^{1/3} -16	3=50-44 = t log(0,45)+50
Black p1 (glossy paper)	2,5 =18/7	5,7 40/7	0,14	0,04	15=50-34 = c (0,20) ^{1/3} -16	-21=50-69 = t log(0,20)+50
Black p2 (glossy paper)	1,8 =18/10	4 40/10	0,10	0,022	8=50-41 = c (0,09) ^{1/3} -16	-46=50-94 = t log(0,09)+50

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

feo61-3n

**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
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24)	L [cd/m ²]	L_{rU} = L/L_U	L_{rW} = L/L_W	L* _{CIELAB_W} = c_WL_{rW} ^{1/3} -16	L* _{TUBLOG_U} = t_Ulog(L_{rU}) +50
White P2 (light)	450 =18*25	1000 =40*25	25	2,24	104=50+54 = c (2,24) ^{1/3} -16	103=50+55 = t log(11,20)+50
White P1 (light)	224 =18*11,2	448 =40*11,2	11,2	1,00	76=50+26 = c (1,00) ^{1/3} -16	78=50+30 = t log(5,00)+50
White W (fluorescent paper)	90 =18*5	200 =40*5	5	0,45	54=50+4 = c (0,45) ^{1/3} -16	53=50+5 = t log(2,24)+50
Grey U (paper)	18 =18*1	40 40*1	1	0,20	37=50-12 = c (0,20) ^{1/3} -16	28=50-19 = t log(1,00)+50
Black N (paper)	3,6 =18/5	8 40/5	0,20	0,09	25=50-24 = c (0,09) ^{1/3} -16	3=50-44 = t log(0,45)+50
Black p1 (glossy paper)	2,5 =18/7	5,7 40/7	0,14	0,04	15=50-34 = c (0,04) ^{1/3} -16	-21=50-69 = t log(0,20)+50
Black p2 (glossy paper)	1,8 =18/10	4 40/10	0,10	0,022	8=50-41 = c (0,02) ^{1/3} -16	-46=50-94 = t log(0,09)+50

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

feo60-7n

**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
Contrast W:N (25:1=100:4)	Y (5 ^{0.5} =2,24)	L [cd/m ²]	L_{rU} = L/L_U	L_{rW} = L/L_W	L* _{IECsRGB_W} = s_WL_{rW} ^{1/2,4}	L* _{TUBLOG_U} = t_Ulog(L_{rU}) +50
White P2 (light)	450 =18*25	1000 =40*25	25	2,24	104=50+54 = s (2,24) ^{1/2,4}	103=50+55 = t log(11,20)+50
White P1 (light)	224 =18*11,2	448 =40*11,2	11,2	1,00	74=50+24 = s (1,00) ^{1/2,4}	78=50+30 = t log(5,00)+50
White W (fluorescent paper)	90 =18*5	200 =40*5	5	0,45	53=50+3 = s (0,45) ^{1/2,4}	53=50+5 = t log(2,24)+50
Grey U (paper)	18 =18*1	40 40*1	1	0,20	38=50-11 = s (0,20) ^{1/2,4}	28=50-19 = t log(1,00)+50
Black N (paper)	3,6 =18/5	8 40/5	0,20	0,09	27=50-22 = s (0,09) ^{1/2,4}	3=50-44 = t log(0,45)+50
Black p1 (glossy paper)	2,5 =18/7	5,7 40/7	0,14	0,04	19=50-30 = s (0,04) ^{1/2,4}	-21=50-69 = t log(0,20)+50
Black p2 (glossy paper)	1,8 =18/10	4 40/10	0,10	0,022	14=50-35 = s (0,02) ^{1/2,4}	-46=50-94 = t log(0,09)+50

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

feo61-7n

TUB-test chart feo6; Colourimetric scaling of achromatic colours between white and black.
 Contrast W:N=90:3,6, P2:p2=1000:4 with L_{rW}, L_{rU}. See ISO 22028-5, ISO/CIE 11664-4, CIE 230