

<http://farbe.li.tu-berlin.de/eeq3/eeq310np.pdf> / .ps; only vector graphic VG; start output  
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**Equal 9 step grey scaling between  $L^*_{0aN}=3.6$  and  $L^*_{0aW}=95.9$ ,  $Y_{0ref}=2.5$ , normalisation grey U**

$L^*_{0aN}=3.6, L^*_{0aU}=49.8, L^*_{0aW}=96.0, Y_{0aN}=0.4, Y_{0aU}=18.2, Y_{0aW}=90.0, C_{0aY}=Y_{0aW}:Y_{0aN}=225.0$   
 $L^*_{taN}=18.1, L^*_{taU}=49.8, L^*_{taW}=92.3, Y_{taN}=2.5, Y_{taU}=18.2, Y_{taW}=81.3, C_{taY}=Y_{taW}:Y_{taN}=31.9$

**Regularity index according to ISO/IEC 15775:2022, annex G for 5 and 9 steps**

$g^* = 100 [\Delta L^*_{min}] / [\Delta L^*_{max}], L^*_{CIELAB} = 116 [Y/Y_N]^{1/3} - 16$  with  $Y \geq 0.882, Y_N=100$

L* <sub>CIELAB</sub> n0.i	intended output				real output				linearized output			
	L* <sub>0a</sub>	L* <sub>0r</sub>	Y <sub>0a</sub>	Y <sub>0r</sub>	L* <sub>ta</sub>	$\Delta L^*_{ta}$	L* <sub>tr</sub>	Y <sub>ta</sub>	$(L^*_{tr})^{1/1.24}$	L* <sub>la</sub>	$\Delta L^*_{la}$	
100	96.0	1.0	90.0	1.0	92.3		1.0	81.3	1.0	92.3		
8	84.4	0.875	64.9	0.72	81.5	10.8	0.854	59.3	0.88	83.4	8.8	
75	72.9	0.75	45.0	0.498	70.7	10.7	0.709	41.8	0.758	74.3	9.1	
6	61.3	0.625	29.6	0.326	60.1	10.6	0.566	28.3	0.632	65.0	9.5	
50	49.8	0.5	18.2	0.199	49.8	10.3	0.427	18.2	0.504	55.5	9.7	
4	38.2	0.375	10.2	0.11	39.9	9.9	0.293	11.2	0.372	45.7	9.7	
25	26.7	0.25	5.0	0.051	30.8	7.5	0.171	6.6	0.241	36.0	9.2	
2	15.2	0.125	1.9	0.017	23.3	5.2	0.07	3.9	0.117	26.9	8.7	
0	3.6	0.0	0.4	0.0	18.1		0.0	2.5	0.0	18.1		

$\Delta L^*_{0a}=11.5$  (i=1,2,...,8) normalisation:  $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq30-3n

**Equal 9 step grey scaling between  $L^*_{0aN}=3.6$  and  $L^*_{0aW}=95.9$ ,  $Y_{0ref}=10.0$ , normalisation grey U**

$L^*_{0aN}=3.6, L^*_{0aU}=49.8, L^*_{0aW}=96.0, Y_{0aN}=0.4, Y_{0aU}=18.2, Y_{0aW}=90.0, C_{0aY}=Y_{0aW}:Y_{0aN}=225.0$   
 $L^*_{taN}=31.2, L^*_{taU}=49.8, L^*_{taW}=84.3, Y_{taN}=6.7, Y_{taU}=18.2, Y_{taW}=64.6, C_{taY}=Y_{taW}:Y_{taN}=9.6$

**Regularity index according to ISO/IEC 15775:2022, annex G for 5 and 9 steps**

$g^* = 100 [\Delta L^*_{min}] / [\Delta L^*_{max}], L^*_{CIELAB} = 116 [Y/Y_N]^{1/3} - 16$  with  $Y \geq 0.882, Y_N=100$

L* <sub>CIELAB</sub> n0.i	intended output				real output				linearized output			
	L* <sub>0a</sub>	L* <sub>0r</sub>	Y <sub>0a</sub>	Y <sub>0r</sub>	L* <sub>ta</sub>	$\Delta L^*_{ta}$	L* <sub>tr</sub>	Y <sub>ta</sub>	$(L^*_{tr})^{1/1.52}$	L* <sub>la</sub>	$\Delta L^*_{la}$	
100	96.0	1.0	90.0	1.0	84.3		1.0	64.6	1.0	84.3		
8	84.4	0.875	64.9	0.72	75.1	9.2	0.827	48.4	0.882	78.0	6.3	
75	72.9	0.75	45.0	0.498	66.2	8.9	0.659	35.5	0.759	71.5	6.5	
6	61.3	0.625	29.6	0.326	57.7	8.5	0.499	25.6	0.632	64.7	6.7	
50	49.8	0.5	18.2	0.199	49.8	7.9	0.351	18.2	0.501	57.8	7.0	
4	38.2	0.375	10.2	0.11	42.9	6.9	0.22	13.1	0.369	50.7	7.0	
25	26.7	0.25	5.0	0.051	37.3	5.6	0.115	9.7	0.24	43.9	6.8	
2	15.2	0.125	1.9	0.017	33.4	3.9	0.042	7.7	0.123	37.7	6.2	
0	3.6	0.0	0.4	0.0	31.2	2.2	0.0	6.7	0.0	31.2	6.5	

$\Delta L^*_{0a}=11.5$  (i=1,2,...,8) normalisation:  $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq30-7n

**Equal 9 step grey scaling between  $L^*_{0aN}=3.6$  and  $L^*_{0aW}=95.9$ ,  $Y_{0ref}=20.0$ , normalisation grey U**

$L^*_{0aN}=3.6, L^*_{0aU}=49.8, L^*_{0aW}=96.0, Y_{0aN}=0.4, Y_{0aU}=18.2, Y_{0aW}=90.0, C_{0aY}=Y_{0aW}:Y_{0aN}=225.0$   
 $L^*_{taN}=37.4, L^*_{taU}=49.8, L^*_{taW}=77.6, Y_{taN}=9.7, Y_{taU}=18.2, Y_{taW}=52.5, C_{taY}=Y_{taW}:Y_{taN}=5.4$

**Regularity index according to ISO/IEC 15775:2022, annex G for 5 and 9 steps**

$g^* = 100 [\Delta L^*_{min}] / [\Delta L^*_{max}], L^*_{CIELAB} = 116 [Y/Y_N]^{1/3} - 16$  with  $Y \geq 0.882, Y_N=100$

L* <sub>CIELAB</sub> n0.i	intended output				real output				linearized output			
	L* <sub>0a</sub>	L* <sub>0r</sub>	Y <sub>0a</sub>	Y <sub>0r</sub>	L* <sub>ta</sub>	$\Delta L^*_{ta}$	L* <sub>tr</sub>	Y <sub>ta</sub>	$(L^*_{tr})^{1/1.68}$	L* <sub>la</sub>	$\Delta L^*_{la}$	
100	96.0	1.0	90.0	1.0	77.6		1.0	52.5	1.0	77.6		
8	84.4	0.875	64.9	0.72	69.8	7.7	0.808	40.5	0.881	72.8	4.8	
75	72.9	0.75	45.0	0.498	62.5	7.3	0.626	31.0	0.757	67.8	5.0	
6	61.3	0.625	29.6	0.326	55.8	6.7	0.458	23.7	0.629	62.6	5.2	
50	49.8	0.5	18.2	0.199	49.8	6.0	0.309	18.2	0.498	57.4	5.2	
4	38.2	0.375	10.2	0.11	44.8	5.0	0.186	14.4	0.368	52.2	5.2	
25	26.7	0.25	5.0	0.051	41.1	3.7	0.093	11.9	0.244	47.2	5.0	
2	15.2	0.125	1.9	0.017	38.7	2.4	0.032	10.5	0.131	42.6	4.5	
0	3.6	0.0	0.4	0.0	37.4	1.3	0.0	9.7	0.0	37.4	5.2	

$\Delta L^*_{0a}=11.5$  (i=1,2,...,8) normalisation:  $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq31-3n

**Equal 9 step grey scaling between  $L^*_{0aN}=3.6$  and  $L^*_{0aW}=95.9$ ,  $Y_{0ref}=90.0$ , normalisation grey U**

$L^*_{0aN}=3.6, L^*_{0aU}=49.8, L^*_{0aW}=96.0, Y_{0aN}=0.4, Y_{0aU}=18.2, Y_{0aW}=90.0, C_{0aY}=Y_{0aW}:Y_{0aN}=225.0$   
 $L^*_{taN}=46.0, L^*_{taU}=49.8, L^*_{taW}=62.0, Y_{taN}=15.2, Y_{taU}=18.2, Y_{taW}=30.3, C_{taY}=Y_{taW}:Y_{taN}=2.0$

**Regularity index according to ISO/IEC 15775:2022, annex G for 5 and 9 steps**

$g^* = 100 [\Delta L^*_{min}] / [\Delta L^*_{max}], L^*_{CIELAB} = 116 [Y/Y_N]^{1/3} - 16$  with  $Y \geq 0.882, Y_N=100$

L* <sub>CIELAB</sub> n0.i	intended output				real output				linearized output			
	L* <sub>0a</sub>	L* <sub>0r</sub>	Y <sub>0a</sub>	Y <sub>0r</sub>	L* <sub>ta</sub>	$\Delta L^*_{ta}$	L* <sub>tr</sub>	Y <sub>ta</sub>	$(L^*_{tr})^{1/2.0}$	L* <sub>la</sub>	$\Delta L^*_{la}$	
100	96.0	1.0	90.0	1.0	62.0		1.0	30.3	1.0	62.0		
8	84.4	0.875	64.9	0.72	58.2	3.8	0.762	26.1	0.873	59.9	2.0	
75	72.9	0.75	45.0	0.498	54.8	3.3	0.554	22.8	0.745	57.9	2.0	
6	61.3	0.625	29.6	0.326	52.0	2.8	0.379	20.2	0.616	55.8	2.0	
50	49.8	0.5	18.2	0.199	49.8	2.2	0.24	18.2	0.49	53.8	2.0	
4	38.2	0.375	10.2	0.11	48.1	1.7	0.136	16.9	0.369	51.9	1.9	
25	26.7	0.25	5.0	0.051	47.0	1.1	0.064	16.0	0.254	50.0	1.7	
2	15.2	0.125	1.9	0.017	46.3	0.7	0.022	15.5	0.148	48.3	1.7	
0	3.6	0.0	0.4	0.0	46.0	0.3	0.0	15.2	0.0	46.0	2.4	

$\Delta L^*_{0a}=11.5$  (i=1,2,...,8) normalisation:  $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq31-7n

Test chart eqq3; Equal 9 step grey scaling for four display reflections  $Y_{ref} = 2.5, 10, 20, 90$ , and black  $L^*_{N,CIELAB}=3.61, Y_N=0.4$  and white  $L^*_{W,CIELAB}=95.99, Y_W=90$ , normalisation: grey U

see similar files of the whole serie: <http://farbe.li.tu-berlin.de/eeq3.htm>  
 technical information: <http://farbe.li.tu-berlin.de> or <http://color.li.tu-berlin.de>

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 application for evaluation and measurement of display or print output  
 TUB material: code=rh4ta