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Equal 9 step grey scaling between $L^*_{0aN}=22.3$ and $L^*_{0aW}=95.9$, $Y_{0ref}=2.5$, normalisation grey U

$L^*_{0aN}=22.3$, $L^*_{0aU}=59.1$, $L^*_{0aW}=96.0$, $Y_{0aN}=3.6$, $Y_{0aU}=27.2$, $Y_{0aW}=90.0$, $C_{0aY}=Y_{0aW}:Y_{0aN}=25.0$
 $L^*_{taN}=28.3$, $L^*_{taU}=59.1$, $L^*_{taW}=93.7$, $Y_{taN}=5.6$, $Y_{taU}=27.2$, $Y_{taW}=84.7$, $C_{taY}=Y_{taW}:Y_{taN}=15.2$

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^*_{CIELAB} n0.i	intended output				real output				linearized output			
	L^*_{0a}	L^*_{0r}	Y_{0a}	Y_{0r}	L^*_{ta}	ΔL^*_{ta}	L^*_{tr}	Y_{ta}	$(L^*_{tr})^{1/1.09}$	L^*_{la}	ΔL^*_{la}	
9	96.0	1.0	90.0	1.0	93.7	8.8	1.0	84.7	1.0	93.7	8.1	
8	86.8	0.875	69.6	0.763	85.0	8.7	0.866	66.0	0.876	85.6	8.1	
7	77.6	0.75	52.5	0.566	76.3	8.6	0.733	50.4	0.751	77.5	8.2	
6	68.4	0.625	38.5	0.403	67.7	8.5	0.601	37.5	0.626	69.3	8.2	
5	59.1	0.5	27.2	0.273	59.1	8.3	0.471	27.2	0.5	61.0	8.2	
4	49.9	0.375	18.4	0.171	50.8	8.0	0.343	19.1	0.374	52.8	8.2	
3	40.7	0.25	11.7	0.094	42.8	7.6	0.22	13.0	0.248	44.6	8.1	
2	31.5	0.125	6.9	0.038	35.2	6.8	0.104	8.6	0.125	36.5	8.1	
1	22.3	0.0	3.6	0.0	28.3		0.0	5.6	0.0	28.3	8.2	

$\Delta L^*_{0a}=9.2$ (i=1,2,...,8) normalisation: $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq10-3n

Equal 9 step grey scaling between $L^*_{0aN}=22.3$ and $L^*_{0aW}=95.9$, $Y_{0ref}=20.0$, normalisation grey U

$L^*_{0aN}=22.3$, $L^*_{0aU}=59.1$, $L^*_{0aW}=96.0$, $Y_{0aN}=3.6$, $Y_{0aU}=27.2$, $Y_{0aW}=90.0$, $C_{0aY}=Y_{0aW}:Y_{0aN}=25.0$
 $L^*_{taN}=43.6$, $L^*_{taU}=59.1$, $L^*_{taW}=83.6$, $Y_{taN}=13.6$, $Y_{taU}=27.2$, $Y_{taW}=63.4$, $C_{taY}=Y_{taW}:Y_{taN}=4.7$

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^*_{CIELAB} n0.i	intended output				real output				linearized output			
	L^*_{0a}	L^*_{0r}	Y_{0a}	Y_{0r}	L^*_{ta}	ΔL^*_{ta}	L^*_{tr}	Y_{ta}	$(L^*_{tr})^{1/1.35}$	L^*_{la}	ΔL^*_{la}	
9	96.0	1.0	90.0	1.0	83.6	6.6	1.0	63.4	1.0	83.6	5.0	
8	86.8	0.875	69.6	0.763	77.0	6.3	0.835	51.6	0.875	78.6	5.0	
7	77.6	0.75	52.5	0.566	70.7	6.0	0.677	41.8	0.749	73.6	5.1	
6	68.4	0.625	38.5	0.403	64.7	5.6	0.527	33.7	0.622	68.5	5.0	
5	59.1	0.5	27.2	0.273	59.1	5.0	0.387	27.2	0.496	63.5	5.0	
4	49.9	0.375	18.4	0.171	54.1	4.3	0.262	22.1	0.372	58.5	4.8	
3	40.7	0.25	11.7	0.094	49.8	3.5	0.154	18.3	0.251	53.7	4.7	
2	31.5	0.125	6.9	0.038	46.3	2.6	0.066	15.5	0.134	49.0	5.3	
1	22.3	0.0	3.6	0.0	43.6		0.0	13.6	0.0	43.6		

$\Delta L^*_{0a}=9.2$ (i=1,2,...,8) normalisation: $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq11-3n

Equal 9 step grey scaling between $L^*_{0aN}=22.3$ and $L^*_{0aW}=95.9$, $Y_{0ref}=10.0$, normalisation grey U

$L^*_{0aN}=22.3$, $L^*_{0aU}=59.1$, $L^*_{0aW}=96.0$, $Y_{0aN}=3.6$, $Y_{0aU}=27.2$, $Y_{0aW}=90.0$, $C_{0aY}=Y_{0aW}:Y_{0aN}=25.0$
 $L^*_{taN}=37.7$, $L^*_{taU}=59.1$, $L^*_{taW}=88.5$, $Y_{taN}=9.9$, $Y_{taU}=27.2$, $Y_{taW}=73.1$, $C_{taY}=Y_{taW}:Y_{taN}=7.3$

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^*_{CIELAB} n0.i	intended output				real output				linearized output			
	L^*_{0a}	L^*_{0r}	Y_{0a}	Y_{0r}	L^*_{ta}	ΔL^*_{ta}	L^*_{tr}	Y_{ta}	$(L^*_{tr})^{1/1.24}$	L^*_{la}	ΔL^*_{la}	
9	96.0	1.0	90.0	1.0	88.5	7.7	1.0	73.1	1.0	88.5	6.3	
8	86.8	0.875	69.6	0.763	80.8	7.5	0.849	58.2	0.876	82.2	6.3	
7	77.6	0.75	52.5	0.566	73.3	7.2	0.701	45.7	0.751	75.9	6.4	
6	68.4	0.625	38.5	0.403	66.1	6.9	0.558	35.4	0.625	69.5	6.4	
5	59.1	0.5	27.2	0.273	59.1	6.5	0.422	27.2	0.498	63.0	6.4	
4	49.9	0.375	18.4	0.171	52.7	5.9	0.294	20.7	0.372	56.6	6.3	
3	40.7	0.25	11.7	0.094	46.8	5.0	0.178	15.9	0.249	50.4	6.1	
2	31.5	0.125	6.9	0.038	41.7	4.0	0.079	12.3	0.129	44.3	6.5	
1	22.3	0.0	3.6	0.0	37.7		0.0	9.9	0.0	37.7		

$\Delta L^*_{0a}=9.2$ (i=1,2,...,8) normalisation: $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq10-7n

Equal 9 step grey scaling between $L^*_{0aN}=22.3$ and $L^*_{0aW}=95.9$, $Y_{0ref}=90.0$, normalisation grey U

$L^*_{0aN}=22.3$, $L^*_{0aU}=59.1$, $L^*_{0aW}=96.0$, $Y_{0aN}=3.6$, $Y_{0aU}=27.2$, $Y_{0aW}=90.0$, $C_{0aY}=Y_{0aW}:Y_{0aN}=25.0$
 $L^*_{taN}=53.7$, $L^*_{taU}=59.1$, $L^*_{taW}=70.7$, $Y_{taN}=21.7$, $Y_{taU}=27.2$, $Y_{taW}=41.8$, $C_{taY}=Y_{taW}:Y_{taN}=1.9$

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^*_{CIELAB} n0.i	intended output				real output				linearized output			
	L^*_{0a}	L^*_{0r}	Y_{0a}	Y_{0r}	L^*_{ta}	ΔL^*_{ta}	L^*_{tr}	Y_{ta}	$(L^*_{tr})^{1/1.6}$	L^*_{la}	ΔL^*_{la}	
9	96.0	1.0	90.0	1.0	70.7	3.4	1.0	41.8	1.0	70.7	2.2	
8	86.8	0.875	69.6	0.763	67.3	3.1	0.799	37.0	0.869	68.5	2.2	
7	77.6	0.75	52.5	0.566	64.2	2.7	0.617	33.1	0.74	66.3	2.1	
6	68.4	0.625	38.5	0.403	61.5	2.3	0.457	29.8	0.613	64.1	2.1	
5	59.1	0.5	27.2	0.273	59.1	1.9	0.319	27.2	0.491	62.1	2.0	
4	49.9	0.375	18.4	0.171	57.2	1.5	0.205	25.1	0.372	60.0	1.9	
3	40.7	0.25	11.7	0.094	55.7	1.1	0.115	23.6	0.259	58.1	1.9	
2	31.5	0.125	6.9	0.038	54.5	0.8	0.047	22.5	0.149	56.3	2.5	
1	22.3	0.0	3.6	0.0	53.7		0.0	21.7	0.0	53.7		

$\Delta L^*_{0a}=9.2$ (i=1,2,...,8) normalisation: $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$

eeq11-7n

Test chart eq1; Equal 9 step grey scaling for four display reflections $Y_{ref} = 2.5, 10, 20, 90$, and black $L^*_{N,CIELAB}=22.3$, $Y_N=3.6$ and white $L^*_{W,CIELAB}=95.99$, $Y_W=90$, normalisation: grey U

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 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