

# Equal 9 step grey scaling between $L^*_{0aN}=31$ & $L^*_{0aW}=81.8$ , $Y_{0ref}=2$ , normalisation white W

$L^*_{0aN}=31.0$ ,  $L^*_{0aU}=56.4$ ,  $L^*_{0aW}=81.8$ ,  $Y_{0aN}=6.7$ ,  $Y_{0aU}=24.3$ ,  $Y_{0aW}=60.0$ ,  $C_{0aY}=Y_{0aW}:Y_{0aN}=9.0$

$L^*_{taN}=34.8$ ,  $L^*_{taU}=57.6$ ,  $L^*_{taW}=81.8$ ,  $Y_{taN}=8.4$ ,  $Y_{taU}=25.5$ ,  $Y_{taW}=60.0$ ,  $C_{taY}=Y_{taW}:Y_{taN}=7.1$

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

$g^* = 100 [\Delta L^*_{min}] / [\Delta L^*_{max}]$ ,  $L^*_{CIELAB,W} = 116 [Y/Y_n]^{1/3} - 16$  with  $Y \geq 0,882$ ,  $Y_n=100$

$g^*_5=99$ ,  $g^*_9=99$

$g^*_5=90$ ,  $g^*_9=88$

$g^*_5=94$ ,  $g^*_9=91$

$L^*_{CIELAB,W}$  intended output real output linearized output

n0. i	intended output				real output					linearized output	
	$L^*_{0a}$	$L^*_{0r}$	$Y_{0a}$	$Y_{0r}$	$L^*_{ta}$	$\Delta L^*_{ta}$	$L^*_{tr}$	$Y_{ta}$	$(L^*_{tr})^{1/1.07}$	$L^*_{la}$	$\Delta L^*_{la}$
9	81.8	1.0	60.0	1.0	81.8		1.0	60.0	1.0	81.8	
8	75.5	0.875	49.1	0.795	75.7	6.1	0.87	49.4	0.878	76.1	5.7
7	69.1	0.75	39.5	0.616	69.6	6.1	0.74	40.2	0.755	70.3	5.8
6	62.8	0.625	31.3	0.462	63.6	6.0	0.611	32.3	0.632	64.5	5.8
5	56.4	0.5	24.3	0.332	57.6	6.0	0.484	25.5	0.509	58.7	5.8
4	50.1	0.375	18.5	0.222	51.6	5.9	0.358	19.8	0.384	52.9	5.9
3	43.7	0.25	13.7	0.131	45.8	5.8	0.235	15.1	0.259	47.0	5.9
2	37.4	0.125	9.7	0.058	40.2	5.6	0.115	11.4	0.133	41.1	5.9
1	31.0	0.0	6.7	0.0	34.8	5.4	0.0	8.4	0.0	34.8	6.3

$\Delta L^*_{0a}=6.3$

(i=1,2,...,8)

normalisation:  $Y_{taiW}=Y_{0aW} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aW}+Y_{0ref}}$