

# Equal 9 step grey scaling between $L^*_{0aN}=8.1$ and $L^*_{0aW}=95.9$ , $Y_{0ref}=3.6$ , normalisation grey U

$L^*_{0aN}=8.1$ ,  $L^*_{0aU}=52.1$ ,  $L^*_{0aW}=96.0$ ,  $Y_{0aN}=0.9$ ,  $Y_{0aU}=20.2$ ,  $Y_{0aW}=90.0$ ,  $C_{0aY}=Y_{0aW}:Y_{0aN}=99.9$

$L^*_{taN}=23.1$ ,  $L^*_{taU}=52.1$ ,  $L^*_{taW}=91.4$ ,  $Y_{taN}=3.8$ ,  $Y_{taU}=20.2$ ,  $Y_{taW}=79.4$ ,  $C_{taY}=Y_{taW}:Y_{taN}=20.8$

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  $Y \geq 0.882$ ,  $Y_n=100$

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

$g^*_5=58$ ,  $g^*_9=47$

$g^*_5=93$ ,  $g^*_9=91$

$L^*_{CIELAB}$	n0. i	intended output				real output					linearized output	
		$L^*_{0a}$	$L^*_{0r}$	$Y_{0a}$	$Y_{0r}$	$L^*_{ta}$	$\Delta L^*_{ta}$	$L^*_{tr}$	$Y_{ta}$	$(L^*_{tr})^{1/1.25}$	$L^*_{la}$	$\Delta L^*_{la}$
100	9	96.0	1.0	90.0	1.0	91.4		1.0	79.4	1.0	91.4	
	8	85.0	0.875	66.0	0.731	81.3	10.1	0.852	59.1	0.88	83.2	8.2
75	7	74.0	0.75	46.7	0.515	71.4	10.0	0.707	42.7	0.757	74.8	8.4
	6	63.0	0.625	31.6	0.345	61.6	9.8	0.563	29.9	0.631	66.2	8.6
	5	52.1	0.5	20.2	0.217	52.1	9.5	0.424	20.2	0.502	57.4	8.8
50	4	41.1	0.375	11.9	0.124	43.0	9.0	0.292	13.2	0.372	48.5	8.9
	3	30.1	0.25	6.3	0.06	34.8	8.2	0.171	8.4	0.243	39.6	8.9
25	2	19.1	0.125	2.8	0.021	27.9	6.9	0.07	5.4	0.119	31.2	8.5
	1	8.1	0.0	0.9	0.0	23.1	4.8	0.0	3.8	0.0	23.1	8.1

$\Delta L^*_{0a}=11.0$  (i=1,2,...,8)

normalisation:  $Y_{taiU}=Y_{0aU} \frac{Y_{0ai}+Y_{0ref}}{Y_{0aU}+Y_{0ref}}$