

$\log(L^*/L_{\text{u}}^*)$
CIELAB

relative lightness L^*/L_{u}^*
normalized to the
background lightness L_{u}^*

2

$$L^*_{\text{CIELAB}} = 116 \left(Y/Y_{\text{n}} \right)^{1/3} - 16 \quad (Y_{\text{n}}=100, 0,89 \leq Y) \quad [2a]$$

$$L^*_{\text{CIELAB}} = 65,4 \left(Y/Y_{\text{u}} \right)^{1/3} - 16 \quad (Y_{\text{u}}=18, 0,89 \leq Y) \quad [2b]$$

1

$$L^*_{\text{CIELAB},r}=1, m_{\text{u}}=1,02$$

$$L^*_{\text{CIELAB},u}=49, Y_{\text{u}}=18$$

$$0,1 \quad 1 \quad 10 \quad 100 \quad 1000 \quad Y$$

application
range

white

black

cea20-1a

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CIELAB

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$$L^*_{\text{CIELAB}} = 116 \left(Y/Y_{\text{n}} \right)^{1/3} - 16 \quad (Y_{\text{n}}=100, 0,89 \leq Y) \quad [2a]$$

$$L^*_{\text{CIELAB}} = 65,4 \left(Y/Y_{\text{u}} \right)^{1/3} - 16 \quad (Y_{\text{u}}=18, 0,89 \leq Y) \quad [2b]$$

regularity index: $g^*_5=99, g^*_9=99,$

[ISO 15775]

intended output:

equally spaced 9 steps in CIELAB
for contrast $C_Y=25:1$

$$L^*_{\text{CIELAB},r}=1, m_{\text{u}}=1,02$$

$$L^*_{\text{CIELAB},u}=49, Y_{\text{u}}=18$$

$$0,1 \quad 1 \quad 10 \quad 100 \quad 1000 \quad Y$$

application
range

white

black

cea20-2a

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regularity index: $g^*_5=30, g^*_9=23,$

[ISO 15775]

1 non linearized real output:

nonequally spaced 9 steps in CIELAB
for contrast $C_Y=2:1$

1

$$L^*_{\text{CIELAB},r}=1, m_{\text{u}}=1,02$$

$$L^*_{\text{CIELAB},u}=49, Y_{\text{u}}=18$$

$$-2 \quad -1 \quad 0 \quad 1 \quad 10 \quad 100 \quad 1000 \quad Y$$

white

device white

black

device black

cea20-3a

cea20-3n

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CIELAB

relative lightness L^*/L_{u}^*
normalized to the
background lightness L_{u}^*

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$$L^*_{\text{CIELAB}} = 116 \left(Y/Y_{\text{n}} \right)^{1/3} - 16 \quad (Y_{\text{n}}=100, 0,89 \leq Y) \quad [2a]$$

$$L^*_{\text{CIELAB}} = 65,4 \left(Y/Y_{\text{u}} \right)^{1/3} - 16 \quad (Y_{\text{u}}=18, 0,89 \leq Y) \quad [2b]$$

regularity index: $g^*_5=88, g^*_9=74,$

[ISO 15775]

1 linearized real output:

equally spaced 9 steps in CIELAB
after contrast transfer $C_Y=25:1$ to $2:1$

1

$$L^*_{\text{CIELAB},r}=1, m_{\text{u}}=1,02$$

$$L^*_{\text{CIELAB},u}=49, Y_{\text{u}}=18$$

$$-2 \quad -1 \quad 0 \quad 1 \quad 10 \quad 100 \quad 1000 \quad Y$$

white

device white

black

device black

cea20-4a