

$L^*_{\text{CIELAB},r}$

relative lightness normalized to the background lightness $L^*_{\text{CIELAB},u}$

$$L^* = 116 (Y/Y_u)^{1/3} - 16, \quad Y_n=100, Y_u=18, 1 \leq Y \leq 100 \quad [1b]$$

$$L^* = k_u (Y/Y_u)^{1/3} - 16, \quad k_u=116 [Y_u/Y_n]^{1/3}=65,50 \quad [2b]$$

$$L^*/L^*_u = [(Y/Y_u)^{1/3} - 16/k_u] / [1 - 16/k_u] \quad [3b]$$

