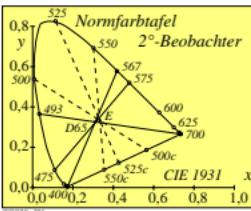


CIELAB 1976 $L^*a^*b^*$ -Farbraum Definition und Umkehrung

$$\begin{aligned} L^* &= 116 [(Y/Y_n)^{1/3} - 1] \\ a^* &= 500 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] \\ b^* &= 200 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] \\ X &= X_n [(L^* + 16) / 116 + a^*/500]^3 \\ Y &= Y_n [(L^* + 16) / 116]^3 \\ Z &= Z_n [(L^* + 16) / 116 - b^*/200]^3 \end{aligned}$$

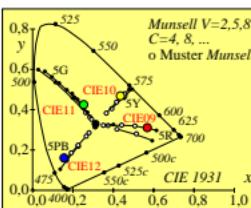
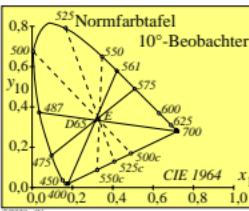
CGS20-1N



Q -Funktions-Änderung: Übergang von der Licht- zur Farb-Metrik

$$\begin{aligned} \text{Stufungsfunktion der Lichtmetrik: } Q[\mathbf{k}(x - u)] &= Q[k(\log L - \log L_0)] \\ \log L \rightarrow \log P \text{ für Farbmefitik: } Q[\log(L - \log L_0)] &= Q[k(\log(L - \log L_0) + \log P - \log L)] \\ \text{mit Sättigung: } p = \log P - \log L \text{ für Farbmefitik: } Q[\mathbf{k}(x - u + p)] &= \end{aligned}$$

CGS20-2N



CGS20-3N

$$\begin{aligned} \text{CIELAB 1976 } L^*a^*b^*\text{-Farbraum} \\ \text{Definition und Ableitung: } (x_c, y_c, z_c, y_n, z_n, 0.18) \\ L^* &= 116 [(Y/Y_n)^{1/3} - 16] \quad [Y/Y_n]^{1/3} > 24/116 \\ a^* &= 500 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] \quad Y > 0.885 \\ b^* &= 200 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] \\ dL^*/dY &= 116 [(Y/Y_n)^{-2/3} (3/Y_n)] \quad Y_n = 100 \\ da^*/dY &= 500 [(X/X_n)^{-2/3} (3/X_n) - (Y/Y_n)^{-2/3} (3/Y_n)] \\ db^*/dY &= 200 [(Y/Y_n)^{-2/3} (3/X_n) - (Z/Z_n)^{-2/3} (3/Z_n)] \\ c_a = [Y/Y_n]^{1/3} &= 0.18^{1/3} = 0.5647, \text{ ähnlich für } X, Z \\ u_a = 116c &= 65.51 \cdot 0.5647 = 28.235, u_b = 200c = 112.94 \end{aligned}$$

CGS20-7N

Siehe ähnliche Dateien:

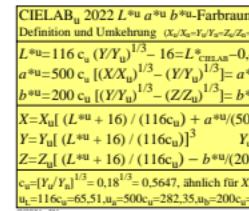
Technische Information: http://farbe.li.tu-berlin.de/CGS2/CGS2L0N1.TXT/.PS

Technische Information: http://farbe.li.tu-berlin.de oder http://color.li.tu-berlin.de

CIELAB 1976 $L^*a^*b^*$ -Farbraum und CIELAB_u 2022 $L^*a^*b^*$ -Farbraum

$$\begin{aligned} L^* &= 116 [(Y/Y_n)^{1/3} - 16] \quad [Y/Y_n]^{1/3} > 24/116 \\ a^* &= 500 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] \quad Y > 0.885 \\ b^* &= 200 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] \\ L^*_{\text{u}} &= 116 c_u [(Y/Y_n)^{1/3} - 16] = L^* - 0.49 \quad Y_n = 18 \\ a^*_{\text{u}} &= 500 c_u [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] = a^* \\ b^*_{\text{u}} &= 200 c_u [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] = b^* \\ c_u = [Y/Y_n]^{1/3} &= 0.18^{1/3} = 0.5647, \text{ ähnlich für } X, Z \\ u_a = 116c_u &= 65.51 \cdot 0.5647 = 28.235, u_b = 200c_u = 112.94 \end{aligned}$$

CGS21-1N



$$\begin{aligned} \text{CIELAB}_u 2022 L^*a^*b^*\text{-Farbraum} \\ \text{Definition und Umkehrung: } (x_c, y_c, z_c, y_n, z_n, 0.18) \\ L^*_{\text{u}} &= 116 c_u [(Y/Y_n)^{1/3} - 16] = L^*_{\text{CIELAB}} - 0.49 \\ a^*_{\text{u}} &= 500 c_u [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] = a^*_{\text{CIELAB}} \\ b^*_{\text{u}} &= 200 c_u [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] = b^*_{\text{CIELAB}} \\ X = X_{\text{u}} &= (L^* + 16) / (116c_u) + a^*_{\text{u}} / (500c_u)^3 \\ Y = Y_{\text{u}} &= (L^* + 16) / (116c_u)^3 \quad Y_n = 18 \\ Z = Z_{\text{u}} &= (L^* + 16) / (116c_u) - b^*_{\text{u}} / (200c_u)^3 \\ c_u = [Y/Y_n]^{1/3} &= 0.18^{1/3} = 0.5647, \text{ ähnlich für } X, Z \\ u_a = 116c_u &= 65.51 \cdot 0.5647 = 28.235, u_b = 200c_u = 112.94 \end{aligned}$$

CGS21-3N

$$\begin{aligned} \text{CIELAB}_u 2022 L^*a^*b^*\text{-Farbraum} \\ \text{Definition und Umkehrung: } (x_c, y_c, z_c, y_n, z_n, 0.18) \\ L^*_{\text{u}} &= 65.51 [(Y/Y_n)^{1/3} - 16] = L^*_{\text{CIELAB}} - 0.49 \\ a^*_{\text{u}} &= 284.56 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] = a^*_{\text{CIELAB}} \\ b^*_{\text{u}} &= 112.94 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] = b^*_{\text{CIELAB}} \\ X = X_{\text{u}} &= (L^* + 16) / 65.51 + a^*_{\text{u}} / 282.35^3 \\ Y = Y_{\text{u}} &= (L^* + 16) / 65.51^3 \quad Y_n = 18 \\ Z = Z_{\text{u}} &= (L^* + 16) / 65.51 - b^*_{\text{u}} / 112.94^3 \\ c_u = [Y/Y_n]^{1/3} &= 0.18^{1/3} = 0.5647, \text{ ähnlich für } X, Z \\ u_a = 116c_u &= 65.51 \cdot 0.5647 = 28.235, u_b = 200c_u = 112.94 \end{aligned}$$

CGS21-5N

$$\begin{aligned} \text{CIELAB}_u 2022 L^*a^*b^*\text{-Farbraum} \\ \text{Definition und Umkehrung: } (x_c, y_c, z_c, y_n, z_n, 0.18) \\ L^*_{\text{u}} &= 65.51 [(Y/Y_n)^{1/3} - 16] = L^*_{\text{CIELAB}} - 0.49 \\ a^*_{\text{u}} &= 284.56 [(X/X_n)^{1/3} - (Y/Y_n)^{1/3}] = a^*_{\text{CIELAB}} \\ b^*_{\text{u}} &= 113.78 [(Y/Y_n)^{1/3} - (Z/Z_n)^{1/3}] = b^*_{\text{CIELAB}} \\ X = X_{\text{u}} &= (L^* + 16) / 65.51 + a^*_{\text{u}} / 284.56^3 \\ Y = Y_{\text{u}} &= (L^* + 16) / 65.51^3 \quad Y_n = 18 \\ Z = Z_{\text{u}} &= (L^* + 16) / 65.51 - b^*_{\text{u}} / 113.78^3 \\ c_u = [Y/Y_n]^{1/3} &= 0.18^{1/3} = 0.5647, \text{ ähnlich für } X, Z \\ u_a = 116c_u &= 65.51 \cdot 0.5647 = 28.235, u_b = 200c_u = 112.94 \end{aligned}$$

CGS21-7N