TUB registration: 20220301-BET0/BET0L0NP.PDF /.PS
TUB material: code=rha4ta
application for measurement of display output

log (L*) CIELAB lightness
$\log(L^*)$ L^*
CIELAB lightness for all colours, L^*_W=100:
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$ (Y_n=100, Y > 1)
L^*_u=50, Y_u=18
$\log(L^*_u)$=1,69, m_u=0,43
BET00−1A

log (L*/L*_u) relative CIELAB lightness
L^*/L^*_u
relative normalized CIELAB data
CIELAB lightness for all colours, L^*_W=100:
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$ (Y_n=100, Y > 1)
L^*_u=50, Y_u=18
$\log[(L^*)/(L^*_u)]$=0, m_u=0,43
BET00−2A

log (L*) LABJND lightness
$\log(L^*)$ L^*
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
L^*_u=508, Y_u=18, dY_u=0,08, dY_u/Y_u=0,004
$\log(L^*_u)$=2,7, m_u=0,43
BET01−1A

log (L*/L*_u) relative LABJND lightness
L^*/L^*_u
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
$L^*/L^*_u= ln \, (A_1 + A_2 · Y) − ln \, (A_1 + A_2 · Y_u)$
A_0=1,50 A_1=0,0170 A_2=0,0058
L^*_u=508, Y_u=18, dY_u=0,08, dY_u/Y_u=0,004
$\log[(L^*)/(L^*_u)]$=0, m_u=0,43
BET01−2A

log ΔY CIELAB−tristimulus value difference
$\log(\Delta Y)$ ΔY
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$
CIELAB−tristimulus value difference
$\log(dY) = \log(3 (Y_n/116)) + (2/3) \log(Y/Y_n)$
$= \log(3(Y_n^{1/3})/116) + (2/3) \log(Y)$
Y_u=18, dY_u=0,83, dY_u/Y_u=0,0454
$\log(dY)$=0,82, m_u=0,66
BET00−3A

log(Δ Y/ΔY_u) relative CIELAB−tristimulus value difference
$\Delta Y/\Delta Y_u$
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$
relative CIELAB−tristimulus value difference
$\log(dY) = \log(3 (Y_n/116)) + (2/3) \log(Y/Y_n)$
$= \log(3(Y_n^{1/3})/116) + (2/3) \log(Y)$
Y_u=18, dY_u=0,83, dY_u/Y_u=0,0454
$\log[(dY)/(dY_u)]$=0, m_u=0,66
BET00−4A

log ΔY LABJND−tristimulus value difference
$\log(\Delta Y)$ ΔY
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
tristimulus value difference
$\log(dY) = \log[(A_1 + A_2 · Y) / A_0]$
Y_u=18, dY_u=0,08, dY_u/Y_u=0,004
$\log(dY)$=−1,09, m_u=0,86
BET01−3A

log(ΔY/ΔY_u) relative LABJND−tristimulus value difference
$\Delta Y/\Delta Y_u$
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
relative tristimulus value difference
$\log(dY/dY_u) = \log((A_1 + A_2 · Y)$
$− \log(A_1 + A_2 · Y_u)$
Y_u=18, dY_u=0,08, dY_u/Y_u=0,004
$\log[(dY)/(dY_u)]$=0, m_u=0,86
BET01−4A

log (ΔY/Y) CIELAB−tristimulus value sensitivity
$\log(C_r)$ C_r=(ΔY/Y)
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$
CIELAB−tristimulus value sensitivity
$\log[(dY/Y) = \log(3 (Y_n^{1/3})/116) − (1/3) \log Y$
$\log(dY/Y)$=−1,33, m_u=−0,33
Y_u=18, dY_u=0,83, dY_u/Y_u=0,0454
BET00−5A

log [(ΔY/Y) / (ΔY_u/Y_u)] relative CIELAB−tristi− mulus value sensitivity
C_r/C_{ru}=(ΔY/Y)/(ΔY/Y_u)
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$
relative CIELAB−tristimulus value sensitivity
$\log(dY/Y)/(dY_u/Y_u)] = \log(Y/Y_u)^{−1/3}$
$\log[(dY/Y)/(dY_u/Y_u)]$=0, m_u=−0,33
Y_u=18, dY_u=0,83, dY_u/Y_u=0,0454
BET00−6A

log (ΔY/Y) LABJND−tristimulus value sensitivity
$\log(C_r)$ C_r=(ΔY/Y)
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
LABJND−tristimulus value sensitivity
$\log(dY/Y) = \log[(A_1 + A_2 · Y) / (A_0 · Y)]$
$\log(dY/Y)$=−2,34, m_u=−0,13
Y_u=18, dY_u=0,08, dY_u/Y_u=0,004
BET01−5A

log [(ΔY/Y) / (ΔY_u/Y_u)] relative LABJND−tristi− mulus value sensitivity
C_r/C_{ru}=(ΔY/Y)/(ΔY/Y_u)
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
relative LABJND−tristimulus value sensitivity
$\log[(dY/Y)/(dY_u/Y_u)] = \log[(A_1 + A_2 · Y) / Y]$
$− \log[(A_1 + A_2 · Y_u) / Y_u]$
$\log[(dY/Y)/(dY_u/Y_u)]$=0, m_u=−0,13
Y_u=18, dY_u=0,08, dY_u/Y_u=0,004
BET01−6A

log (Y/ΔY) CIELAB−tristimulus value contrast
$\log(S_r)$ S_r=(Y/ΔY)
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$
CIELAB−tristimulus value contrast
$\log(Y/dY) = \log[(1/3) (116/Y_n)] + (1/3) \log(Y/Y_n)$
$= \log[(1/3) 116/(Y_n^{1/3})] + (1/3) \log(Y)$
L^*_u=50, Y_u=18, dY_u=0,83, Y_u/dY_u=21
$\log(Y/dY)$=1,33, m_u=0,33
BET00−7A

log [(Y/ΔY) / (Y_u/ΔY_u)] relative CIELAB−tristi− mulus value contrast
$\log(S_r)$ S_r/S_{ru}=(Y/ΔY)/(Y_u/ΔY_u)
$L^*_{CIELAB} = 116 (Y/Y_n)^{1/3} − 16$
relative CIELAB−tristimulus value contrast
$\log[(Y/ΔY)/(Y_u/ΔY_u)] = \log(Y/Y_u)^{1/3}$
L^*_u=50, Y_u=18, dY_u=0,83
L^*_u=50, Y_u=18, dY_u=0,83, Y_u/dY_u=21
$\log[(Y/dY)/(Y_u/dY_u)]$=0, m_u=0,33
BET00−8A

log (Y/ΔY) LABJND−tristimulus value contrast
$\log(S_r)$ S_r=(Y/ΔY)
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
LABJND−tristimulus value contrast
$\log(Y/dY) = \log[(A_1 + A_2 · Y) / (A_0 · Y)]$
Y_u=18, dY_u=0,08, Y_u/dY_u=222
$\log(Y/dY)$=2,34, m_u=0,13
BET01−7A

log [(Y/ΔY) / (Y_u/ΔY_u)] relative LABJND−tristi− mulus value contrast
$\log(S_r)$ S_r/S_{ru}=(Y/ΔY)/(Y_u/ΔY_u)
$L^*_{LABJND}= (A_0/A_2) \, ln \, (A_1 + A_2 · Y)$
A_0=1,50 A_1=0,0170 A_2=0,0058
relative LABJND−tristimulus value contrast
$\log[(Y/dY)/(Y_u/dY_u)] = \log[Y / (A_1 + A_2 · Y)]$
$− \log[Y_u / (A_1 + A_2 · Y_u)]$
Y_u=18, dY_u=0,08, Y_u/dY_u=222
$\log[(Y/dY)/(Y_u/dY_u)]$=0, m_u=0,13
BET01−8A

BET00−7N
BET01−7N

TUB-test chart BET0; CIELAB and LABJND color-difference formulae
Absolute and relative lightness, sensitivity and contrast; colour line element and derivation
input: *w/rgb*

application range