

$\Delta Y$  and **TUBsRGB tristimulus value difference**  
 $\Delta Y / \Delta Y_u$   **$\Delta Y$  normalized to  $\Delta Y_u$**

**text lightness**

$$L^* = s (Y/Y_n)^n - d \quad (Y_n=100, Y_u=18, s=100, n=1/\ln(10), d=0) \quad [1a]$$

$$L^* = r (Y/Y_u)^n - d \quad (r = s (Y_u/Y_n)^n = 47,48, L^*_u = r - d) \quad [1b]$$

**text relative lightness**

$$dY = [Y_n / (n s)] (Y / Y_n)^{1-n} \quad [2c]$$

**text  $\log(L^*/L^*_u)$**

$$dY_u = [Y_n / (n s)] (Y_u / Y_n)^{1-n} = 1,0934 \quad [2d]$$

**text  $\ln(L^*/L_u)$**

$$dY / dY_u = (Y / Y_u)^{1-n} \quad [2e]$$

**text  $L^*/L^*_u = e^{**x}$**

$$\log(dY / dY_u) = (1-n) \log(Y / Y_u) \quad [2f]$$