http://farbe.li.tu-berlin.de/hes4/hes4l0n1.txt /.ps; only vector graphic VG; start output
see separate images of this page: http://farbe.li.tu-berlin.de/hes4/hes4.htm

see similar files of the whole serie: http://farbe.li.tu-berlin.de/hess.htm
technical information: http://farbe.li.tu-berlin.de or http://color.li.tu-berlin.de

TUB registration: 20241201-hes4/hes4l0n1.txt /.ps
application for evaluation and measurement of display or print output
TUB material: code=rha4ta

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=300 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = C_T(\varphi)L_T^n - B_a(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$L_{Lt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_a^n]^{1/n}$ (t=black threshold) [3]

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $L_{Lt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 831 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 3,75 | 79,99 |
| 519 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 3,75 | 79,99 |
| 300 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 3,75 | 79,99 |
| 154 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 3,75 | 79,99 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 3,75 | 79,99 |
| 21 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 3,75 | 79,99 |
| 3,75 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 3,75 | 79,99 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 3,75 | 79,99 |

hes40−1a j=0, $L_r$=300, $L_{aj}$=300, φ=120’, $B_a$=34,60, $B^*_{LT}$=99,99

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=300 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = s_x(\varphi)L_T^n - d_{xa}(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$s_x(\varphi) = C_T(\varphi)$ [3] $d_{xa}(\varphi) = B_a(L_a, \varphi)$ [4] (s=scaling factor)

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $s_x(\varphi)$ | $d_{xa}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 831 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 22,96 | 34,60 |
| 519 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 22,96 | 34,60 |
| 300 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 22,96 | 34,60 |
| 154 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 22,96 | 34,60 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 22,96 | 34,60 |
| 21 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 22,96 | 34,60 |
| 3,75 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 22,96 | 34,60 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 22,96 | 34,60 |

hes40−2a j=0, $L_r$=300, $L_{aj}$=300, φ=120’, $B_a$=34,60, $B^*_{YT}$=99,99, $s_x$=22,96, $d_{xa}$=34,60

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=300 cd/m$^2$**

$B^*_{YT}(L_T, L_r, L_r, \varphi) = [C_T(\varphi)L_T^n - B_r(L_r, \varphi)]B^*_{ra}$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$L_{Yt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_r^n]^{1/n}B^*_{ra}$ (t=black threshold) [3]

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $L_{Yt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 831 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 3,75 | 79,99 |
| 519 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 3,75 | 79,99 |
| 300 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 3,75 | 79,99 |
| 154 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 3,75 | 79,99 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 3,75 | 79,99 |
| 21 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 3,75 | 79,99 |
| 3,75 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 3,75 | 79,99 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 3,75 | 79,99 |

hes40−3a j=0, $L_r$=300, $L_{aj}$=300, φ=120’, $B_r$=34,60, $B^*_{YT}$=99,99

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=300 cd/m$^2$**

$B^*_{YT}(L_T, L_r, \varphi) = s_{yra}(\varphi)L_T^n - d_{yra}(\varphi)$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$s_{yra}(\varphi)=C_T(\varphi)B^*_{ra}$ [3] $d_{yra}(\varphi)=B_r(L_r, \varphi)B^*_{ra}$ [4] (s=scaling factor)

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $s_{yra}(\varphi)$ | $d_{yra}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 831 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 22,96 | 34,60 |
| 519 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 22,96 | 34,60 |
| 300 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 22,96 | 34,60 |
| 154 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 22,96 | 34,60 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 22,96 | 34,60 |
| 21 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 22,96 | 34,60 |
| 3,75 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 22,96 | 34,60 |
| 67 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 22,96 | 34,60 |

hes40−4a j=0, $L_r$=300, $L_{aj}$=300, φ=120’, $B_r$=34,60, $B^*_{YT}$=99,99, $s_{yra}$=22,96, $d_{yra}$=34,60

hes40−3R_R

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=200 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = C_T(\varphi)L_T^n - B_a(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$L_{Lt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_a^n]^{1/n}$ (t=black threshold) [3]

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $L_{Lt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 552 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 131,98 | 2,55 | 78,36 |
| 346 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 109,99 | 2,55 | 78,36 |
| 200 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 87,99 | 2,55 | 78,36 |
| 103 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 65,99 | 2,55 | 78,36 |
| 44 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 43,99 | 2,55 | 78,36 |
| 14 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 21,99 | 2,55 | 78,36 |
| 2,55 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 0,00 | 2,55 | 78,36 |
| 44 | 120’ | 22,969 | 0,0718 | 0,2448 | 31,54 | 43,99 | 2,55 | 78,36 |

hes41−1a j=2, $L_r$=300, $L_{aj}$=200, φ=120’, $B_a$=30,71, $B^*_{LT}$=87,99

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=200 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = s_x(\varphi)L_T^n - d_{xa}(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$s_x(\varphi) = C_T(\varphi)$ [3] $d_{xa}(\varphi) = B_a(L_a, \varphi)$ [4] (s=scaling factor)

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $s_x(\varphi)$ | $d_{xa}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 552 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 131,98 | 22,96 | 30,71 |
| 346 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 109,99 | 22,96 | 30,71 |
| 200 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 87,99 | 22,96 | 30,71 |
| 103 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 65,99 | 22,96 | 30,71 |
| 44 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 43,99 | 22,96 | 30,71 |
| 14 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 21,99 | 22,96 | 30,71 |
| 2,55 | 120’ | 22,969 | 0,0718 | 0,2448 | 30,71 | 0,00 | 22,96 | 30,71 |
| 44 | 120’ | 22,969 | 0,0718 | 0,2448 | 31,54 | 43,99 | 22,96 | 30,71 |

hes41−2a j=2, $L_r$=300, $L_{aj}$=200, φ=120’, $B_a$=30,71, $B^*_{YT}$=87,99, $s_x$=22,96, $d_{xa}$=30,71

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=200 cd/m$^2$**

$B^*_{YT}(L_T, L_r, L_r, \varphi) = [C_T(\varphi)L_T^n - B_r(L_r, \varphi)]B^*_{ra}$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$L_{Yt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_r^n]^{1/n}B^*_{ra}$ (t=black threshold) [3]

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $L_{Yt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 628 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 2,90 | 78,36 |
| 393 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 2,90 | 78,36 |
| 227 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 2,90 | 78,36 |
| 117 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 2,90 | 78,36 |
| 51 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 2,90 | 78,36 |
| 16 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 2,90 | 78,36 |
| 2,55 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 2,90 | 78,36 |
| 51 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 2,90 | 78,36 |

hes41−3a j=2, $L_r$=300, $L_{aj}$=200, φ=120’, $B_r$=34,60, $B^*_{YT}$=95,57

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=200 cd/m$^2$**

$B^*_{YT}(L_T, L_r, \varphi) = s_{yra}(\varphi)L_T^n - d_{yra}(\varphi)$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$s_{yra}(\varphi)=C_T(\varphi)B^*_{ra}$ [3] $d_{yra}(\varphi)=B_r(L_r, \varphi)B^*_{ra}$ [4] (s=scaling factor)

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $s_{yra}(\varphi)$ | $d_{yra}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 628 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 26,10 | 34,90 |
| 393 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 26,10 | 34,90 |
| 227 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 26,10 | 34,90 |
| 117 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 26,10 | 34,90 |
| 51 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 26,10 | 34,90 |
| 16 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 26,10 | 34,90 |
| 2,90 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 26,10 | 34,90 |
| 51 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 26,10 | 34,90 |

hes41−4a j=2, $L_r$=300, $L_{aj}$=200, φ=120’, $B_r$=34,60, $B^*_{YT}$=95,57, $s_{yra}$=26,10, $d_{yra}$=34,90

hes40−3R_R

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=1000 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = C_T(\varphi)L_T^n - B_a(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$L_{Lt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_a^n]^{1/n}$ (t=black threshold) [3]

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $L_{Lt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 2782 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 218,98 | 11,91 | 83,94 |
| 1736 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 182,48 | 11,91 | 83,94 |
| 1000 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 145,98 | 11,91 | 83,94 |
| 513 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 109,49 | 11,91 | 83,94 |
| 221 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 72,99 | 11,91 | 83,94 |
| 70 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 36,49 | 11,91 | 83,94 |
| 11,91 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 0,00 | 11,91 | 83,94 |
| 221 | 120’ | 22,969 | 0,0718 | 0,2448 | 50,82 | 72,99 | 11,91 | 83,94 |

hes40−5a j=1, $L_r$=300, $L_{aj}$=1000, φ=120’, $B_a$=49,51, $B^*_{LT}$=145,98

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=1000 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = s_x(\varphi)L_T^n - d_{xa}(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$s_x(\varphi) = C_T(\varphi)$ [3] $d_{xa}(\varphi) = B_a(L_a, \varphi)$ [4] (s=scaling factor)

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $s_x(\varphi)$ | $d_{xa}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 2782 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 218,98 | 22,96 | 49,51 |
| 1736 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 182,48 | 22,96 | 49,51 |
| 1000 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 145,98 | 22,96 | 49,51 |
| 513 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 109,49 | 22,96 | 49,51 |
| 221 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 72,99 | 22,96 | 49,51 |
| 70 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 36,49 | 22,96 | 49,51 |
| 11,91 | 120’ | 22,969 | 0,0718 | 0,2448 | 49,51 | 0,00 | 22,96 | 49,51 |
| 221 | 120’ | 22,969 | 0,0718 | 0,2448 | 50,82 | 72,99 | 22,96 | 49,51 |

hes40−6a j=1, $L_r$=300, $L_{aj}$=1000, φ=120’, $B_a$=49,51, $B^*_{YT}$=145,98, $s_x$=22,96, $d_{xa}$=49,51

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=1000 cd/m$^2$**

$B^*_{YT}(L_T, L_r, L_r, \varphi) = [C_T(\varphi)L_T^n - B_r(L_r, \varphi)]B^*_{ra}$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$L_{Yt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_r^n]^{1/n}B^*_{ra}$ (t=black threshold) [3]

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $L_{Yt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 1906 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 8,15 | 83,94 |
| 1189 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 8,15 | 83,94 |
| 684 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 8,15 | 83,94 |
| 351 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 8,15 | 83,94 |
| 151 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 8,15 | 83,94 |
| 48 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 8,15 | 83,94 |
| 11,91 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 8,15 | 83,94 |
| 151 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 8,15 | 83,94 |

hes40−7a j=1, $L_r$=300, $L_{aj}$=1000, φ=120’, $B_r$=34,60, $B^*_{YT}$=110,21

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=1000 cd/m$^2$**

$B^*_{YT}(L_T, L_r, \varphi) = s_{yra}(\varphi)L_T^n - d_{yra}(\varphi)$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$s_{yra}(\varphi)=C_T(\varphi)B^*_{ra}$ [3] $d_{yra}(\varphi)=B_r(L_r, \varphi)B^*_{ra}$ [4] (s=scaling factor)

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $s_{yra}(\varphi)$ | $d_{yra}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 1906 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 15,73 | 33,91 |
| 1189 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 15,73 | 33,91 |
| 684 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 15,73 | 33,91 |
| 351 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 15,73 | 33,91 |
| 151 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 15,73 | 33,91 |
| 48 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 15,73 | 33,91 |
| 8,15 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 15,73 | 33,91 |
| 151 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 15,73 | 33,91 |

hes40−8a j=1, $L_r$=300, $L_{aj}$=1000, φ=120’, $B_r$=34,60, $B^*_{YT}$=110,21, $s_{yra}$=15,73, $d_{yra}$=33,91

hes40−3R_R

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=40 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = C_T(\varphi)L_T^n - B_a(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$L_{Lt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_a^n]^{1/n}$ (t=black threshold) [3]

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $L_{Lt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 109 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 79,16 | 0,56 | 70,18 |
| 68 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 65,97 | 0,56 | 70,18 |
| 39 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 52,77 | 0,56 | 70,18 |
| 20 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 39,58 | 0,56 | 70,18 |
| 9 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 26,38 | 0,56 | 70,18 |
| 3 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 13,19 | 0,56 | 70,18 |
| 0,56 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 0,00 | 0,56 | 70,18 |
| 9 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,83 | 26,38 | 0,56 | 70,18 |

hes41−5a j=3, $L_r$=300, $L_{aj}$=40, φ=120’, $B_a$=19,29, $B^*_{LT}$=52,77

**Relationship brightness $B^*_{LT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=40 cd/m$^2$**

$B^*_{LT}(L_T, L_a, \varphi) = s_x(\varphi)L_T^n - d_{xa}(L_a, \varphi)$ brightness $B^*_{LT}$ [1]
$B_a(L_a, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_a^n]$ (n=0,31) [2]
$s_x(\varphi) = C_T(\varphi)$ [3] $d_{xa}(\varphi) = B_a(L_a, \varphi)$ [4] (s=scaling factor)

| $L_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_a(L_a,\varphi)$ | $B^*_{LT}$ | $s_x(\varphi)$ | $d_{xa}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 109 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 79,16 | 22,96 | 19,29 |
| 68 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 65,97 | 22,96 | 19,29 |
| 39 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 52,77 | 22,96 | 19,29 |
| 20 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 39,58 | 22,96 | 19,29 |
| 9 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 26,38 | 22,96 | 19,29 |
| 3 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 13,19 | 22,96 | 19,29 |
| 0,56 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,29 | 0,00 | 22,96 | 19,29 |
| 9 | 120’ | 22,969 | 0,0718 | 0,2448 | 19,83 | 26,38 | 22,96 | 19,29 |

hes41−6a j=3, $L_r$=300, $L_{aj}$=40, φ=120’, $B_a$=19,29, $B^*_{YT}$=52,77, $s_x$=22,96, $d_{xa}$=19,29

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=40 cd/m$^2$**

$B^*_{YT}(L_T, L_r, L_r, \varphi) = [C_T(\varphi)L_T^n - B_r(L_r, \varphi)]B^*_{ra}$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$L_{Yt}(L_a, \varphi) = [S_0(\varphi) + S_1(\varphi)L_r^n]^{1/n}B^*_{ra}$ (t=black threshold) [3]

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $L_{Yt}$ | $L_a/L_t$ |
|---|---|---|---|---|---|---|---|---|
| 207 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 1,07 | 70,18 |
| 130 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 1,07 | 70,18 |
| 75 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 1,07 | 70,18 |
| 39 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 1,07 | 70,18 |
| 17 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 1,07 | 70,18 |
| 5 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 1,07 | 70,18 |
| 0,56 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 1,07 | 70,18 |
| 17 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 1,07 | 70,18 |

hes41−7a j=3, $L_r$=300, $L_{aj}$=40, φ=120’, $B_r$=34,60, $B^*_{YT}$=70,99

**Relationship brightness $B^*_{YT}$ and luminance $L_T$ as function of tristimulus value $Y_T$ for the adaptation luminance $L_a$=40 cd/m$^2$**

$B^*_{YT}(L_T, L_r, \varphi) = s_{yra}(\varphi)L_T^n - d_{yra}(\varphi)$ brightness $B^*_{YT}$ [1]
$B_r(L_r, \varphi) = C_T(\varphi)[S_0(\varphi) + S_1(\varphi)L_r^n]$ (n=0,31, $B^*_{ra}=B^*_{LT,r}/B^*_{LT,a}$) [2]
$s_{yra}(\varphi)=C_T(\varphi)B^*_{ra}$ [3] $d_{yra}(\varphi)=B_r(L_r, \varphi)B^*_{ra}$ [4] (s=scaling factor)

| $Y_T$ | φ | $C_T(\varphi)$ | $S_0(\varphi)$ | $S_1(\varphi)$ | $B_r(L_r,\varphi)$ | $B^*_{YT}$ | $s_{yra}(\varphi)$ | $d_{yra}(\varphi)$ |
|---|---|---|---|---|---|---|---|---|
| 207 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 149,99 | 43,51 | 36,55 |
| 130 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 124,99 | 43,51 | 36,55 |
| 75 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 99,99 | 43,51 | 36,55 |
| 39 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 74,99 | 43,51 | 36,55 |
| 17 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 49,99 | 43,51 | 36,55 |
| 5 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 24,99 | 43,51 | 36,55 |
| 1,07 | 120’ | 22,969 | 0,0718 | 0,2448 | 34,60 | 0,00 | 43,51 | 36,55 |
| 17 | 120’ | 22,969 | 0,0718 | 0,2448 | 35,53 | 49,99 | 43,51 | 36,55 |

hes41−8a j=3, $L_r$=300, $L_{aj}$=40, φ=120’, $B_r$=34,60, $B^*_{YT}$=70,99, $s_{yra}$=43,51, $d_{yra}$=36,55

hes40−3R_R

TUB-test chart hes4; HAULAB, scaling of achromatic colours in white surround of 180 degree,
*Haubner* (1980), Adaptations $L_{wa}$=300, 1000, 200 & 40cd/m$^2$; 7 test luminances for 120’