

see similar files of the whole serie: <http://farbe.li.tu-berlin.de/hes9.htm>
 technical information: <http://farbe.li.tu-berlin.de> OR <http://color.li.tu-berlin.de>

TUB registration: 20241201-hes9/hes910np.pdf / .ps
 application for evaluation and measurement of display or print output

TUB material: code=thata

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=300$ cd/m²

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

brightness B_{YT}^* [1]
 $L_T \quad \phi \quad C_T(\phi) \quad \Delta L \quad B^*/B_a \quad B_a(L_a, \phi) \quad B_{YT}^* \quad L_{LT} \quad L_a/L_T$

14.84	120°	22.969	0.260	2.99P	34.60	149.99	3.75	22.96
9.28	120°	22.969	0.188	2.49	35.53	124.99	3.75	22.96
5.35	120°	22.969	0.129	1.99D	37.21	99.99	3.75	22.96
2.76	120°	22.969	0.082	1.49	40.48	74.99	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96
0.38	120°	22.969	0.021	0.50	63.91	24.99	3.75	22.96
3.75	120°	22.969	0.073	0.00N	80.18	0.00	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96

hes90-1a j=0, L_a=300, L_{aj}=300, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=300$ cd/m²

brightness B_{YT}^* [1]
 $B_{YT}^*(L_T, L_a, \phi) = s_{Yra}(\phi) L_T^n - d_{Yra}(\phi)$ [1]
 $B_a(L_a, \phi) = C_T(\phi) [S_0(\phi) + S_1(\phi) L_a^n]$ (n=0,31) [2]
 $s_{Yra}(\phi) = C_T(\phi)$ [3] $d_{Yra}(\phi) = B_a(L_a, \phi)$ [4] (=s-scaling factor)

brightness B_{YT}^* [1]
 $L_T \quad \phi \quad C_T(\phi) \quad \Delta L \quad B^*/B_a \quad B_a(L_a, \phi) \quad B_{YT}^* \quad s_{Yra}(\phi) \quad d_{Yra}(\phi)$

14.84	120°	22.969	0.260	2.99P	34.60	149.99	3.75	22.96
9.28	120°	22.969	0.188	2.49	35.53	124.99	3.75	22.96
5.35	120°	22.969	0.129	1.99D	37.21	99.99	3.75	22.96
2.76	120°	22.969	0.082	1.49	40.48	74.99	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96
0.38	120°	22.969	0.021	0.50	63.91	24.99	3.75	22.96
3.75	120°	22.969	0.073	0.00N	80.18	0.00	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96

hes90-2a j=2, L_a=300, L_{aj}=300, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=200$ cd/m²

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

brightness B_{YT}^* [1]
 $L_T \quad \phi \quad C_T(\phi) \quad \Delta L \quad B^*/B_a \quad B_a(L_a, \phi) \quad B_{YT}^* \quad L_{LT} \quad L_a/L_T$

10.55	120°	22.969	0.210	3.00P	30.71	131.98	2.55	22.96
6.60	120°	22.969	0.152	2.50	31.54	109.99	2.55	22.96
3.81	120°	22.969	0.104	2.00D	33.11	87.99	2.55	22.96
1.97	120°	22.969	0.066	1.50	36.07	65.99	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96
0.27	120°	22.969	0.017	0.50	57.02	21.99	2.55	22.96
2.55	120°	22.969	0.054	0.00N	71.70	0.00	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96

hes91-1a j=2, L_a=300, L_{aj}=200, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=200$ cd/m²

brightness B_{YT}^* [1]
 $B_{YT}^*(L_T, L_a, \phi) = s_{Yra}(\phi) L_T^n - d_{Yra}(\phi)$ [1]
 $B_a(L_a, \phi) = C_T(\phi) [S_0(\phi) + S_1(\phi) L_a^n]$ (n=0,31) [2]
 $s_{Yra}(\phi) = C_T(\phi)$ [3] $d_{Yra}(\phi) = B_a(L_a, \phi)$ [4] (=s-scaling factor)

brightness B_{YT}^* [1]
 $L_T \quad \phi \quad C_T(\phi) \quad \Delta L \quad B^*/B_a \quad B_a(L_a, \phi) \quad B_{YT}^* \quad s_{Yra}(\phi) \quad d_{Yra}(\phi)$

10.55	120°	22.969	0.210	3.00P	30.71	131.98	2.55	22.96
6.60	120°	22.969	0.152	2.50	31.54	109.99	2.55	22.96
3.81	120°	22.969	0.104	2.00D	33.11	87.99	2.55	22.96
1.97	120°	22.969	0.066	1.50	36.07	65.99	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96
0.27	120°	22.969	0.017	0.50	57.02	21.99	2.55	22.96
2.55	120°	22.969	0.054	0.00N	71.70	0.00	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96

hes91-2a j=2, L_a=300, L_{aj}=200, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=300$ cd/m²

brightness B_{YT}^* [1]
 $B_{YT}^*(L_T, L_r, L_r, \phi) = [C_T(\phi) L_T^n - B_r(L_r, \phi)] B_{ra}^*$ [1]
 $B_r(L_r, \phi) = C_T(\phi) [S_0(\phi) + S_1(\phi) L_r^n]$ (n=0,31, $B_{ra}^* = B_{YT}^*/B_{LT,ra}^*$) [2]
 $L_{Yr}(L_a, \phi) = [S_0(\phi) + S_1(\phi) L_r^n]^{1/n} B_{ra}^*$ (=black threshold) [3]

brightness B_{YT}^* [1]
 $Y_T \quad \phi \quad C_T(\phi) \quad \Delta Y \quad B^*/B_a \quad B_r(L_r, \phi) \quad B_{YT}^* \quad L_{Yr} \quad L_a/L_r$

14.84	120°	22.969	0.260	2.99P	34.60	149.99	3.75	22.96
9.28	120°	22.969	0.188	2.49	35.53	124.99	3.75	22.96
5.35	120°	22.969	0.129	1.99D	37.21	99.99	3.75	22.96
2.76	120°	22.969	0.082	1.49	40.48	74.99	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96
0.38	120°	22.969	0.021	0.50	63.91	24.99	3.75	22.96
3.75	120°	22.969	0.073	0.00N	80.18	0.00	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96

hes90-3a j=0, L_a=300, L_{aj}=300, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=300$ cd/m²

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

brightness B_{YT}^* [1]
 $Y_T \quad \phi \quad C_T(\phi) \quad \Delta Y \quad B^*/B_a \quad B_r(L_r, \phi) \quad B_{YT}^* \quad s_{Yra}(\phi) \quad d_{Yra}(\phi)$

14.84	120°	22.969	0.260	2.99P	34.60	149.99	3.75	22.96
9.28	120°	22.969	0.188	2.49	35.53	124.99	3.75	22.96
5.35	120°	22.969	0.129	1.99D	37.21	99.99	3.75	22.96
2.76	120°	22.969	0.082	1.49	40.48	74.99	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96
0.38	120°	22.969	0.021	0.50	63.91	24.99	3.75	22.96
3.75	120°	22.969	0.073	0.00N	80.18	0.00	3.75	22.96
1.19	120°	22.969	0.046	1.00U	53.74	49.99	3.75	22.96

hes90-4a j=0, L_a=300, L_{aj}=300, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=200$ cd/m²

brightness B_{YT}^* [1]
 $B_{YT}^*(L_T, L_r, L_r, \phi) = [C_T(\phi) L_T^n - B_r(L_r, \phi)] B_{ra}^*$ [1]
 $B_r(L_r, \phi) = C_T(\phi) [S_0(\phi) + S_1(\phi) L_r^n]$ (n=0,31, $B_{ra}^* = B_{YT}^*/B_{LT,ra}^*$) [2]
 $L_{Yr}(L_a, \phi) = [S_0(\phi) + S_1(\phi) L_r^n]^{1/n} B_{ra}^*$ (=black threshold) [3]

brightness B_{YT}^* [1]
 $Y_T \quad \phi \quad C_T(\phi) \quad \Delta Y \quad B^*/B_a \quad B_r(L_r, \phi) \quad B_{YT}^* \quad L_{Yr} \quad L_a/L_r$

10.55	120°	22.969	0.210	3.00P	30.71	131.98	2.55	22.96
6.60	120°	22.969	0.152	2.50	31.54	109.99	2.55	22.96
3.81	120°	22.969	0.104	2.00D	33.11	87.99	2.55	22.96
1.97	120°	22.969	0.066	1.50	36.07	65.99	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96
0.27	120°	22.969	0.017	0.50	57.02	21.99	2.55	22.96
2.55	120°	22.969	0.054	0.00N	71.70	0.00	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96

hes91-3a j=2, L_a=300, L_{aj}=200, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=200$ cd/m²

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

brightness B_{YT}^* [1]
 $Y_T \quad \phi \quad C_T(\phi) \quad \Delta Y \quad B^*/B_a \quad B_r(L_r, \phi) \quad B_{YT}^* \quad s_{Yra}(\phi) \quad d_{Yra}(\phi)$

10.55	120°	22.969	0.210	3.00P	30.71	131.98	2.55	22.96
6.60	120°	22.969	0.152	2.50	31.54	109.99	2.55	22.96
3.81	120°	22.969	0.104	2.00D	33.11	87.99	2.55	22.96
1.97	120°	22.969	0.066	1.50	36.07	65.99	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96
0.27	120°	22.969	0.017	0.50	57.02	21.99	2.55	22.96
2.55	120°	22.969	0.054	0.00N	71.70	0.00	2.55	22.96
0.85	120°	22.969	0.037	1.00U	47.94	43.99	2.55	22.96

hes91-4a j=2, L_a=300, L_{aj}=200, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=1000$ cd/m²

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

brightness B_{YT}^* [1]
 $L_T \quad \phi \quad C_T(\phi) \quad \Delta L \quad B^*/B_a \quad B_a(L_a, \phi) \quad B_{YT}^* \quad L_{LT} \quad L_a/L_T$

42.53	120°	22.969	0.513	2.99P	49.51	218.98	11.91	22.96
26.54	120°	22.969	0.370	2.50	50.82	182.48	11.91	22.96
15.28	120°	22.969	0.253	2.00D	52.89	145.98	11.91	22.96
7.84	120°	22.969	0.160	1.49	57.37	109.49	11.91	22.96
3.38	120°	22.969	0.089	1.00U	75.92	72.99	11.91	22.96
1.08	120°	22.969	0.041	0.50	90.28	36.49	11.91	22.96
11.91	120°	22.969	0.194	0.00N	112.66	0.00	11.91	22.96
3.38	120°	22.969	0.089	1.00U	75.92	72.99	11.91	22.96

hes90-5a j=1, L_a=300, L_{aj}=1000, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=1000$ cd/m²

brightness B_{YT}^* [1]
 $B_{YT}^*(L_T, L_a, \phi) = s_{Yra}(\phi) L_T^n - d_{Yra}(\phi)$ [1]
 $B_a(L_a, \phi) = C_T(\phi) [S_0(\phi) + S_1(\phi) L_a^n]$ (n=0,31) [2]
 $s_{Yra}(\phi) = C_T(\phi)$ [3] $d_{Yra}(\phi) = B_a(L_a, \phi)$ [4] (=s-scaling factor)

brightness B_{YT}^* [1]
 $L_T \quad \phi \quad C_T(\phi) \quad \Delta L \quad B^*/B_a \quad B_a(L_a, \phi) \quad B_{YT}^* \quad s_{Yra}(\phi) \quad d_{Yra}(\phi)$

42.53	120°	22.969	0.513	2.99P	49.51	218.98	11.91	22.96
26.54	120°	22.969	0.370	2.50	50.82	182.48	11.91	22.96
15.28	120°	22.969	0.253	2.00D	52.89	145.98	11.91	22.96
7.84	120°	22.969	0.160	1.49	57.37	109.49	11.91	22.96
3.38	120°	22.969	0.089	1.00U	75.92	72.99	11.91	22.96
1.08	120°	22.969	0.041	0.50	90.28	36.49	11.91	22.96
11.91	120°	22.969	0.194	0.00N	112.66	0.00	11.91	22.96
3.38	120°	22.969	0.089	1.00U	75.92	72.99	11.91	22.96

hes90-6a j=1, L_a=300, L_{aj}=1000, φ=120°

Relationship brightness B_{YT}^* and luminance L_T as function of tristimulus value Y_T for the adaptation luminance $L_a=40$ cd/m²

brightness B_{YT}^* [1]
 $B_{YT}^*(L_T, L_a, \phi) = C_T(\phi) L_T^n - B_a(L_a, \phi)$ [1]
 $B_a(L_a, \phi) = C_T(\phi) [S_0(\phi) + S_1(\phi) L_a^n]$ (n=0