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TUB registration: 202412101-hep4/hep4l0np.pdf / .ps  
 application for evaluation and measurement of display or print output  
 TUB material: code=thata

**Relationship brightness  $B^*_{LT}$  and luminance  $L_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=300 \text{ cd/m}^2$**

$B^*_{LT}(L_T, L_a, \phi) = C_T(\phi)L_T^n - B_0(L_a, \phi)$  brightness  $B^*_{LT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31) [2]  
 $L_{LT}(L_a, \phi) = [S_0(\phi) + S_1(\phi)L_a^n]^{1/n}$  (t=black threshold) [3]

$L_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{LT}$	$L_{LT}$	$L_a/L_T$
300 120'	22.969	0.0718	0.2448	34.60	99.99	3.75	79.99
300 100'	23.128	0.0747	0.2494	34.60	99.99	3.75	79.99
300 90'	23.415	0.1086	0.2526	35.53	99.99	3.99	75.07
300 60'	23.973	0.1313	0.2657	37.21	100.00	4.45	67.31
300 30'	26.235	0.1797	0.3188	40.48	99.99	5.42	55.33
300 20'	27.971	0.2013	0.3555	53.74	100.00	10.10	29.68
300 10'	30.747	0.2730	0.3984	63.91	99.99	14.37	20.86
67,0U 120'	22.969	0.0718	0.2448	34.60	49.99U	3.75	79.99

hep40-1a  $L_{aj}=300, L_r=300, L_{ajdr}=1.00, L_{ajdren}=1.00, 0' < \phi < 120'$

**Relationship brightness  $B^*_{LT}$  and luminance  $L_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=300 \text{ cd/m}^2$**

$B^*_{LT}(L_T, L_a, \phi) = s_x(\phi)L_T^n - d_x(L_a, \phi)$  brightness  $B^*_{LT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31) [2]  
 $s_x(\phi) = C_T(\phi)$  [3]  $d_x(L_a, \phi) = B_0(L_a, \phi)$  [4] (s=scaling factor)

$L_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{LT}$	$s_x(\phi)$	$d_x(L_a, \phi)$
300 120'	22.969	0.0718	0.2448	34.60	99.99	22.969	34.60
300 100'	23.128	0.0747	0.2494	34.60	99.99	22.969	34.60
300 90'	23.415	0.1086	0.2526	35.53	99.99	23.128	35.53
300 60'	23.973	0.1313	0.2657	37.21	100.00	23.415	37.21
300 30'	26.235	0.1797	0.3188	40.48	99.99	26.235	40.48
300 20'	27.971	0.2013	0.3555	53.74	100.00	27.971	53.74
300 10'	30.747	0.2730	0.3984	63.91	99.99	27.971	63.91
67,0U 120'	22.969	0.0718	0.2448	34.60	49.99U	22.969	34.60

hep40-2a  $L_{aj}=300, L_r=300, L_{ajdr}=1.00, L_{ajdren}=1.00, 0' < \phi < 120'$

**Relationship brightness  $B^*_{LT}$  and luminance  $L_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=200 \text{ cd/m}^2$**

$B^*_{LT}(L_T, L_a, \phi) = C_T(\phi)L_T^n - B_0(L_a, \phi)$  brightness  $B^*_{LT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31) [2]  
 $L_{LT}(L_a, \phi) = [S_0(\phi) + S_1(\phi)L_a^n]^{1/n}$  (t=black threshold) [3]

$L_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{LT}$	$L_{LT}$	$L_a/L_T$
200 120'	22.969	0.0718	0.2448	30.71	87.99	2.55	78.36
200 100'	23.128	0.0747	0.2494	31.54	87.98	2.72	73.51
200 90'	23.415	0.1086	0.2526	33.11	87.89	3.05	65.36
200 60'	23.973	0.1313	0.2657	36.07	87.81	3.73	53.51
200 30'	26.235	0.1797	0.3188	47.94	87.63	6.99	28.58
200 20'	27.971	0.2013	0.3555	57.02	87.52	9.95	20.09
200 10'	30.747	0.2730	0.3984	71.70	87.19	15.35	13.02
44,9U 120'	22.969	0.0718	0.2448	30.71	43.99U	2.55	78.36

hep41-1a  $L_{aj}=200, L_r=300, L_{ajdr}=0.66, L_{ajdren}=0.88, 0' < \phi < 120'$

**Relationship brightness  $B^*_{LT}$  and luminance  $L_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=200 \text{ cd/m}^2$**

$B^*_{LT}(L_T, L_a, \phi) = s_x(\phi)L_T^n - d_x(L_a, \phi)$  brightness  $B^*_{LT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31) [2]  
 $s_x(\phi) = C_T(\phi)$  [3]  $d_x(L_a, \phi) = B_0(L_a, \phi)$  [4] (s=scaling factor)

$L_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{LT}$	$s_x(\phi)$	$d_x(L_a, \phi)$
200 120'	22.969	0.0718	0.2448	30.71	87.99	22.969	30.71
200 100'	23.128	0.0747	0.2494	31.54	87.98	23.128	31.54
200 90'	23.415	0.1086	0.2526	33.11	87.89	23.415	33.11
200 60'	23.973	0.1313	0.2657	36.07	87.81	23.973	36.07
200 30'	26.235	0.1797	0.3188	47.94	87.63	26.235	47.94
200 20'	27.971	0.2013	0.3555	57.02	87.52	27.971	57.02
200 10'	30.747	0.2730	0.3984	71.70	87.19	30.747	71.70
44,9U 120'	22.969	0.0718	0.2448	30.71	43.99U	22.969	30.71

hep41-2a  $L_{aj}=200, L_r=300, L_{ajdr}=0.66, L_{ajdren}=0.88, 0' < \phi < 120'$

**Relationship brightness  $B^*_{YT}$  and tristimulus value  $Y_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=300 \text{ cd/m}^2$**

$B^*_{YT}(L_T, L_a, \phi) = [C_T(\phi)L_T^n - B_0(L_a, \phi)]L_{ra}^n$  brightness  $B^*_{YT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31,  $L_{ra}^n=(L_{300}/L_a)^n$ ) [2]  
 $L_{YT}(L_a, \phi) = [S_0(\phi) + S_1(\phi)L_a^n]^{1/n} L_{ra}^n$  (t=black threshold)

$Y_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{YT}$	$L_{YT}$	$L_a/L_T$
300 120'	22.969	0.0718	0.2448	34.60	99.99	3.75	79.99
300 100'	23.128	0.0747	0.2494	34.60	99.99	3.75	79.99
300 90'	23.415	0.1086	0.2526	35.53	99.99	3.99	75.07
300 60'	23.973	0.1313	0.2657	37.21	100.00	4.45	67.31
300 30'	26.235	0.1797	0.3188	40.48	99.99	5.42	55.33
300 20'	27.971	0.2013	0.3555	53.74	100.00	10.10	29.68
300 10'	30.747	0.2730	0.3984	63.91	99.99	14.37	20.86
53,1U 120'	22.969	0.0718	0.2448	34.60	50,00U	3.75	79.99

hep40-3a  $L_{aj}=300, L_r=300, L_{ajdr}=1.00, L_{ajdren}=1.00, 0' < \phi < 120'$   
 hep40-3R R

**Relationship brightness  $B^*_{YT}$  and tristimulus value  $Y_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=300 \text{ cd/m}^2$**

$B^*_{YT}(L_T, L_a, \phi) = s_x(L_a, \phi)L_T^n - d_y(L_a, \phi)$  brightness  $B^*_{YT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31,  $L_{ra}^n=(L_{300}/L_a)^n$ ) [2]  
 $s_y(\phi) = C_T(\phi)L_{ra}^n$  [3]  $d_y(L_a, \phi) = B_0(L_a, \phi)L_{ra}^n$  [4] (s=scaling factor)

$Y_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{YT}$	$s_y(L_a, \phi)$	$d_y(L_a, \phi)$
300 120'	22.969	0.0718	0.2448	34.60	99.99	22.969	34.60
300 100'	23.128	0.0747	0.2494	34.60	99.99	22.969	34.60
300 90'	23.415	0.1086	0.2526	35.53	99.99	23.128	35.53
300 60'	23.973	0.1313	0.2657	37.21	100.00	23.415	37.21
300 30'	26.235	0.1797	0.3188	40.48	99.99	26.235	40.48
300 20'	27.971	0.2013	0.3555	53.74	100.00	27.971	53.74
300 10'	30.747	0.2730	0.3984	63.91	99.99	27.971	63.91
23,8U 120'	22.969	0.0718	0.2448	34.60	50,00U	22.969	34.60

hep40-4a  $L_{aj}=300, L_r=300, L_{ajdr}=1.00, L_{ajdren}=1.00, 0' < \phi < 120'$

**Relationship brightness  $B^*_{YT}$  and tristimulus value  $Y_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=200 \text{ cd/m}^2$**

$B^*_{YT}(L_T, L_a, \phi) = [C_T(\phi)L_T^n - B_0(L_a, \phi)]L_{ra}^n$  brightness  $B^*_{YT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31,  $L_{ra}^n=(L_{300}/L_a)^n$ ) [2]  
 $L_{YT}(L_a, \phi) = [S_0(\phi) + S_1(\phi)L_a^n]^{1/n} L_{ra}^n$  (t=black threshold)

$Y_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{YT}$	$L_{YT}$	$L_a/L_T$
200 120'	22.969	0.0718	0.2448	30.71	99.77	2.89	78.36
200 100'	23.128	0.0747	0.2494	31.54	99.76	3.08	73.51
200 90'	23.415	0.1086	0.2526	33.11	99.66	3.46	65.36
200 60'	23.973	0.1313	0.2657	36.07	99.57	4.23	53.51
200 30'	26.235	0.1797	0.3188	47.94	99.36	7.93	28.58
200 20'	27.971	0.2013	0.3555	57.02	99.24	11.28	20.09
200 10'	30.747	0.2730	0.3984	71.70	98.87	17.41	13.02
45,0U 120'	22.969	0.0718	0.2448	30.71	50,00U	2.89	78.36

hep41-3a  $L_{aj}=200, L_r=300, L_{ajdr}=0.66, L_{ajdren}=0.88, 0' < \phi < 120'$   
 hep41-3R R

**Relationship brightness  $B^*_{YT}$  and tristimulus value  $Y_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=200 \text{ cd/m}^2$**

$B^*_{YT}(L_T, L_a, \phi) = s_x(L_a, \phi)L_T^n - d_y(L_a, \phi)$  brightness  $B^*_{YT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31,  $L_{ra}^n=(L_{300}/L_a)^n$ ) [2]  
 $s_y(\phi) = C_T(\phi)L_{ra}^n$  [3]  $d_y(L_a, \phi) = B_0(L_a, \phi)L_{ra}^n$  [4] (s=scaling factor)

$Y_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{YT}$	$s_y(L_a, \phi)$	$d_y(L_a, \phi)$
200 120'	22.969	0.0718	0.2448	30.71	99.77	22.969	30.71
200 100'	23.128	0.0747	0.2494	31.54	99.76	23.128	31.54
200 90'	23.415	0.1086	0.2526	33.11	99.66	23.415	33.11
200 60'	23.973	0.1313	0.2657	36.07	99.57	23.973	36.07
200 30'	26.235	0.1797	0.3188	47.94	99.36	26.235	47.94
200 20'	27.971	0.2013	0.3555	57.02	99.24	27.971	57.02
200 10'	30.747	0.2730	0.3984	71.70	98.87	30.747	71.70
19,2U 120'	22.969	0.0718	0.2448	30.71	50,00U	2.89	78.36

hep41-4a  $L_{aj}=200, L_r=300, L_{ajdr}=0.66, L_{ajdren}=0.88, 0' < \phi < 120'$

**Relationship brightness  $B^*_{LT}$  and luminance  $L_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=1000 \text{ cd/m}^2$**

$B^*_{LT}(L_T, L_a, \phi) = C_T(\phi)L_T^n - B_0(L_a, \phi)$  brightness  $B^*_{LT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31) [2]  
 $L_{LT}(L_a, \phi) = [S_0(\phi) + S_1(\phi)L_a^n]^{1/n}$  (t=black threshold) [3]

$L_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{LT}$	$L_{LT}$	$L_a/L_T$
1000 120'	22.969	0.0718	0.2448	49.51	145.98	11.91	83.94
1000 100'	23.128	0.0747	0.2494	50.82	146.02	12.68	78.86
1000 90'	23.415	0.1086	0.2526	52.89	146.39	13.85	72.15
1000 60'	23.973	0.1313	0.2657	57.37	146.66	16.69	59.88
1000 30'	26.235	0.1797	0.3188	75.92	147.37	30.80	32.46
1000 20'	27.971	0.2013	0.3555	90.28	147.78	43.81	22.82
1000 10'	30.747	0.2730	0.3984	112.66	149.03	65.96	15.16
221,4U120'	22.969	0.0718	0.2448	49.51	72.99U	11.91	83.94

hep40-5a  $L_{aj}=1000, L_r=300, L_{ajdr}=3.33, L_{ajdren}=1.45, 0' < \phi < 120'$

**Relationship brightness  $B^*_{LT}$  and luminance  $L_T$  as function of viewing angle  $\phi$  for test equal adaptation luminance  $L_a=1000 \text{ cd/m}^2$**

$B^*_{LT}(L_T, L_a, \phi) = s_x(\phi)L_T^n - d_x(L_a, \phi)$  brightness  $B^*_{LT}$  [1]  
 $B_0(L_a, \phi) = C_T(\phi)[S_0(\phi) + S_1(\phi)L_a^n]$  (n=0,31) [2]  
 $s_x(\phi) = C_T(\phi)$  [3]  $d_x(L_a, \phi) = B_0(L_a, \phi)$  [4] (s=scaling factor)

$L_T$	$C_T(\phi)$	$S_0(\phi)$	$S_1(\phi)$	$B_0(L_a, \phi)$	$B^*_{LT}$	$s_x(\phi)$	$d_x(L_a, \phi)$
1000 120'	22.969	0.0718	0.2448	49.51	145.98	22.969	49.51
1000 100'	23.128	0.0747	0.2494	50.82	146.02	23.128	50.82
1000 90'	23.415	0.1086	0.2526	52.89	146.39	23.415	52.89
1000 60'	23.973	0.1313	0.2657	57.37	146.66	23.973	57.37
1000 30'	26.235	0.1797	0.3188	75.92	147.37	26.235	75.92
1000 20'	27.971	0.2013	0.3555	90.28	147.78	27.971	90.28
1000 10'	30.747	0.2730	0.3984	112.66	149.03	30.747	112.66
221,4U120'	22.969	0.0718	0.2448	49.51	72.99U	22.969	49.51

hep40-6a  $L_{aj}=1000, L_r=300, L_{ajdr}=3.33, L_{ajdren}=1.45$