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NATA

LumCAT: CR01D03536BM
Luminaire: 92.70.110.00
Report No: NATA0100
Test No: GC2018123002
LampCAT: CREE CXA1304
Lamp flux(lm): 440.0
Number of Lamps: 1
Length(mm): 35
Phm Type: C

Voltage(V): 10.0000
Current(A): 0.4500
Power (W): 4.5000
PF: 0.0000
Ballast type: DC
Width(mm): 35
Height(mm): 0

Photometric Results

Lumens(lm): 372.50
Efficiency(%): 84.66%
Lumens(lm)/Power(W): 82.81
Central intensity(cd): 744.877
Maximum intensity(cd): 744.877
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=35.6
 [C90/270]Total=35.6
Field angle(10%Imax): [C0/180]Total=59.6
 [C90/270]Total=59.6
Maximum s/h(1/2): C0_180=0.59 C90_270=0.59
Maximum s/h(1/4): C0_180=0.57 C90_270=0.57
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 84.70%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 88.874%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	744.877	0.178	0.178	.041%	.048%
1.0	744.103	1.424	1.602	.324%	.430%
2.0	741.220	2.837	4.439	.645%	1.192%
3.0	736.137	4.225	8.664	.960%	2.326%
4.0	729.471	5.580	14.244	1.268%	3.824%
5.0	719.508	6.877	21.121	1.563%	5.670%
6.0	708.145	8.117	29.238	1.845%	7.849%
7.0	693.056	9.262	38.5	2.105%	10.336%
8.0	675.429	10.308	48.809	2.343%	13.103%
9.0	654.405	11.226	60.035	2.551%	16.117%
10.0	629.909	11.995	72.03	2.726%	19.337%
11.0	602.838	12.614	84.644	2.867%	22.723%
12.0	574.277	13.093	97.737	2.976%	26.238%
13.0	542.299	13.378	111.115	3.040%	29.830%
14.0	507.727	13.470	124.584	3.061%	33.446%
15.0	473.098	13.428	138.012	3.052%	37.050%
16.0	437.562	13.226	151.238	3.006%	40.601%
17.0	402.525	12.906	164.144	2.933%	44.066%
18.0	364.971	12.368	176.511	2.811%	47.386%
19.0	331.066	11.820	188.331	2.686%	50.559%
20.0	294.877	11.060	199.391	2.514%	53.528%
21.0	259.798	10.210	209.601	2.320%	56.269%
22.0	230.238	9.458	219.059	2.150%	58.808%
23.0	199.301	8.540	227.598	1.941%	61.101%
24.0	173.053	7.719	235.317	1.754%	63.173%
25.0	149.252	6.917	242.234	1.572%	65.030%
26.0	129.023	6.202	248.437	1.410%	66.695%
27.0	109.589	5.456	253.892	1.240%	68.160%
28.0	95.147	4.898	258.791	1.113%	69.475%
29.0	82.638	4.393	263.184	.999%	70.654%
30.0	72.605	3.981	267.165	.905%	71.723%
31.0	64.027	3.616	270.781	.822%	72.694%
32.0	57.150	3.321	274.102	.755%	73.585%
33.0	51.455	3.073	277.176	.698%	74.410%
34.0	46.905	2.876	280.052	.654%	75.182%
35.0	43.116	2.712	282.764	.616%	75.910%
36.0	39.769	2.563	285.327	.583%	76.598%
37.0	37.259	2.459	287.786	.559%	77.259%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	34.826	2.351	290.137	.534%	77.890%
39.0	32.674	2.255	292.392	.512%	78.495%
40.0	30.945	2.181	294.574	.496%	79.081%
41.0	29.405	2.115	296.689	.481%	79.649%
42.0	27.956	2.051	298.74	.466%	80.199%
43.0	26.740	2.000	300.74	.455%	80.736%
44.0	25.706	1.958	302.698	.445%	81.262%
45.0	24.623	1.909	304.608	.434%	81.774%
46.0	23.773	1.875	306.483	.426%	82.278%
47.0	23.013	1.846	308.329	.419%	82.773%
48.0	22.359	1.822	310.151	.414%	83.263%
49.0	21.783	1.803	311.954	.410%	83.747%
50.0	21.284	1.788	313.742	.406%	84.227%
51.0	20.834	1.775	315.517	.404%	84.703%
52.0	20.412	1.764	317.281	.401%	85.177%
53.0	19.990	1.751	319.032	.398%	85.647%
54.0	19.624	1.741	320.773	.396%	86.114%
55.0	19.336	1.737	322.51	.395%	86.580%
56.0	19.076	1.734	324.244	.394%	87.046%
57.0	18.886	1.737	325.981	.395%	87.512%
58.0	18.682	1.737	327.718	.395%	87.979%
59.0	18.506	1.740	329.458	.395%	88.446%
60.0	18.352	1.743	331.201	.396%	88.914%
61.0	18.225	1.748	332.949	.397%	89.383%
62.0	18.113	1.754	334.702	.399%	89.854%
63.0	18.014	1.760	336.462	.400%	90.326%
64.0	17.888	1.763	338.225	.401%	90.799%
65.0	17.712	1.760	339.986	.400%	91.272%
66.0	17.522	1.755	341.741	.399%	91.743%
67.0	17.325	1.749	343.49	.397%	92.213%
68.0	17.093	1.738	345.228	.395%	92.679%
69.0	16.847	1.725	346.953	.392%	93.142%
70.0	16.580	1.708	348.661	.388%	93.601%
71.0	16.256	1.686	350.347	.383%	94.053%
72.0	15.891	1.657	352.004	.377%	94.498%
73.0	15.539	1.630	353.634	.370%	94.936%
74.0	15.152	1.597	355.231	.363%	95.365%
75.0	14.752	1.563	356.793	.355%	95.784%

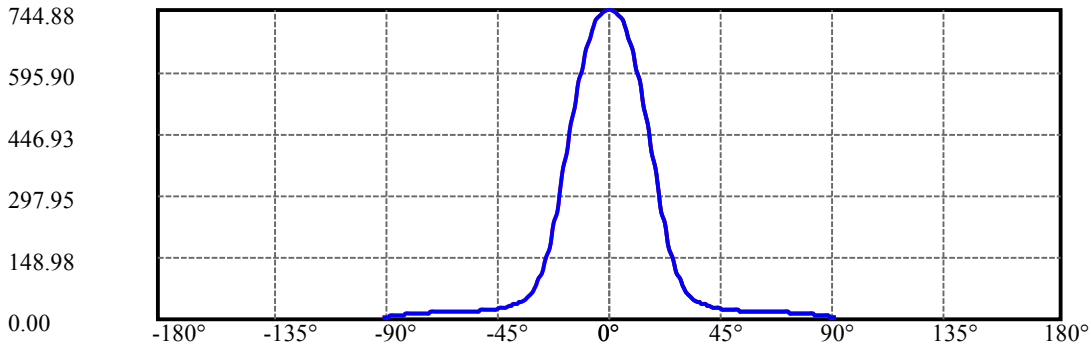
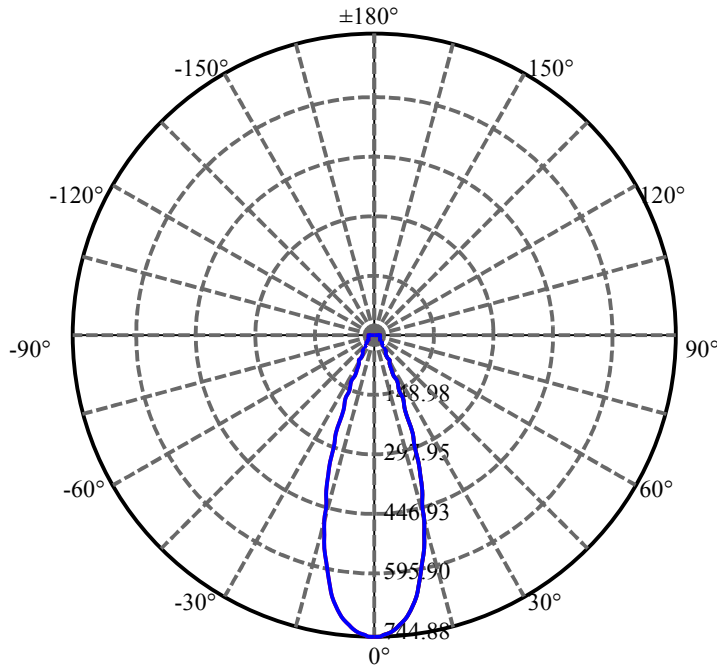
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	14.252	1.516	358.31	.345%	96.191%
77.0	13.746	1.469	359.779	.334%	96.586%
78.0	13.212	1.417	361.196	.322%	96.966%
79.0	12.705	1.368	362.563	.311%	97.333%
80.0	12.122	1.309	363.873	.298%	97.685%
81.0	11.616	1.258	365.131	.286%	98.022%
82.0	11.088	1.204	366.335	.274%	98.346%
83.0	10.526	1.146	367.48	.260%	98.653%
84.0	9.942	1.084	368.565	.246%	98.944%
85.0	9.373	1.024	369.589	.233%	99.219%
86.0	8.705	0.952	370.541	.216%	99.475%
87.0	7.446	0.815	371.356	.185%	99.694%
88.0	5.681	0.623	371.979	.142%	99.861%
89.0	3.551	0.389	372.368	.088%	99.965%
90.0	2.355	0.129	372.497	.029%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	267.17	60.72%	71.72%
0-40	294.57	66.95%	79.08%
0-60	331.20	75.27%	88.91%
0-90	372.37	84.63%	99.97%
0-120	372.37	84.63%	99.97%
0-180	372.50	84.66%	100.00%
60-90	42.91	9.75%	11.52%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-41.64	298.00	67.73%	80.00%

ZONAL LUMEN SUMMARY

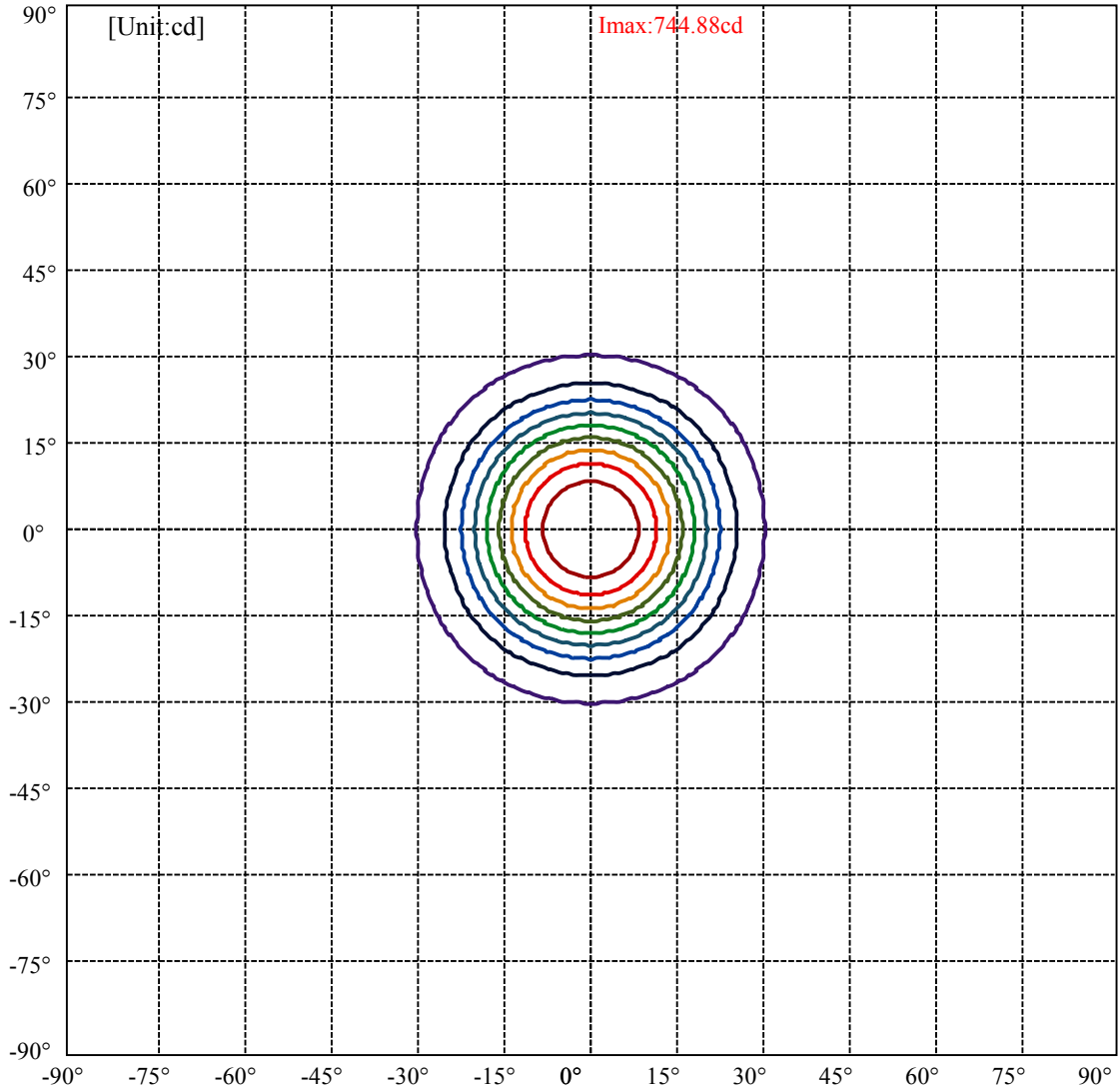
0-10	72.03
10-20	127.36
20-30	67.77
30-40	27.41
40-50	19.17
50-60	17.46
60-70	17.46
70-80	15.21
80-90	8.50
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00



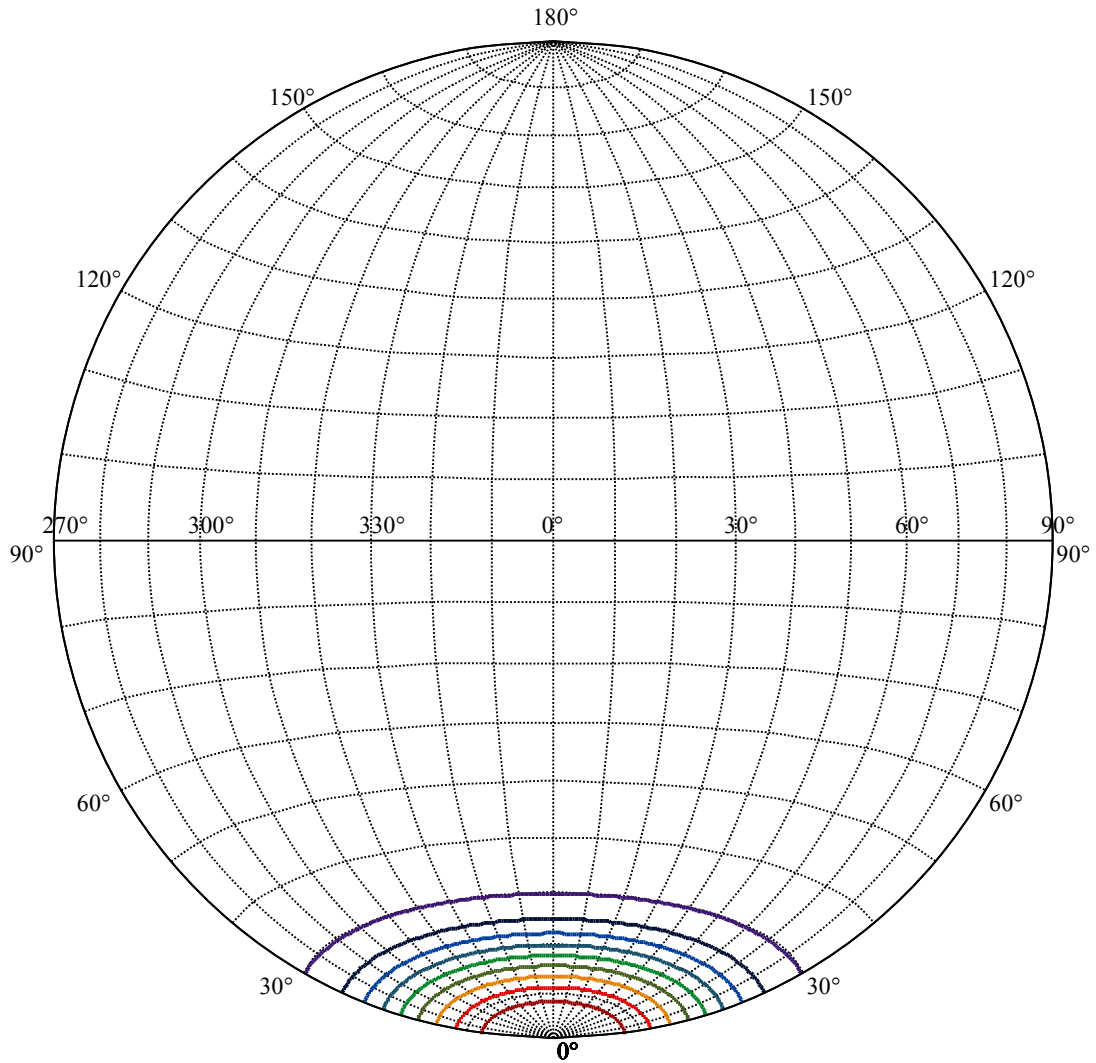
C0(Max): —————
C0/C180: —————
C90/C270: —————

Field angle(10%Imax):C0/180Left:29.8 Right:29.8
:C90/270Left:29.8 Right:29.8

Beam Angle(50%Imax):C0/180Left:17.8 Right:17.8
:C90/270Left:17.8 Right:17.8



(10%Imax) 74.4877	—
(20%Imax) 148.975	—
(30%Imax) 223.463	—
(40%Imax) 297.951	—
(50%Imax) 372.438	—
(60%Imax) 446.926	—
(70%Imax) 521.414	—
(80%Imax) 595.901	—
(90%Imax) 670.389	—



House

[Unit:cd]

Road

Imax:744.88

(10%Imax) 74.4877

(20%Imax) 148.975

(30%Imax) 223.463

(40%Imax) 297.951

(50%Imax) 372.438

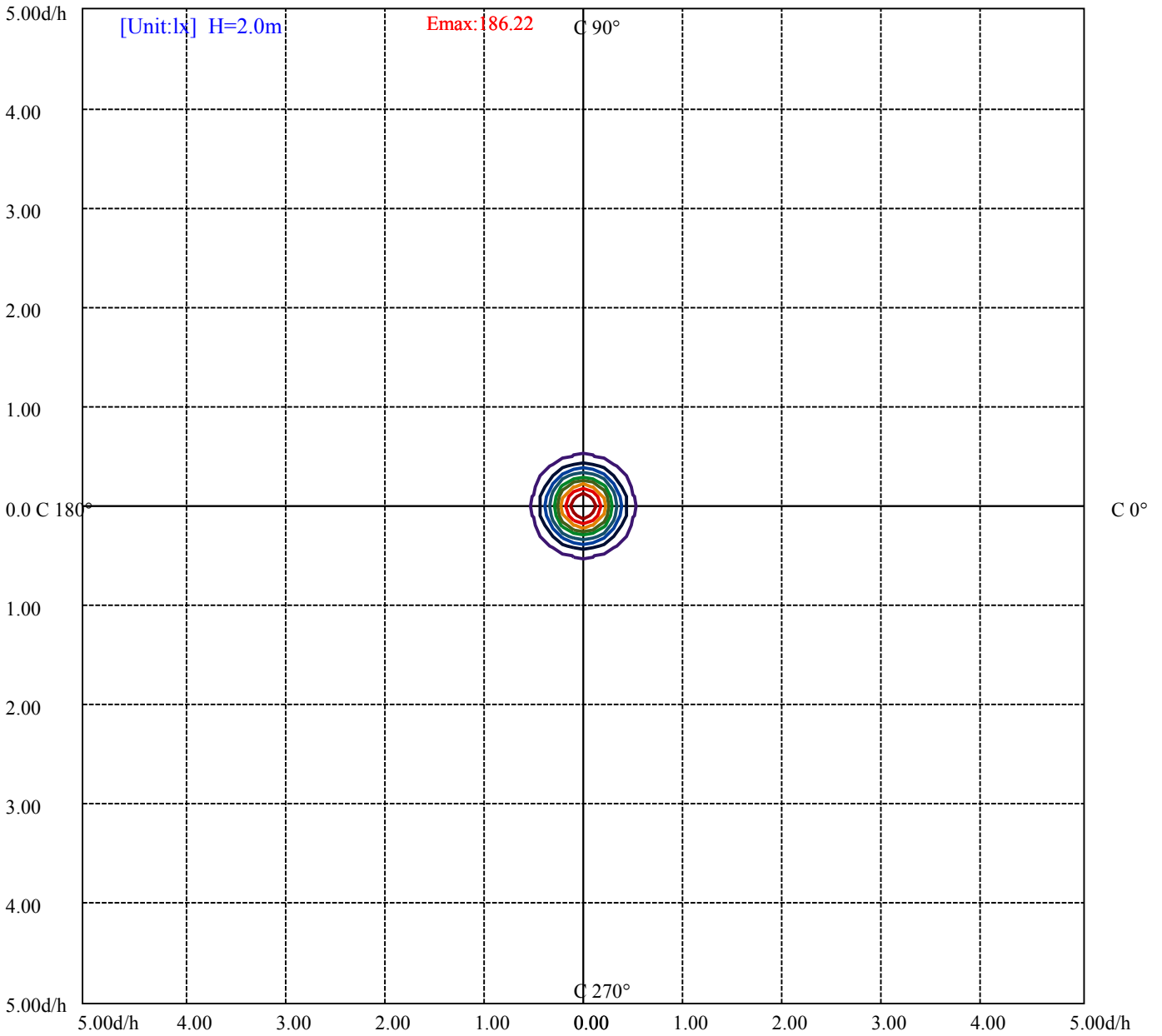
(60%Imax) 446.926

(70%Imax) 521.414

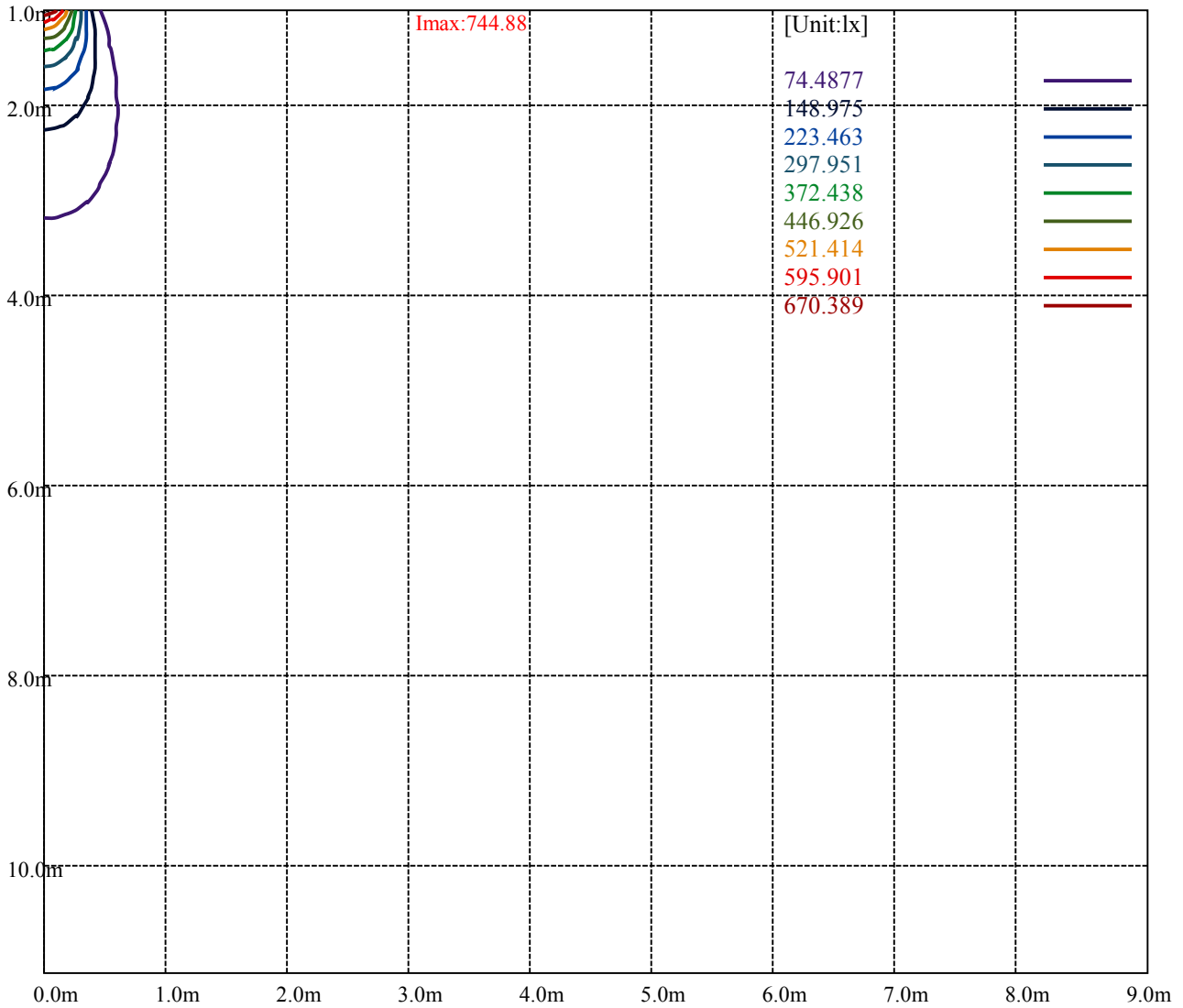
(80%Imax) 595.901

(90%Imax) 670.389





(10%Emax) 18.6219	—
(20%Emax) 37.24375	—
(30%Emax) 55.86575	—
(40%Emax) 74.48775	—
(50%Emax) 93.1095	—
(60%Emax) 111.7315	—
(70%Emax) 130.3533	—
(80%Emax) 148.9753	—
(90%Emax) 167.5972	—



Luminance Table

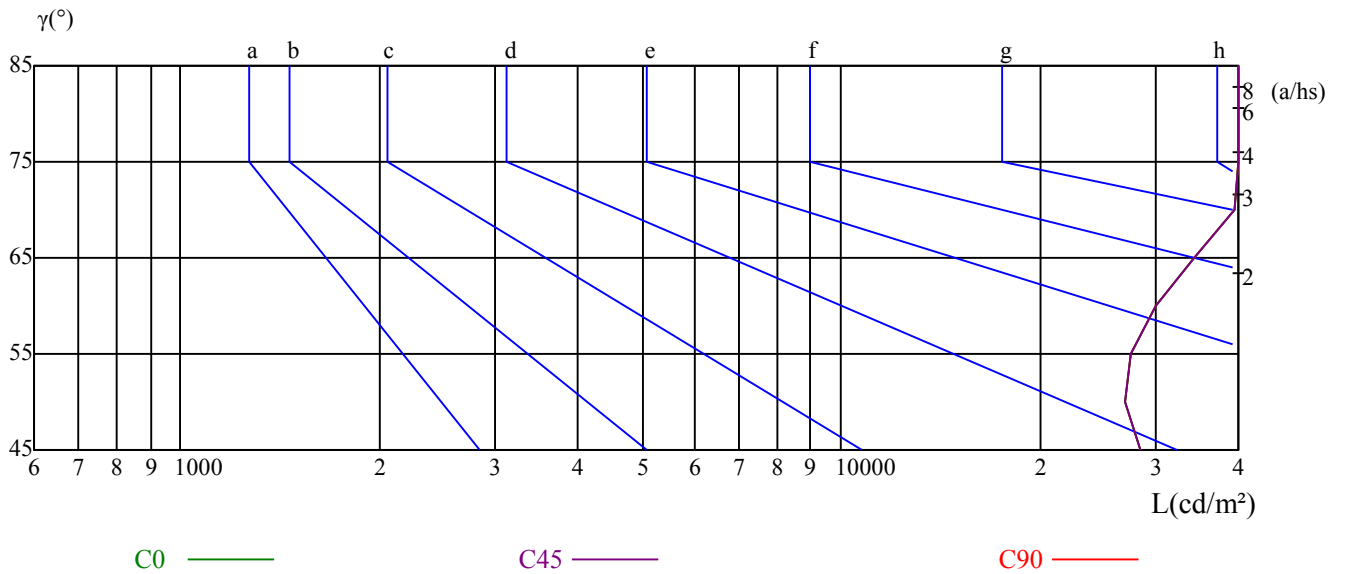
γ	45	50	55	60	65	70	75	80	85
C0	28427	27030	27519	29962	34212	39572	46527	56985	87787
C45	28427	27030	27519	29962	34212	39572	46527	56985	87787
C90	28427	27030	27519	29962	34212	39572	46527	56985	87787

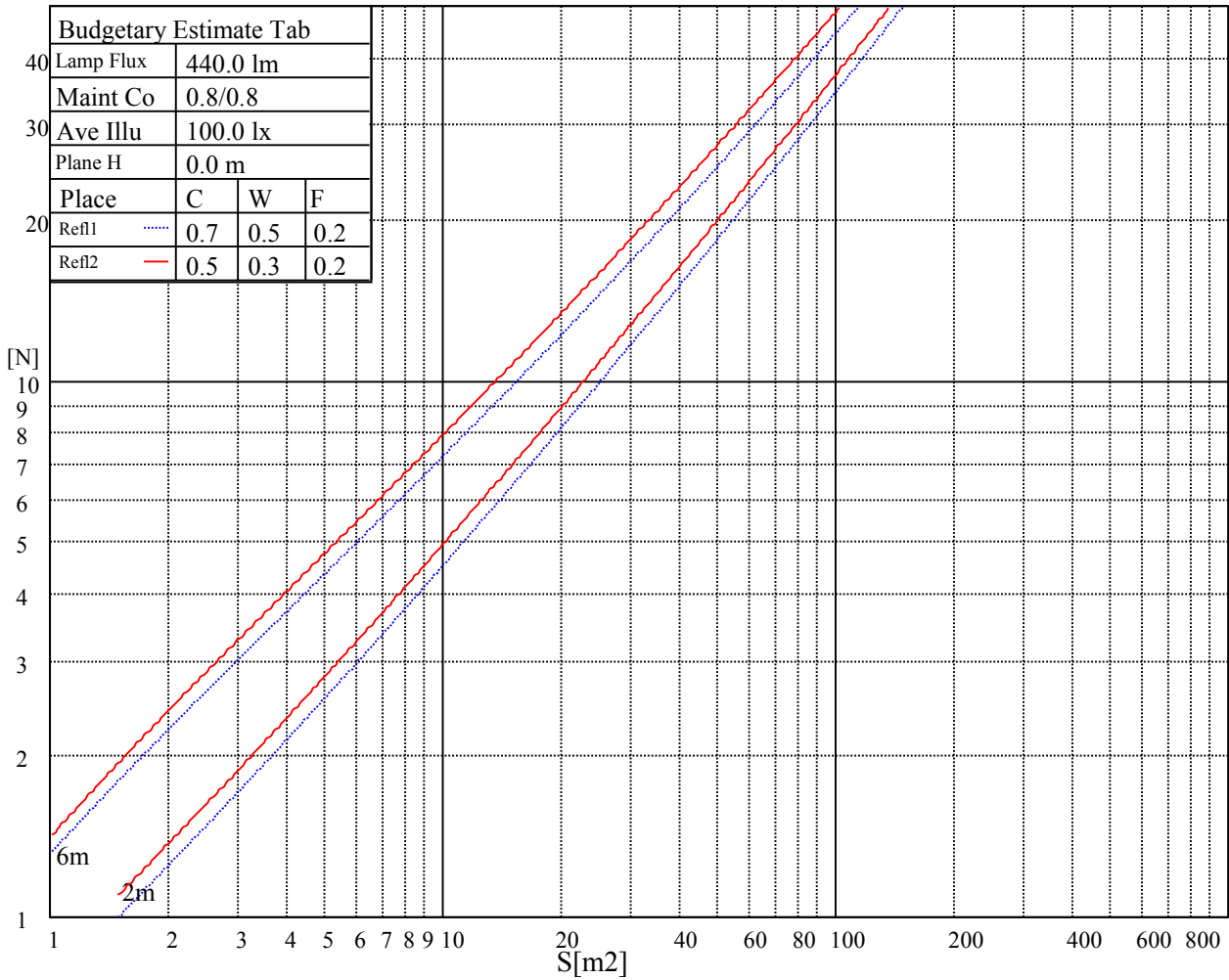
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
34212	34212	34212	46527	46527	46527	87787	87787	87787

Glare Table

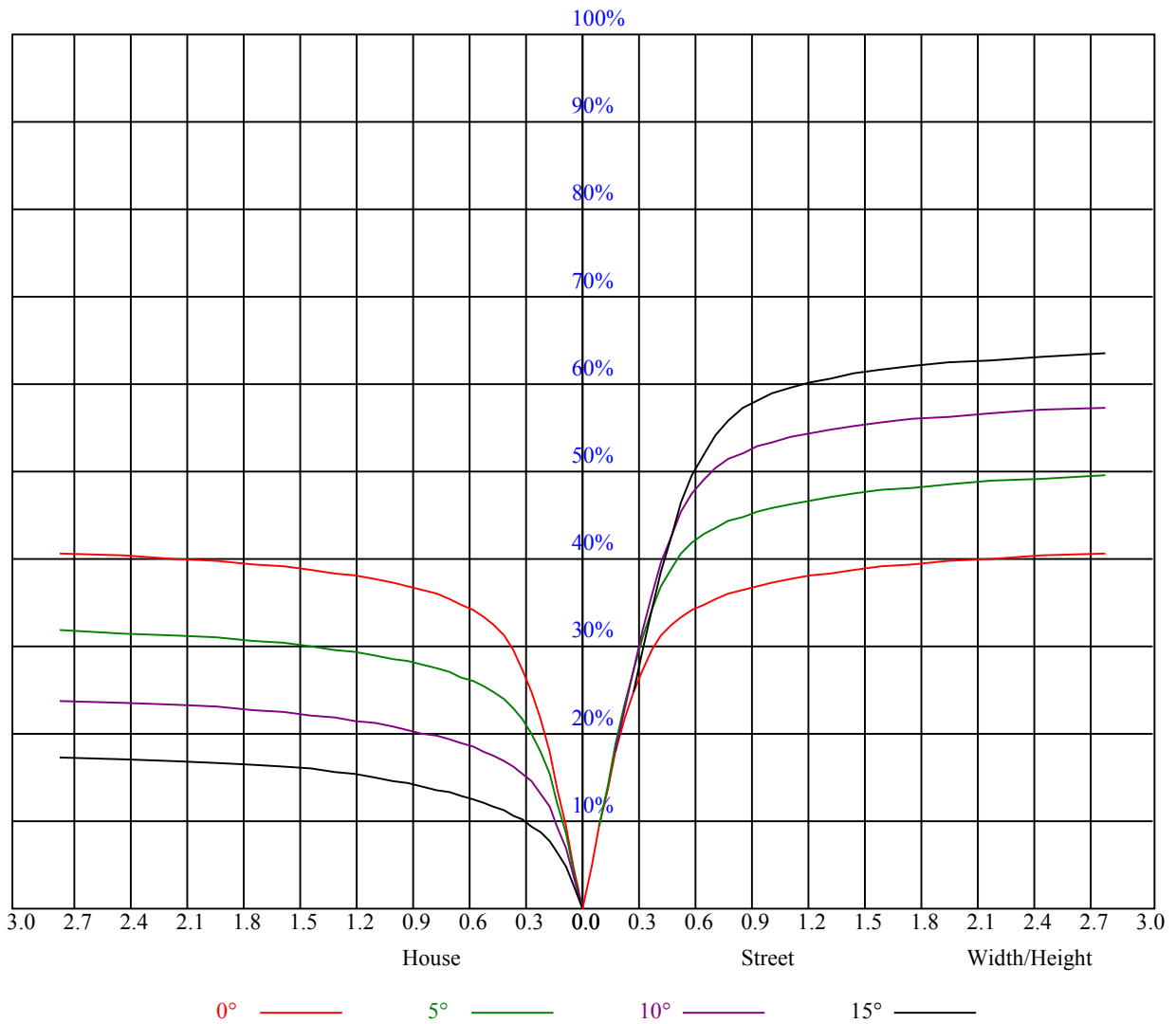
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

Luminance Limiting Curve





RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFICIENTS OF UTILIZATION RHOFC=20 CU															
0	1.01	1.01	1.01	0.98	0.98	0.98	0.94	0.94	0.94	0.90	0.90	0.90	0.86	0.86	0.86	0.85
1	0.92	0.89	0.87	0.90	0.87	0.85	0.86	0.84	0.83	0.83	0.82	0.80	0.80	0.79	0.78	0.76
2	0.84	0.80	0.77	0.83	0.79	0.76	0.80	0.77	0.74	0.78	0.75	0.73	0.75	0.73	0.71	0.70
3	0.79	0.74	0.70	0.77	0.73	0.69	0.75	0.71	0.68	0.73	0.70	0.67	0.71	0.68	0.66	0.65
4	0.74	0.69	0.65	0.73	0.68	0.64	0.71	0.67	0.63	0.69	0.66	0.63	0.67	0.64	0.62	0.61
5	0.69	0.64	0.60	0.69	0.64	0.60	0.67	0.63	0.60	0.66	0.62	0.59	0.64	0.61	0.58	0.57
6	0.66	0.61	0.57	0.65	0.60	0.57	0.64	0.59	0.56	0.63	0.59	0.56	0.61	0.58	0.55	0.54
7	0.63	0.57	0.54	0.62	0.57	0.54	0.61	0.57	0.53	0.60	0.56	0.53	0.59	0.55	0.53	0.52
8	0.60	0.55	0.51	0.59	0.54	0.51	0.58	0.54	0.51	0.57	0.53	0.51	0.57	0.53	0.50	0.49
9	0.57	0.52	0.49	0.57	0.52	0.49	0.56	0.52	0.49	0.55	0.51	0.48	0.54	0.51	0.48	0.47
10	0.55	0.50	0.47	0.54	0.50	0.47	0.54	0.50	0.47	0.53	0.49	0.47	0.52	0.49	0.46	0.45



Intensity data(cd)

C/γ(°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.0	744.02	750.49	754.82	755.89	755.66	752.18	747.17	739.52	729.34
45.0	743.29	747.39	749.64	750.88	750.38	748.13	744.08	736.43	727.26
90.0	743.85	742.22	739.13	734.18	728.66	720.45	709.88	697.56	681.02
135.0	748.35	743.06	734.34	725.68	715.22	700.14	686.03	669.71	649.35
180.0	744.02	736.88	726.64	713.36	700.14	683.33	665.61	642.94	617.85
225.0	743.29	736.93	729.28	718.43	704.76	690.13	673.20	648.62	626.06
270.0	743.85	744.53	742.44	738.34	732.15	720.11	707.40	691.93	671.12
315.0	748.35	751.33	753.47	752.34	748.80	741.60	731.81	717.75	701.44
360.0	744.02	750.49	754.82	755.89	755.66	752.18	747.17	739.52	729.34
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	712.97	695.59	674.61	647.44	615.99	584.83	547.54	508.11	472.61
45.0	711.28	694.52	674.27	648.00	617.68	588.15	552.15	516.09	482.40
90.0	663.58	641.36	615.43	590.34	563.18	526.56	495.62	463.44	426.04
135.0	626.57	603.84	575.72	549.73	518.06	485.44	454.50	421.65	387.28
180.0	593.04	563.18	531.73	503.33	473.63	435.88	405.51	375.08	340.09
225.0	600.86	565.93	535.73	504.51	468.23	431.49	398.64	361.35	328.56
270.0	646.99	621.39	589.16	558.51	521.55	487.18	447.64	407.31	372.04
315.0	679.95	653.46	626.06	592.37	560.08	522.28	483.19	447.47	411.19
360.0	712.97	695.59	674.61	647.44	615.99	584.83	547.54	508.11	472.61
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	432.39	396.51	356.96	318.15	284.91	253.41	216.62	189.28	167.51
45.0	446.74	406.52	367.71	328.84	294.92	258.58	227.93	196.37	170.78
90.0	387.34	352.97	315.34	278.55	247.33	214.59	187.76	160.09	136.07
135.0	355.22	327.32	285.02	254.64	228.54	189.51	164.87	146.53	122.96
180.0	304.93	274.22	241.03	209.87	184.11	158.23	137.70	117.51	100.58
225.0	293.01	258.86	230.01	199.52	171.45	149.01	129.38	108.79	95.01
270.0	333.17	299.76	264.04	229.95	202.11	170.72	148.50	128.93	111.94
315.0	366.98	332.38	298.91	258.86	228.54	200.36	171.68	146.53	127.35
360.0	432.39	396.51	356.96	318.15	284.91	253.41	216.62	189.28	167.51
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	137.42	119.08	103.73	89.38	77.63	70.03	61.14	54.62	49.73
45.0	142.59	123.58	106.65	93.04	78.53	69.86	61.31	54.84	50.06
90.0	117.79	102.38	86.23	75.77	67.39	58.95	53.66	49.05	44.89
135.0	104.74	90.96	78.92	69.64	61.88	54.45	49.73	45.84	41.74
180.0	88.09	76.33	66.54	59.46	53.72	47.81	44.04	40.89	37.91
225.0	83.36	71.44	63.90	57.54	51.75	46.97	43.37	39.99	37.41
270.0	94.05	82.69	73.18	64.52	57.43	52.31	47.48	43.43	40.33
315.0	108.68	94.73	81.96	71.49	63.90	56.81	50.91	46.58	42.86
360.0	137.42	119.08	103.73	89.38	77.63	70.03	61.14	54.62	49.73
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	45.11	41.57	38.25	35.44	33.19	31.33	29.31	28.01	26.89
45.0	45.56	42.24	38.98	36.34	34.20	32.23	30.21	28.74	27.56
90.0	41.40	38.76	36.23	34.03	32.40	30.54	29.14	27.96	26.66
135.0	39.04	36.73	34.37	32.74	31.16	29.36	28.13	27.06	25.88
180.0	35.49	33.98	32.18	30.09	28.63	27.45	26.38	25.09	24.30
225.0	35.04	33.08	31.50	29.70	28.24	27.17	26.10	24.98	24.19
270.0	37.41	35.21	32.85	31.28	29.59	28.46	27.00	25.93	25.09
315.0	39.09	36.51	34.26	31.78	30.15	28.69	27.39	26.16	25.09
360.0	45.11	41.57	38.25	35.44	33.19	31.33	29.31	28.01	26.89

Intensity data(cd)

C/γ(°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	25.43	24.47	23.57	22.73	21.99	21.43	20.87	20.48	19.97
45.0	26.16	25.03	24.13	23.34	22.50	21.88	21.38	20.81	20.31
90.0	25.65	24.64	23.74	23.01	22.39	21.77	21.32	20.87	20.31
135.0	24.81	24.08	23.23	22.67	22.11	21.60	21.26	20.81	20.36
180.0	23.57	22.89	22.22	21.77	21.38	20.93	20.48	20.14	19.74
225.0	23.46	22.73	22.22	21.77	21.32	20.98	20.64	20.31	20.08
270.0	23.91	23.18	22.61	21.88	21.38	21.04	20.48	20.08	19.74
315.0	24.02	23.18	22.39	21.71	21.21	20.64	20.25	19.80	19.41
360.0	25.43	24.47	23.57	22.73	21.99	21.43	20.87	20.48	19.97
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	19.58	19.24	18.90	18.62	18.39	18.17	17.89	17.78	17.61
45.0	19.86	19.41	18.96	18.73	18.45	18.28	18.00	17.83	17.66
90.0	19.86	19.52	19.18	18.96	18.68	18.39	18.23	18.00	17.78
135.0	19.97	19.69	19.41	19.24	18.96	18.79	18.56	18.45	18.28
180.0	19.52	19.29	19.07	18.90	18.73	18.56	18.51	18.34	18.34
225.0	19.91	19.69	19.63	19.52	19.46	19.41	19.41	19.41	19.41
270.0	19.35	19.18	19.01	18.84	18.73	18.56	18.45	18.39	18.28
315.0	18.96	18.68	18.45	18.28	18.06	17.89	17.78	17.61	17.55
360.0	19.58	19.24	18.90	18.62	18.39	18.17	17.89	17.78	17.61
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	17.44	17.44	17.27	17.10	16.93	16.71	16.54	16.31	16.09
45.0	17.55	17.33	17.21	16.99	16.65	16.48	16.26	15.98	15.69
90.0	17.66	17.55	17.27	17.04	16.82	16.48	16.26	15.92	15.53
135.0	18.23	18.00	17.83	17.55	17.38	17.10	16.82	16.54	16.14
180.0	18.11	18.00	17.78	17.61	17.44	17.21	16.93	16.71	16.37
225.0	19.35	19.24	19.13	19.07	18.90	18.68	18.39	18.06	17.72
270.0	18.28	18.11	18.00	17.78	17.55	17.38	17.10	16.88	16.54
315.0	17.49	17.44	17.21	17.04	16.93	16.71	16.48	16.26	15.98
360.0	17.44	17.44	17.27	17.10	16.93	16.71	16.54	16.31	16.09
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	15.69	15.47	15.19	14.85	14.51	14.12	13.61	13.22	12.71
45.0	15.36	14.96	14.68	14.29	13.78	13.44	12.94	12.38	11.81
90.0	15.24	14.85	14.40	14.12	13.67	13.11	12.71	12.26	11.53
135.0	15.75	15.47	15.08	14.68	14.18	13.61	13.11	12.60	12.04
180.0	15.98	15.69	15.24	14.85	14.34	13.73	13.22	12.71	12.15
225.0	17.27	16.76	16.26	15.75	15.02	14.40	13.78	13.22	12.49
270.0	16.20	15.81	15.47	14.96	14.51	14.01	13.33	12.83	12.32
315.0	15.64	15.30	14.91	14.51	14.01	13.56	12.99	12.43	11.93
360.0	15.69	15.47	15.19	14.85	14.51	14.12	13.61	13.22	12.71
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	12.15	11.70	11.08	10.41	9.79	9.06	8.49	7.59	4.84
45.0	11.36	10.86	10.46	9.96	9.39	8.83	8.10	6.02	4.22
90.0	11.19	10.74	10.24	9.62	9.06	8.27	6.08	4.28	2.31
135.0	11.48	11.03	10.46	9.90	9.23	8.61	6.75	4.28	2.59
180.0	11.59	10.97	10.18	9.45	8.89	8.21	5.91	3.94	1.97
225.0	11.98	11.31	10.69	10.13	9.45	8.89	7.71	4.84	3.32
270.0	11.76	11.19	10.63	10.13	9.68	8.89	8.33	7.31	4.61
315.0	11.42	10.91	10.46	9.96	9.51	8.89	8.21	7.20	4.56
360.0	12.15	11.70	11.08	10.41	9.79	9.06	8.49	7.59	4.84

Intensity data(cd)

C/γ(°)	90.0
0.0	3.38
45.0	2.08
90.0	1.63
135.0	1.63
180.0	1.63
225.0	1.80
270.0	3.21
315.0	3.49
360.0	3.38