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## NATA

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LumCAT: CR01D01720AA-N

Luminaire:

Report No: NATA0100

Voltage(V): 3.6000

Test No: GC2018122910

Current(A): 0.3000

LampCAT: CREE XPG2

Power (W): 1.0800

Lamp flux(lm): 133.0

PF: 0.0000

Number of Lamps: 1

Ballast type:

Length(mm): 15

Width(mm): 15

Phm Type: C

Height(mm): 0

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## Photometric Results

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Lumens(lm): 123.70

Efficiency(%): 93.01%

Lumens(lm)/Power(W): 114.64

Central intensity(cd): 462.270

Maximum intensity(cd): 462.270

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=22.0

[C90/270]Total=22.0

Field angle(10%Imax): [C0/180]Total=48.0

[C90/270]Total=48.0

Maximum s/h(1/2): C0\_180=0.37 C90\_270=0.37

Maximum s/h(1/4): C0\_180=0.40 C90\_270=0.40

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 93.09%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 92.633%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	462.270	0.111	0.111	.083%	.089%
1.0	459.738	0.880	0.99	.662%	.801%
2.0	451.315	1.727	2.718	1.299%	2.197%
3.0	436.887	2.507	5.225	1.885%	4.224%
4.0	419.280	3.207	8.432	2.412%	6.817%
5.0	396.689	3.791	12.224	2.851%	9.882%
6.0	372.340	4.268	16.492	3.209%	13.332%
7.0	343.652	4.593	21.084	3.453%	17.045%
8.0	316.202	4.826	25.91	3.628%	20.946%
9.0	286.903	4.922	30.832	3.701%	24.925%
10.0	257.344	4.900	35.732	3.685%	28.886%
11.0	231.356	4.841	40.573	3.640%	32.800%
12.0	207.415	4.729	45.302	3.556%	36.622%
13.0	182.159	4.494	49.796	3.379%	40.255%
14.0	160.509	4.258	54.054	3.202%	43.697%
15.0	142.242	4.037	58.091	3.035%	46.961%
16.0	123.870	3.744	61.836	2.815%	49.988%
17.0	109.828	3.521	65.357	2.648%	52.834%
18.0	96.469	3.269	68.626	2.458%	55.477%
19.0	84.790	3.027	71.653	2.276%	57.924%
20.0	74.602	2.798	74.451	2.104%	60.186%
21.0	65.911	2.590	77.041	1.948%	62.280%
22.0	58.296	2.395	79.436	1.801%	64.216%
23.0	51.884	2.223	81.659	1.672%	66.013%
24.0	46.350	2.067	83.727	1.554%	67.684%
25.0	41.084	1.904	85.631	1.432%	69.224%
26.0	36.872	1.773	87.403	1.333%	70.657%
27.0	33.047	1.645	89.048	1.237%	71.987%
28.0	29.770	1.533	90.581	1.152%	73.226%
29.0	26.754	1.422	92.003	1.069%	74.375%
30.0	24.314	1.333	93.336	1.002%	75.453%
31.0	21.994	1.242	94.579	.934%	76.457%
32.0	19.969	1.160	95.739	.872%	77.395%
33.0	18.352	1.096	96.835	.824%	78.281%
34.0	16.833	1.032	97.867	.776%	79.116%
35.0	15.483	0.974	98.841	.732%	79.903%
36.0	14.323	0.923	99.764	.694%	80.649%
37.0	13.366	0.882	100.647	.663%	81.363%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	12.410	0.838	101.484	.630%	82.040%
39.0	11.630	0.803	102.287	.603%	82.689%
40.0	10.983	0.774	103.061	.582%	83.315%
41.0	10.329	0.743	103.804	.559%	83.915%
42.0	9.823	0.721	104.525	.542%	84.498%
43.0	9.338	0.698	105.223	.525%	85.062%
44.0	8.880	0.676	105.9	.509%	85.609%
45.0	8.473	0.657	106.557	.494%	86.140%
46.0	8.142	0.642	107.199	.483%	86.660%
47.0	7.812	0.627	107.826	.471%	87.166%
48.0	7.502	0.611	108.437	.460%	87.660%
49.0	7.200	0.596	109.033	.448%	88.142%
50.0	6.940	0.583	109.616	.438%	88.613%
51.0	6.680	0.569	110.185	.428%	89.074%
52.0	6.441	0.557	110.742	.418%	89.523%
53.0	6.180	0.541	111.283	.407%	89.961%
54.0	5.934	0.526	111.809	.396%	90.387%
55.0	5.716	0.513	112.323	.386%	90.802%
56.0	5.498	0.500	112.823	.376%	91.206%
57.0	5.280	0.486	113.308	.365%	91.598%
58.0	5.077	0.472	113.781	.355%	91.980%
59.0	4.894	0.460	114.241	.346%	92.352%
60.0	4.697	0.446	114.687	.335%	92.713%
61.0	4.521	0.434	115.12	.326%	93.063%
62.0	4.352	0.421	115.542	.317%	93.404%
63.0	4.184	0.409	115.95	.307%	93.734%
64.0	4.036	0.398	116.348	.299%	94.056%
65.0	3.888	0.386	116.735	.291%	94.368%
66.0	3.748	0.375	117.11	.282%	94.672%
67.0	3.600	0.363	117.474	.273%	94.965%
68.0	3.473	0.353	117.827	.266%	95.251%
69.0	3.354	0.343	118.17	.258%	95.529%
70.0	3.248	0.335	118.505	.252%	95.799%
71.0	3.150	0.327	118.831	.246%	96.063%
72.0	3.059	0.319	119.15	.240%	96.321%
73.0	2.974	0.312	119.462	.235%	96.573%
74.0	2.911	0.307	119.769	.231%	96.821%
75.0	2.834	0.300	120.069	.226%	97.064%

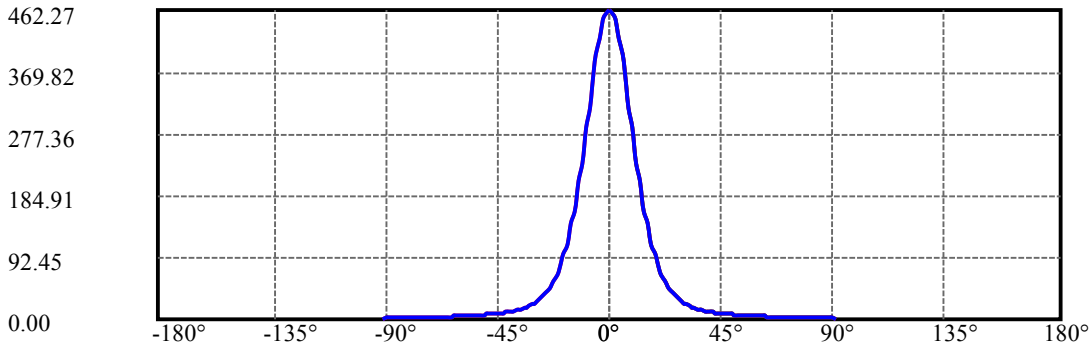
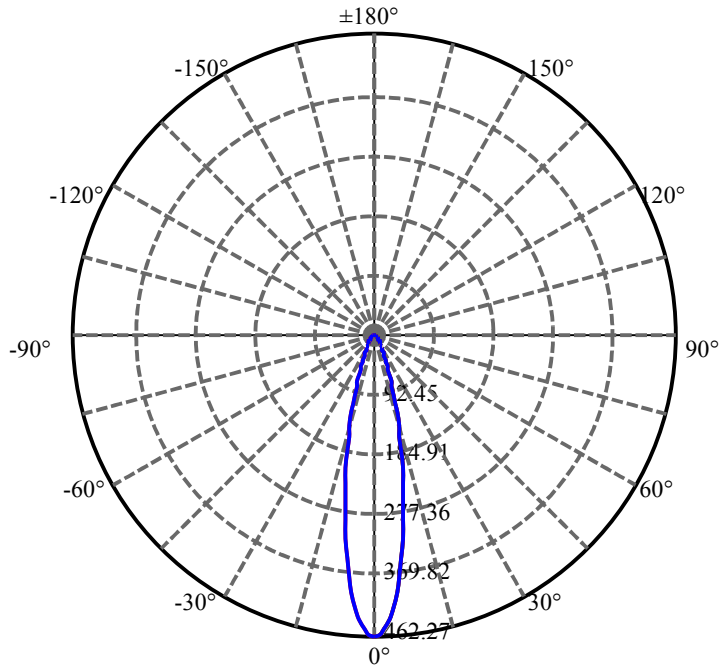
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	2.777	0.296	120.365	.222%	97.303%
77.0	2.700	0.288	120.653	.217%	97.536%
78.0	2.651	0.284	120.938	.214%	97.766%
79.0	2.602	0.280	121.218	.211%	97.992%
80.0	2.531	0.273	121.491	.206%	98.213%
81.0	2.475	0.268	121.759	.202%	98.430%
82.0	2.405	0.261	122.02	.196%	98.641%
83.0	2.320	0.253	122.273	.190%	98.845%
84.0	2.278	0.248	122.521	.187%	99.046%
85.0	2.229	0.243	122.765	.183%	99.243%
86.0	2.187	0.239	123.004	.180%	99.436%
87.0	2.194	0.240	123.244	.181%	99.631%
88.0	2.116	0.232	123.476	.174%	99.818%
89.0	1.596	0.175	123.651	.132%	99.959%
90.0	0.914	0.050	123.701	.038%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	93.34	70.18%	75.45%
0-40	103.06	77.49%	83.31%
0-60	114.69	86.23%	92.71%
0-90	123.65	92.97%	99.96%
0-120	123.65	92.97%	99.96%
0-180	123.70	93.01%	100.00%
60-90	9.41	7.08%	7.61%
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%
0-35.13	98.96	74.41%	80.00%

ZONAL LUMEN SUMMARY

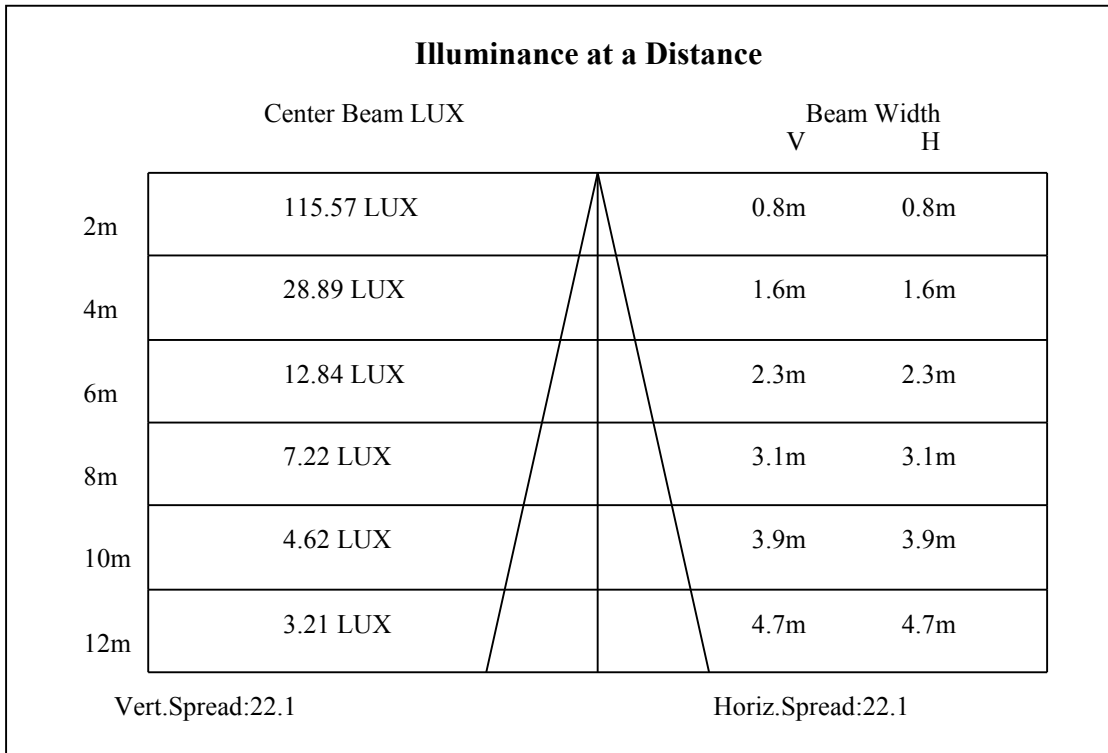
0-10	35.73
10-20	38.72
20-30	18.89
30-40	9.72
40-50	6.55
50-60	5.07
60-70	3.82
70-80	2.99
80-90	2.16
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

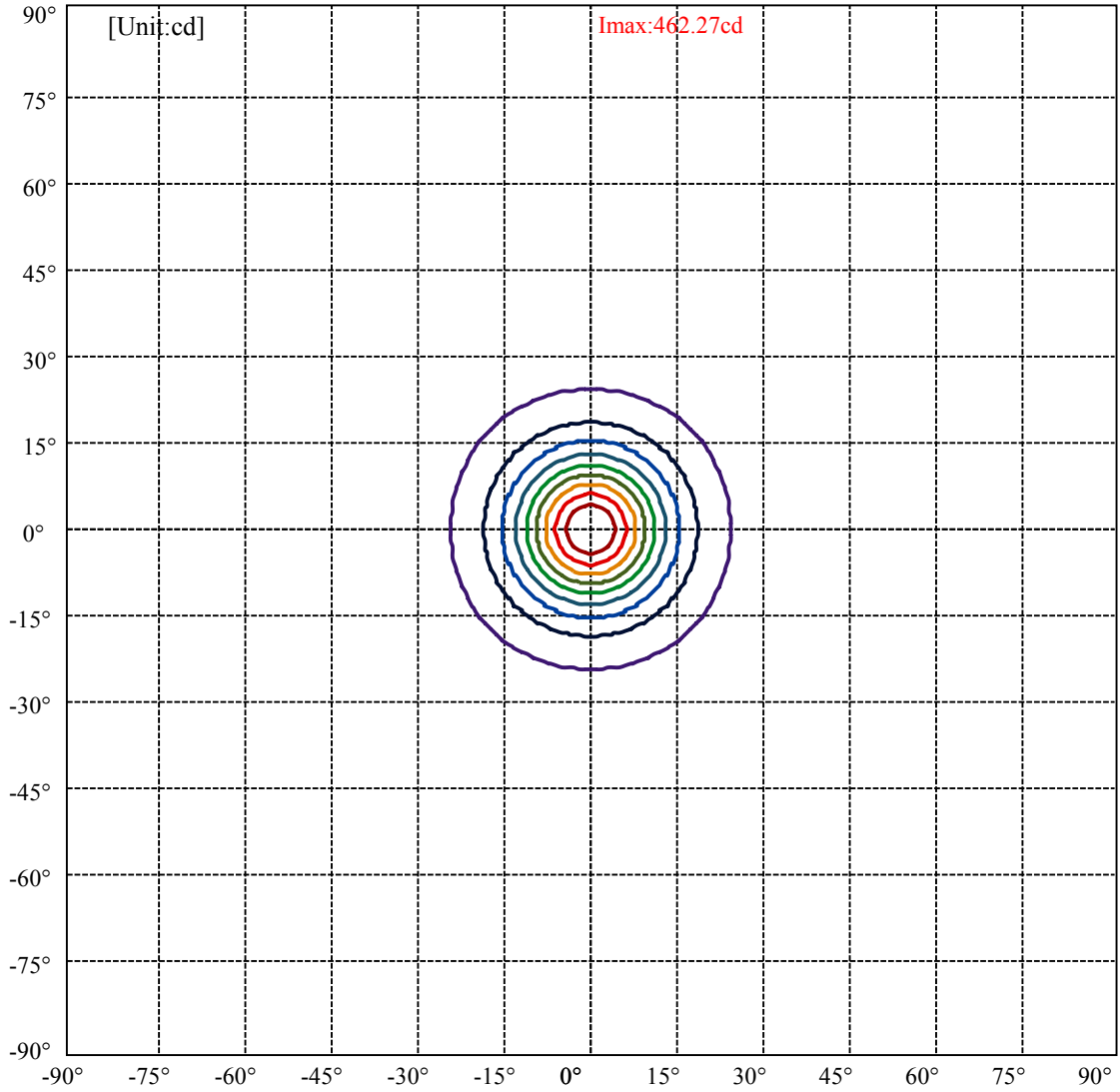


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:24.0 Right:24.0  
:C90/270Left:24.0 Right:24.0

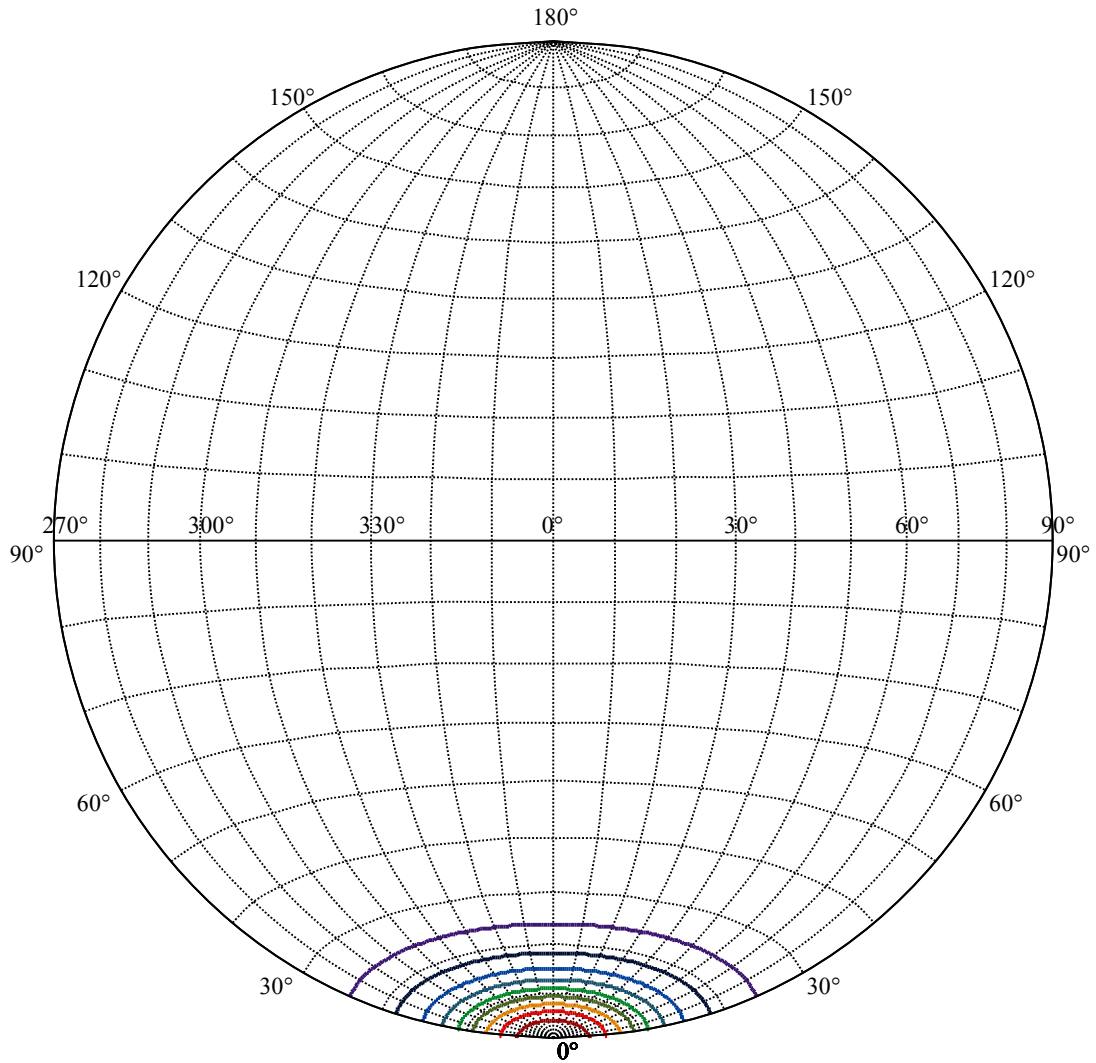
Beam Angle(50%Imax):C0/180Left:11.0 Right:11.0  
:C90/270Left:11.0 Right:11.0





(10%Imax) 46.227	—
(20%Imax) 92.4539	—
(30%Imax) 138.681	—
(40%Imax) 184.908	—
(50%Imax) 231.135	—
(60%Imax) 277.362	—
(70%Imax) 323.589	—
(80%Imax) 369.816	—
(90%Imax) 416.043	—





House

[Unit:cd]

Road

**I<sub>max</sub>:462.27**

(10%I<sub>max</sub>) 46.227

(20%I<sub>max</sub>) 92.4539

(30%I<sub>max</sub>) 138.681

(40%I<sub>max</sub>) 184.908

(50%I<sub>max</sub>) 231.135

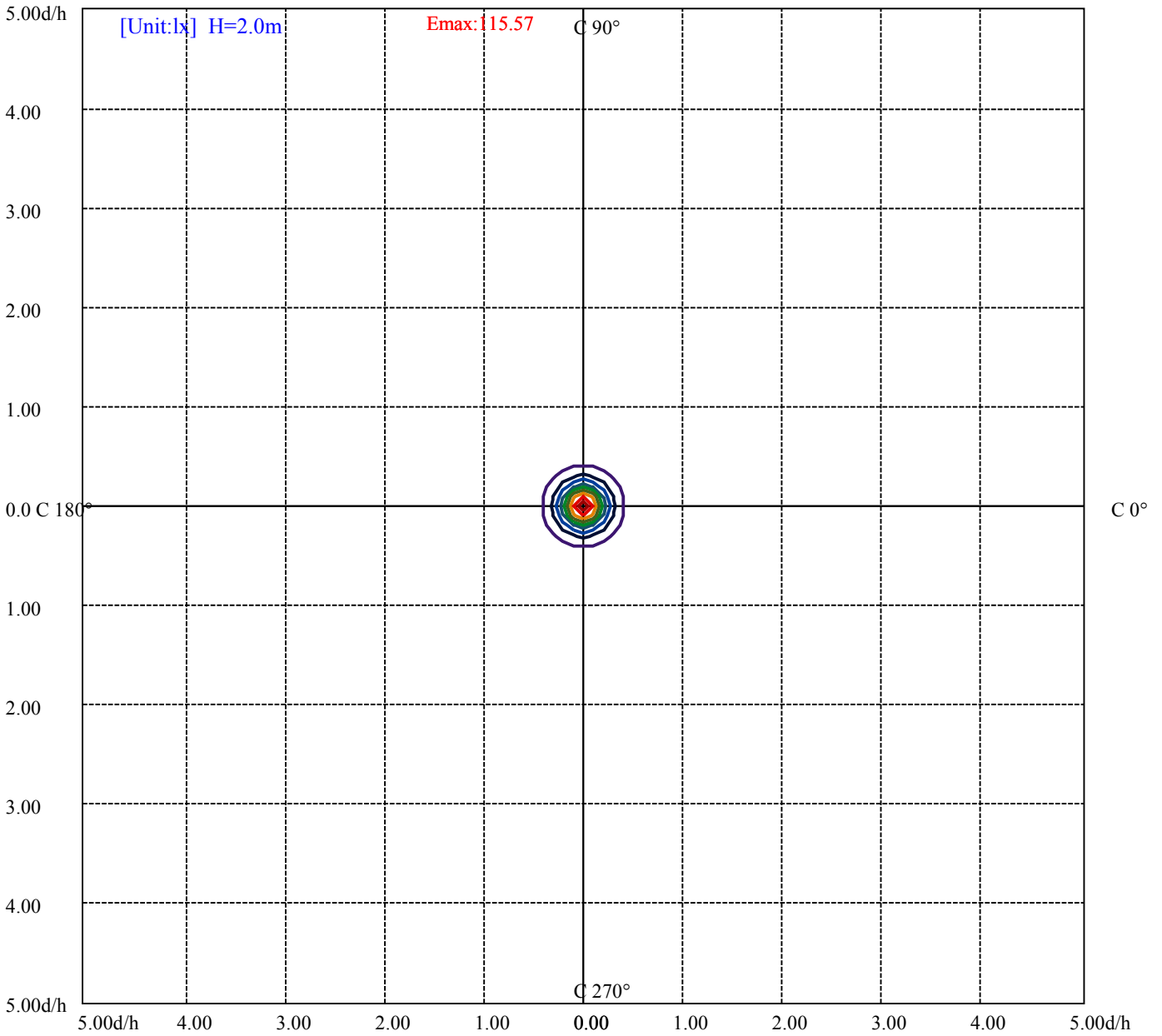
(60%I<sub>max</sub>) 277.362

(70%I<sub>max</sub>) 323.589

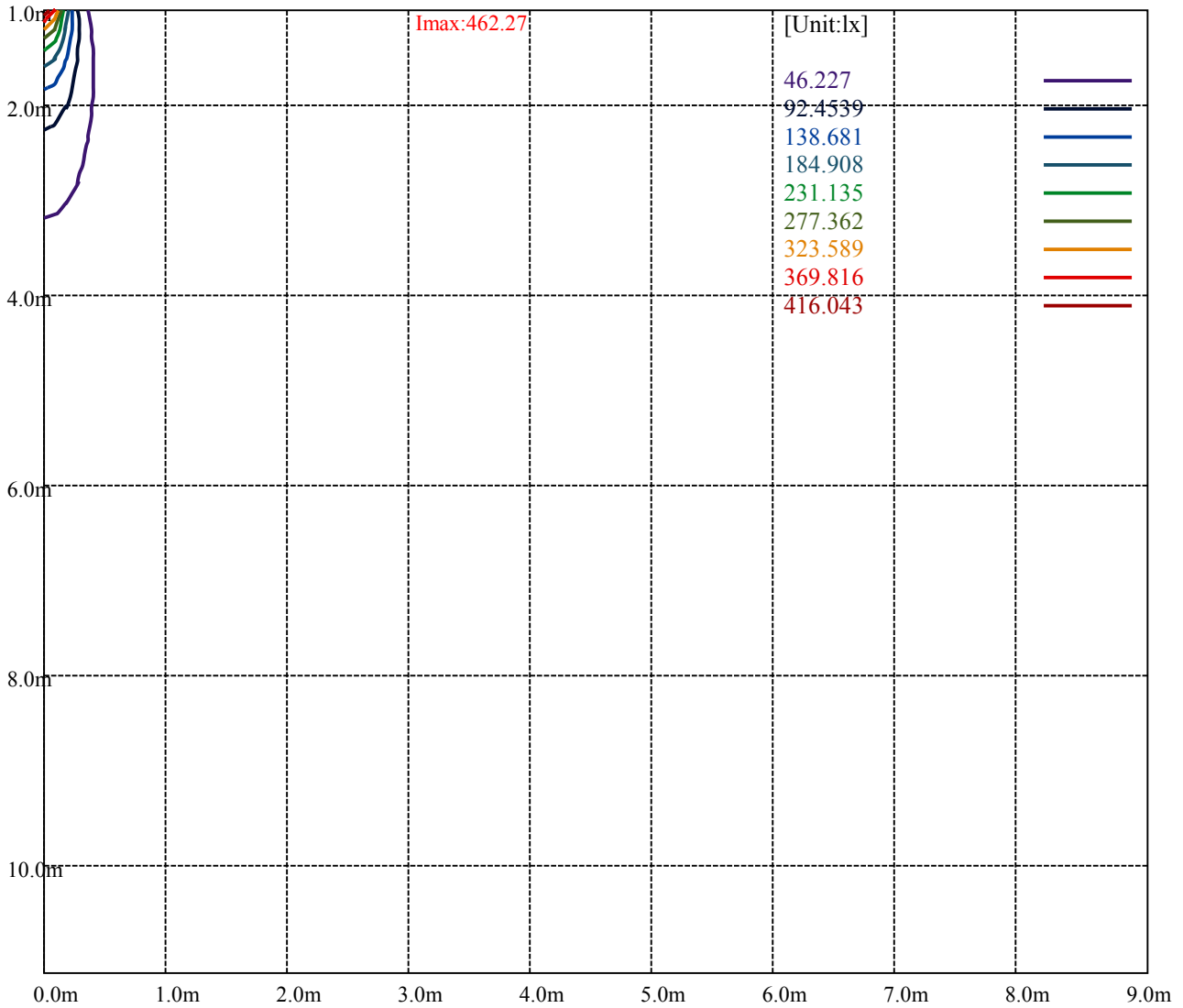
(80%I<sub>max</sub>) 369.816

(90%I<sub>max</sub>) 416.043





(10%Emax) 11.55672	—
(20%Emax) 23.11345	—
(30%Emax) 34.67025	—
(40%Emax) 46.227	—
(50%Emax) 57.78375	—
(60%Emax) 69.3405	—
(70%Emax) 80.897	—
(80%Emax) 92.45375	—
(90%Emax) 104.0105	—



Luminance Table

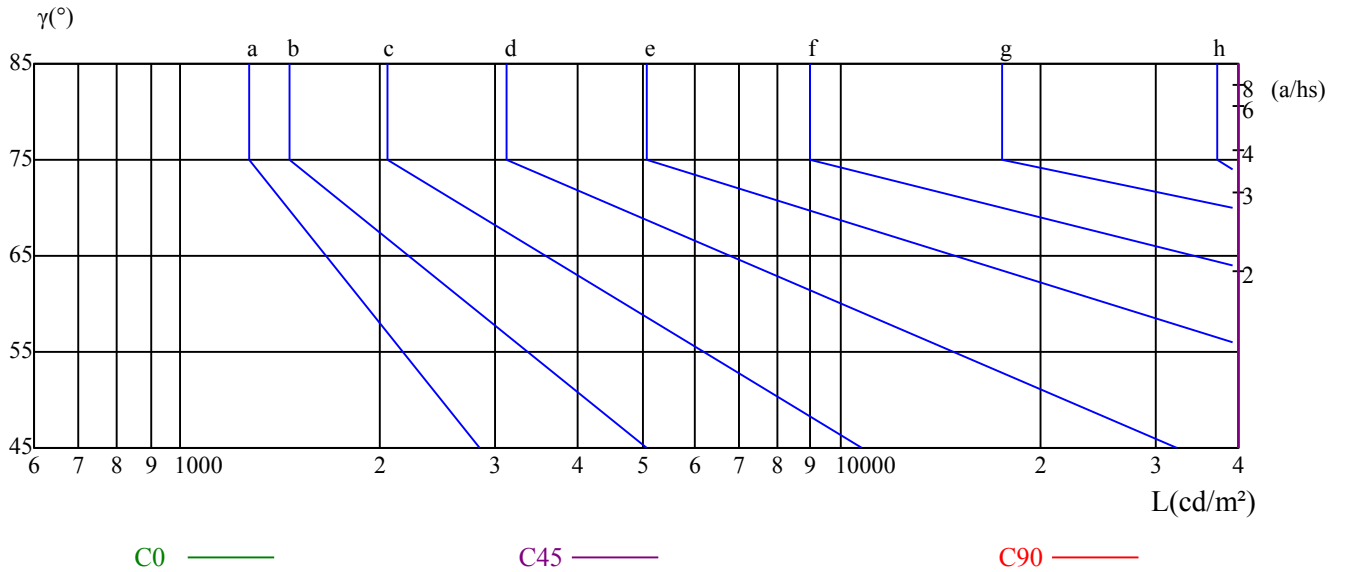
$\gamma$	45	50	55	60	65	70	75	80	85
C0	53254	47984	44294	41750	40891	42212	48659	64786	113661
C45	53254	47984	44294	41750	40891	42212	48659	64786	113661
C90	53254	47984	44294	41750	40891	42212	48659	64786	113661

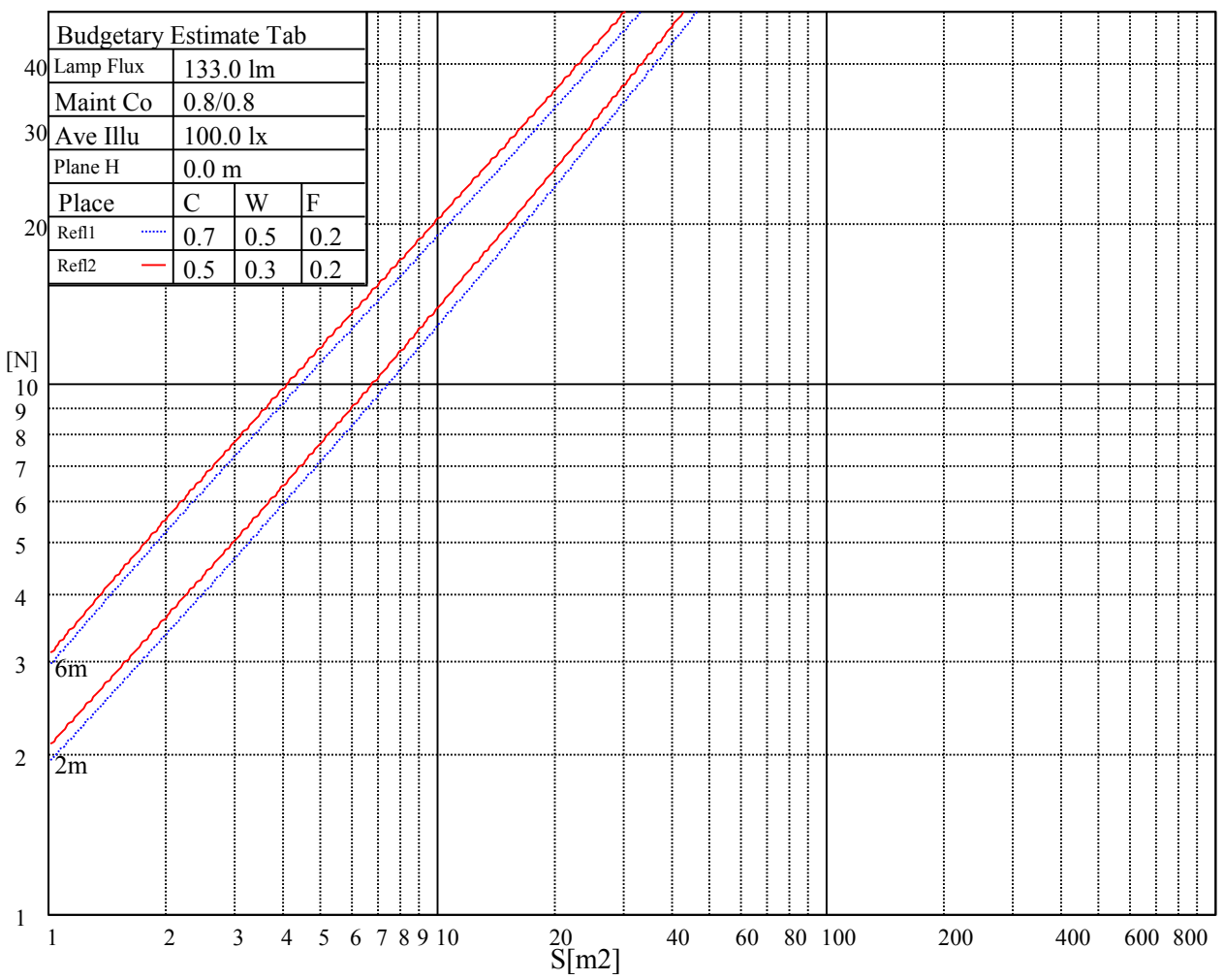
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
40891	40891	40891	48659	48659	48659	113661	113661	113661

Glare Table

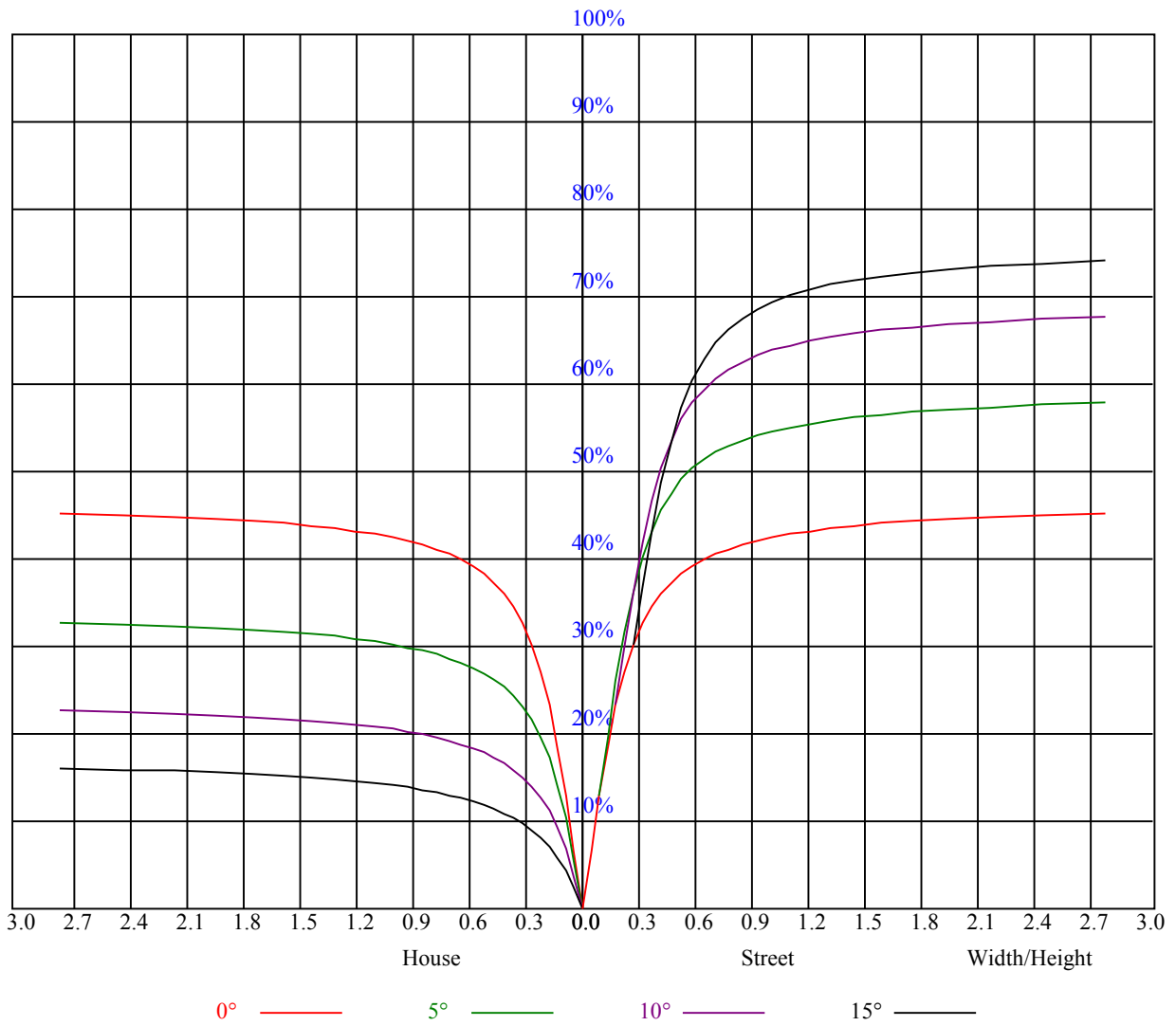
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.11	1.11	1.11	1.08	1.08	1.08	1.03	1.03	1.03	0.99	0.99	0.99	0.95	0.95	0.95	0.93
1	1.02	0.99	0.97	1.00	0.98	0.96	0.96	0.94	0.93	0.93	0.91	0.90	0.89	0.88	0.87	0.86
2	0.95	0.91	0.88	0.93	0.90	0.87	0.90	0.87	0.85	0.88	0.85	0.83	0.85	0.83	0.81	0.80
3	0.89	0.85	0.81	0.88	0.84	0.80	0.85	0.82	0.79	0.83	0.80	0.78	0.81	0.79	0.76	0.75
4	0.84	0.79	0.75	0.83	0.79	0.75	0.81	0.77	0.74	0.79	0.76	0.73	0.78	0.75	0.72	0.71
5	0.80	0.75	0.71	0.79	0.74	0.71	0.78	0.73	0.70	0.76	0.72	0.70	0.75	0.71	0.69	0.68
6	0.76	0.71	0.67	0.76	0.71	0.67	0.74	0.70	0.67	0.73	0.69	0.66	0.72	0.68	0.66	0.65
7	0.73	0.68	0.64	0.72	0.68	0.64	0.71	0.67	0.64	0.70	0.66	0.64	0.69	0.66	0.63	0.62
8	0.70	0.65	0.62	0.70	0.65	0.62	0.69	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.61	0.60
9	0.68	0.63	0.59	0.67	0.62	0.59	0.66	0.62	0.59	0.65	0.62	0.59	0.65	0.61	0.59	0.58
10	0.65	0.60	0.57	0.65	0.60	0.57	0.64	0.60	0.57	0.63	0.60	0.57	0.63	0.59	0.57	0.56



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	463.39	460.46	451.29	437.46	418.84	395.04	371.87	342.45	316.18
45.0	461.19	460.46	453.15	439.59	423.39	401.57	375.53	349.59	322.99
90.0	461.48	457.09	445.89	428.23	409.16	383.96	358.99	327.60	296.10
135.0	462.94	461.25	453.26	440.33	422.04	399.88	376.82	347.85	321.19
180.0	463.56	461.25	453.77	439.31	422.72	402.24	376.82	347.91	320.85
225.0	461.19	456.98	448.37	433.01	413.10	392.06	369.23	337.39	311.12
270.0	461.48	461.48	454.22	443.14	428.06	403.03	380.64	356.23	327.38
315.0	462.94	458.94	450.56	434.03	416.93	395.72	368.83	340.20	313.82
360.0	463.39	460.46	451.29	437.46	418.84	395.04	371.87	342.45	316.18
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	286.48	256.95	232.43	211.50	181.86	161.89	145.91	123.75	110.08
45.0	288.73	261.96	235.74	208.35	182.81	161.83	140.57	122.18	107.78
90.0	268.54	239.06	211.05	187.65	166.67	141.81	124.65	109.58	94.56
135.0	290.59	260.61	234.62	210.66	182.48	161.49	142.88	122.63	108.68
180.0	293.57	260.16	235.58	211.78	187.14	164.08	145.52	126.68	112.05
225.0	284.96	252.79	228.04	205.20	178.37	159.41	142.03	122.96	111.21
270.0	297.96	272.08	243.45	219.99	194.91	171.90	153.84	135.68	119.76
315.0	284.40	255.15	229.95	204.19	183.04	161.66	142.54	127.52	114.53
360.0	286.48	256.95	232.43	211.50	181.86	161.89	145.91	123.75	110.08
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	99.34	86.06	75.66	68.57	59.34	53.38	47.93	41.96	37.63
45.0	93.09	81.62	70.59	61.03	54.11	47.08	41.29	36.68	32.51
90.0	81.17	70.76	61.09	52.88	46.63	40.67	36.06	31.61	27.84
135.0	95.29	83.64	71.49	62.49	55.07	47.42	42.19	37.46	32.79
180.0	97.14	84.09	73.91	64.29	55.74	49.39	44.04	38.31	34.31
225.0	97.76	85.05	77.23	68.63	60.19	54.90	49.56	43.09	39.77
270.0	107.66	96.81	85.16	77.06	69.81	62.66	56.25	51.30	45.96
315.0	100.29	90.28	81.68	72.34	65.48	59.57	53.49	48.26	44.16
360.0	99.34	86.06	75.66	68.57	59.34	53.38	47.93	41.96	37.63
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	33.86	29.76	27.11	24.75	22.11	20.31	18.56	17.04	15.64
45.0	28.46	25.71	23.18	20.81	18.79	17.21	15.81	14.40	13.33
90.0	24.86	22.56	19.91	18.06	16.48	14.79	13.73	12.77	11.81
135.0	28.91	25.99	23.12	21.04	18.79	16.93	15.58	14.34	13.11
180.0	30.88	27.51	24.36	22.05	19.80	17.89	16.59	15.36	14.18
225.0	36.17	32.46	29.36	26.78	24.24	22.05	20.31	18.45	17.10
270.0	41.29	37.69	33.98	31.11	28.18	25.59	23.46	21.43	19.41
315.0	39.94	36.51	33.02	29.93	27.56	24.98	22.78	20.87	19.29
360.0	33.86	29.76	27.11	24.75	22.11	20.31	18.56	17.04	15.64
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	14.68	13.44	12.60	11.87	11.19	10.63	10.13	9.68	9.23
45.0	12.43	11.64	10.86	10.24	9.84	9.34	8.89	8.49	8.16
90.0	10.97	10.46	9.79	9.34	8.83	8.44	8.10	7.82	7.43
135.0	12.32	11.53	10.52	9.96	9.56	8.89	8.49	8.21	7.82
180.0	13.05	12.21	11.36	10.69	10.13	9.56	9.23	8.66	8.27
225.0	15.58	14.40	13.56	12.66	11.70	10.97	10.41	9.73	9.28
270.0	17.94	16.71	15.24	14.18	13.33	12.32	11.59	10.97	10.35
315.0	17.61	16.54	15.36	14.12	13.28	12.49	11.76	11.14	10.52
360.0	14.68	13.44	12.60	11.87	11.19	10.63	10.13	9.68	9.23



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	8.83	8.49	8.27	7.88	7.65	7.37	7.09	6.92	6.64
45.0	7.88	7.59	7.31	7.09	6.86	6.64	6.41	6.24	6.02
90.0	7.20	6.98	6.69	6.47	6.30	6.08	5.85	5.63	5.46
135.0	7.48	7.20	6.92	6.64	6.41	6.19	6.02	5.79	5.51
180.0	7.93	7.65	7.31	7.14	6.75	6.58	6.36	6.08	5.85
225.0	8.83	8.44	8.04	7.65	7.31	6.98	6.75	6.47	6.19
270.0	9.73	9.34	8.94	8.49	8.10	7.76	7.43	7.09	6.75
315.0	9.90	9.45	9.00	8.66	8.21	7.93	7.54	7.31	7.03
360.0	8.83	8.49	8.27	7.88	7.65	7.37	7.09	6.92	6.64
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	6.41	6.19	5.91	5.68	5.46	5.34	5.12	4.89	4.78
45.0	5.85	5.63	5.40	5.23	5.06	4.89	4.73	4.56	4.44
90.0	5.23	5.12	4.89	4.73	4.56	4.39	4.28	4.11	3.94
135.0	5.29	5.12	4.89	4.73	4.56	4.39	4.22	4.16	3.94
180.0	5.57	5.34	5.23	5.01	4.78	4.61	4.44	4.28	4.11
225.0	5.96	5.68	5.51	5.23	5.01	4.78	4.61	4.39	4.22
270.0	6.53	6.24	6.02	5.74	5.51	5.29	5.01	4.84	4.61
315.0	6.64	6.41	6.13	5.91	5.68	5.46	5.18	4.95	4.78
360.0	6.41	6.19	5.91	5.68	5.46	5.34	5.12	4.89	4.78
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	4.56	4.33	4.22	4.11	3.94	3.77	3.60	3.54	3.43
45.0	4.28	4.11	3.99	3.88	3.71	3.60	3.49	3.43	3.32
90.0	3.83	3.71	3.60	3.43	3.32	3.21	3.09	2.98	2.93
135.0	3.83	3.71	3.60	3.49	3.38	3.26	3.15	3.04	2.98
180.0	3.99	3.88	3.71	3.54	3.43	3.32	3.26	3.09	3.04
225.0	4.05	3.94	3.77	3.60	3.49	3.32	3.21	3.09	3.04
270.0	4.39	4.22	4.05	3.88	3.66	3.54	3.43	3.32	3.15
315.0	4.56	4.39	4.16	4.05	3.88	3.77	3.60	3.49	3.32
360.0	4.56	4.33	4.22	4.11	3.94	3.77	3.60	3.54	3.43
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	3.32	3.26	3.21	3.09	3.04	2.93	2.87	2.87	2.87
45.0	3.21	3.09	3.04	2.98	2.93	2.87	2.81	2.81	2.76
90.0	2.87	2.76	2.70	2.64	2.59	2.53	2.48	2.42	2.31
135.0	2.93	2.87	2.81	2.76	2.70	2.59	2.59	2.53	2.48
180.0	2.98	2.93	2.81	2.76	2.70	2.64	2.59	2.53	2.42
225.0	2.87	2.81	2.76	2.70	2.64	2.59	2.53	2.48	2.42
270.0	3.09	2.98	2.87	2.76	2.70	2.59	2.53	2.42	2.36
315.0	3.21	3.09	3.09	2.98	2.93	2.87	2.81	2.76	2.64
360.0	3.32	3.26	3.21	3.09	3.04	2.93	2.87	2.87	2.87
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	2.81	2.70	2.70	2.59	2.48	2.48	2.59	2.64	2.59
45.0	2.64	2.59	2.53	2.53	2.53	2.59	2.48	2.48	1.91
90.0	2.31	2.25	2.14	2.19	2.14	2.08	2.08	1.80	0.90
135.0	2.48	2.36	2.31	2.25	2.19	2.14	2.14	2.03	0.96
180.0	2.36	2.25	2.14	2.08	2.03	1.97	1.91	1.58	0.84
225.0	2.36	2.36	2.19	2.14	2.14	2.03	2.03	1.97	1.07
270.0	2.25	2.19	2.08	2.03	1.97	1.91	1.91	1.97	1.97
315.0	2.59	2.53	2.48	2.42	2.36	2.31	2.42	2.48	2.53
360.0	2.81	2.70	2.70	2.59	2.48	2.48	2.59	2.64	2.59

Intensity data(cd)

C/ $\gamma$ (°)	90.0
0.0	1.29
45.0	0.90
90.0	0.73
135.0	0.68
180.0	0.73
225.0	0.73
270.0	1.01
315.0	1.24
360.0	1.29