
NATA

Client:

LumCAT: 2-1258-N

Luminaire: 92.70.065.00+92.70.059.00

Report No: nata-0100

Voltage(V): 36.2000

Test No: GC2018112102

Current(A): 0.5000

LampCAT: OSRAM SOLERIQ S13

Power (W): 18.1000

Lamp flux(lm): 1781.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 70

Width(mm): 70

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1359.37, Efficiency(%): 76.33% , Luminous Efficacy(lm/W): 75.10

Central intensity(cd): 8897.625, Maximum intensity(cd): 8897.625

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=17.4

[C90/270]Total=17.4

Field angle(10%Imax): [C0/180]Total=33.2

[C90/270]Total=33.2

Maximum s/h(1/2): C0_180=0.30 C90_270=0.30

Maximum s/h(1/4): C0_180=0.28 C90_270=0.28

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 76.44%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 97.657%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	8897.625	2.129	2.129	.120%	.157%
1.0	8868.727	16.973	19.102	.953%	1.405%
2.0	8739.141	33.446	52.548	1.878%	3.866%
3.0	8523.281	48.917	101.465	2.747%	7.464%
4.0	8193.656	62.678	164.142	3.519%	12.075%
5.0	7614.141	72.773	236.915	4.086%	17.428%
6.0	6896.883	79.057	315.972	4.439%	23.244%
7.0	6077.813	81.226	397.198	4.561%	29.219%
8.0	5077.617	77.494	474.691	4.351%	34.920%
9.0	4143.234	71.076	545.768	3.991%	40.149%
10.0	3310.172	63.034	608.801	3.539%	44.786%
11.0	2544.469	53.241	662.042	2.989%	48.702%
12.0	2024.578	46.160	708.202	2.592%	52.098%
13.0	1586.974	39.148	747.35	2.198%	54.978%
14.0	1297.962	34.434	781.784	1.933%	57.511%
15.0	1084.683	30.786	812.57	1.729%	59.776%
16.0	964.652	29.158	841.728	1.637%	61.921%
17.0	845.409	27.105	868.834	1.522%	63.915%
18.0	759.860	25.749	894.583	1.446%	65.809%
19.0	695.306	24.824	919.407	1.394%	67.635%
20.0	633.488	23.760	943.167	1.334%	69.383%
21.0	581.801	22.864	966.031	1.284%	71.065%
22.0	539.916	22.180	988.211	1.245%	72.696%
23.0	497.503	21.317	1009.528	1.197%	74.265%
24.0	458.114	20.433	1029.961	1.147%	75.768%
25.0	424.005	19.650	1049.611	1.103%	77.213%
26.0	390.593	18.777	1068.388	1.054%	78.595%
27.0	359.494	17.897	1086.285	1.005%	79.911%
28.0	330.026	16.991	1103.276	.954%	81.161%
29.0	302.091	16.061	1119.336	.902%	82.343%
30.0	275.569	15.110	1134.446	.848%	83.454%
31.0	253.280	14.305	1148.751	.803%	84.506%
32.0	229.141	13.316	1162.067	.748%	85.486%
33.0	210.115	12.549	1174.616	.705%	86.409%
34.0	193.395	11.859	1186.475	.666%	87.282%
35.0	176.885	11.126	1197.601	.625%	88.100%
36.0	162.724	10.489	1208.09	.589%	88.872%
37.0	150.996	9.965	1218.055	.560%	89.605%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	139.887	9.444	1227.499	.530%	90.299%
39.0	128.714	8.883	1236.382	.499%	90.953%
40.0	118.997	8.388	1244.77	.471%	91.570%
41.0	110.081	7.920	1252.69	.445%	92.152%
42.0	100.132	7.347	1260.037	.413%	92.693%
43.0	92.018	6.882	1266.919	.386%	93.199%
44.0	84.776	6.458	1273.377	.363%	93.674%
45.0	77.245	5.990	1279.367	.336%	94.115%
46.0	70.488	5.560	1284.927	.312%	94.524%
47.0	64.230	5.151	1290.078	.289%	94.903%
48.0	58.113	4.736	1294.814	.266%	95.251%
49.0	52.861	4.375	1299.189	.246%	95.573%
50.0	47.791	4.015	1303.204	.225%	95.868%
51.0	43.327	3.692	1306.896	.207%	96.140%
52.0	39.635	3.425	1310.321	.192%	96.392%
53.0	36.070	3.159	1313.48	.177%	96.624%
54.0	32.576	2.890	1316.37	.162%	96.837%
55.0	29.784	2.675	1319.046	.150%	97.034%
56.0	27.134	2.467	1321.513	.139%	97.215%
57.0	24.427	2.246	1323.759	.126%	97.381%
58.0	22.380	2.081	1325.841	.117%	97.534%
59.0	20.573	1.934	1327.774	.109%	97.676%
60.0	18.661	1.772	1329.547	.100%	97.806%
61.0	17.163	1.646	1331.193	.092%	97.927%
62.0	15.870	1.537	1332.729	.086%	98.040%
63.0	14.611	1.428	1334.157	.080%	98.146%
64.0	13.739	1.354	1335.511	.076%	98.245%
65.0	13.078	1.300	1336.811	.073%	98.341%
66.0	12.530	1.255	1338.066	.070%	98.433%
67.0	12.136	1.225	1339.291	.069%	98.523%
68.0	11.714	1.191	1340.482	.067%	98.611%
69.0	11.299	1.157	1341.639	.065%	98.696%
70.0	10.997	1.133	1342.772	.064%	98.779%
71.0	10.666	1.106	1343.878	.062%	98.861%
72.0	10.336	1.078	1344.956	.061%	98.940%
73.0	10.083	1.057	1346.013	.059%	99.018%
74.0	9.816	1.035	1347.048	.058%	99.094%
75.0	9.506	1.007	1348.055	.057%	99.168%

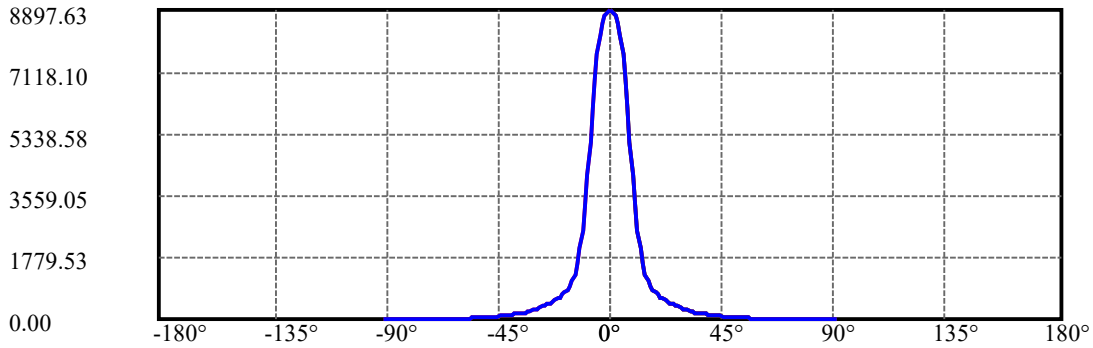
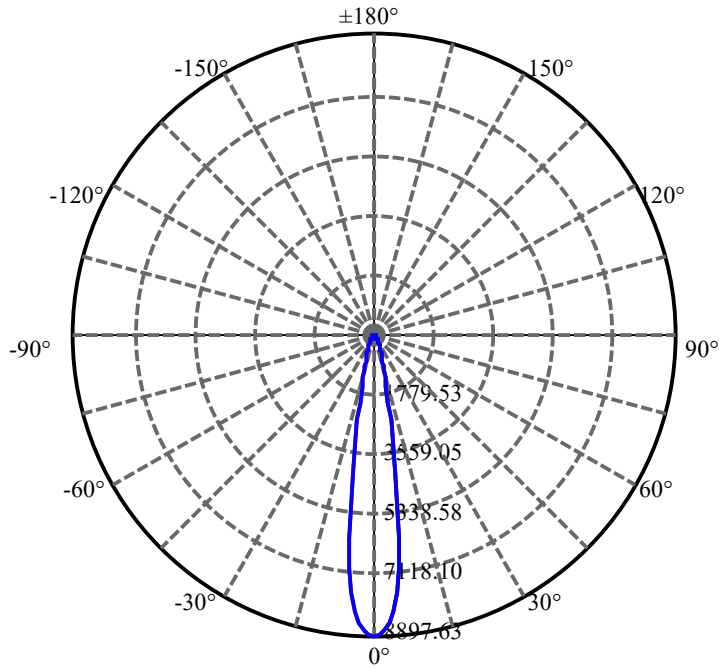
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.246	0.984	1349.039	.055%	99.240%
77.0	8.986	0.960	1349.999	.054%	99.311%
78.0	8.677	0.931	1350.93	.052%	99.379%
79.0	8.374	0.901	1351.831	.051%	99.446%
80.0	8.051	0.869	1352.701	.049%	99.510%
81.0	7.699	0.834	1353.535	.047%	99.571%
82.0	7.404	0.804	1354.339	.045%	99.630%
83.0	7.059	0.768	1355.107	.043%	99.687%
84.0	6.729	0.734	1355.841	.041%	99.741%
85.0	6.441	0.704	1356.544	.040%	99.792%
86.0	6.117	0.669	1357.214	.038%	99.842%
87.0	5.864	0.642	1357.856	.036%	99.889%
88.0	5.625	0.616	1358.472	.035%	99.934%
89.0	5.463	0.599	1359.071	.034%	99.978%
90.0	5.379	0.295	1359.366	.017%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1134.45	63.70%	83.45%
0-40	1244.77	69.89%	91.57%
0-60	1329.55	74.65%	97.81%
0-90	1359.07	76.31%	99.98%
0-120	1359.07	76.31%	99.98%
0-180	1359.37	76.33%	100.00%
60-90	31.30	1.76%	2.30%
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%
0-27.07	1087.49	61.06%	80.00%

ZONAL LUMEN SUMMARY

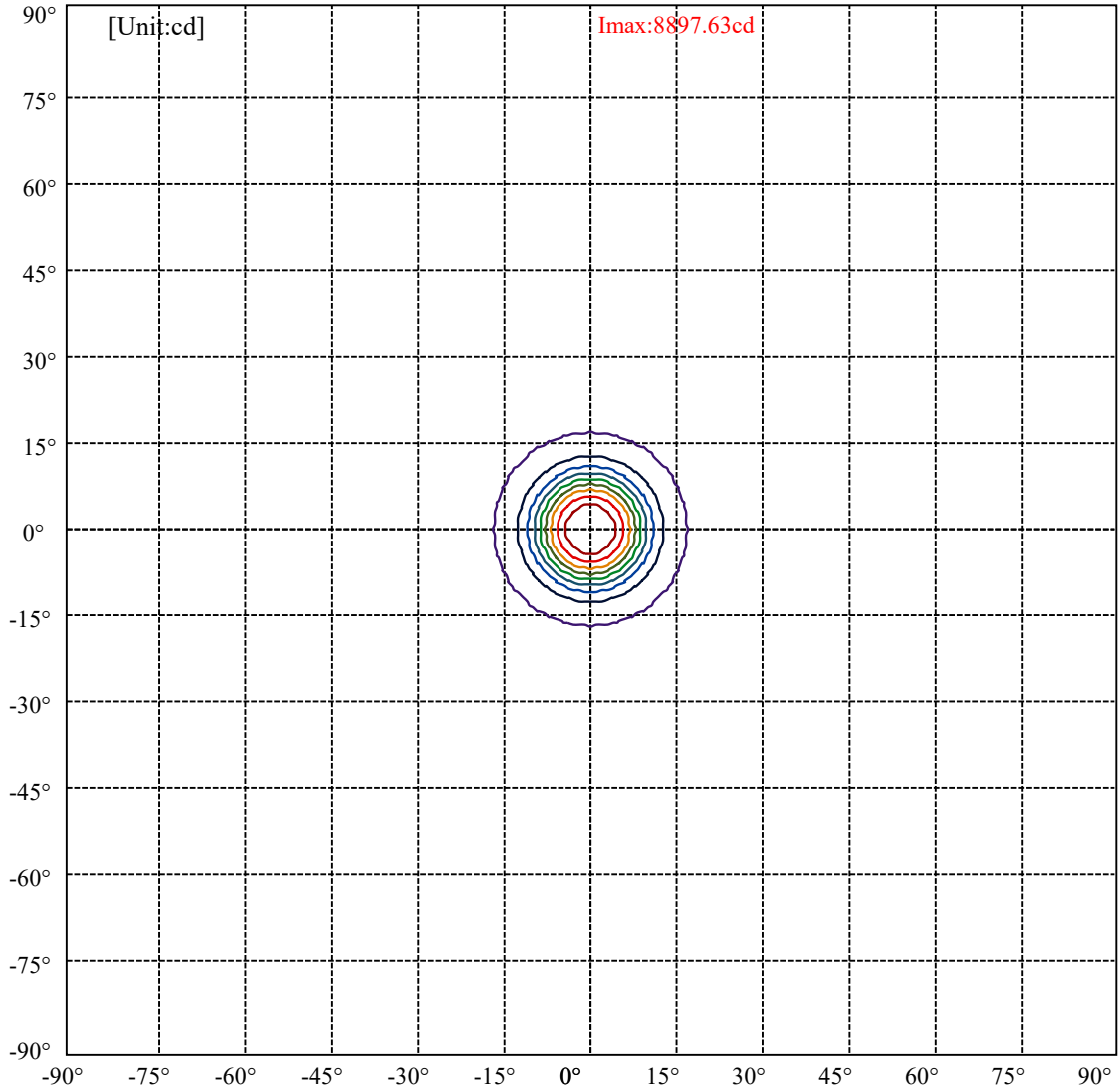
0-10	608.80
10-20	334.37
20-30	191.28
30-40	110.32
40-50	58.43
50-60	26.34
60-70	13.23
70-80	9.93
80-90	6.37
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00



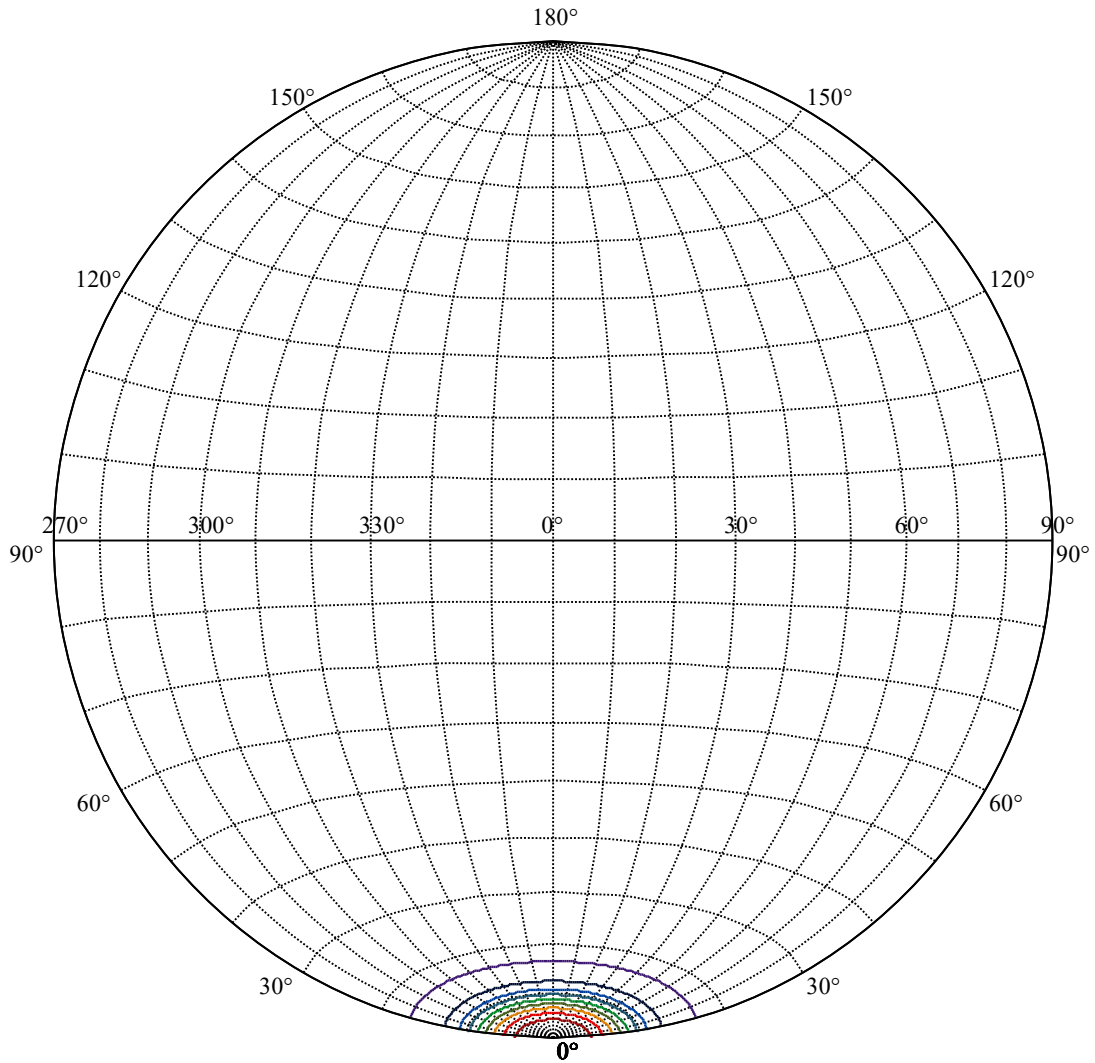
C0(Max): —————
C0/C180: —————
C90/C270: —————

Field angle(10%Imax):C0/180Left:16.6 Right:16.6
:C90/270Left:16.6 Right:16.6

Beam Angle(50%Imax):C0/180Left:8.7 Right:8.7
:C90/270Left:8.7 Right:8.7



(10%Imax) 889.763	—
(20%Imax) 1779.53	—
(30%Imax) 2669.29	—
(40%Imax) 3559.05	—
(50%Imax) 4448.81	—
(60%Imax) 5338.58	—
(70%Imax) 6228.34	—
(80%Imax) 7118.1	—
(90%Imax) 8007.86	—



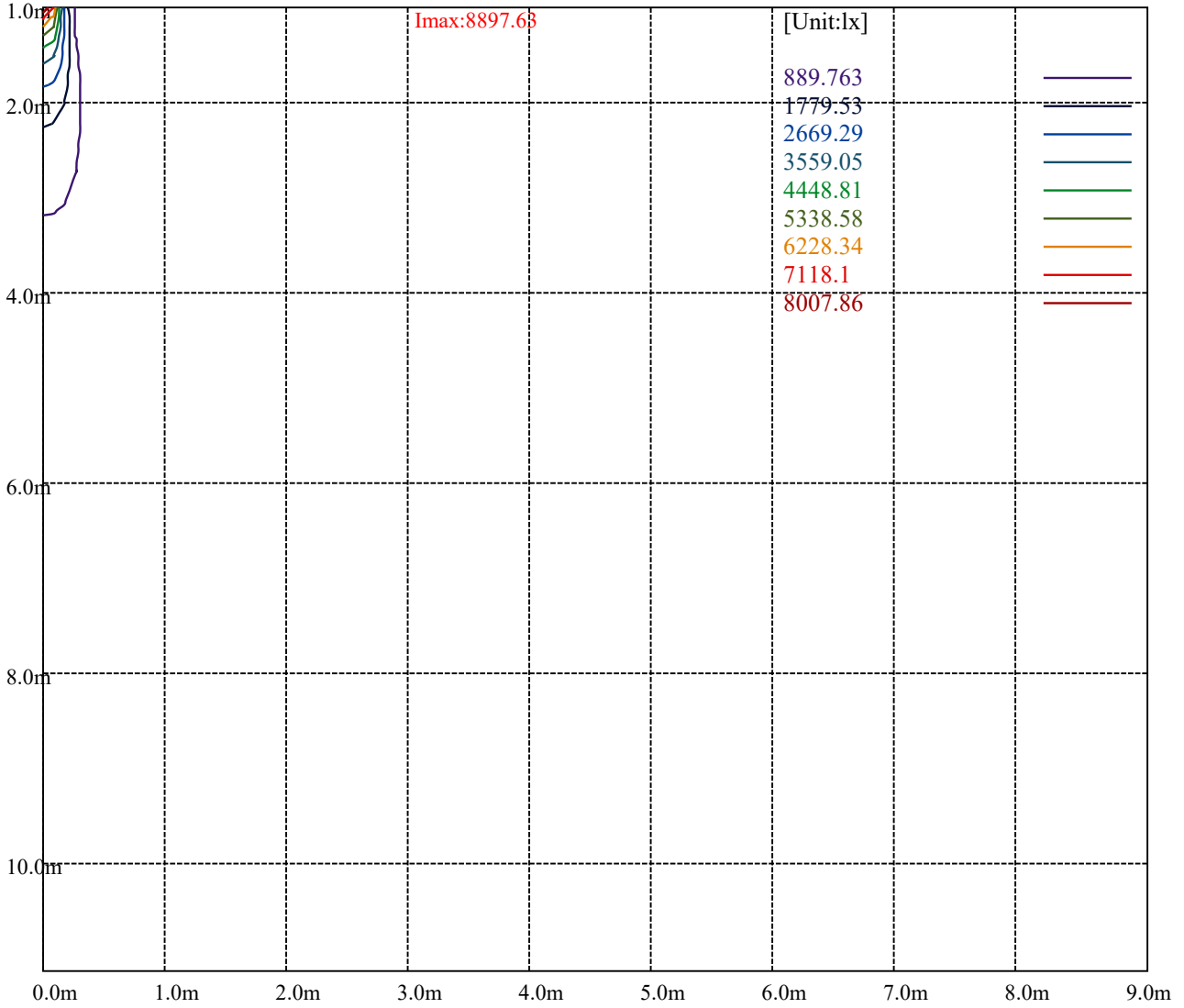
House

[Unit:cd]

Road

Imax:8897.63

(10%Imax) 889.763	—
(20%Imax) 1779.53	—
(30%Imax) 2669.29	—
(40%Imax) 3559.05	—
(50%Imax) 4448.81	—
(60%Imax) 5338.58	—
(70%Imax) 6228.34	—
(80%Imax) 7118.1	—
(90%Imax) 8007.86	—



Luminance Table

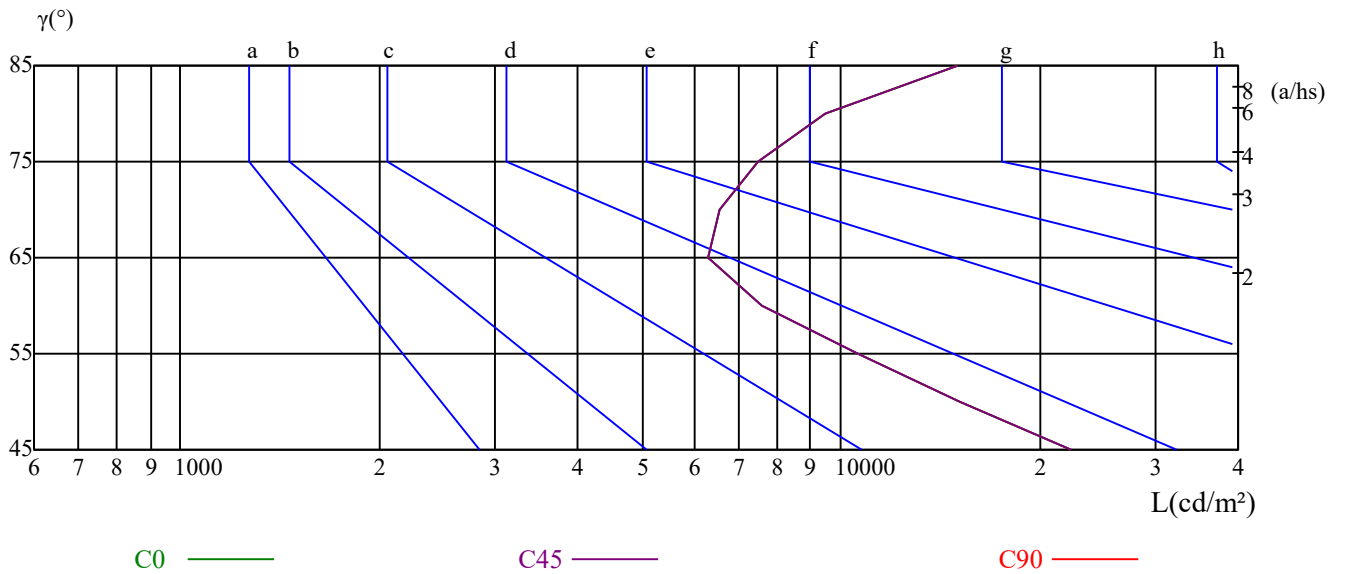
γ	45	50	55	60	65	70	75	80	85
C0	22294	15174	10597	7617	6315	6562	7496	9462	15081
C45	22294	15174	10597	7617	6315	6562	7496	9462	15081
C90	22294	15174	10597	7617	6315	6562	7496	9462	15081

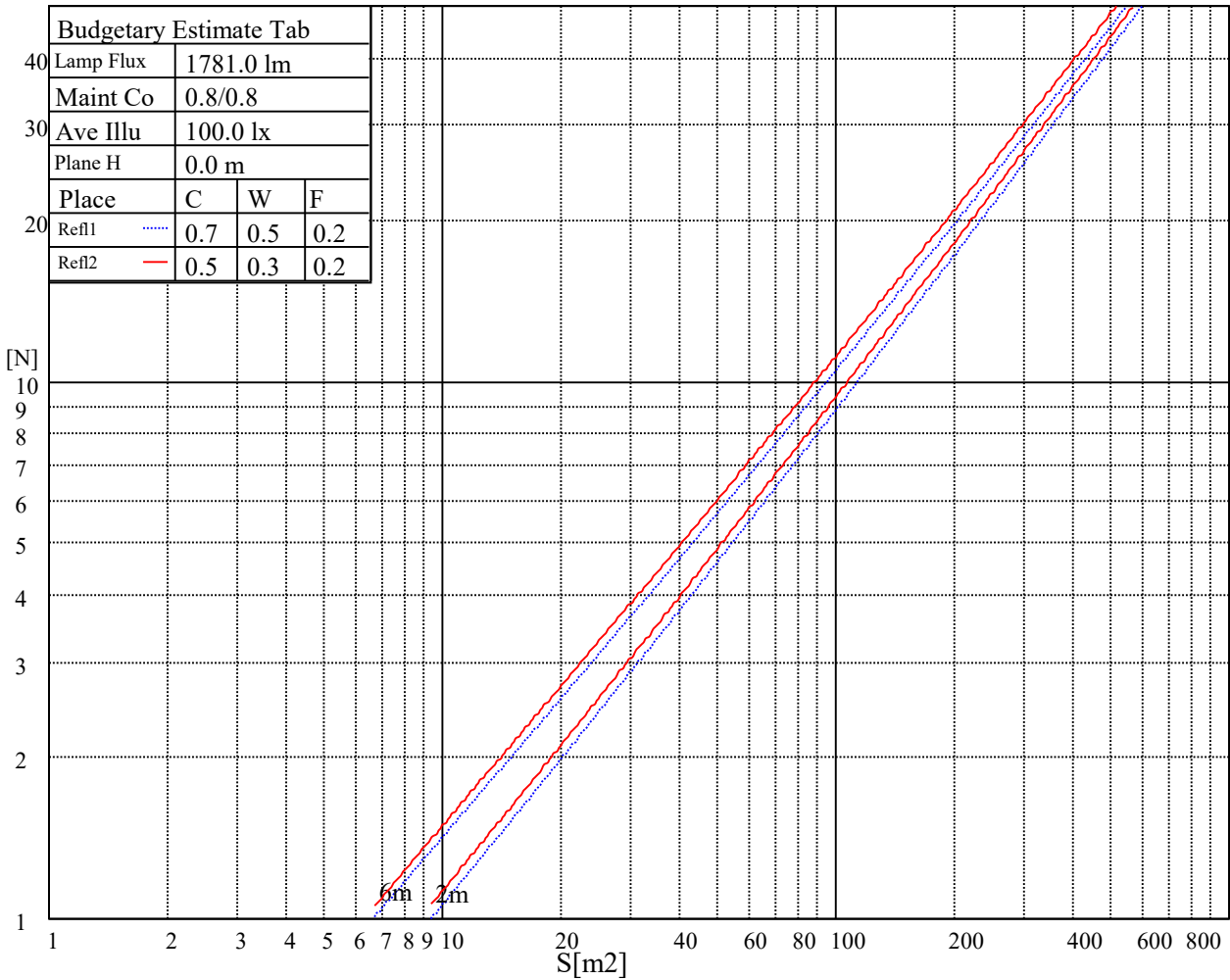
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
6315	6315	6315	7496	7496	7496	15081	15081	15081

Glare Table

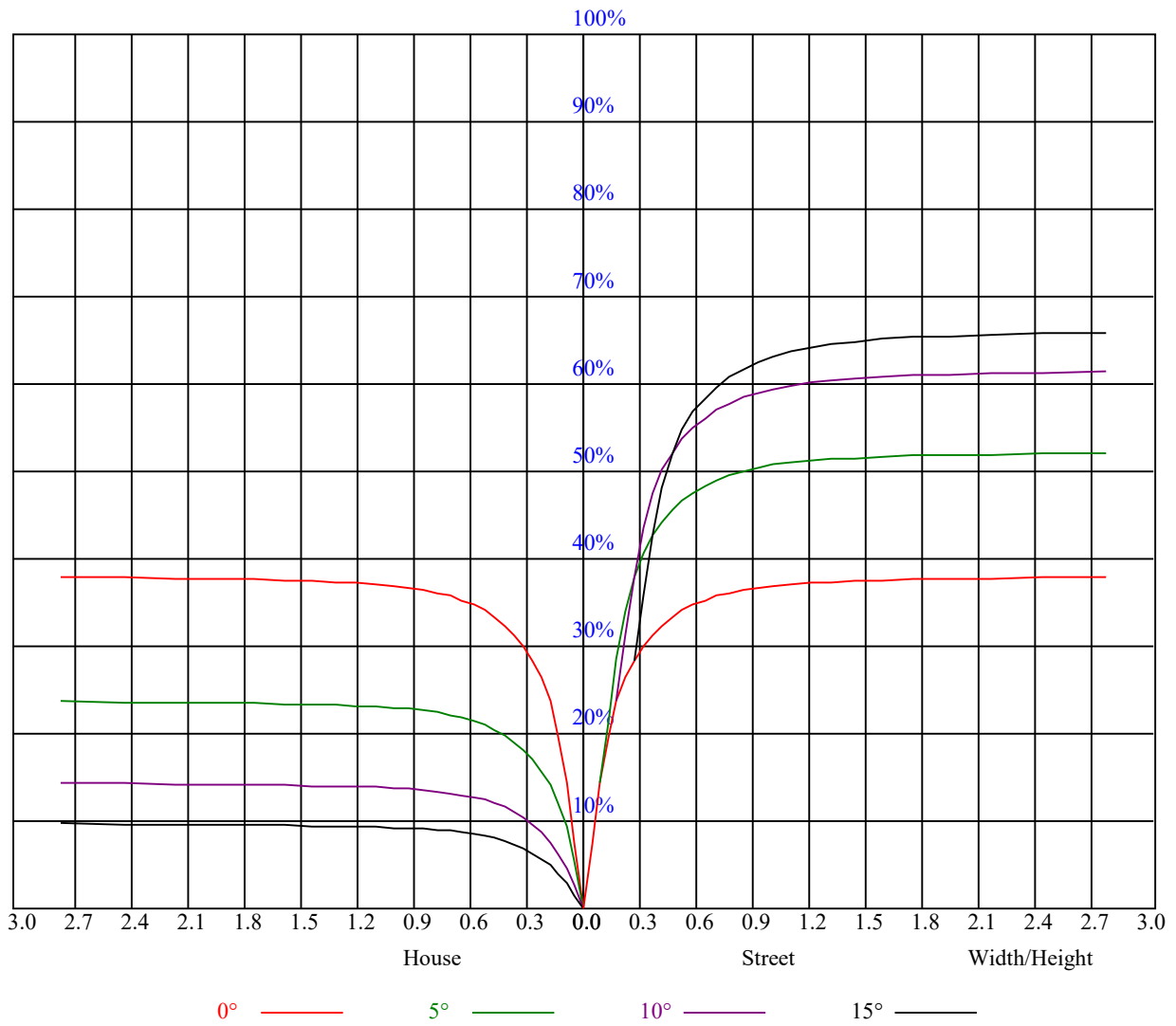
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

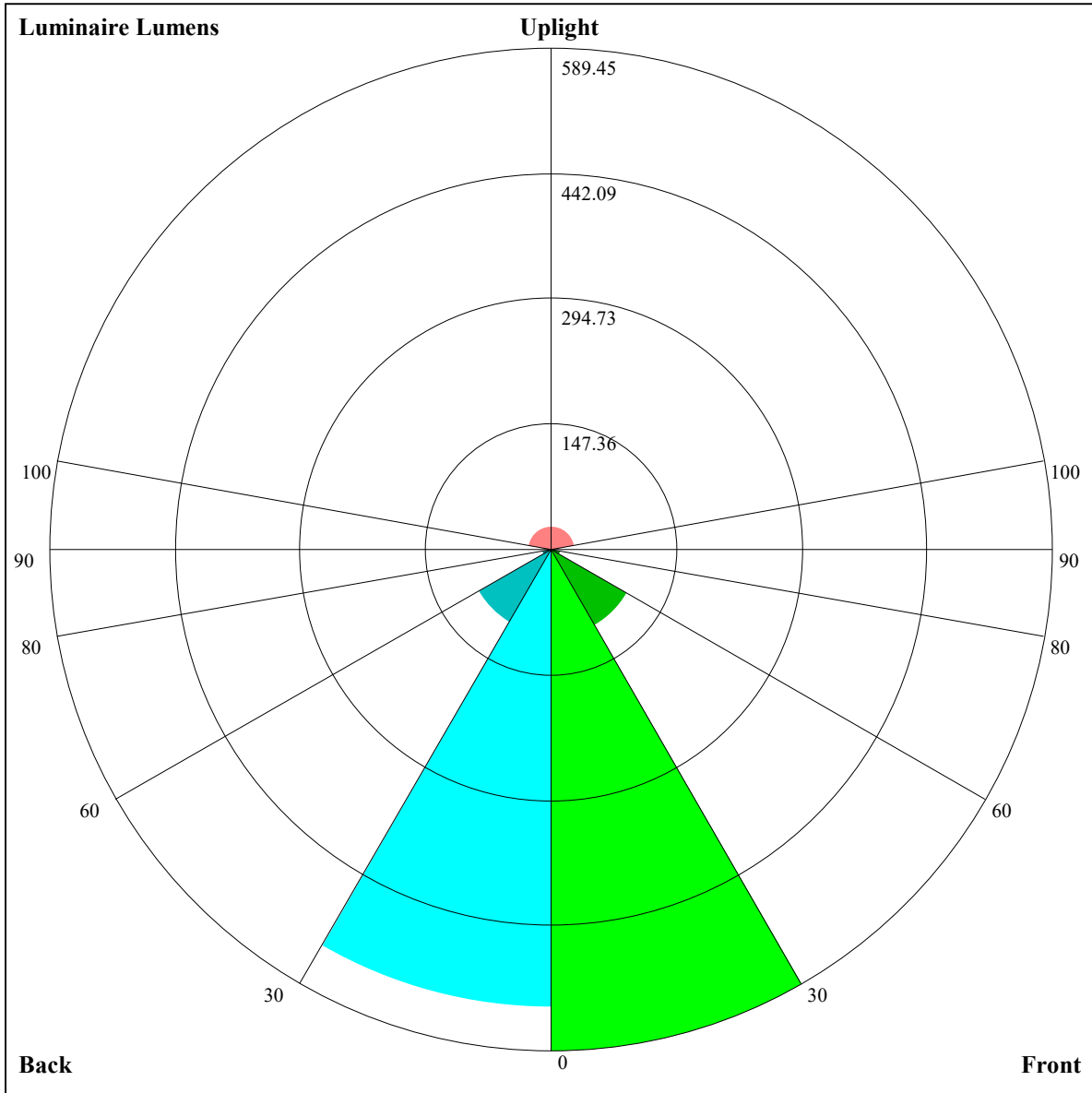
Luminance Limiting Curve





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	0.91	0.91	0.91	0.89	0.89	0.89	0.85	0.85	0.85	0.81	0.81	0.81	0.78	0.78	0.78	0.76
1	0.85	0.84	0.82	0.84	0.82	0.81	0.81	0.80	0.79	0.78	0.77	0.76	0.75	0.75	0.74	0.73
2	0.81	0.78	0.76	0.80	0.77	0.75	0.77	0.75	0.74	0.75	0.73	0.72	0.73	0.72	0.71	0.69
3	0.77	0.74	0.72	0.76	0.73	0.71	0.74	0.72	0.70	0.72	0.70	0.69	0.71	0.69	0.68	0.67
4	0.74	0.70	0.68	0.73	0.70	0.67	0.71	0.69	0.67	0.70	0.68	0.66	0.69	0.67	0.65	0.64
5	0.71	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.68	0.65	0.63	0.67	0.65	0.63	0.62
6	0.68	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.62	0.66	0.63	0.61	0.65	0.63	0.61	0.60
7	0.66	0.62	0.60	0.65	0.62	0.60	0.65	0.62	0.60	0.64	0.61	0.59	0.63	0.61	0.59	0.58
8	0.64	0.60	0.58	0.64	0.60	0.58	0.63	0.60	0.58	0.62	0.60	0.58	0.61	0.59	0.57	0.57
9	0.62	0.59	0.56	0.62	0.59	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.60	0.58	0.56	0.55
10	0.60	0.57	0.55	0.60	0.57	0.55	0.60	0.57	0.55	0.59	0.56	0.55	0.59	0.56	0.55	0.54





Luminaire Lumens:

FL=589.45,FM=103.48,FH=12.04,FVH=3.62

BL=538.18,BM=99.07,BH=11.65,BVH=3.5

UL=5.87,UH=27.93

BUG Rating:B2-U2-G0

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	8843.63	8918.44	8939.25	8898.75	8811.00	8521.88	8053.31	7540.88	6597.56
45.0	8928.56	8893.69	8762.06	8533.69	8147.25	7408.13	6619.50	5720.63	4653.56
90.0	8903.25	8811.56	8573.06	8223.19	7709.06	6823.69	6053.63	4970.81	3782.25
135.0	8915.06	8830.69	8609.06	8300.25	7860.94	7171.31	6285.94	5392.13	4362.75
180.0	8843.63	8689.50	8355.94	7943.06	7379.44	6649.88	5555.25	4633.88	3751.88
225.0	8928.56	8920.13	8838.00	8656.88	8386.31	7902.56	7306.31	6450.75	5452.88
270.0	8903.25	8939.81	8916.75	8823.38	8648.44	8233.31	7714.69	7041.38	6109.88
315.0	8915.06	8946.00	8919.00	8807.06	8606.81	8202.38	7586.44	6872.06	5910.19
360.0	8843.63	8918.44	8939.25	8898.75	8811.00	8521.88	8053.31	7540.88	6597.56
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5601.38	4792.50	3669.75	2901.94	2284.31	1722.38	1405.69	1175.63	974.25
45.0	3631.50	2853.56	2171.81	1735.31	1384.88	1141.88	987.19	860.63	765.56
90.0	3057.75	2308.50	1726.31	1439.44	1102.56	990.23	876.15	792.34	727.03
135.0	3394.13	2673.56	2046.94	1648.69	1335.38	1125.56	990.00	883.13	779.63
180.0	2891.25	2228.63	1801.13	1456.88	1121.74	1069.03	938.76	844.54	756.90
225.0	4528.13	3549.94	2732.06	2168.44	1756.69	1407.38	1119.54	1070.21	939.94
270.0	5064.19	4136.63	3195.00	2498.06	1912.50	1504.69	1252.69	1056.94	918.56
315.0	4977.56	3938.06	3012.75	2347.88	1797.75	1422.56	1107.45	1033.82	901.41
360.0	5601.38	4792.50	3669.75	2901.94	2284.31	1722.38	1405.69	1175.63	974.25
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	858.38	771.19	689.06	636.75	589.50	543.38	500.06	465.19	428.63
45.0	698.63	642.94	582.75	540.00	501.19	456.75	423.56	392.06	360.56
90.0	660.83	615.21	572.63	522.45	485.78	451.29	414.34	380.31	351.62
135.0	713.25	658.69	597.94	554.63	514.69	473.63	435.94	403.88	370.69
180.0	684.73	629.55	581.96	529.20	492.58	458.49	416.87	386.49	356.79
225.0	834.58	758.36	685.80	623.31	575.83	527.40	489.49	450.06	413.21
270.0	828.00	757.69	688.50	640.69	596.81	546.75	508.50	471.94	433.13
315.0	800.49	728.83	669.26	607.39	562.95	522.34	476.16	442.13	410.12
360.0	858.38	771.19	689.06	636.75	589.50	543.38	500.06	465.19	428.63
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	397.69	365.06	333.56	307.13	285.75	253.46	233.72	215.83	194.96
45.0	330.75	305.44	284.06	253.86	230.63	212.29	193.61	177.08	164.31
90.0	321.13	295.43	268.20	243.79	224.04	203.74	185.91	171.68	159.24
135.0	343.13	312.75	286.31	257.51	233.16	211.73	194.57	179.38	162.68
180.0	324.90	294.36	270.00	245.70	225.62	205.09	186.64	172.07	157.56
225.0	383.74	354.66	320.68	295.88	272.70	245.64	226.18	208.46	190.13
270.0	397.13	366.19	333.56	307.69	284.63	254.98	235.63	215.27	196.59
315.0	377.49	346.33	320.34	293.01	269.72	246.21	224.66	207.39	189.62
360.0	397.69	365.06	333.56	307.13	285.75	253.46	233.72	215.83	194.96
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	179.72	166.05	152.10	139.56	129.83	119.93	109.63	101.08	92.64
45.0	151.43	140.91	131.46	120.38	110.19	102.54	92.42	85.61	79.20
90.0	145.41	135.62	126.79	117.11	106.76	98.72	89.94	82.35	75.88
135.0	150.69	139.89	128.31	119.53	110.19	100.91	92.42	85.39	77.91
180.0	144.90	134.55	125.55	114.64	106.03	98.10	90.06	82.46	75.99
225.0	174.26	161.55	150.24	138.49	127.35	117.62	107.27	98.33	90.73
270.0	181.86	168.58	155.31	143.49	134.33	125.10	112.39	103.39	95.57
315.0	173.53	160.82	149.34	136.52	127.29	117.73	106.93	97.54	90.28
360.0	179.72	166.05	152.10	139.56	129.83	119.93	109.63	101.08	92.64

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	86.18	78.69	71.83	65.98	60.41	53.83	49.22	45.06	40.44
45.0	71.21	65.19	60.24	53.83	48.60	44.55	40.39	36.90	33.75
90.0	68.91	62.94	56.81	51.13	46.80	42.36	38.36	35.16	32.29
135.0	71.49	64.69	58.22	53.16	48.04	43.54	39.88	36.51	32.74
180.0	69.08	62.49	57.21	51.81	47.42	42.92	38.87	35.55	32.51
225.0	82.63	75.83	68.46	61.71	56.42	50.91	45.96	42.08	38.53
270.0	86.18	79.14	72.45	65.42	58.78	53.44	48.09	43.93	39.83
315.0	82.29	74.93	68.63	61.88	56.42	50.79	45.84	41.91	38.48
360.0	86.18	78.69	71.83	65.98	60.41	53.83	49.22	45.06	40.44
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	37.07	33.98	30.88	27.90	25.54	23.12	21.04	19.35	17.66
45.0	30.32	27.68	25.43	22.67	20.98	19.35	17.55	16.26	15.08
90.0	28.91	26.38	24.19	21.99	20.08	18.56	16.99	15.58	14.46
135.0	29.98	27.34	24.75	22.39	20.64	19.07	17.27	15.98	14.74
180.0	28.97	26.44	24.19	21.71	19.91	18.34	16.59	15.36	14.29
225.0	34.71	31.73	28.91	26.10	23.63	21.60	19.69	17.94	16.54
270.0	36.11	33.13	29.93	27.00	24.75	23.01	20.48	18.84	17.55
315.0	34.54	31.61	28.80	25.65	23.51	21.54	19.69	18.00	16.65
360.0	37.07	33.98	30.88	27.90	25.54	23.12	21.04	19.35	17.66
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	16.43	15.02	14.06	13.44	12.94	12.38	11.98	11.64	11.19
45.0	13.95	13.22	12.66	12.21	11.76	11.42	11.03	10.74	10.46
90.0	13.44	12.94	12.38	11.93	11.59	11.19	10.80	10.58	10.29
135.0	13.67	12.94	12.49	12.04	11.70	11.31	10.91	10.63	10.29
180.0	13.33	12.94	12.43	11.93	11.64	11.25	10.80	10.58	10.29
225.0	15.02	14.01	13.22	12.66	12.26	11.87	11.36	11.08	10.74
270.0	15.81	14.68	13.89	13.16	12.66	12.26	11.87	11.48	11.08
315.0	15.24	14.18	13.50	12.88	12.54	12.04	11.64	11.25	10.97
360.0	16.43	15.02	14.06	13.44	12.94	12.38	11.98	11.64	11.19
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.86	10.52	10.29	10.01	9.68	9.45	9.17	8.89	8.61
45.0	10.18	9.96	9.68	9.39	9.11	8.89	8.55	8.21	7.93
90.0	9.96	9.73	9.51	9.23	8.94	8.66	8.38	8.04	7.65
135.0	9.96	9.73	9.45	9.17	8.89	8.61	8.27	7.99	7.65
180.0	9.96	9.79	9.45	9.11	8.89	8.61	8.27	7.88	7.54
225.0	10.41	10.18	9.90	9.56	9.34	9.11	8.83	8.55	8.21
270.0	10.74	10.41	10.18	9.84	9.62	9.34	9.06	8.78	8.49
315.0	10.63	10.35	10.07	9.73	9.51	9.23	8.89	8.66	8.33
360.0	10.86	10.52	10.29	10.01	9.68	9.45	9.17	8.89	8.61
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.27	7.99	7.59	7.26	6.98	6.64	6.36	5.96	5.68
45.0	7.48	7.20	6.92	6.58	6.24	5.91	5.68	5.51	5.34
90.0	7.31	7.03	6.69	6.36	6.08	5.79	5.57	5.40	5.34
135.0	7.31	7.03	6.69	6.41	6.13	5.79	5.63	5.46	5.34
180.0	7.20	6.86	6.58	6.24	5.96	5.68	5.51	5.34	5.34
225.0	7.88	7.59	7.20	6.86	6.58	6.24	5.96	5.74	5.51
270.0	8.16	7.82	7.43	7.09	6.81	6.47	6.13	5.79	5.63
315.0	7.99	7.71	7.37	7.03	6.75	6.41	6.08	5.79	5.51
360.0	8.27	7.99	7.59	7.26	6.98	6.64	6.36	5.96	5.68

Intensity data(cd)

C/ γ ($^{\circ}$)	90.0
0.0	5.46
45.0	5.34
90.0	5.34
135.0	5.34
180.0	5.34
225.0	5.34
270.0	5.40
315.0	5.46
360.0	5.46