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Nata

LumCAT: 2-2076-M
Luminaire: 92.70.131.00
Report No: NATA0100
Test No: GC2019092505
LampCAT: OSRAM OPTO SOLERIQ S15
Lamp flux(lm): 1643.0
Number of Lamps: 1
Length(mm): 0
Phm Type: C

Voltage(V): 34.5500
Current(A): 0.4470
Power (W): 15.4400
PF: 0.0000
Ballast type: DC
Width(mm): 0
Height(mm): 0

Photometric Results

Lumens(lm): 1359.15
Efficiency(%): 82.72%
Lumens(lm)/Power(W): 88.03
Central intensity(cd): 11232.280
Maximum intensity(cd): 11232.280
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=16.5
 [C90/270]Total=16.5
Field angle(10%Imax): [C0/180]Total=36.7
 [C90/270]Total=36.7
Maximum s/h(1/2): C0_180=0.28 C90_270=0.28
Maximum s/h(1/4): C0_180=0.31 C90_270=0.31
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 82.72%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.540%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	11232.281	0.000	0	.000%	.000%
1.0	11176.734	10.722	10.722	.653%	.789%
2.0	10827.703	31.583	42.305	1.922%	3.113%
3.0	10285.453	50.496	92.801	3.073%	6.828%
4.0	9525.234	66.313	159.114	4.036%	11.707%
5.0	8683.031	78.331	237.445	4.768%	17.470%
6.0	7652.883	85.850	323.294	5.225%	23.787%
7.0	6661.406	88.849	412.143	5.408%	30.324%
8.0	5815.125	89.292	501.435	5.435%	36.893%
9.0	4953.164	87.271	588.706	5.312%	43.314%
10.0	4204.195	82.871	671.577	5.044%	49.412%
11.0	3601.898	77.999	749.576	4.747%	55.150%
12.0	3127.711	73.564	823.14	4.477%	60.563%
13.0	2610.141	68.094	891.234	4.144%	65.573%
14.0	2256.539	62.293	953.527	3.791%	70.156%
15.0	1925.297	57.410	1010.937	3.494%	74.380%
16.0	1647.211	52.347	1063.284	3.186%	78.232%
17.0	1396.793	47.403	1110.688	2.885%	81.719%
18.0	1195.657	42.744	1153.431	2.602%	84.864%
19.0	985.725	37.952	1191.383	2.310%	87.656%
20.0	815.787	32.973	1224.356	2.007%	90.082%
21.0	640.884	27.971	1252.327	1.702%	92.140%
22.0	481.008	22.545	1274.872	1.372%	93.799%
23.0	350.093	17.439	1292.31	1.061%	95.082%
24.0	225.035	12.574	1304.885	.765%	96.007%
25.0	128.250	8.033	1312.918	.489%	96.598%
26.0	62.248	4.497	1317.414	.274%	96.929%
27.0	31.015	2.282	1319.696	.139%	97.097%
28.0	16.186	1.195	1320.891	.073%	97.185%
29.0	12.846	0.760	1321.651	.046%	97.241%
30.0	11.883	0.668	1322.318	.041%	97.290%
31.0	10.962	0.636	1322.954	.039%	97.337%
32.0	10.195	0.606	1323.56	.037%	97.381%
33.0	9.661	0.585	1324.145	.036%	97.425%
34.0	9.176	0.570	1324.715	.035%	97.466%
35.0	8.768	0.557	1325.272	.034%	97.507%
36.0	8.430	0.548	1325.82	.033%	97.548%
37.0	8.135	0.540	1326.36	.033%	97.588%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	7.903	0.535	1326.896	.033%	97.627%
39.0	7.706	0.533	1327.428	.032%	97.666%
40.0	7.545	0.532	1327.96	.032%	97.705%
41.0	7.404	0.532	1328.493	.032%	97.744%
42.0	7.298	0.534	1329.027	.033%	97.784%
43.0	7.165	0.536	1329.563	.033%	97.823%
44.0	7.088	0.538	1330.1	.033%	97.863%
45.0	7.003	0.542	1330.642	.033%	97.903%
46.0	6.940	0.545	1331.187	.033%	97.943%
47.0	6.877	0.550	1331.737	.033%	97.983%
48.0	6.841	0.555	1332.291	.034%	98.024%
49.0	6.778	0.559	1332.851	.034%	98.065%
50.0	6.729	0.563	1333.414	.034%	98.106%
51.0	6.687	0.568	1333.981	.035%	98.148%
52.0	6.652	0.572	1334.554	.035%	98.190%
53.0	6.623	0.577	1335.131	.035%	98.233%
54.0	6.588	0.582	1335.714	.035%	98.276%
55.0	6.567	0.587	1336.301	.036%	98.319%
56.0	6.532	0.592	1336.893	.036%	98.362%
57.0	6.504	0.596	1337.489	.036%	98.406%
58.0	6.483	0.601	1338.089	.037%	98.450%
59.0	6.469	0.605	1338.695	.037%	98.495%
60.0	6.455	0.611	1339.305	.037%	98.540%
61.0	6.420	0.614	1339.92	.037%	98.585%
62.0	6.405	0.618	1340.538	.038%	98.631%
63.0	6.384	0.622	1341.16	.038%	98.676%
64.0	6.391	0.627	1341.787	.038%	98.722%
65.0	6.370	0.632	1342.418	.038%	98.769%
66.0	6.370	0.636	1343.054	.039%	98.816%
67.0	6.356	0.640	1343.694	.039%	98.863%
68.0	6.349	0.644	1344.337	.039%	98.910%
69.0	6.349	0.648	1344.985	.039%	98.958%
70.0	6.328	0.651	1345.636	.040%	99.006%
71.0	6.321	0.654	1346.29	.040%	99.054%
72.0	6.321	0.657	1346.947	.040%	99.102%
73.0	6.321	0.661	1347.609	.040%	99.151%
74.0	6.321	0.665	1348.273	.040%	99.200%
75.0	6.307	0.667	1348.94	.041%	99.249%

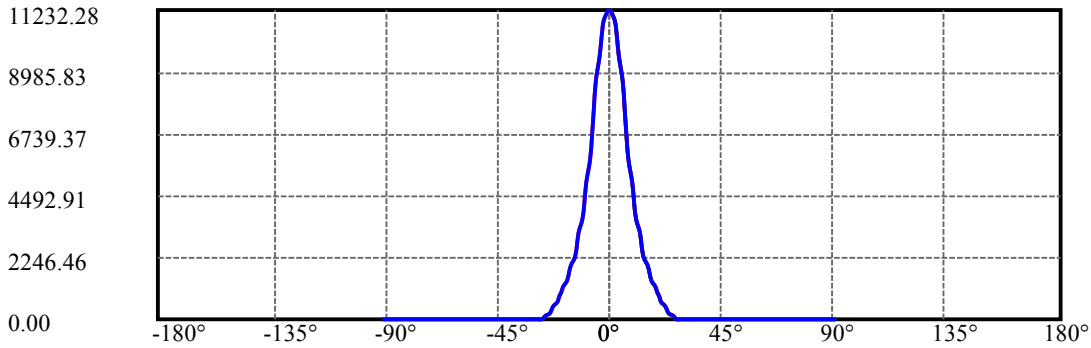
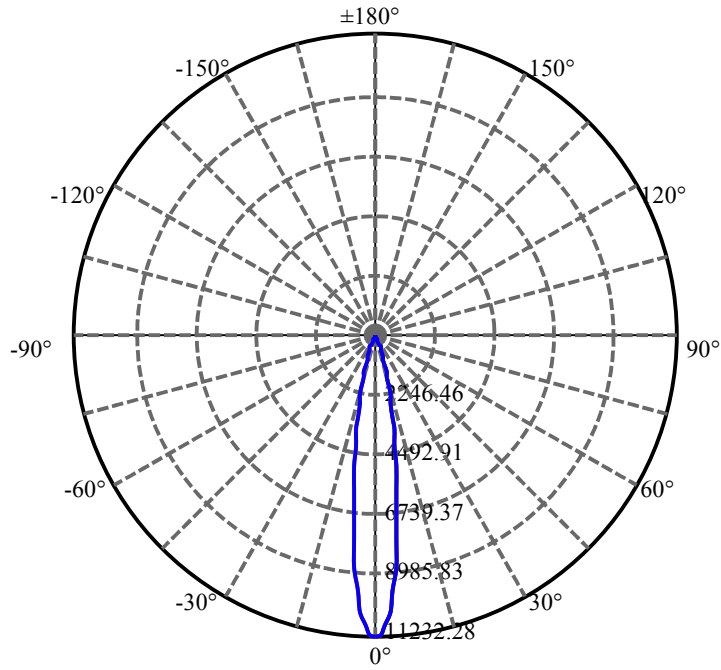
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	6.300	0.669	1349.61	.041%	99.298%
77.0	6.300	0.672	1350.281	.041%	99.348%
78.0	6.300	0.674	1350.956	.041%	99.397%
79.0	6.286	0.676	1351.632	.041%	99.447%
80.0	6.286	0.678	1352.31	.041%	99.497%
81.0	6.293	0.680	1352.99	.041%	99.547%
82.0	6.293	0.683	1353.673	.042%	99.597%
83.0	6.286	0.684	1354.356	.042%	99.647%
84.0	6.286	0.685	1355.041	.042%	99.698%
85.0	6.272	0.685	1355.727	.042%	99.748%
86.0	6.251	0.685	1356.411	.042%	99.799%
87.0	6.244	0.684	1357.095	.042%	99.849%
88.0	6.251	0.684	1357.779	.042%	99.899%
89.0	6.244	0.685	1358.464	.042%	99.950%
90.0	6.258	0.685	1359.15	.042%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1322.32	80.48%	97.29%
0-40	1327.96	80.83%	97.71%
0-60	1339.31	81.52%	98.54%
0-90	1358.46	82.68%	99.95%
0-120	1358.46	82.68%	99.95%
0-180	1359.15	82.72%	100.00%
60-90	19.77	1.20%	1.45%
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%
0-16.51	1087.32	66.18%	80.00%

ZONAL LUMEN SUMMARY

0-10	671.58
10-20	552.78
20-30	97.96
30-40	5.64
40-50	5.45
50-60	5.89
60-70	6.33
70-80	6.67
80-90	6.15
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: —————

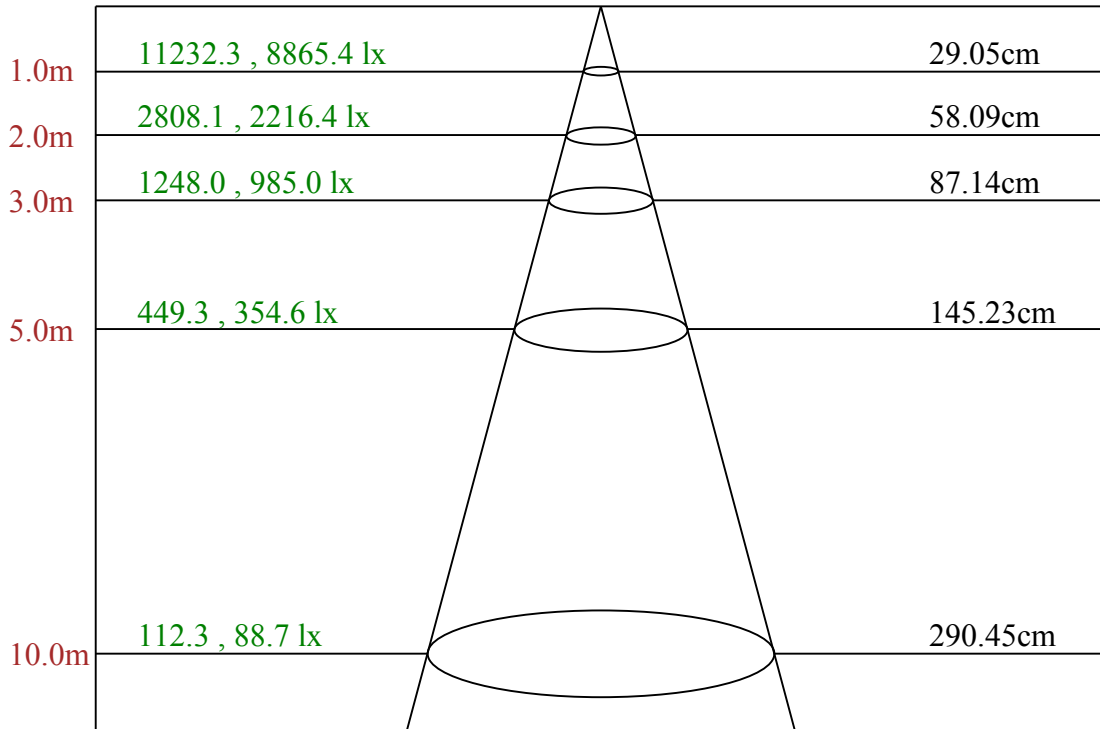
C90/C270: —————

Field angle(10%Imax):C0/180Left:18.3 Right:18.3

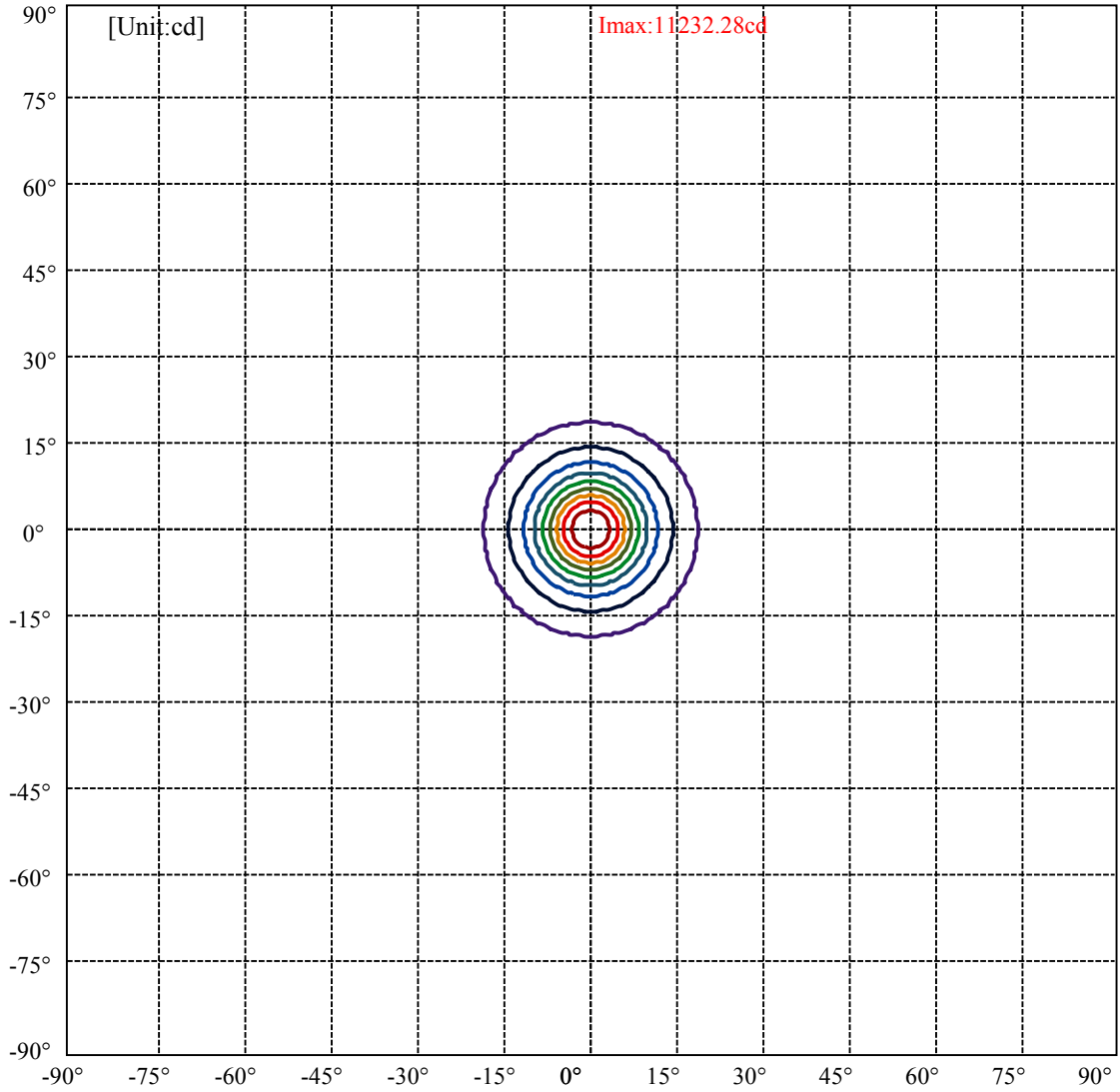
:C90/270Left:18.3 Right:18.3

Beam Angle(50%Imax):C0/180Left:8.2 Right:8.2

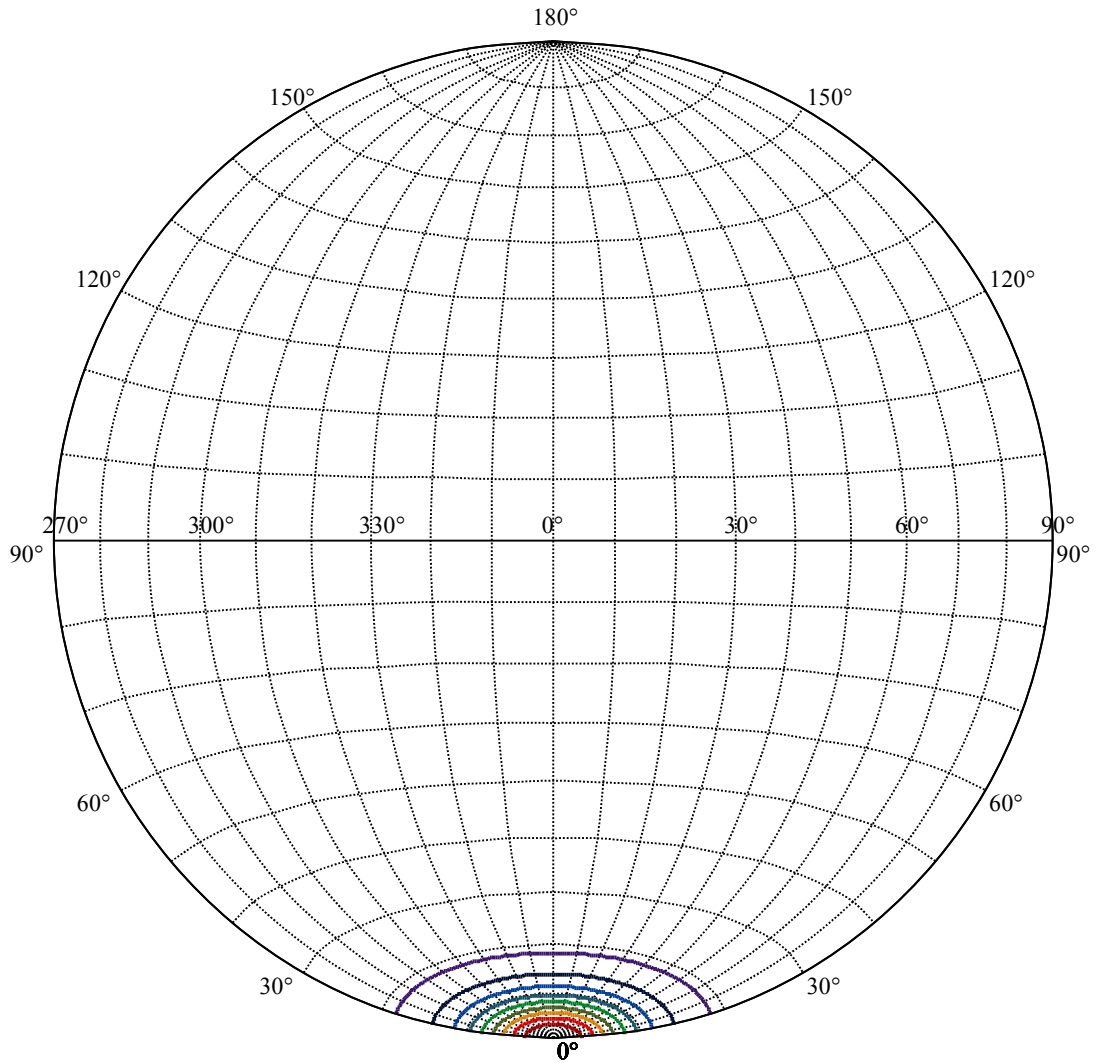
:C90/270Left:8.2 Right:8.2



Max , Ave Beam angle of C0 plane 16.53



(10%Imax) 1123.23	—
(20%Imax) 2246.46	—
(30%Imax) 3369.68	—
(40%Imax) 4492.91	—
(50%Imax) 5616.14	—
(60%Imax) 6739.37	—
(70%Imax) 7862.6	—
(80%Imax) 8985.83	—
(90%Imax) 10109.1	—



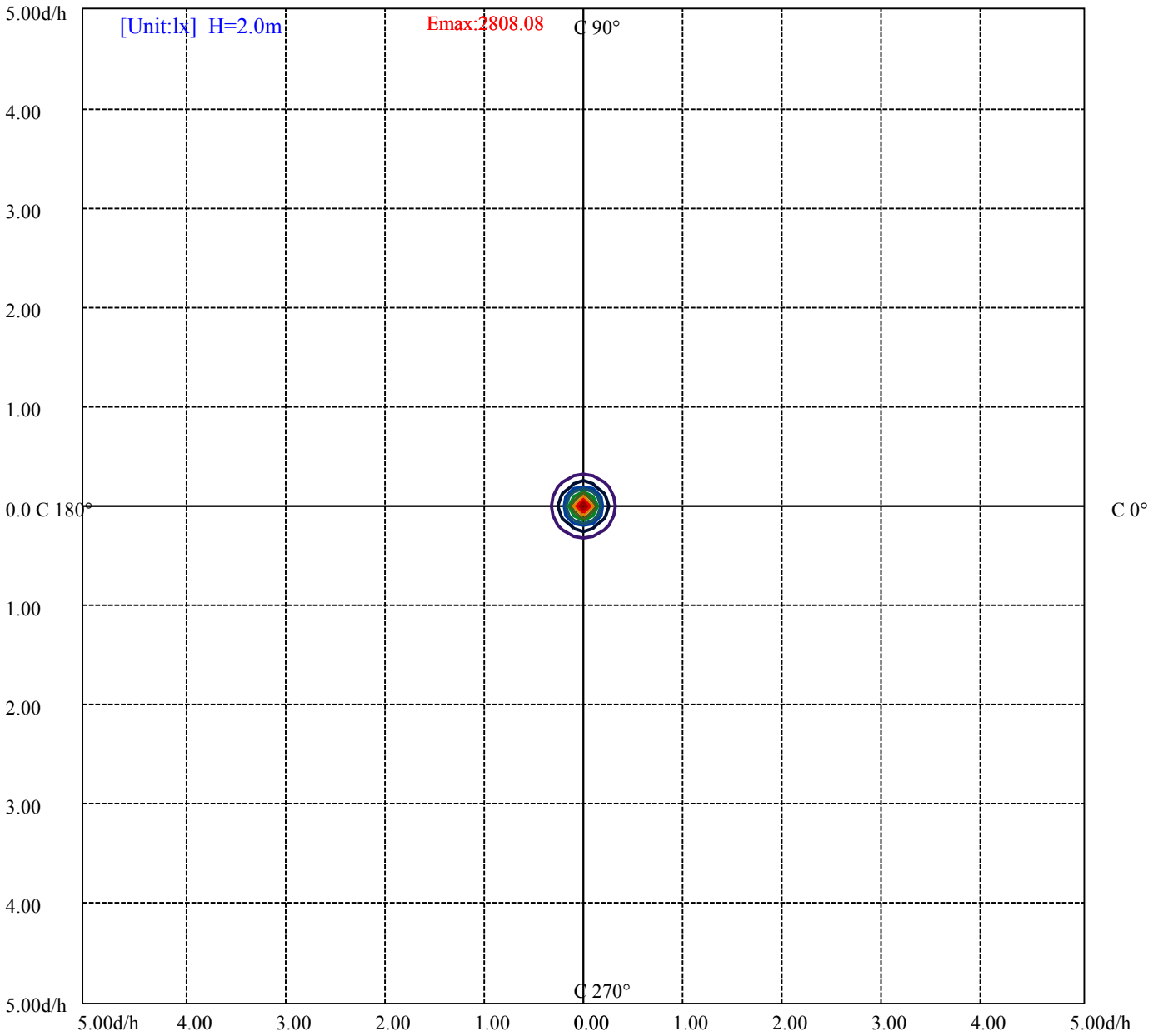
House

[Unit:cd]

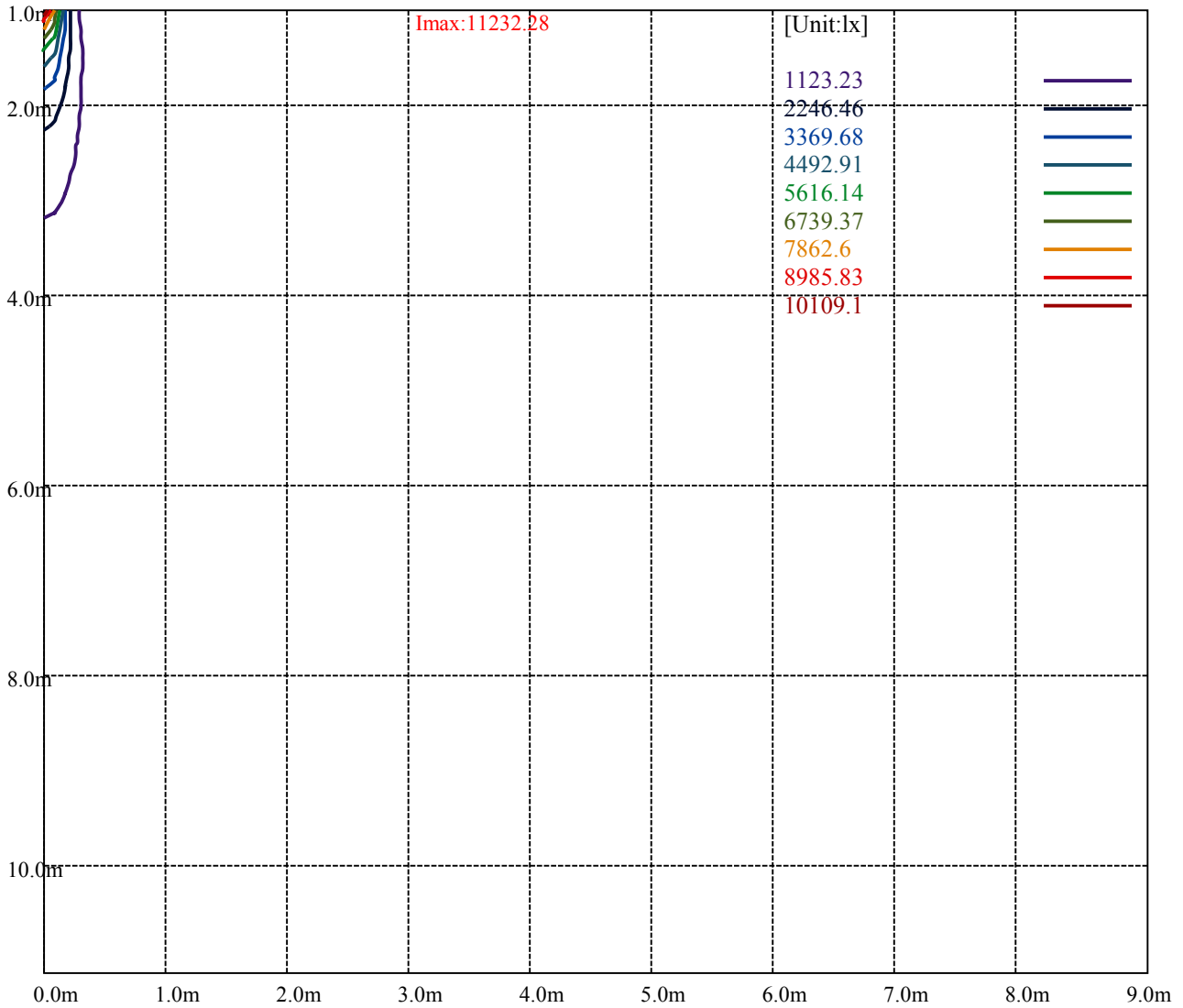
Road

Imax:11232.28

(10%Imax)	1123.23	—
(20%Imax)	2246.46	—
(30%Imax)	3369.68	—
(40%Imax)	4492.91	—
(50%Imax)	5616.14	—
(60%Imax)	6739.37	—
(70%Imax)	7862.6	—
(80%Imax)	8985.83	—
(90%Imax)	10109.1	—



- (10%Emax) 280.8075
- (20%Emax) 561.6125
- (30%Emax) 842.42
- (40%Emax) 1123.228
- (50%Emax) 1404.035
- (60%Emax) 1684.84
- (70%Emax) 1965.647
- (80%Emax) 2246.455
- (90%Emax) 2527.25



Luminance Table

γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

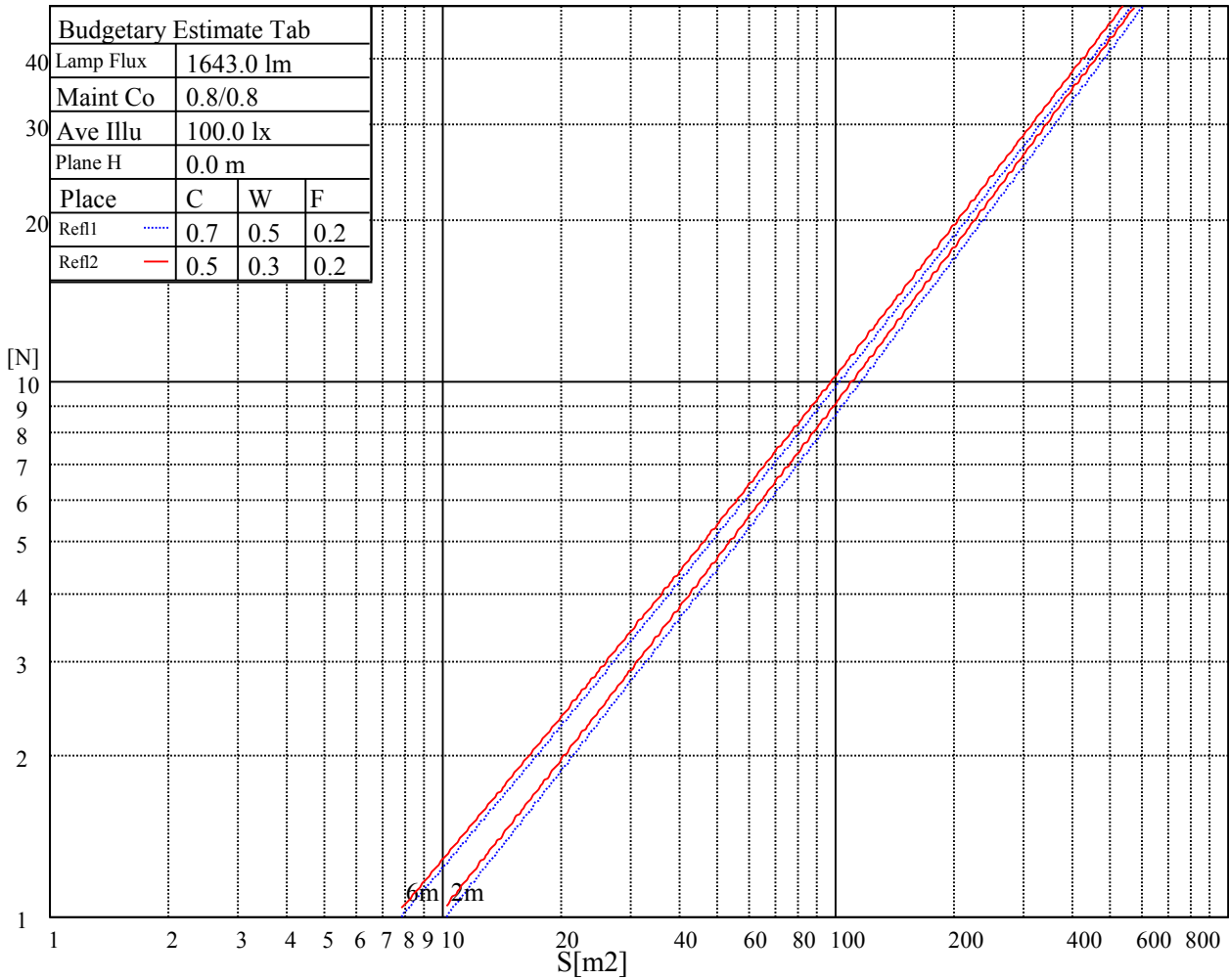
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

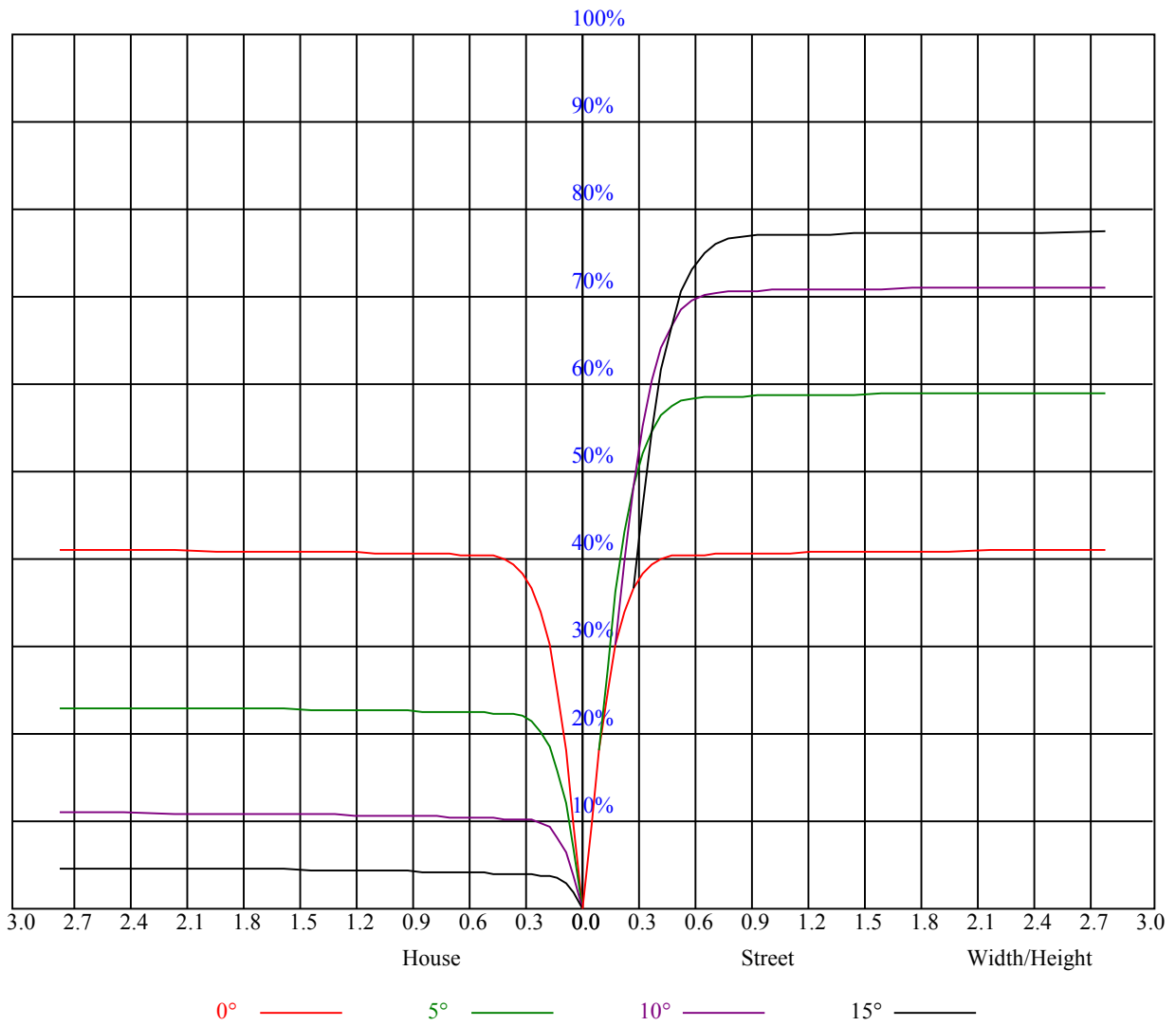
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.98	0.98	0.98	0.96	0.96	0.96	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84	0.83
1	0.94	0.92	0.91	0.92	0.90	0.89	0.89	0.87	0.87	0.86	0.85	0.84	0.83	0.82	0.82	0.80
2	0.90	0.87	0.85	0.88	0.86	0.84	0.86	0.84	0.83	0.83	0.82	0.81	0.81	0.80	0.79	0.78
3	0.86	0.84	0.81	0.85	0.83	0.81	0.83	0.81	0.80	0.81	0.80	0.78	0.80	0.78	0.77	0.76
4	0.84	0.81	0.78	0.83	0.80	0.78	0.81	0.79	0.77	0.80	0.78	0.76	0.78	0.77	0.75	0.75
5	0.81	0.78	0.76	0.81	0.78	0.76	0.79	0.77	0.75	0.78	0.76	0.74	0.77	0.75	0.74	0.73
6	0.79	0.76	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.77	0.74	0.73	0.76	0.74	0.72	0.72
7	0.77	0.74	0.72	0.77	0.74	0.72	0.76	0.73	0.72	0.75	0.73	0.71	0.74	0.72	0.71	0.70
8	0.75	0.72	0.70	0.75	0.72	0.70	0.74	0.72	0.70	0.74	0.71	0.70	0.73	0.71	0.70	0.69
9	0.74	0.71	0.69	0.74	0.71	0.69	0.73	0.70	0.69	0.72	0.70	0.69	0.72	0.70	0.68	0.68
10	0.72	0.70	0.68	0.72	0.69	0.68	0.72	0.69	0.67	0.71	0.69	0.67	0.71	0.69	0.67	0.66



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	11244.38	10940.63	10344.38	9472.50	8561.25	7475.63	6412.50	5591.25	4848.75
45.0	11289.38	11103.75	10659.38	9928.13	9095.63	8195.63	6997.50	6080.63	5281.88
90.0	11224.69	11052.00	10718.44	10055.25	9068.63	8274.38	7226.44	6087.38	5387.06
135.0	11170.69	11224.69	11154.38	10878.75	10395.00	9680.63	8623.13	7672.50	6755.63
180.0	11244.38	11351.25	11203.31	11095.88	10593.00	9915.75	9072.56	7888.50	6914.81
225.0	11289.38	11463.75	11212.88	10838.81	10142.44	9336.94	8467.31	7428.38	6390.56
270.0	11224.69	11413.13	10991.25	10496.25	9810.00	9000.00	7869.38	6941.25	6086.25
315.0	11170.69	10864.69	10337.63	9518.06	8535.94	7585.31	6554.25	5601.38	4856.06
360.0	11244.38	10940.63	10344.38	9472.50	8561.25	7475.63	6412.50	5591.25	4848.75
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4027.50	3459.38	2970.00	2857.50	2148.75	1867.50	1622.81	1342.13	1135.69
45.0	4393.13	3774.38	3234.38	2880.00	2316.94	2013.19	1728.00	1476.00	1271.25
90.0	4649.06	3844.13	3303.00	2849.06	2378.25	2065.50	1806.19	1551.38	1238.06
135.0	5681.25	4916.25	4235.63	3566.25	3003.75	2846.25	2256.19	1937.81	1670.63
180.0	6001.31	5015.81	4320.56	3709.13	3122.44	2638.69	2286.56	1956.94	1708.88
225.0	5561.44	4724.44	3977.44	3407.06	2917.69	2424.38	2099.25	1819.69	1557.56
270.0	5124.38	4438.13	3808.13	3200.63	2857.50	2334.94	1983.94	1724.63	1470.94
315.0	4187.25	3461.06	2966.06	2552.06	2135.81	1861.88	1619.44	1369.13	1121.34
360.0	4027.50	3459.38	2970.00	2857.50	2148.75	1867.50	1622.81	1342.13	1135.69
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	962.44	780.19	599.63	452.25	299.25	228.26	97.76	42.30	17.94
45.0	1059.75	895.50	703.69	525.94	384.75	289.69	144.17	67.44	26.16
90.0	1111.61	940.39	758.48	577.35	428.74	277.93	160.76	87.92	36.39
135.0	1446.75	1212.75	1011.38	843.75	658.13	498.38	339.75	284.06	120.04
180.0	1450.69	1111.22	1022.29	833.68	635.12	502.48	361.07	198.79	124.43
225.0	1319.06	1102.22	939.38	748.07	581.46	416.14	287.33	171.11	85.05
270.0	1238.63	1056.94	868.50	690.75	538.31	393.75	308.25	135.73	69.69
315.0	976.33	786.60	622.97	455.29	322.31	194.12	101.19	38.64	18.28
360.0	962.44	780.19	599.63	452.25	299.25	228.26	97.76	42.30	17.94
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	13.89	12.54	11.59	10.80	10.01	9.45	9.00	8.55	8.27
45.0	14.40	12.99	11.98	11.14	10.35	9.79	9.34	8.89	8.55
90.0	16.76	13.50	12.26	11.36	10.69	9.96	9.45	9.06	8.66
135.0	57.38	20.36	13.67	12.54	11.42	10.63	10.01	9.51	9.00
180.0	65.31	24.81	13.78	12.60	11.59	10.58	9.96	9.39	9.00
225.0	33.98	17.38	14.06	12.94	11.93	10.91	10.29	9.73	9.23
270.0	32.23	15.08	13.73	12.77	11.48	10.74	10.18	9.56	9.11
315.0	14.18	12.83	11.70	10.91	10.24	9.51	9.06	8.72	8.33
360.0	13.89	12.54	11.59	10.80	10.01	9.45	9.00	8.55	8.27
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	7.99	7.76	7.54	7.37	7.26	7.14	7.03	6.98	6.86
45.0	8.27	7.99	7.82	7.65	7.48	7.37	7.26	7.14	7.09
90.0	8.38	8.10	7.88	7.71	7.59	7.43	7.37	7.20	7.14
135.0	8.66	8.33	8.10	7.88	7.71	7.54	7.43	7.26	7.20
180.0	8.55	8.27	7.99	7.76	7.59	7.43	7.31	7.14	7.09
225.0	8.78	8.44	8.16	7.88	7.71	7.54	7.43	7.26	7.14
270.0	8.78	8.38	8.10	7.93	7.71	7.59	7.43	7.31	7.26
315.0	8.04	7.82	7.65	7.48	7.31	7.20	7.14	7.03	6.92
360.0	7.99	7.76	7.54	7.37	7.26	7.14	7.03	6.98	6.86

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	6.81	6.81	6.75	6.69	6.64	6.58	6.53	6.53	6.47
45.0	7.03	6.92	6.86	6.86	6.81	6.75	6.69	6.69	6.64
90.0	7.03	6.98	6.92	6.92	6.86	6.81	6.75	6.69	6.69
135.0	7.09	7.03	6.98	6.86	6.81	6.81	6.75	6.69	6.69
180.0	6.98	6.92	6.86	6.81	6.75	6.69	6.64	6.58	6.58
225.0	7.09	6.98	6.92	6.92	6.81	6.75	6.69	6.69	6.64
270.0	7.09	7.03	6.98	6.92	6.86	6.81	6.81	6.75	6.69
315.0	6.92	6.86	6.75	6.75	6.69	6.64	6.64	6.58	6.58
360.0	6.81	6.81	6.75	6.69	6.64	6.58	6.53	6.53	6.47
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	6.47	6.41	6.41	6.41	6.36	6.36	6.36	6.30	6.30
45.0	6.58	6.58	6.58	6.53	6.53	6.47	6.47	6.41	6.41
90.0	6.64	6.64	6.64	6.58	6.53	6.53	6.53	6.53	6.47
135.0	6.64	6.64	6.58	6.53	6.53	6.53	6.53	6.47	6.47
180.0	6.53	6.53	6.47	6.41	6.47	6.41	6.36	6.36	6.36
225.0	6.64	6.58	6.53	6.53	6.47	6.47	6.47	6.41	6.41
270.0	6.69	6.64	6.58	6.58	6.58	6.58	6.53	6.47	6.47
315.0	6.53	6.53	6.47	6.47	6.41	6.41	6.41	6.41	6.36
360.0	6.47	6.41	6.41	6.41	6.36	6.36	6.36	6.30	6.30
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	6.30	6.30	6.24	6.30	6.24	6.24	6.24	6.24	6.24
45.0	6.41	6.41	6.36	6.36	6.36	6.36	6.36	6.30	6.30
90.0	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.47	6.41
135.0	6.41	6.41	6.41	6.41	6.41	6.41	6.36	6.36	6.36
180.0	6.30	6.30	6.30	6.24	6.24	6.24	6.24	6.24	6.24
225.0	6.36	6.41	6.36	6.36	6.36	6.36	6.36	6.30	6.30
270.0	6.47	6.47	6.47	6.47	6.47	6.41	6.41	6.41	6.41
315.0	6.36	6.36	6.36	6.36	6.30	6.30	6.36	6.30	6.30
360.0	6.30	6.30	6.24	6.30	6.24	6.24	6.24	6.24	6.24
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	6.24	6.24	6.24	6.19	6.19	6.19	6.19	6.19	6.19
45.0	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.24	6.24
90.0	6.41	6.47	6.41	6.41	6.41	6.41	6.41	6.41	6.41
135.0	6.36	6.36	6.36	6.36	6.30	6.30	6.30	6.30	6.30
180.0	6.24	6.19	6.24	6.19	6.19	6.19	6.19	6.19	6.19
225.0	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.24	6.24
270.0	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41	6.41
315.0	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.30
360.0	6.24	6.24	6.24	6.19	6.19	6.19	6.19	6.19	6.19
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.19
45.0	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24
90.0	6.47	6.47	6.47	6.47	6.36	6.30	6.30	6.30	6.30
135.0	6.30	6.30	6.30	6.30	6.30	6.30	6.24	6.30	6.24
180.0	6.19	6.19	6.19	6.19	6.19	6.13	6.19	6.19	6.19
225.0	6.30	6.30	6.24	6.24	6.24	6.24	6.24	6.24	6.24
270.0	6.36	6.41	6.41	6.41	6.36	6.36	6.30	6.30	6.30
315.0	6.30	6.24	6.24	6.24	6.30	6.24	6.24	6.24	6.24
360.0	6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.19

Intensity data(cd)

C/γ(°)	90.0
0.0	6.19
45.0	6.30
90.0	6.30
135.0	6.24
180.0	6.19
225.0	6.24
270.0	6.30
315.0	6.30
360.0	6.19