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## Nata

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LumCAT: 2-2076-M  
Luminaire: 92.70.131.00  
Report No: NATA0100  
Test No: GC2019091106  
LampCAT: CITIZEN CLU038  
Lamp flux(lm): 1918.0  
Number of Lamps: 1  
Length(mm): 65  
Phm Type: C

Voltage(V): 33.9200  
Current(A): 0.3970  
Power (W): 13.4600  
PF: 0.0000  
Ballast type: DC  
Width(mm): 65  
Height(mm): 0

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## Photometric Results

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Lumens(lm): 1551.30  
Efficiency(%): 80.88%  
Lumens(lm)/Power(W): 115.25  
Central intensity(cd): 12476.250  
Maximum intensity(cd): 12476.250  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=16.7  
                                  [C90/270]Total=16.7  
Field angle(10%Imax): [C0/180]Total=37.1  
                                  [C90/270]Total=37.1  
Maximum s/h(1/2): C0\_180=0.29 C90\_270=0.29  
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(%): 80.88%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.532%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	12476.250	0.000	0	.000%	.000%
1.0	12337.734	11.873	11.873	.619%	.765%
2.0	11985.750	34.911	46.784	1.820%	3.016%
3.0	11324.813	55.751	102.536	2.907%	6.610%
4.0	10463.695	72.933	175.469	3.803%	11.311%
5.0	9583.453	86.242	261.71	4.496%	16.870%
6.0	8538.961	95.238	356.949	4.965%	23.010%
7.0	7482.305	99.444	456.392	5.185%	29.420%
8.0	6569.227	100.564	556.956	5.243%	35.903%
9.0	5627.250	98.846	655.802	5.154%	42.274%
10.0	4810.922	94.462	750.264	4.925%	48.364%
11.0	4163.203	89.670	839.934	4.675%	54.144%
12.0	3551.484	84.333	924.266	4.397%	59.580%
13.0	3069.633	78.576	1002.842	4.097%	64.645%
14.0	2614.922	72.762	1075.604	3.794%	69.336%
15.0	2233.898	66.567	1142.171	3.471%	73.627%
16.0	1912.711	60.759	1202.93	3.168%	77.544%
17.0	1622.419	55.051	1257.982	2.870%	81.092%
18.0	1376.051	49.438	1307.42	2.578%	84.279%
19.0	1140.420	43.781	1351.202	2.283%	87.101%
20.0	938.412	38.048	1389.25	1.984%	89.554%
21.0	747.464	32.372	1421.622	1.688%	91.641%
22.0	583.158	26.739	1448.362	1.394%	93.365%
23.0	425.651	21.168	1469.529	1.104%	94.729%
24.0	289.821	15.643	1485.172	.816%	95.737%
25.0	167.773	10.405	1495.577	.542%	96.408%
26.0	101.552	6.357	1501.934	.331%	96.818%
27.0	45.007	3.586	1505.52	.187%	97.049%
28.0	23.091	1.724	1507.244	.090%	97.160%
29.0	15.293	1.004	1508.248	.052%	97.225%
30.0	13.591	0.780	1509.028	.041%	97.275%
31.0	12.572	0.728	1509.756	.038%	97.322%
32.0	11.714	0.696	1510.452	.036%	97.367%
33.0	11.074	0.671	1511.123	.035%	97.410%
34.0	10.533	0.654	1511.777	.034%	97.452%
35.0	10.062	0.640	1512.417	.033%	97.494%
36.0	9.675	0.628	1513.045	.033%	97.534%
37.0	9.373	0.621	1513.666	.032%	97.574%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	9.084	0.616	1514.282	.032%	97.614%
39.0	8.859	0.612	1514.895	.032%	97.653%
40.0	8.670	0.611	1515.506	.032%	97.693%
41.0	8.508	0.612	1516.118	.032%	97.732%
42.0	8.374	0.613	1516.731	.032%	97.772%
43.0	8.241	0.615	1517.347	.032%	97.812%
44.0	8.142	0.618	1517.965	.032%	97.851%
45.0	8.051	0.622	1518.587	.032%	97.891%
46.0	7.980	0.627	1519.214	.033%	97.932%
47.0	7.896	0.631	1519.846	.033%	97.973%
48.0	7.847	0.636	1520.482	.033%	98.014%
49.0	7.777	0.642	1521.124	.033%	98.055%
50.0	7.713	0.646	1521.769	.034%	98.097%
51.0	7.664	0.651	1522.42	.034%	98.139%
52.0	7.636	0.657	1523.077	.034%	98.181%
53.0	7.601	0.663	1523.739	.035%	98.224%
54.0	7.573	0.669	1524.408	.035%	98.267%
55.0	7.530	0.674	1525.082	.035%	98.310%
56.0	7.488	0.679	1525.761	.035%	98.354%
57.0	7.460	0.683	1526.444	.036%	98.398%
58.0	7.439	0.689	1527.133	.036%	98.442%
59.0	7.418	0.695	1527.828	.036%	98.487%
60.0	7.390	0.700	1528.528	.036%	98.532%
61.0	7.383	0.705	1529.233	.037%	98.578%
62.0	7.376	0.711	1529.944	.037%	98.624%
63.0	7.341	0.716	1530.659	.037%	98.670%
64.0	7.320	0.719	1531.379	.038%	98.716%
65.0	7.320	0.724	1532.103	.038%	98.763%
66.0	7.305	0.730	1532.833	.038%	98.810%
67.0	7.291	0.734	1533.567	.038%	98.857%
68.0	7.284	0.738	1534.305	.038%	98.905%
69.0	7.270	0.743	1535.048	.039%	98.953%
70.0	7.256	0.746	1535.794	.039%	99.001%
71.0	7.249	0.750	1536.544	.039%	99.049%
72.0	7.249	0.754	1537.297	.039%	99.098%
73.0	7.249	0.758	1538.056	.040%	99.146%
74.0	7.249	0.762	1538.818	.040%	99.196%
75.0	7.235	0.765	1539.583	.040%	99.245%

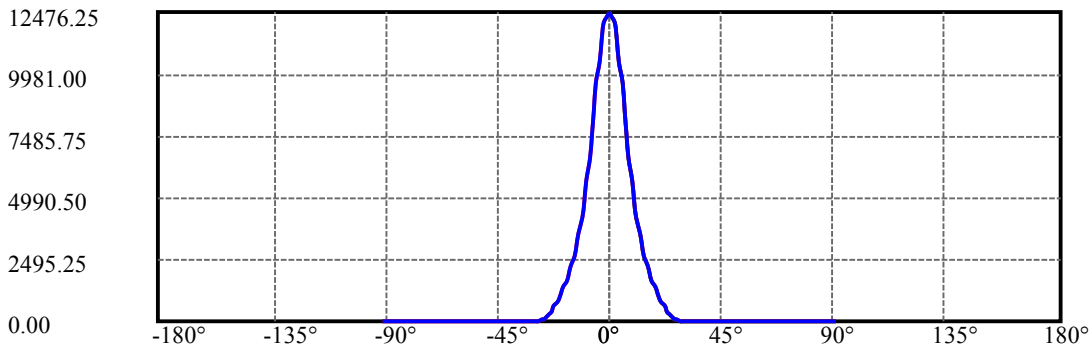
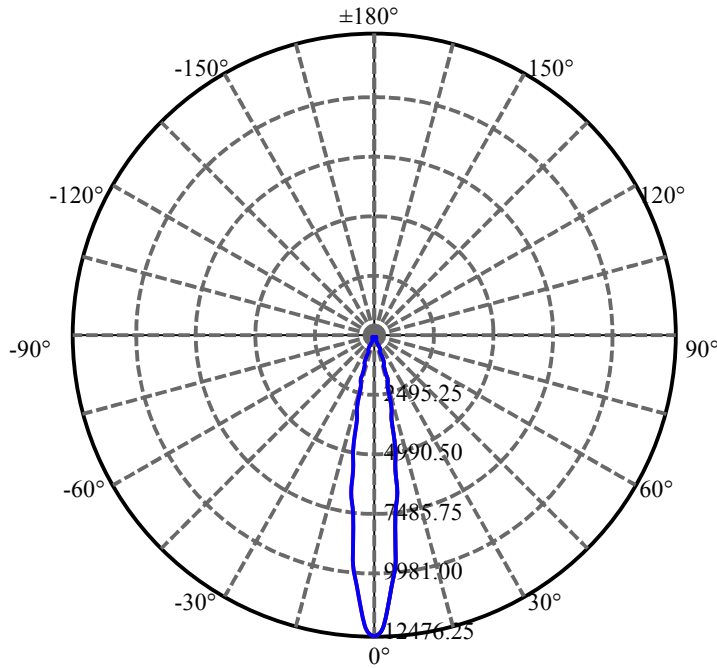
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	7.242	0.769	1540.352	.040%	99.294%
77.0	7.221	0.771	1541.123	.040%	99.344%
78.0	7.221	0.773	1541.896	.040%	99.394%
79.0	7.228	0.776	1542.672	.040%	99.444%
80.0	7.214	0.779	1543.451	.041%	99.494%
81.0	7.207	0.780	1544.231	.041%	99.545%
82.0	7.207	0.782	1545.012	.041%	99.595%
83.0	7.207	0.784	1545.796	.041%	99.645%
84.0	7.200	0.785	1546.581	.041%	99.696%
85.0	7.200	0.786	1547.367	.041%	99.747%
86.0	7.179	0.786	1548.153	.041%	99.797%
87.0	7.179	0.786	1548.938	.041%	99.848%
88.0	7.165	0.786	1549.724	.041%	99.899%
89.0	7.172	0.786	1550.51	.041%	99.949%
90.0	7.172	0.786	1551.296	.041%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1509.03	78.68%	97.28%
0-40	1515.51	79.01%	97.69%
0-60	1528.53	79.69%	98.53%
0-90	1550.51	80.84%	99.95%
0-120	1550.51	80.84%	99.95%
0-180	1551.30	80.88%	100.00%
60-90	22.68	1.18%	1.46%
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%
0-16.69	1241.04	64.70%	80.00%

ZONAL LUMEN SUMMARY

0-10	750.26
10-20	638.99
20-30	119.78
30-40	6.48
40-50	6.26
50-60	6.76
60-70	7.27
70-80	7.66
80-90	7.06
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



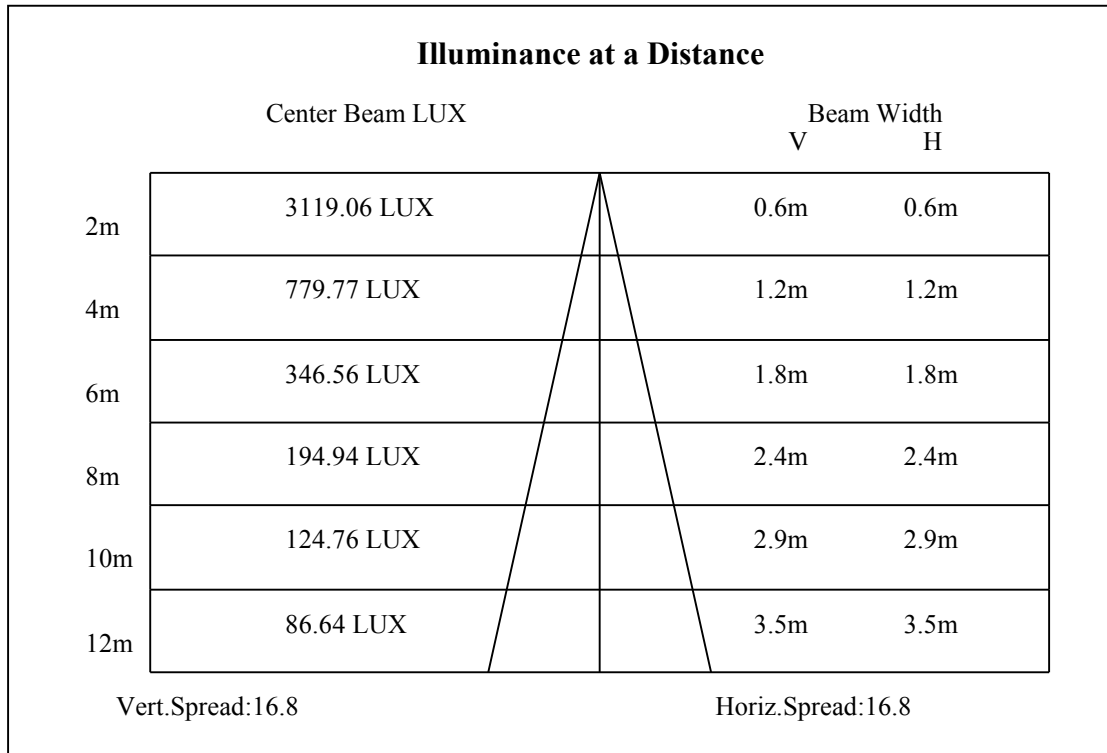
C0(Max): —————

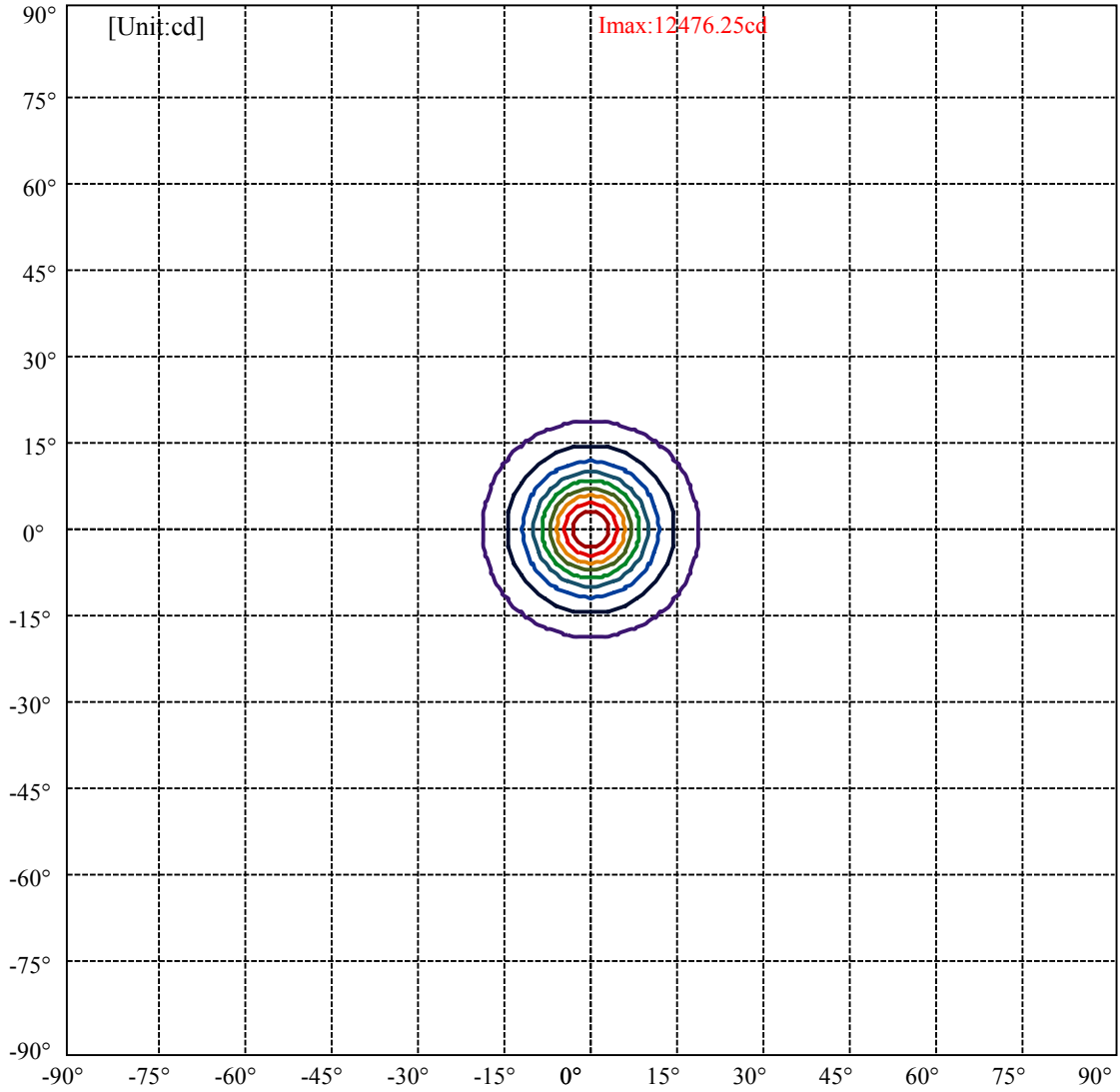
C0/C180: —————

C90/C270: —————

Field angle(10%Imax):C0/180Left:18.5 Right:18.5  
:C90/270Left:18.5 Right:18.5

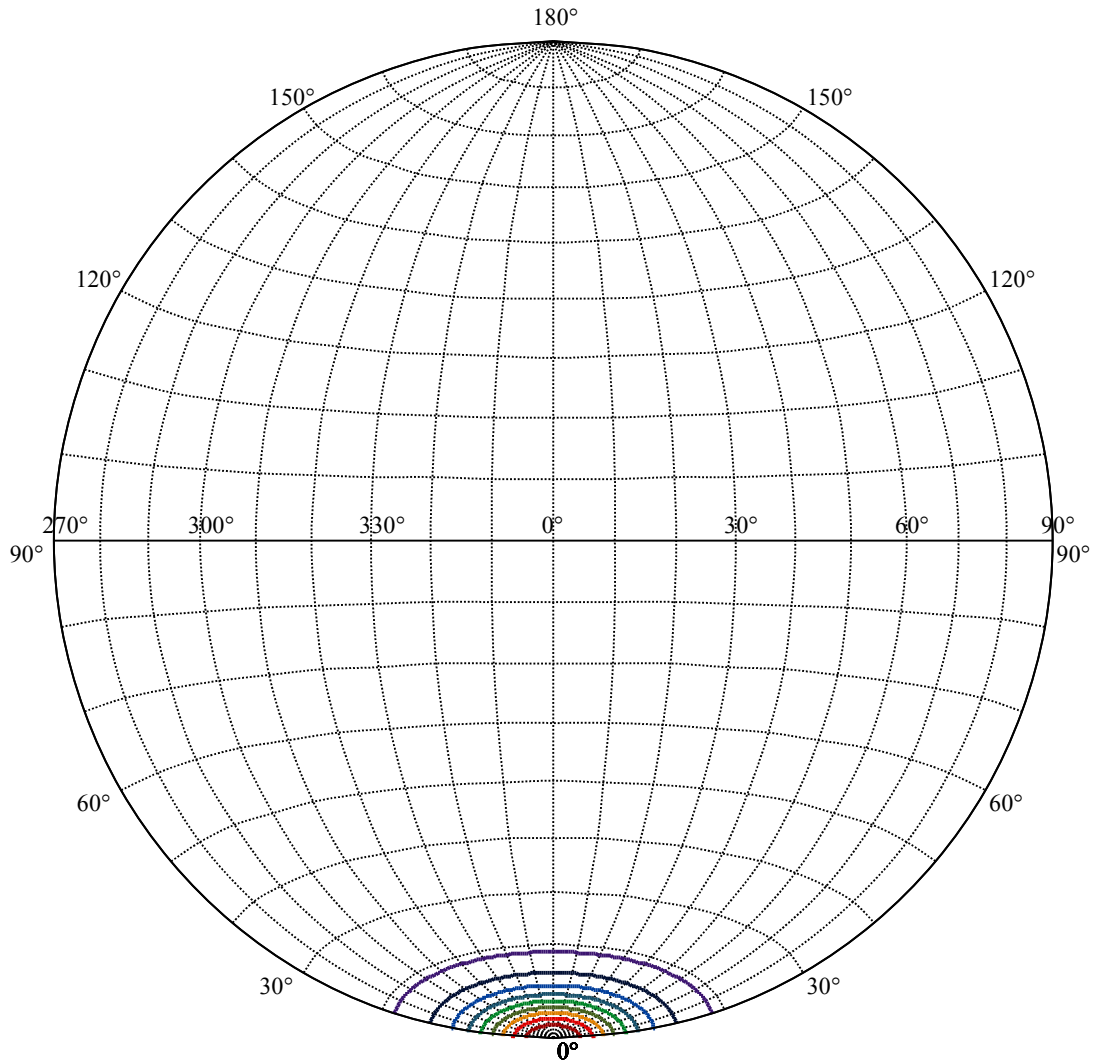
Beam Angle(50%Imax):C0/180Left:8.4 Right:8.4  
:C90/270Left:8.4 Right:8.4





(10%Imax) 1247.62	—
(20%Imax) 2495.25	—
(30%Imax) 3742.87	—
(40%Imax) 4990.5	—
(50%Imax) 6238.12	—
(60%Imax) 7485.75	—
(70%Imax) 8733.37	—
(80%Imax) 9981	—
(90%Imax) 11228.6	—





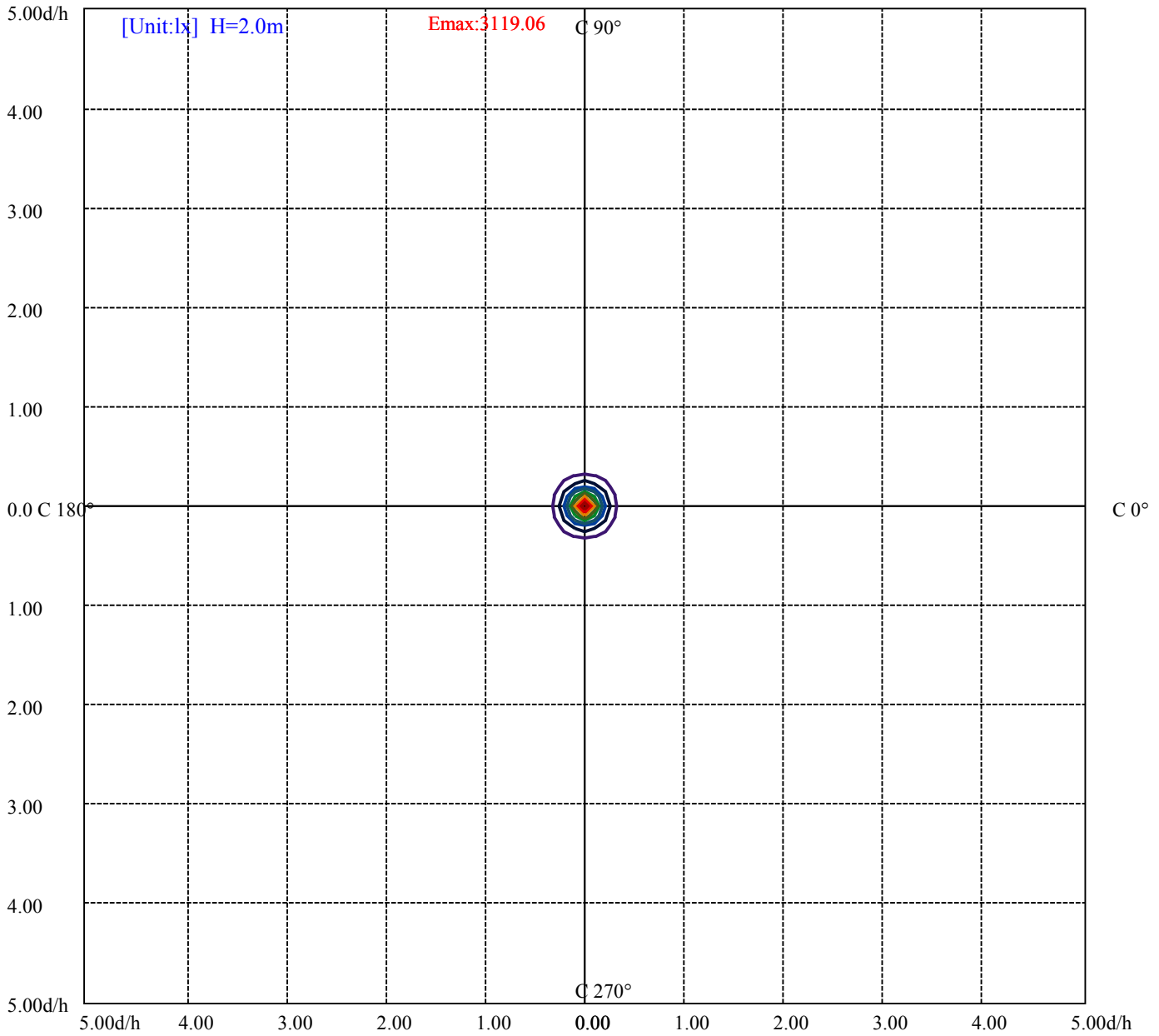
House

[Unit:cd]

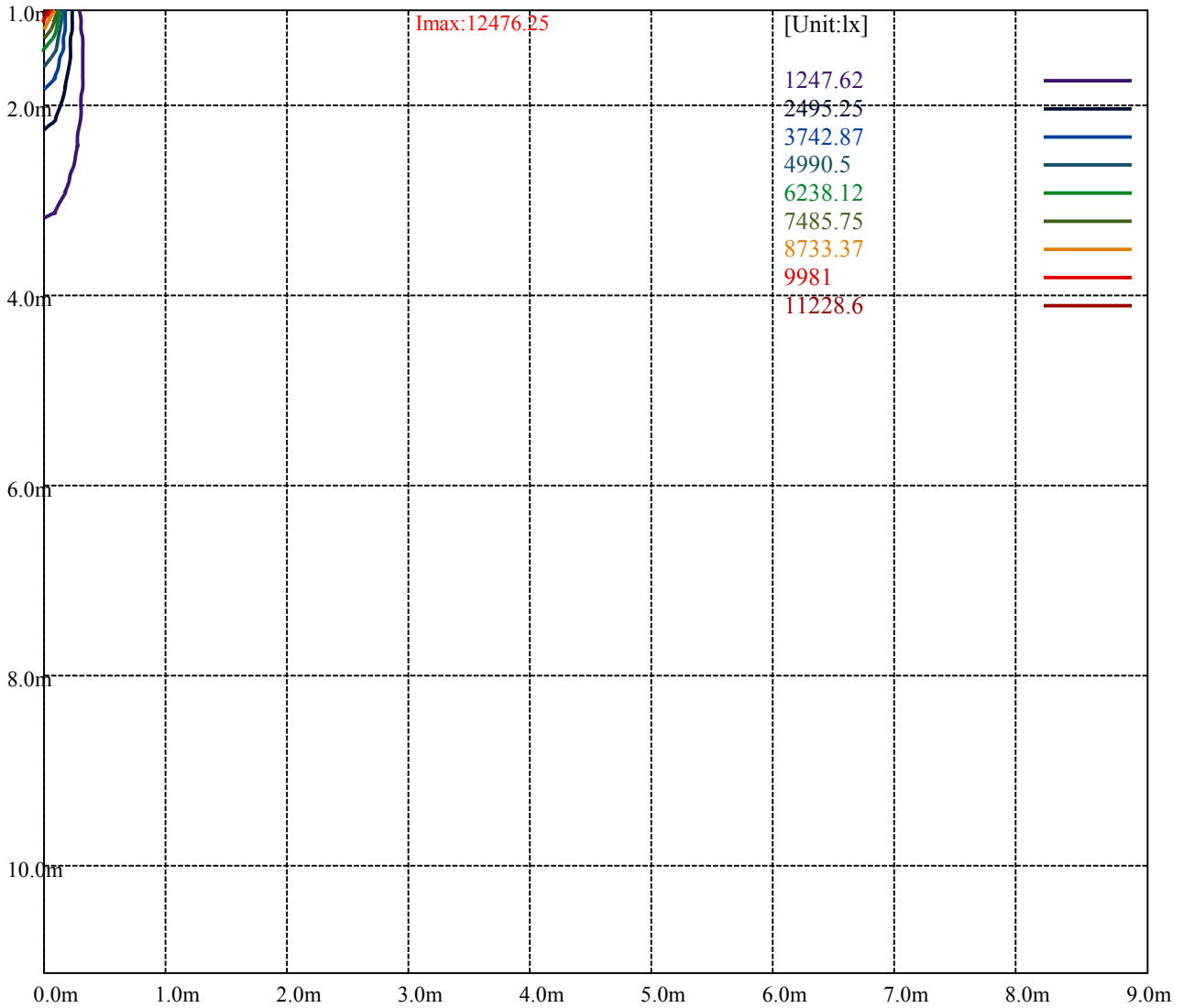
Road

**Imax:12476.25**

(10%Imax) 1247.62	—
(20%Imax) 2495.25	—
(30%Imax) 3742.87	—
(40%Imax) 4990.5	—
(50%Imax) 6238.12	—
(60%Imax) 7485.75	—
(70%Imax) 8733.37	—
(80%Imax) 9981	—
(90%Imax) 11228.6	—



(10%Emax) 311.905	—
(20%Emax) 623.8125	—
(30%Emax) 935.7175	—
(40%Emax) 1247.623	—
(50%Emax) 1559.527	—
(60%Emax) 1871.435	—
(70%Emax) 2183.34	—
(80%Emax) 2495.245	—
(90%Emax) 2807.15	—



Luminance Table

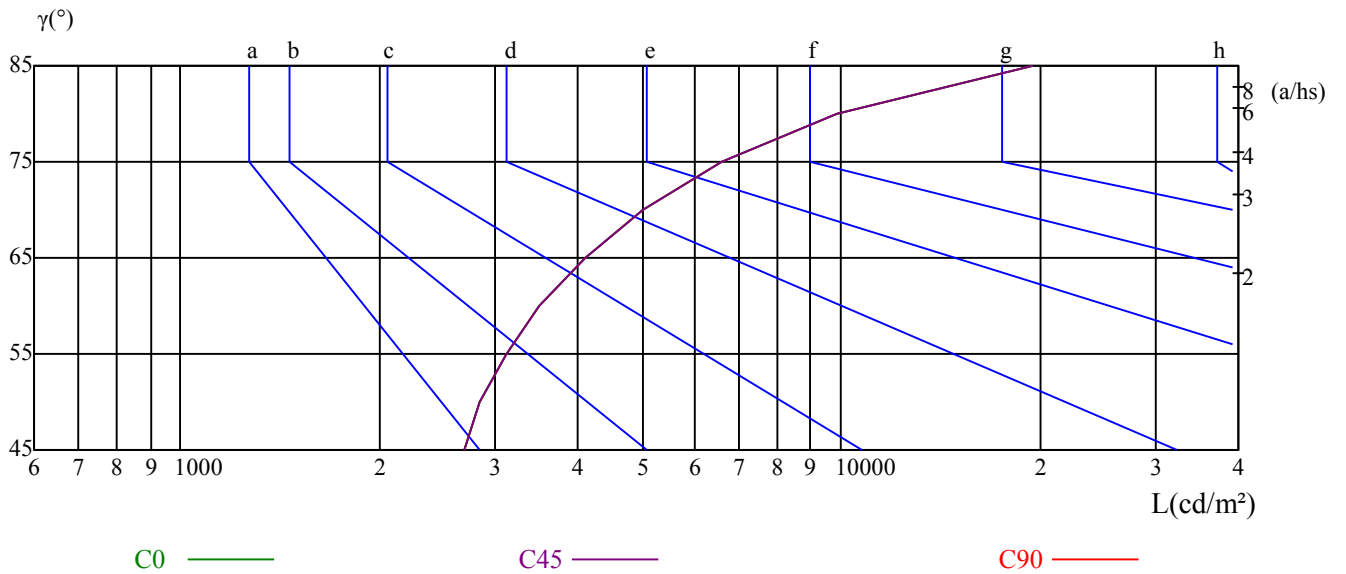
$\gamma$	45	50	55	60	65	70	75	80	85
C0	2695	2840	3107	3498	4099	5022	6616	9833	19553
C45	2695	2840	3107	3498	4099	5022	6616	9833	19553
C90	2695	2840	3107	3498	4099	5022	6616	9833	19553

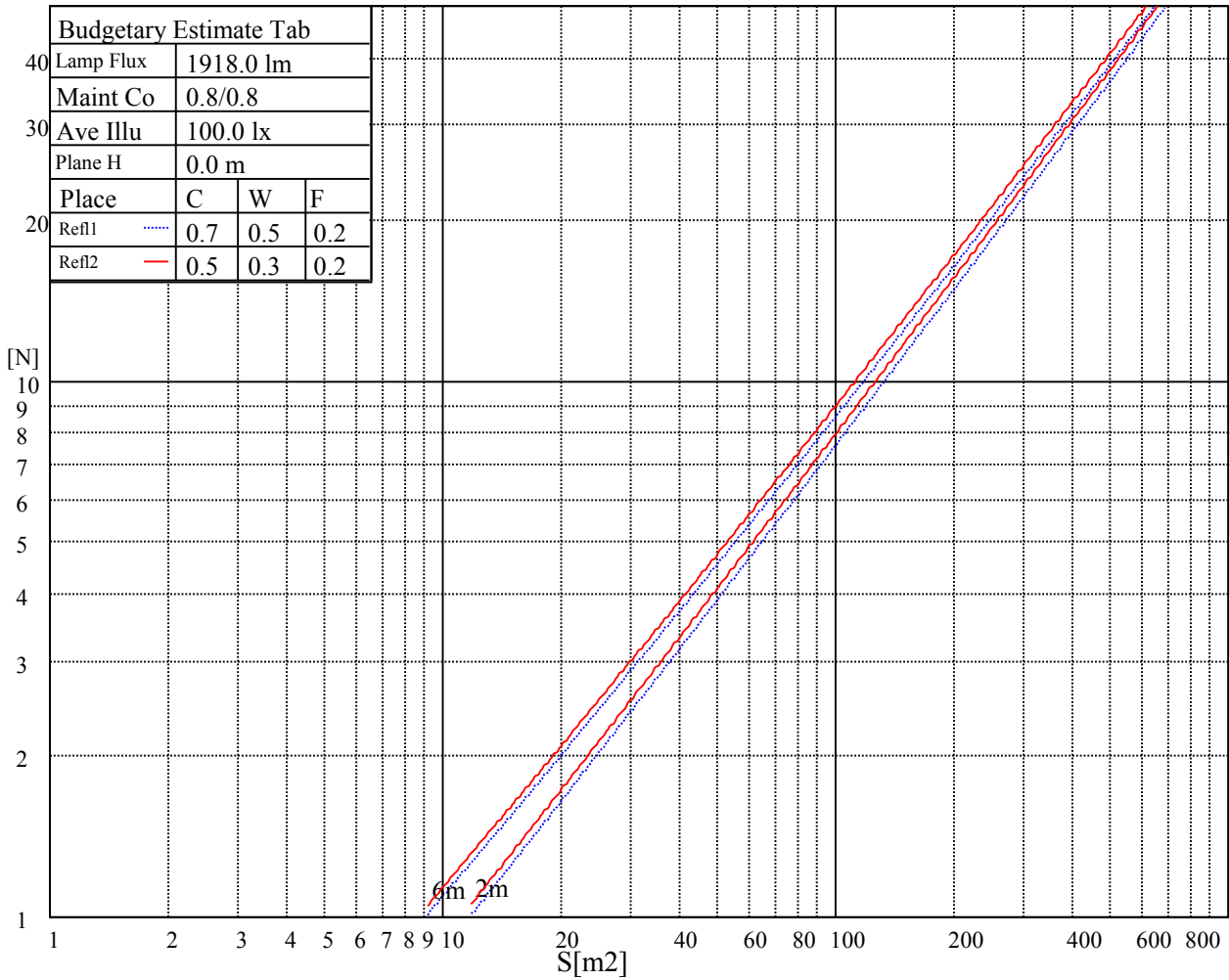
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4099	4099	4099	6616	6616	6616	19553	19553	19553

Glare Table

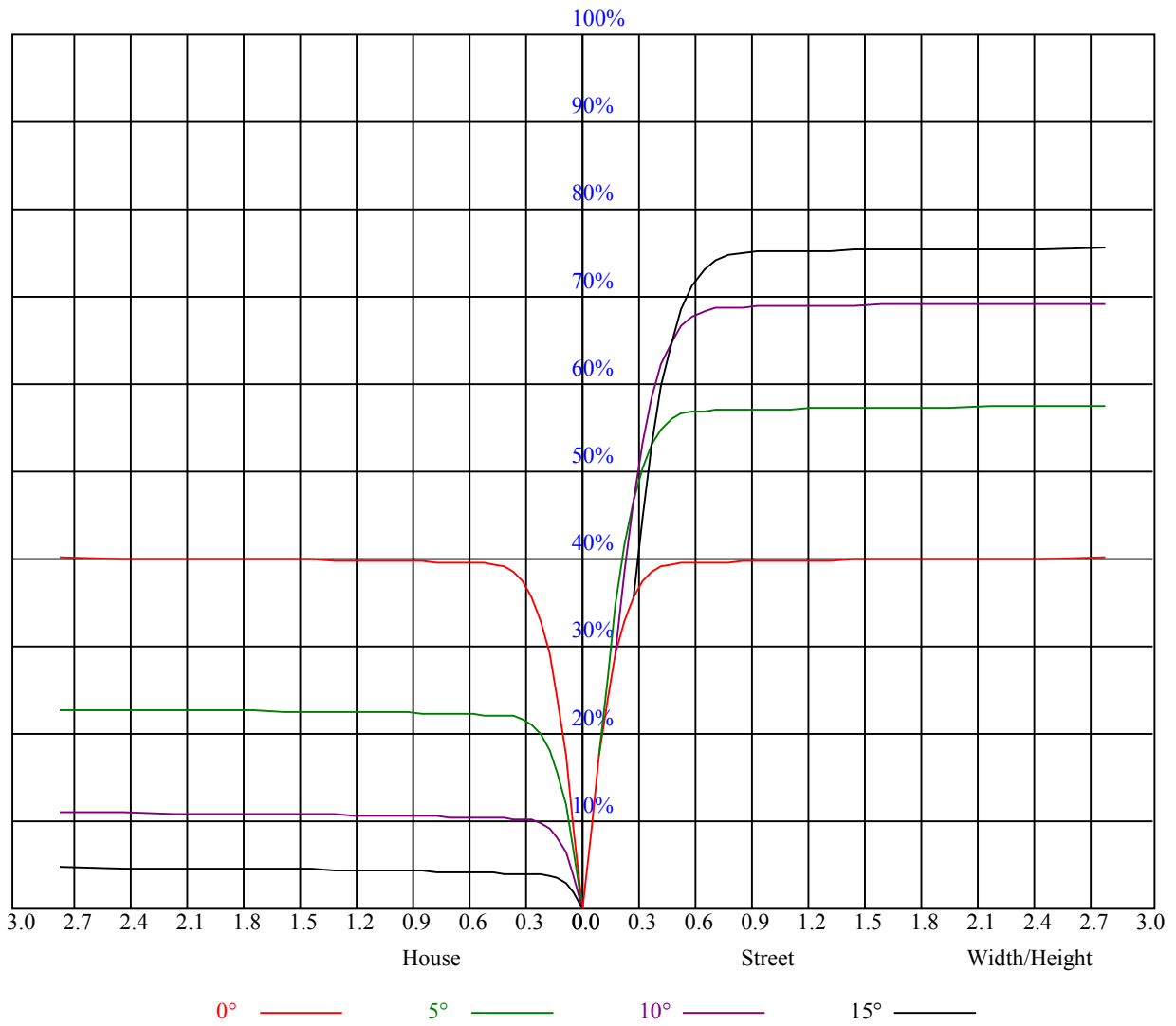
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.96	0.96	0.96	0.94	0.94	0.94	0.90	0.90	0.90	0.86	0.86	0.86	0.83	0.83	0.83	0.81
1	0.91	0.90	0.89	0.90	0.88	0.87	0.87	0.85	0.85	0.84	0.83	0.82	0.81	0.80	0.80	0.78
2	0.88	0.85	0.83	0.86	0.84	0.82	0.84	0.82	0.81	0.81	0.80	0.79	0.79	0.78	0.77	0.76
3	0.84	0.82	0.80	0.83	0.81	0.79	0.81	0.79	0.78	0.80	0.78	0.77	0.78	0.77	0.75	0.74
4	0.82	0.79	0.77	0.81	0.78	0.76	0.79	0.77	0.75	0.78	0.76	0.74	0.76	0.75	0.74	0.73
5	0.79	0.76	0.74	0.79	0.76	0.74	0.77	0.75	0.73	0.76	0.74	0.73	0.75	0.73	0.72	0.71
6	0.77	0.74	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.75	0.73	0.71	0.74	0.72	0.70	0.70
7	0.75	0.72	0.70	0.75	0.72	0.70	0.74	0.71	0.70	0.73	0.71	0.69	0.72	0.71	0.69	0.68
8	0.74	0.71	0.69	0.73	0.70	0.68	0.72	0.70	0.68	0.72	0.70	0.68	0.71	0.69	0.68	0.67
9	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.69	0.67	0.70	0.68	0.67	0.70	0.68	0.66	0.66
10	0.70	0.68	0.66	0.70	0.68	0.66	0.70	0.67	0.66	0.69	0.67	0.65	0.69	0.67	0.65	0.65



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	12566.25	12110.63	11407.50	10552.50	9433.13	8263.13	7267.50	6260.63	5461.88
45.0	12510.00	12217.50	11643.75	10935.00	9928.13	8825.63	7852.50	6744.38	5883.75
90.0	12470.63	12380.63	12060.00	11216.81	10604.25	9695.81	8456.63	7463.25	6514.31
135.0	12358.13	12616.88	12605.63	12420.00	11919.38	11143.13	10293.75	9168.75	8156.25
180.0	12566.25	12706.88	12673.13	12324.38	11171.25	11062.69	10033.88	8884.13	7846.88
225.0	12510.00	12532.50	12358.13	11716.88	11141.44	10268.44	9073.69	8080.31	7104.38
270.0	12470.63	12346.88	11936.25	11323.13	10395.00	9320.63	8330.63	7245.00	6367.50
315.0	12358.13	11790.00	11201.63	10109.81	9117.00	8088.19	7003.13	6012.00	5218.88
360.0	12566.25	12110.63	11407.50	10552.50	9433.13	8263.13	7267.50	6260.63	5461.88
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4663.13	3943.13	3403.13	2936.25	2664.56	2129.63	1848.94	1589.06	1299.38
45.0	5034.38	4280.63	3684.38	3178.13	2846.25	2310.75	2019.38	1692.00	1456.31
90.0	5487.75	4768.31	4119.75	3436.88	3036.38	2591.44	2180.25	1935.56	1679.06
135.0	7065.00	6075.00	5293.13	4567.50	3791.25	3268.13	2880.00	2417.63	2068.31
180.0	6758.44	5787.56	5030.44	4268.81	3685.50	3127.50	2657.25	2305.13	2004.19
225.0	6112.13	5226.19	4526.44	3836.81	3303.56	2815.88	2404.69	2087.44	1812.38
270.0	5461.88	4657.50	4021.88	3465.00	2874.38	2665.13	2170.69	1812.38	1561.50
315.0	4435.31	3749.06	3226.50	2722.50	2355.19	2010.94	1710.00	1462.50	1098.23
360.0	4663.13	3943.13	3403.13	2936.25	2664.56	2129.63	1848.94	1589.06	1299.38
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1104.19	921.94	696.38	527.63	375.75	290.81	119.81	59.01	24.30
45.0	1237.50	1022.63	810.56	619.88	472.50	304.31	217.86	103.39	38.03
90.0	1353.94	1099.63	981.39	775.58	583.99	429.98	293.06	158.79	85.56
135.0	1793.81	1575.00	1261.13	1061.44	905.06	677.25	484.88	357.19	293.06
180.0	1669.50	1426.50	1114.71	948.43	790.59	618.36	439.93	283.44	173.03
225.0	1509.75	1117.69	1095.30	882.39	680.34	515.19	362.48	206.16	117.28
270.0	1338.19	1140.19	902.81	721.13	555.75	384.19	298.69	135.73	61.71
315.0	1001.53	819.79	645.02	443.25	301.28	185.12	101.87	38.48	19.46
360.0	1104.19	921.94	696.38	527.63	375.75	290.81	119.81	59.01	24.30
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	16.26	14.85	13.56	12.71	11.81	11.14	10.58	10.13	9.68
45.0	16.59	14.91	13.50	12.60	11.87	11.08	10.58	10.18	9.73
90.0	36.73	15.64	14.34	13.28	12.26	11.48	10.91	10.35	9.96
135.0	106.93	49.33	20.31	15.19	13.78	12.71	11.93	11.19	10.63
180.0	86.68	38.87	17.04	14.63	13.50	12.49	11.64	11.03	10.52
225.0	56.93	20.76	15.86	14.51	13.33	12.38	11.59	10.97	10.41
270.0	24.36	16.09	14.57	13.50	12.49	11.64	11.08	10.52	10.01
315.0	15.58	14.29	13.16	12.32	11.53	10.80	10.29	9.90	9.56
360.0	16.26	14.85	13.56	12.71	11.81	11.14	10.58	10.13	9.68
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	9.34	9.06	8.78	8.61	8.38	8.27	8.16	8.04	7.93
45.0	9.45	9.23	8.94	8.78	8.61	8.49	8.38	8.27	8.16
90.0	9.62	9.34	9.11	8.83	8.66	8.55	8.44	8.27	8.21
135.0	10.18	9.84	9.45	9.17	9.00	8.78	8.61	8.44	8.33
180.0	9.96	9.62	9.28	9.00	8.78	8.61	8.44	8.27	8.16
225.0	9.96	9.56	9.28	9.06	8.83	8.61	8.44	8.33	8.21
270.0	9.68	9.39	9.06	8.89	8.72	8.49	8.38	8.27	8.16
315.0	9.23	8.94	8.78	8.55	8.38	8.27	8.16	8.04	7.99
360.0	9.34	9.06	8.78	8.61	8.38	8.27	8.16	8.04	7.93



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	7.88	7.76	7.71	7.65	7.59	7.54	7.48	7.48	7.43
45.0	8.10	8.04	7.93	7.93	7.88	7.76	7.76	7.71	7.65
90.0	8.10	8.04	7.99	7.93	7.88	7.82	7.76	7.71	7.71
135.0	8.21	8.10	8.04	7.99	7.88	7.82	7.76	7.71	7.71
180.0	8.04	7.93	7.88	7.76	7.71	7.65	7.59	7.54	7.48
225.0	8.10	8.04	7.93	7.93	7.82	7.76	7.71	7.71	7.65
270.0	8.10	8.04	7.93	7.88	7.82	7.76	7.71	7.71	7.65
315.0	7.88	7.88	7.76	7.71	7.65	7.59	7.54	7.54	7.54
360.0	7.88	7.76	7.71	7.65	7.59	7.54	7.48	7.48	7.43
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	7.43	7.37	7.31	7.31	7.31	7.26	7.20	7.20	7.20
45.0	7.65	7.65	7.54	7.54	7.48	7.48	7.48	7.48	7.48
90.0	7.65	7.59	7.59	7.54	7.54	7.48	7.48	7.48	7.48
135.0	7.65	7.59	7.54	7.54	7.48	7.48	7.43	7.43	7.43
180.0	7.48	7.43	7.37	7.31	7.31	7.26	7.26	7.26	7.20
225.0	7.59	7.59	7.54	7.54	7.48	7.48	7.48	7.43	7.43
270.0	7.65	7.59	7.59	7.54	7.54	7.48	7.48	7.48	7.48
315.0	7.48	7.43	7.43	7.37	7.37	7.37	7.31	7.31	7.31
360.0	7.43	7.37	7.31	7.31	7.31	7.26	7.20	7.20	7.20
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	7.14	7.14	7.14	7.14	7.14	7.09	7.09	7.09	7.09
45.0	7.43	7.43	7.43	7.43	7.37	7.37	7.37	7.37	7.31
90.0	7.43	7.43	7.43	7.37	7.43	7.37	7.37	7.37	7.37
135.0	7.37	7.37	7.37	7.31	7.31	7.31	7.26	7.26	7.26
180.0	7.20	7.14	7.14	7.14	7.09	7.14	7.14	7.09	7.09
225.0	7.43	7.37	7.37	7.37	7.37	7.37	7.31	7.31	7.31
270.0	7.43	7.43	7.43	7.43	7.37	7.37	7.37	7.37	7.37
315.0	7.31	7.26	7.26	7.26	7.26	7.26	7.26	7.20	7.20
360.0	7.14	7.14	7.14	7.14	7.14	7.09	7.09	7.09	7.09
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	7.09	7.09	7.03	7.03	7.09	7.03	7.03	7.03	7.03
45.0	7.31	7.37	7.37	7.37	7.31	7.31	7.31	7.31	7.31
90.0	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37
135.0	7.26	7.26	7.26	7.20	7.20	7.20	7.20	7.20	7.20
180.0	7.09	7.03	7.09	7.03	7.09	7.03	7.03	7.03	6.98
225.0	7.31	7.31	7.31	7.31	7.31	7.26	7.26	7.31	7.31
270.0	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37
315.0	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.14
360.0	7.09	7.09	7.03	7.03	7.09	7.03	7.03	7.03	7.03
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	7.03	7.03	7.03	7.03	7.03	6.98	6.98	7.03	7.03
45.0	7.31	7.31	7.31	7.31	7.31	7.26	7.26	7.26	7.26
90.0	7.37	7.31	7.31	7.31	7.31	7.26	7.26	7.26	7.26
135.0	7.14	7.20	7.20	7.14	7.20	7.20	7.20	7.14	7.14
180.0	7.03	7.03	7.03	6.98	6.98	7.03	7.03	6.98	6.98
225.0	7.26	7.26	7.26	7.26	7.26	7.26	7.26	7.26	7.26
270.0	7.37	7.37	7.37	7.37	7.37	7.31	7.31	7.26	7.26
315.0	7.14	7.14	7.14	7.20	7.14	7.14	7.14	7.14	7.20
360.0	7.03	7.03	7.03	7.03	7.03	6.98	6.98	7.03	7.03

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>7.03</b>
<b>45.0</b>	<b>7.26</b>
<b>90.0</b>	<b>7.26</b>
<b>135.0</b>	<b>7.14</b>
<b>180.0</b>	<b>7.03</b>
<b>225.0</b>	<b>7.26</b>
<b>270.0</b>	<b>7.26</b>
<b>315.0</b>	<b>7.14</b>
<b>360.0</b>	<b>7.03</b>