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## Nata

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LumCAT: 2-2187-M  
Luminaire: 92.70.131.00  
Report No: NATA0100  
Test No: GC20200211710  
LampCAT: OSRAM OPTO SOLERIQ S15  
Lamp flux(lm): 2836.0  
Number of Lamps: 1  
Length(mm): 0  
Phm Type: C

Voltage(V): 35.6000  
Current(A): 0.6000  
Power (W): 21.3600  
PF: 0.0000  
Ballast type: DC  
Width(mm): 0  
Height(mm): 0

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## Photometric Results

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Lumens(lm): 2304.45  
Efficiency(%): 81.26%  
Lumens(lm)/Power(W): 107.89  
Central intensity(cd): 10911.940  
Maximum intensity(cd): 10911.940  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=24.2  
                                  [C90/270]Total=24.2  
Field angle(10%Imax): [C0/180]Total=46.7  
                                  [C90/270]Total=46.7  
Maximum s/h(1/2): C0\_180=0.41 C90\_270=0.41  
Maximum s/h(1/4): C0\_180=0.42 C90\_270=0.42  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 81.26%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.741%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10911.938	0.000	0	.000%	.000%
1.0	10863.141	10.419	10.419	.367%	.452%
2.0	10691.648	30.937	41.356	1.091%	1.795%
3.0	10452.867	50.571	91.927	1.783%	3.989%
4.0	10148.203	68.958	160.886	2.432%	6.982%
5.0	9713.672	85.445	246.33	3.013%	10.689%
6.0	9229.781	99.553	345.883	3.510%	15.009%
7.0	8707.641	111.337	457.22	3.926%	19.841%
8.0	8063.578	120.028	577.249	4.232%	25.049%
9.0	7443.492	125.676	702.925	4.431%	30.503%
10.0	6813.844	129.024	831.949	4.549%	36.102%
11.0	6106.992	129.106	961.055	4.552%	41.704%
12.0	5526.844	127.174	1088.229	4.484%	47.223%
13.0	4941.281	124.230	1212.459	4.380%	52.614%
14.0	4344.047	118.851	1331.311	4.191%	57.771%
15.0	3851.156	112.507	1443.818	3.967%	62.654%
16.0	3409.805	106.393	1550.212	3.752%	67.270%
17.0	2934.211	98.793	1649.005	3.484%	71.558%
18.0	2574.070	90.820	1739.825	3.202%	75.499%
19.0	2246.906	83.875	1823.7	2.958%	79.138%
20.0	1928.109	76.414	1900.114	2.694%	82.454%
21.0	1654.734	68.798	1968.912	2.426%	85.440%
22.0	1380.389	60.992	2029.904	2.151%	88.086%
23.0	1168.833	53.490	2083.394	1.886%	90.408%
24.0	951.919	46.367	2129.761	1.635%	92.420%
25.0	745.664	38.599	2168.36	1.361%	94.095%
26.0	544.134	30.446	2198.806	1.074%	95.416%
27.0	369.731	22.358	2221.164	.788%	96.386%
28.0	241.945	15.486	2236.65	.546%	97.058%
29.0	116.733	9.384	2246.034	.331%	97.465%
30.0	41.653	4.276	2250.311	.151%	97.651%
31.0	18.380	1.671	2251.981	.059%	97.723%
32.0	14.597	0.945	2252.926	.033%	97.764%
33.0	13.704	0.834	2253.76	.029%	97.800%
34.0	13.043	0.809	2254.569	.029%	97.836%
35.0	12.466	0.792	2255.361	.028%	97.870%
36.0	11.981	0.778	2256.14	.027%	97.904%
37.0	11.588	0.769	2256.909	.027%	97.937%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	11.236	0.762	2257.67	.027%	97.970%
39.0	10.927	0.756	2258.427	.027%	98.003%
40.0	10.709	0.755	2259.181	.027%	98.036%
41.0	10.505	0.755	2259.937	.027%	98.069%
42.0	10.329	0.757	2260.694	.027%	98.101%
43.0	10.195	0.760	2261.454	.027%	98.134%
44.0	10.069	0.765	2262.219	.027%	98.168%
45.0	9.963	0.770	2262.989	.027%	98.201%
46.0	9.886	0.776	2263.765	.027%	98.235%
47.0	9.809	0.783	2264.548	.028%	98.269%
48.0	9.752	0.791	2265.339	.028%	98.303%
49.0	9.696	0.799	2266.138	.028%	98.338%
50.0	9.647	0.806	2266.944	.028%	98.373%
51.0	9.577	0.813	2267.757	.029%	98.408%
52.0	9.563	0.821	2268.579	.029%	98.444%
53.0	9.527	0.830	2269.409	.029%	98.480%
54.0	9.485	0.838	2270.247	.030%	98.516%
55.0	9.457	0.846	2271.093	.030%	98.553%
56.0	9.422	0.853	2271.946	.030%	98.590%
57.0	9.415	0.861	2272.807	.030%	98.627%
58.0	9.401	0.870	2273.677	.031%	98.665%
59.0	9.366	0.877	2274.554	.031%	98.703%
60.0	9.338	0.884	2275.438	.031%	98.741%
61.0	9.323	0.891	2276.329	.031%	98.780%
62.0	9.302	0.898	2277.226	.032%	98.819%
63.0	9.288	0.904	2278.13	.032%	98.858%
64.0	9.288	0.912	2279.042	.032%	98.898%
65.0	9.274	0.919	2279.96	.032%	98.937%
66.0	9.260	0.925	2280.885	.033%	98.978%
67.0	9.246	0.931	2281.816	.033%	99.018%
68.0	9.253	0.937	2282.753	.033%	99.059%
69.0	9.253	0.944	2283.697	.033%	99.100%
70.0	9.246	0.950	2284.647	.034%	99.141%
71.0	9.253	0.956	2285.603	.034%	99.182%
72.0	9.232	0.961	2286.564	.034%	99.224%
73.0	9.218	0.965	2287.529	.034%	99.266%
74.0	9.225	0.970	2288.499	.034%	99.308%
75.0	9.239	0.976	2289.474	.034%	99.350%

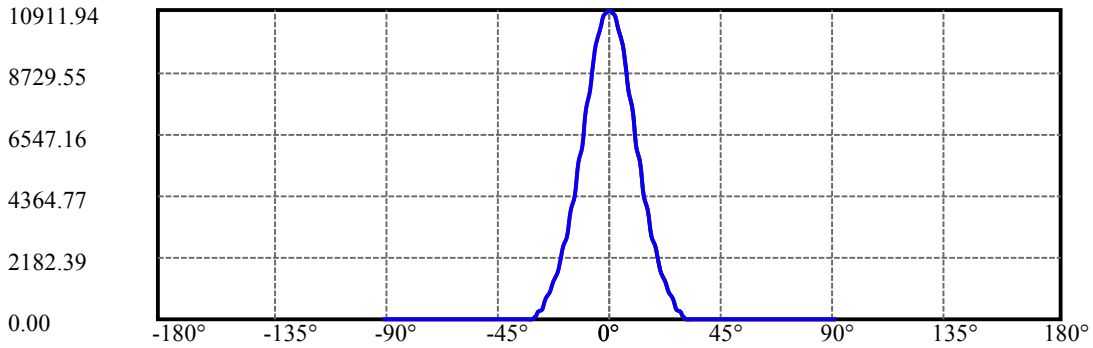
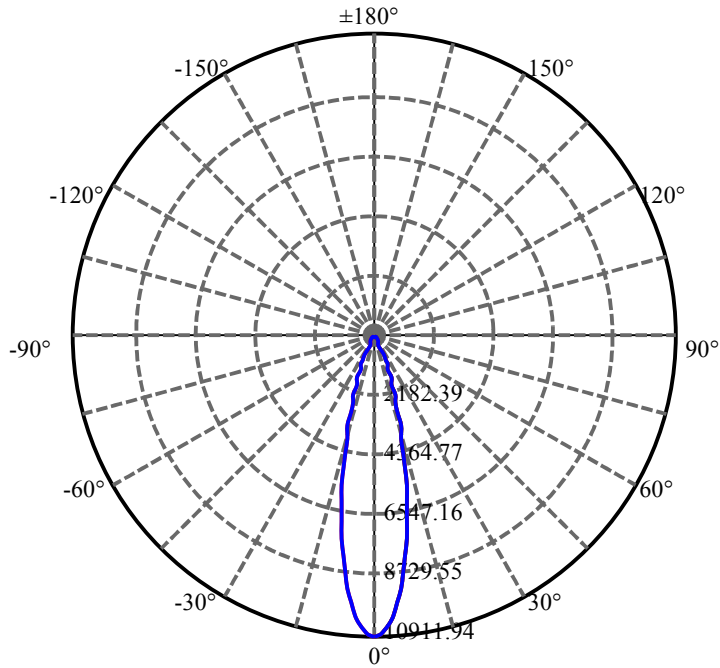
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.239	0.981	2290.455	.035%	99.393%
77.0	9.232	0.985	2291.44	.035%	99.436%
78.0	9.246	0.989	2292.429	.035%	99.479%
79.0	9.239	0.993	2293.422	.035%	99.522%
80.0	9.253	0.997	2294.419	.035%	99.565%
81.0	9.267	1.002	2295.421	.035%	99.608%
82.0	9.246	1.004	2296.425	.035%	99.652%
83.0	9.260	1.006	2297.431	.035%	99.696%
84.0	9.281	1.010	2298.441	.036%	99.739%
85.0	9.190	1.008	2299.449	.036%	99.783%
86.0	9.169	1.004	2300.453	.035%	99.827%
87.0	9.098	1.000	2301.452	.035%	99.870%
88.0	9.098	0.997	2302.449	.035%	99.913%
89.0	9.113	0.998	2303.447	.035%	99.957%
90.0	9.113	0.999	2304.446	.035%	100.000%

## ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2250.31	79.35%	97.65%
0-40	2259.18	79.66%	98.04%
0-60	2275.44	80.23%	98.74%
0-90	2303.45	81.22%	99.96%
0-120	2303.45	81.22%	99.96%
0-180	2304.45	81.26%	100.00%
60-90	28.89	1.02%	1.25%
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%
0-19.26	1843.56	65.01%	80.00%

## ZONAL LUMEN SUMMARY

0-10	831.95
10-20	1068.17
20-30	350.20
30-40	8.87
40-50	7.76
50-60	8.49
60-70	9.21
70-80	9.77
80-90	9.03
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: —————

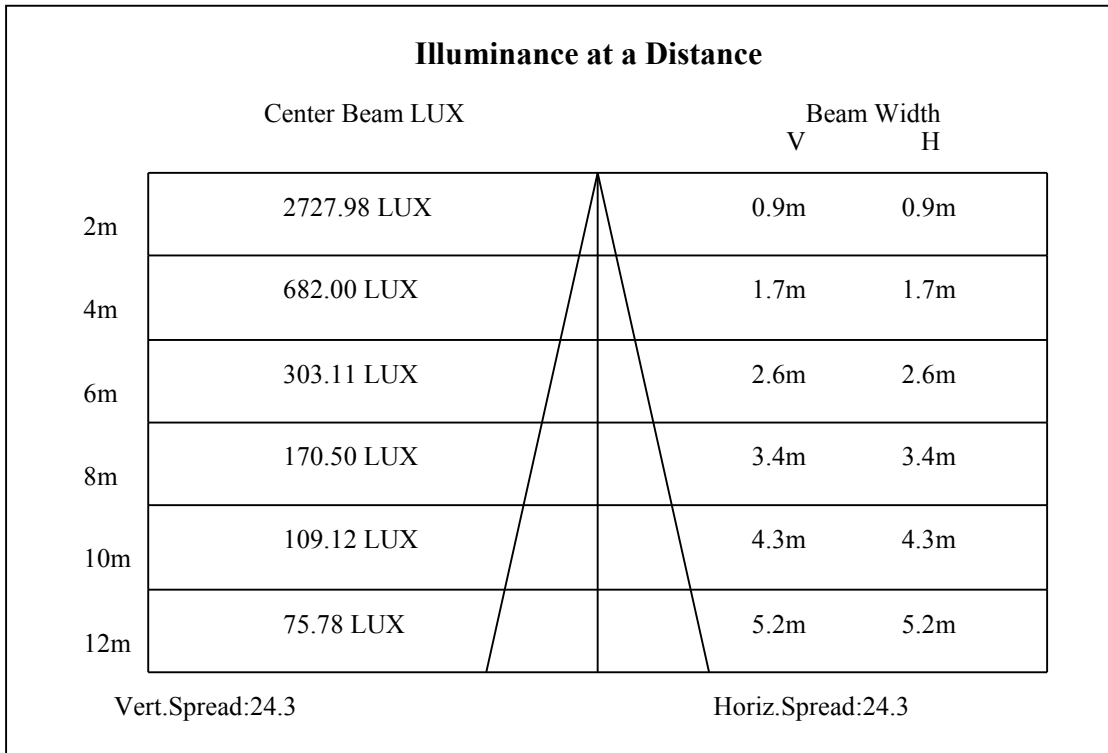
C90/C270: —————

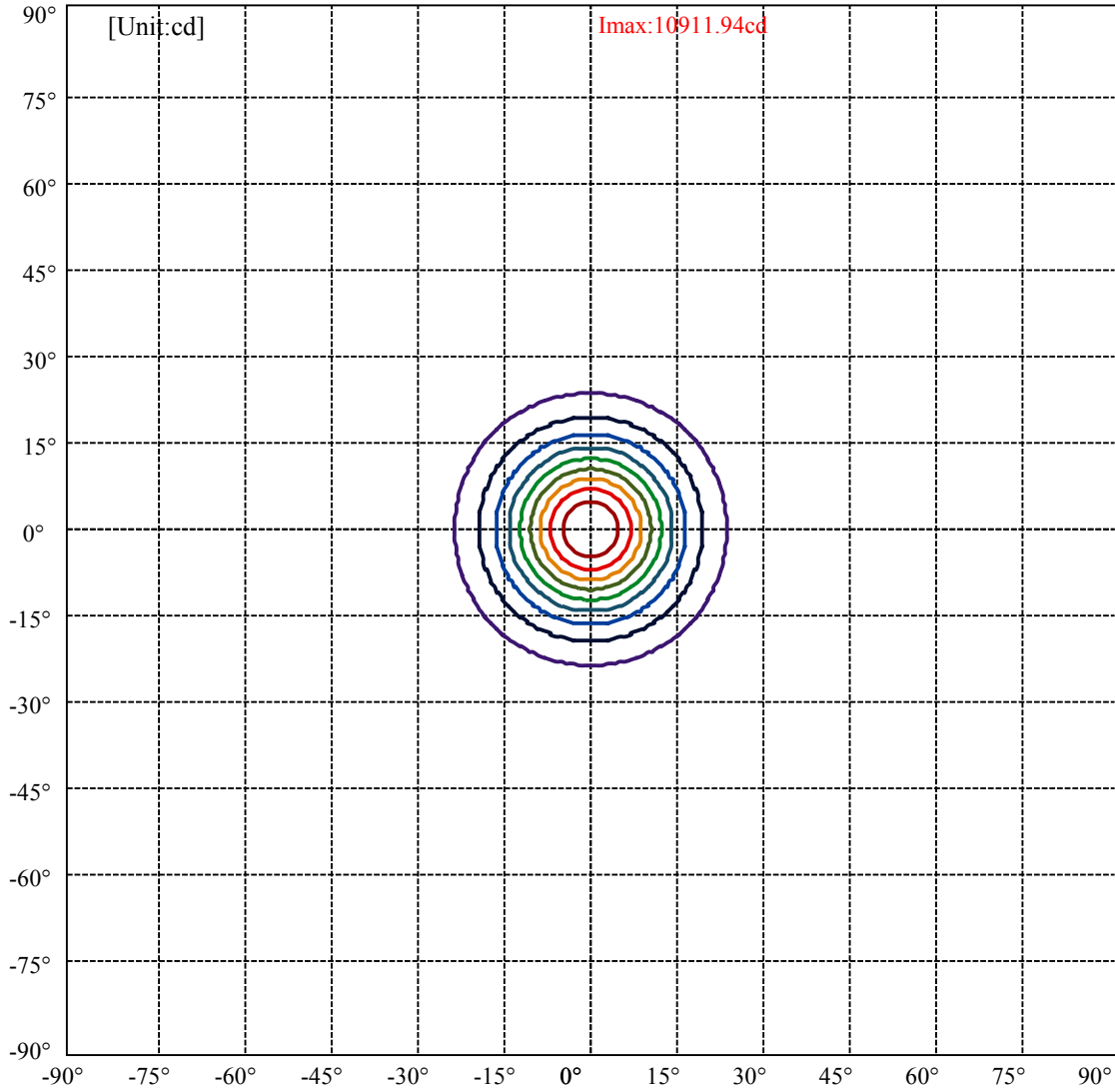
Field angle(10%Imax):C0/180Left:23.4 Right:23.4

:C90/270Left:23.4 Right:23.4

Beam Angle(50%Imax):C0/180Left:12.1 Right:12.1

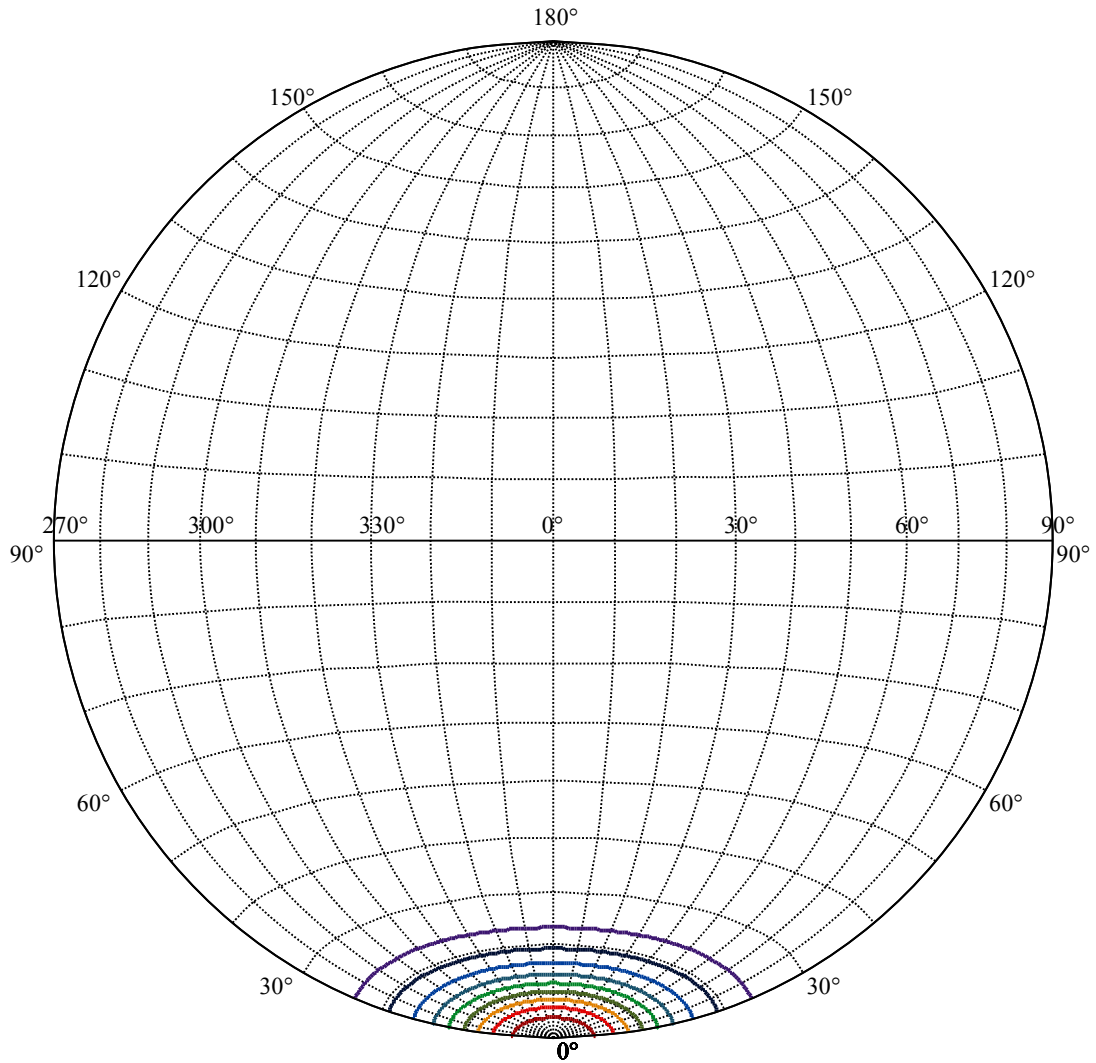
:C90/270Left:12.1 Right:12.1





(10%Imax) 1091.19	—
(20%Imax) 2182.39	—
(30%Imax) 3273.58	—
(40%Imax) 4364.77	—
(50%Imax) 5455.97	—
(60%Imax) 6547.16	—
(70%Imax) 7638.36	—
(80%Imax) 8729.55	—
(90%Imax) 9820.74	—





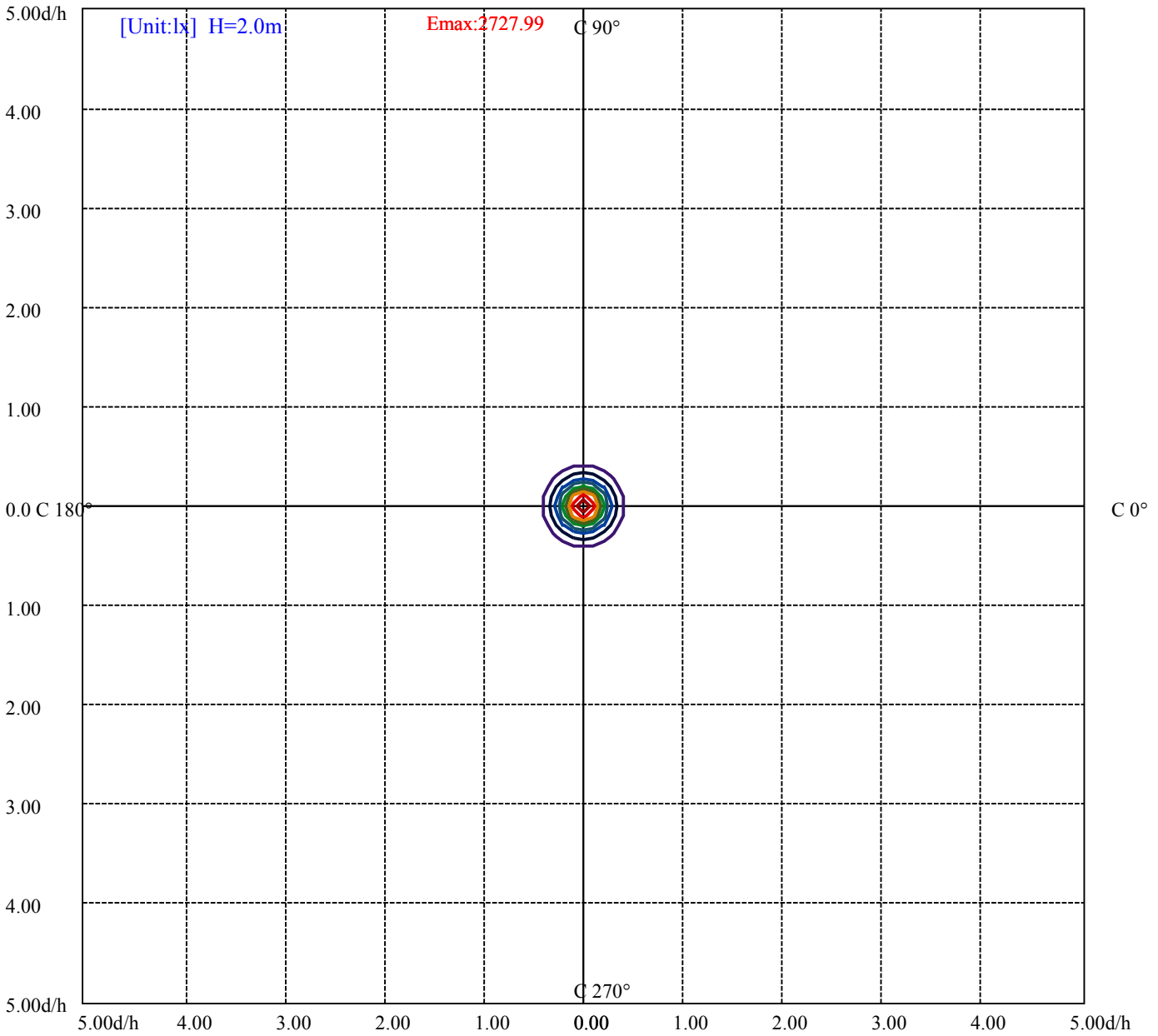
House

[Unit:cd]

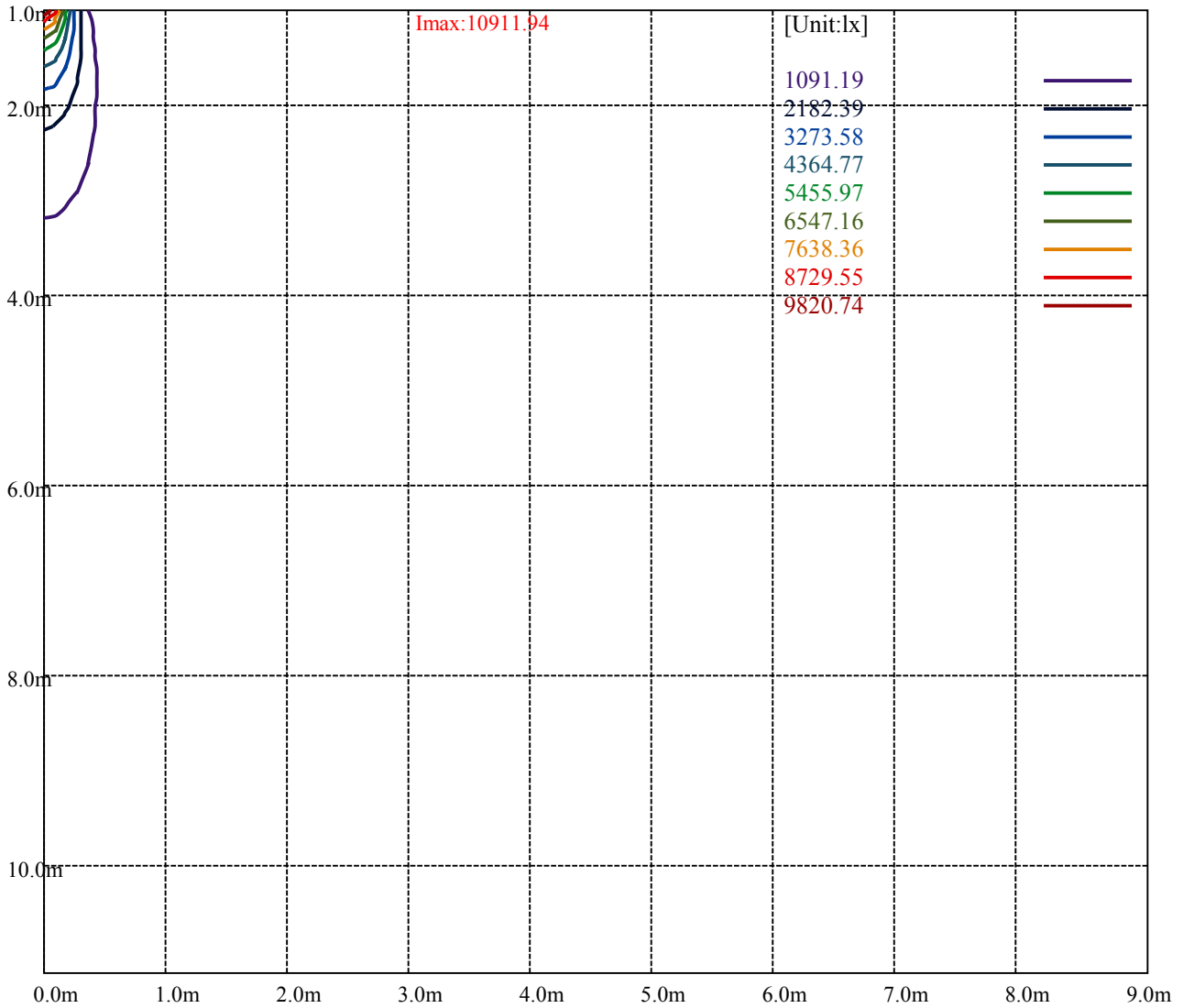
Road

Imax:10911.94

(10%Imax)	1091.19	—
(20%Imax)	2182.39	—
(30%Imax)	3273.58	—
(40%Imax)	4364.77	—
(50%Imax)	5455.97	—
(60%Imax)	6547.16	—
(70%Imax)	7638.36	—
(80%Imax)	8729.55	—
(90%Imax)	9820.74	—



- (10%E<sub>max</sub>) 272.7975
- (20%E<sub>max</sub>) 545.5975
- (30%E<sub>max</sub>) 818.395
- (40%E<sub>max</sub>) 1091.193
- (50%E<sub>max</sub>) 1363.99
- (60%E<sub>max</sub>) 1636.79
- (70%E<sub>max</sub>) 1909.588
- (80%E<sub>max</sub>) 2182.385
- (90%E<sub>max</sub>) 2455.185



Luminance Table

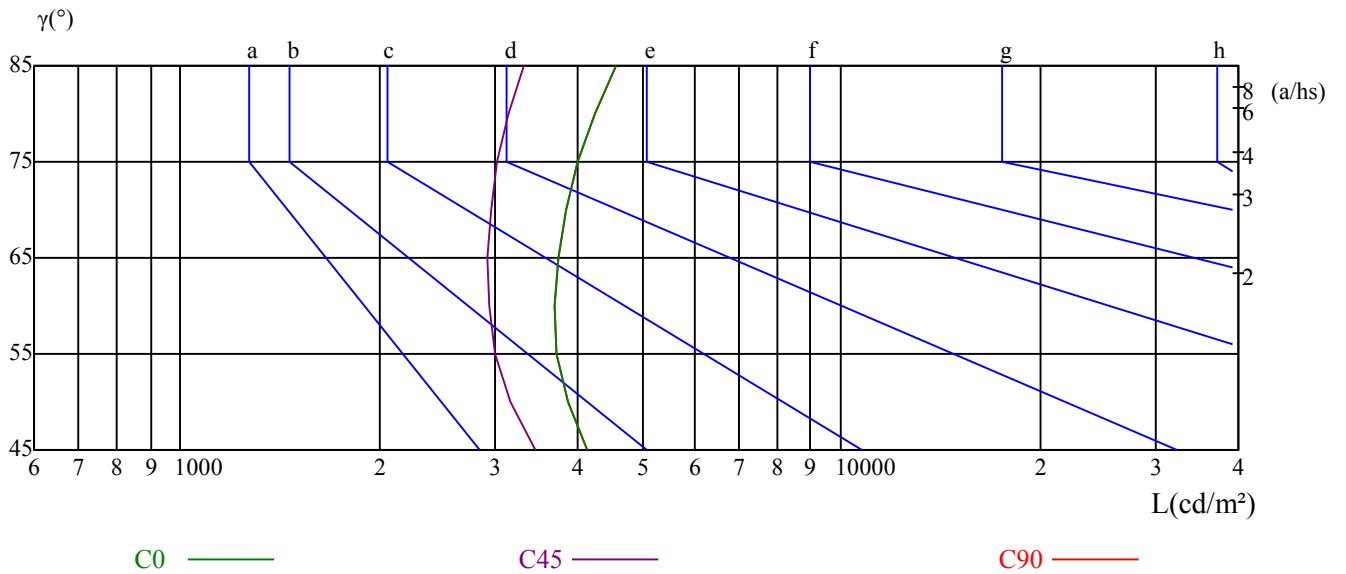
$\gamma$	45	50	55	60	65	70	75	80	85
C0	4126	3855	3707	3678	3726	3839	3986	4232	4579
C45	3438	3165	2998	2929	2920	2957	3015	3139	3321
C90	4126	3855	3707	3678	3726	3839	3986	4232	4579

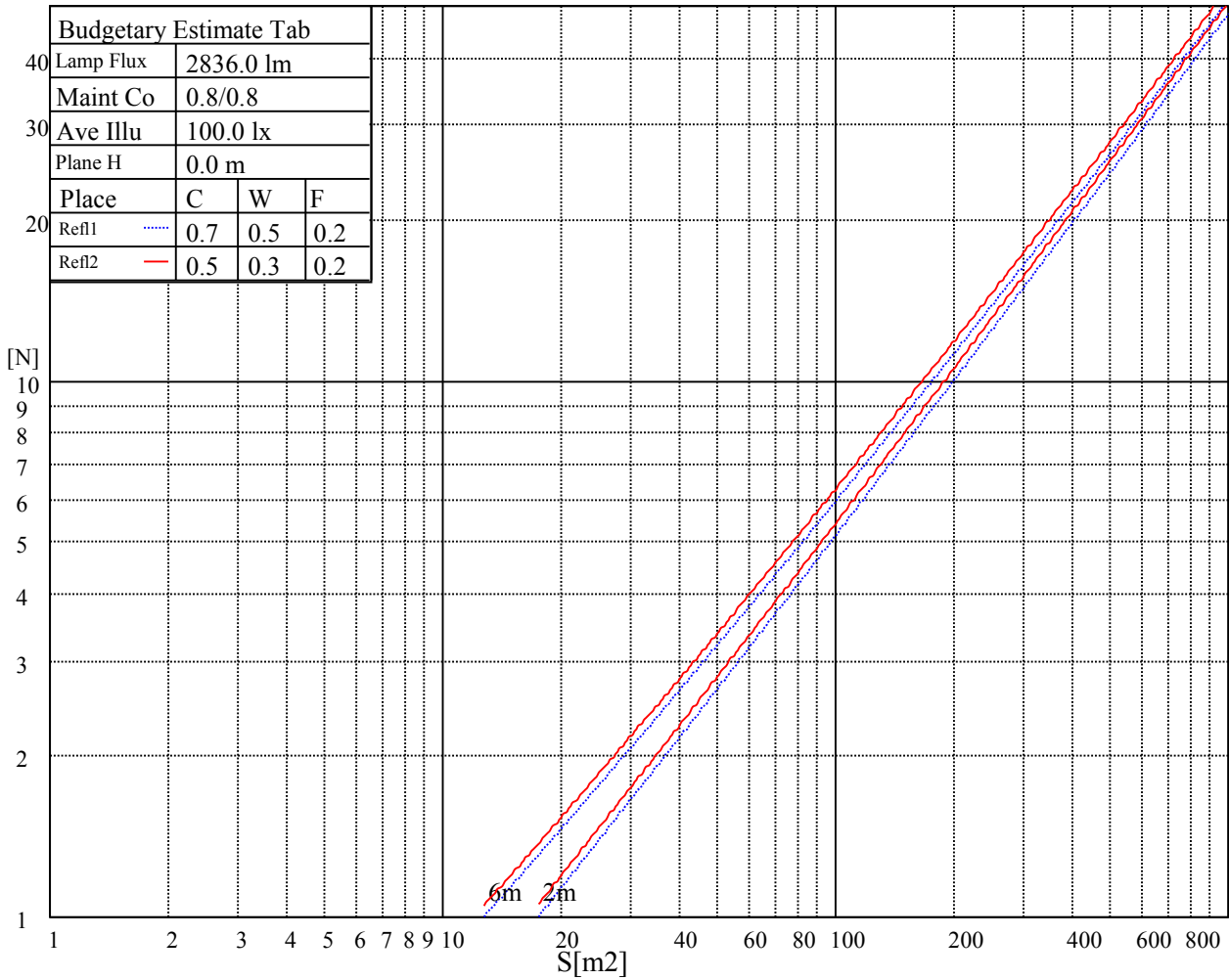
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
11184	11184	11184	17870	17870	17870	53424	53424	53424

Glare Table

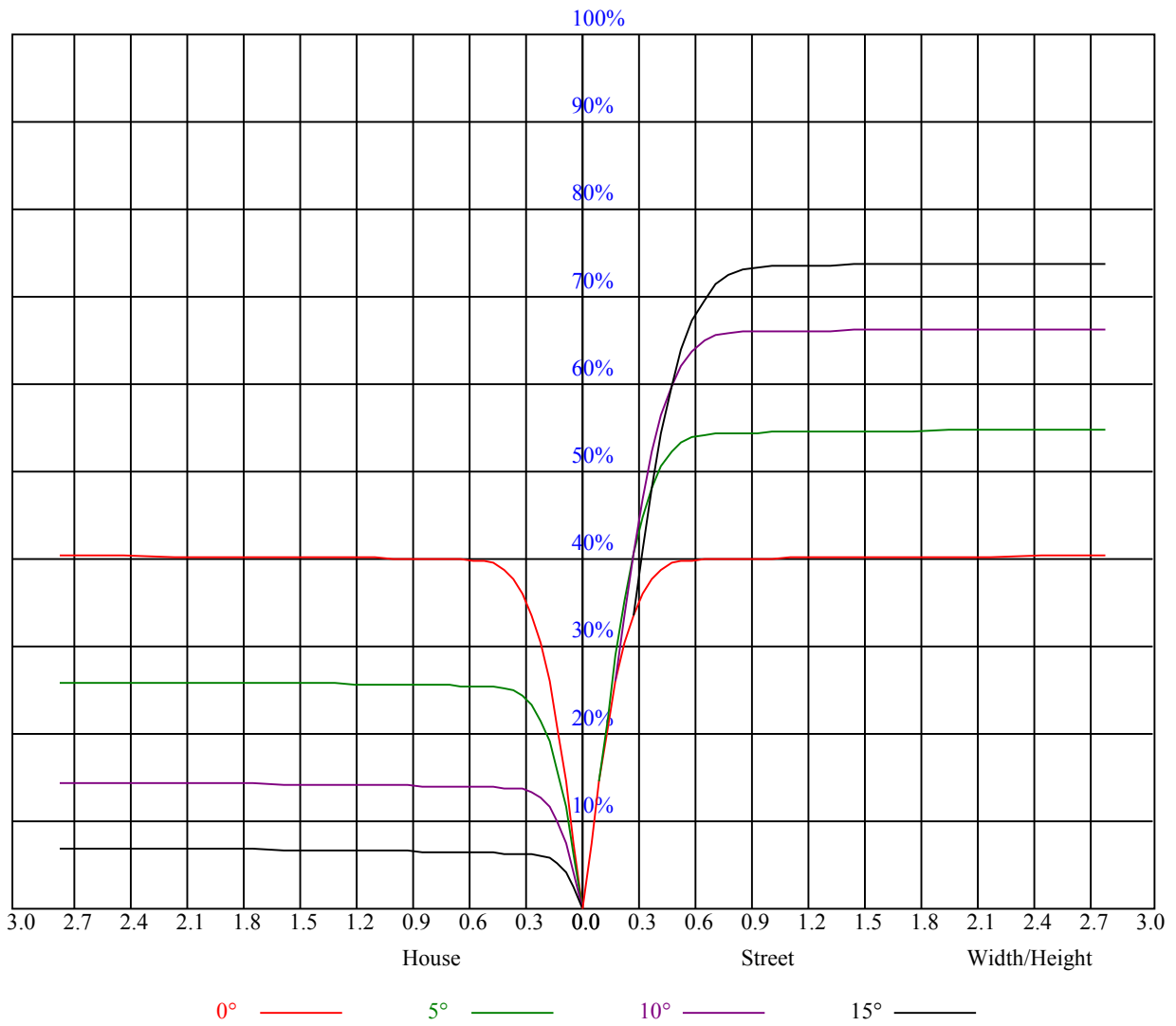
Glare	Quality	Service Values Illuminance(lx)							
		a	b	c	d	e	f	g	h
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.97	0.97	0.97	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	0.92	0.90	0.89	0.90	0.88	0.87	0.87	0.85	0.84	0.84	0.83	0.82	0.81	0.80	0.80	0.78
2	0.87	0.85	0.83	0.86	0.84	0.82	0.83	0.82	0.80	0.81	0.80	0.78	0.79	0.78	0.77	0.76
3	0.84	0.81	0.78	0.83	0.80	0.78	0.81	0.78	0.77	0.79	0.77	0.75	0.77	0.76	0.74	0.73
4	0.81	0.77	0.75	0.80	0.77	0.75	0.78	0.76	0.74	0.77	0.75	0.73	0.75	0.73	0.72	0.71
5	0.78	0.74	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.75	0.72	0.71	0.73	0.71	0.70	0.69
6	0.75	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.69	0.73	0.70	0.68	0.72	0.70	0.68	0.67
7	0.73	0.70	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.70	0.68	0.66	0.65
8	0.71	0.68	0.65	0.70	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.65	0.68	0.66	0.64	0.64
9	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.67	0.65	0.63	0.67	0.64	0.63	0.62
10	0.67	0.64	0.62	0.67	0.64	0.62	0.66	0.63	0.62	0.66	0.63	0.61	0.65	0.63	0.61	0.61



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	10919.81	10896.19	10739.25	10527.75	10251.56	9804.38	9364.50	8876.81	8273.25
45.0	10900.13	10892.25	10758.94	10563.19	10303.88	9939.94	9470.81	8979.19	8378.44
90.0	10924.31	10893.94	10724.63	10511.44	10225.69	9781.88	9328.50	8810.44	8109.00
135.0	10903.50	10934.44	10831.50	10656.00	10407.94	10008.56	9604.69	9124.88	8457.19
180.0	10919.81	10845.56	10683.00	10376.44	10052.44	9659.81	9142.88	8542.13	7962.19
225.0	10900.13	10803.94	10600.31	10308.94	9975.38	9496.69	8949.94	8417.25	7768.69
270.0	10924.31	10859.06	10645.88	10398.94	10074.38	9620.44	9076.50	8551.69	7919.44
315.0	10903.50	10779.75	10549.69	10280.25	9894.38	9397.69	8900.44	8358.75	7640.44
360.0	10919.81	10896.19	10739.25	10527.75	10251.56	9804.38	9364.50	8876.81	8273.25
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	7624.13	7098.75	6352.88	5772.38	5208.75	4543.31	4048.31	3582.56	3057.75
45.0	7727.06	7117.88	6428.81	5834.25	5201.44	4610.25	4118.63	3661.31	3128.63
90.0	7593.19	6906.38	6153.75	5651.44	5031.00	4385.25	3963.94	3516.19	3011.63
135.0	7886.81	7274.81	6492.38	5879.81	5299.31	4689.00	4121.44	3660.75	3177.56
180.0	7269.75	6566.06	5954.63	5299.88	4757.63	4181.06	3652.31	3227.63	2844.00
225.0	7157.81	6467.63	5791.50	5220.00	4615.88	3997.69	3600.00	3178.13	2668.50
270.0	7256.81	6654.38	5989.50	5422.50	4812.19	4236.75	3764.81	3327.19	2839.50
315.0	7032.38	6424.88	5692.50	5134.50	4604.06	4109.06	3539.81	3124.69	2746.13
360.0	7624.13	7098.75	6352.88	5772.38	5208.75	4543.31	4048.31	3582.56	3057.75
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2691.00	2366.44	2004.75	1742.06	1499.63	1230.19	1018.13	808.88	590.63
45.0	2760.19	2405.81	2028.94	1765.13	1529.44	1290.38	1042.88	828.56	622.69
90.0	2649.94	2327.63	2006.44	1716.19	1478.25	1106.89	1007.61	804.26	608.79
135.0	2808.00	2408.06	2077.31	1812.94	1544.63	1307.25	1095.75	879.19	637.31
180.0	2419.31	2120.06	1851.19	1543.50	1258.31	1119.21	890.04	670.89	490.73
225.0	2388.94	2101.50	1809.00	1536.19	1249.88	1108.01	840.60	645.41	472.84
270.0	2498.06	2197.13	1860.75	1611.00	1387.13	1146.94	915.19	713.25	499.50
315.0	2377.13	2048.63	1786.50	1510.88	1095.86	1041.81	805.16	614.87	430.59
360.0	2691.00	2366.44	2004.75	1742.06	1499.63	1230.19	1018.13	808.88	590.63
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	393.75	286.31	126.23	55.52	19.80	15.36	14.40	13.56	12.88
45.0	453.38	289.69	144.17	54.73	20.76	14.79	13.84	13.22	12.60
90.0	412.48	249.36	136.91	52.59	20.59	14.40	13.56	12.94	12.38
135.0	466.31	317.25	221.06	61.93	23.63	14.68	13.78	13.11	12.54
180.0	319.78	181.63	90.11	29.08	15.08	14.01	13.22	12.60	12.21
225.0	305.10	163.52	70.71	26.21	15.64	14.51	13.56	12.94	12.38
270.0	335.25	297.56	83.70	32.79	16.20	14.57	13.78	13.11	12.43
315.0	271.80	150.24	60.98	20.36	15.36	14.46	13.50	12.88	12.32
360.0	393.75	286.31	126.23	55.52	19.80	15.36	14.40	13.56	12.88
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	12.38	11.93	11.36	11.08	10.86	10.58	10.41	10.24	10.13
45.0	12.15	11.76	11.48	11.08	10.80	10.69	10.46	10.35	10.24
90.0	11.87	11.53	11.25	10.91	10.69	10.52	10.35	10.24	10.07
135.0	12.04	11.64	11.25	11.03	10.80	10.52	10.35	10.18	10.07
180.0	11.70	11.36	11.08	10.80	10.58	10.41	10.24	10.13	10.01
225.0	11.93	11.53	11.19	10.86	10.69	10.46	10.35	10.18	10.07
270.0	11.98	11.59	11.19	10.91	10.69	10.52	10.29	10.18	10.07
315.0	11.81	11.36	11.08	10.74	10.58	10.35	10.18	10.07	9.90
360.0	12.38	11.93	11.36	11.08	10.86	10.58	10.41	10.24	10.13



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	9.96	9.84	9.79	9.73	9.68	9.62	9.56	9.51	9.51
45.0	10.13	10.01	9.96	9.90	9.79	9.79	9.68	9.68	9.62
90.0	10.01	9.90	9.79	9.79	9.73	9.68	9.56	9.56	9.51
135.0	9.96	9.90	9.79	9.73	9.68	9.62	9.56	9.56	9.51
180.0	9.90	9.84	9.73	9.62	9.68	9.56	9.51	9.51	9.45
225.0	9.96	9.90	9.84	9.79	9.73	9.68	9.62	9.62	9.62
270.0	9.96	9.90	9.79	9.79	9.73	9.68	9.62	9.62	9.56
315.0	9.84	9.79	9.79	9.68	9.56	9.56	9.51	9.45	9.45
360.0	9.96	9.84	9.79	9.73	9.68	9.62	9.56	9.51	9.51
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	9.45	9.39	9.39	9.34	9.34	9.34	9.28	9.28	9.23
45.0	9.62	9.62	9.51	9.51	9.56	9.45	9.45	9.45	9.39
90.0	9.51	9.45	9.45	9.45	9.45	9.39	9.39	9.34	9.34
135.0	9.45	9.45	9.39	9.39	9.34	9.34	9.28	9.28	9.28
180.0	9.39	9.39	9.34	9.28	9.28	9.28	9.23	9.23	9.17
225.0	9.56	9.45	9.51	9.51	9.45	9.45	9.39	9.34	9.39
270.0	9.51	9.51	9.45	9.45	9.45	9.39	9.39	9.39	9.34
315.0	9.39	9.39	9.34	9.39	9.34	9.28	9.28	9.28	9.28
360.0	9.45	9.39	9.39	9.34	9.34	9.34	9.28	9.28	9.23
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.23	9.23	9.23	9.23	9.17	9.17	9.17	9.17	9.11
45.0	9.39	9.39	9.34	9.34	9.34	9.34	9.39	9.34	9.34
90.0	9.34	9.34	9.34	9.34	9.28	9.34	9.34	9.34	9.39
135.0	9.23	9.23	9.17	9.17	9.23	9.23	9.17	9.17	9.17
180.0	9.23	9.17	9.23	9.17	9.17	9.17	9.11	9.11	9.17
225.0	9.34	9.34	9.34	9.28	9.28	9.28	9.28	9.28	9.28
270.0	9.34	9.39	9.39	9.34	9.34	9.34	9.39	9.39	9.39
315.0	9.23	9.23	9.17	9.23	9.17	9.17	9.17	9.17	9.17
360.0	9.23	9.23	9.23	9.23	9.17	9.17	9.17	9.17	9.11
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.17	9.11	9.11	9.11	9.11	9.06	9.06	9.06	9.11
45.0	9.28	9.28	9.28	9.28	9.28	9.28	9.28	9.23	9.23
90.0	9.39	9.34	9.34	9.39	9.39	9.45	9.45	9.45	9.45
135.0	9.11	9.17	9.17	9.11	9.11	9.11	9.17	9.11	9.11
180.0	9.11	9.11	9.11	9.11	9.11	9.06	9.11	9.11	9.06
225.0	9.23	9.23	9.23	9.28	9.28	9.23	9.23	9.23	9.28
270.0	9.39	9.39	9.45	9.45	9.45	9.51	9.56	9.62	9.62
315.0	9.17	9.11	9.11	9.17	9.17	9.17	9.11	9.11	9.17
360.0	9.17	9.11	9.11	9.11	9.11	9.06	9.06	9.06	9.11
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.11	9.11	9.11	9.11	9.06	9.11	9.06	9.06	9.06
45.0	9.28	9.23	9.23	9.23	9.23	9.23	9.17	9.17	9.23
90.0	9.45	9.45	9.51	9.56	9.34	9.28	9.11	9.11	9.11
135.0	9.06	9.11	9.11	9.11	9.06	9.11	9.06	9.06	9.06
180.0	9.11	9.06	9.06	9.06	9.06	9.06	9.06	9.06	9.06
225.0	9.28	9.23	9.23	9.23	9.28	9.17	9.17	9.17	9.17
270.0	9.68	9.68	9.68	9.79	9.34	9.17	9.11	9.11	9.11
315.0	9.17	9.11	9.17	9.17	9.17	9.23	9.06	9.06	9.11
360.0	9.11	9.11	9.11	9.11	9.06	9.11	9.06	9.06	9.06

Intensity data(cd)

C/ $\gamma$ (°)	90.0
0.0	9.00
45.0	9.23
90.0	9.11
135.0	9.11
180.0	9.06
225.0	9.23
270.0	9.11
315.0	9.06
360.0	9.00