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## Nata

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LumCAT: 2-2136-M	
Luminaire: BJB 47.360.1010	
Report No: NATA0100	Voltage(V): 35.2600
Test No: GC2019102104	Current(A): 0.4270
LampCAT: CITIZEN CLU038	Power (W): 15.0500
Lamp flux(lm): 1963.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 0	Width(mm): 0
Phm Type: C	Height(mm): 0

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## Photometric Results

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Lumens(lm): 1477.99  
Efficiency(%): 75.29%  
Lumens(lm)/Power(W): 98.21  
Central intensity(cd): 7830.000  
Maximum intensity(cd): 7830.000  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=23.7  
                                  [C90/270]Total=23.7  
Field angle(10%Imax): [C0/180]Total=42.2  
                                  [C90/270]Total=42.2  
Maximum s/h(1/2): C0\_180=0.40 C90\_270=0.40  
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(%): 75.29%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 97.902%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	7830.000	0.000	0	.000%	.000%
1.0	7795.336	7.476	7.476	.381%	.506%
2.0	7694.719	22.233	29.709	1.133%	2.010%
3.0	7517.320	36.382	66.091	1.853%	4.472%
4.0	7277.344	49.522	115.614	2.523%	7.822%
5.0	6981.258	61.340	176.954	3.125%	11.973%
6.0	6597.141	71.358	248.312	3.635%	16.801%
7.0	6168.867	79.238	327.55	4.037%	22.162%
8.0	5760.211	85.374	412.924	4.349%	27.938%
9.0	5267.109	89.370	502.295	4.553%	33.985%
10.0	4770.633	90.838	593.133	4.628%	40.131%
11.0	4322.742	90.862	683.994	4.629%	46.279%
12.0	3833.508	89.159	773.154	4.542%	52.311%
13.0	3366.281	85.443	858.597	4.353%	58.092%
14.0	2958.117	80.952	939.549	4.124%	63.569%
15.0	2555.227	75.690	1015.238	3.856%	68.691%
16.0	2184.047	69.444	1084.682	3.538%	73.389%
17.0	1851.961	62.851	1147.533	3.202%	77.642%
18.0	1520.585	55.606	1203.139	2.833%	81.404%
19.0	1253.974	48.272	1251.411	2.459%	84.670%
20.0	1033.692	41.871	1293.282	2.133%	87.503%
21.0	801.148	35.233	1328.514	1.795%	89.887%
22.0	612.049	28.399	1356.913	1.447%	91.808%
23.0	453.094	22.350	1379.263	1.139%	93.320%
24.0	307.090	16.620	1395.883	.847%	94.445%
25.0	194.991	11.416	1407.299	.582%	95.217%
26.0	100.835	6.983	1414.282	.356%	95.690%
27.0	43.573	3.533	1417.815	.180%	95.929%
28.0	23.182	1.690	1419.505	.086%	96.043%
29.0	17.677	1.069	1420.574	.054%	96.115%
30.0	15.546	0.897	1421.471	.046%	96.176%
31.0	14.224	0.828	1422.3	.042%	96.232%
32.0	13.352	0.790	1423.09	.040%	96.286%
33.0	12.713	0.768	1423.858	.039%	96.337%
34.0	12.192	0.754	1424.611	.038%	96.388%
35.0	11.770	0.744	1425.356	.038%	96.439%
36.0	11.475	0.740	1426.096	.038%	96.489%
37.0	11.236	0.741	1426.836	.038%	96.539%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	11.039	0.744	1427.58	.038%	96.589%
39.0	10.877	0.748	1428.328	.038%	96.640%
40.0	10.751	0.754	1429.082	.038%	96.691%
41.0	10.645	0.762	1429.844	.039%	96.743%
42.0	10.568	0.771	1430.615	.039%	96.795%
43.0	10.491	0.780	1431.395	.040%	96.847%
44.0	10.427	0.790	1432.185	.040%	96.901%
45.0	10.399	0.800	1432.985	.041%	96.955%
46.0	10.385	0.813	1433.798	.041%	97.010%
47.0	10.364	0.825	1434.623	.042%	97.066%
48.0	10.371	0.838	1435.461	.043%	97.123%
49.0	10.378	0.852	1436.313	.043%	97.180%
50.0	10.406	0.867	1437.18	.044%	97.239%
51.0	10.470	0.883	1438.063	.045%	97.299%
52.0	10.533	0.901	1438.964	.046%	97.360%
53.0	10.617	0.920	1439.884	.047%	97.422%
54.0	10.709	0.940	1440.824	.048%	97.485%
55.0	10.821	0.961	1441.785	.049%	97.550%
56.0	10.941	0.983	1442.769	.050%	97.617%
57.0	11.109	1.008	1443.777	.051%	97.685%
58.0	11.313	1.037	1444.814	.053%	97.755%
59.0	11.517	1.067	1445.881	.054%	97.828%
60.0	11.742	1.099	1446.98	.056%	97.902%
61.0	12.030	1.134	1448.114	.058%	97.979%
62.0	12.234	1.169	1449.284	.060%	98.058%
63.0	12.389	1.198	1450.481	.061%	98.139%
64.0	12.516	1.222	1451.703	.062%	98.222%
65.0	12.558	1.241	1452.944	.063%	98.305%
66.0	12.600	1.255	1454.199	.064%	98.390%
67.0	12.600	1.267	1455.466	.065%	98.476%
68.0	12.530	1.273	1456.739	.065%	98.562%
69.0	12.417	1.273	1458.012	.065%	98.648%
70.0	12.206	1.265	1459.277	.064%	98.734%
71.0	11.960	1.249	1460.526	.064%	98.818%
72.0	11.616	1.226	1461.752	.062%	98.901%
73.0	11.222	1.194	1462.946	.061%	98.982%
74.0	10.870	1.161	1464.107	.059%	99.061%
75.0	10.280	1.117	1465.225	.057%	99.136%

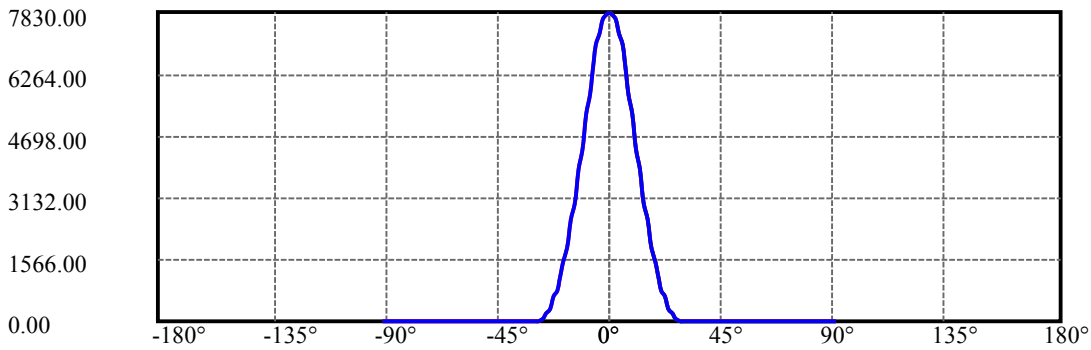
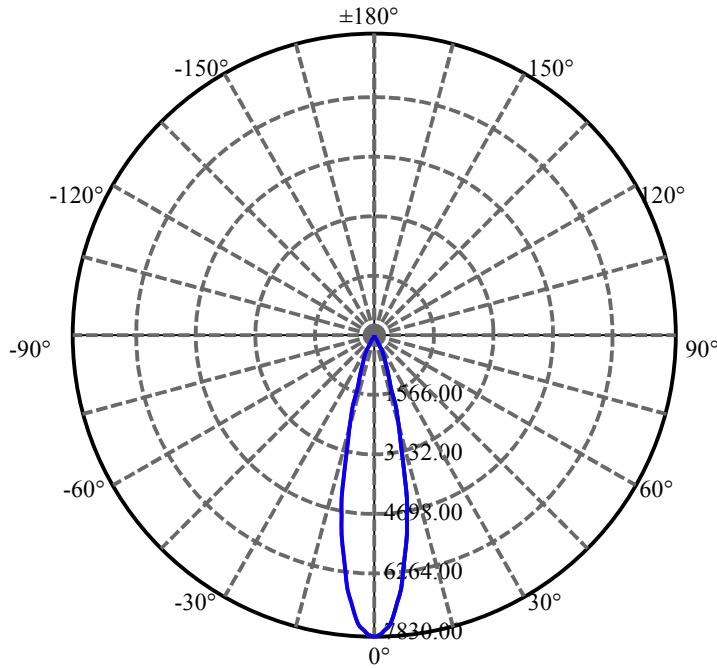
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.724	1.062	1466.287	.054%	99.208%
77.0	9.176	1.008	1467.294	.051%	99.276%
78.0	8.740	0.959	1468.253	.049%	99.341%
79.0	8.353	0.918	1469.172	.047%	99.403%
80.0	8.009	0.882	1470.054	.045%	99.463%
81.0	7.763	0.853	1470.907	.043%	99.521%
82.0	7.608	0.834	1471.74	.042%	99.577%
83.0	7.453	0.819	1472.559	.042%	99.633%
84.0	7.355	0.807	1473.366	.041%	99.687%
85.0	7.263	0.798	1474.164	.041%	99.741%
86.0	7.179	0.789	1474.953	.040%	99.795%
87.0	7.024	0.777	1475.73	.040%	99.847%
88.0	6.919	0.764	1476.494	.039%	99.899%
89.0	6.806	0.752	1477.246	.038%	99.950%
90.0	6.743	0.743	1477.989	.038%	100.000%

## ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1421.47	72.41%	96.18%
0-40	1429.08	72.80%	96.69%
0-60	1446.98	73.71%	97.90%
0-90	1477.25	75.25%	99.95%
0-120	1477.25	75.25%	99.95%
0-180	1477.99	75.29%	100.00%
60-90	31.37	1.60%	2.12%
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%
0-17.63	1182.39	60.23%	80.00%

## ZONAL LUMEN SUMMARY

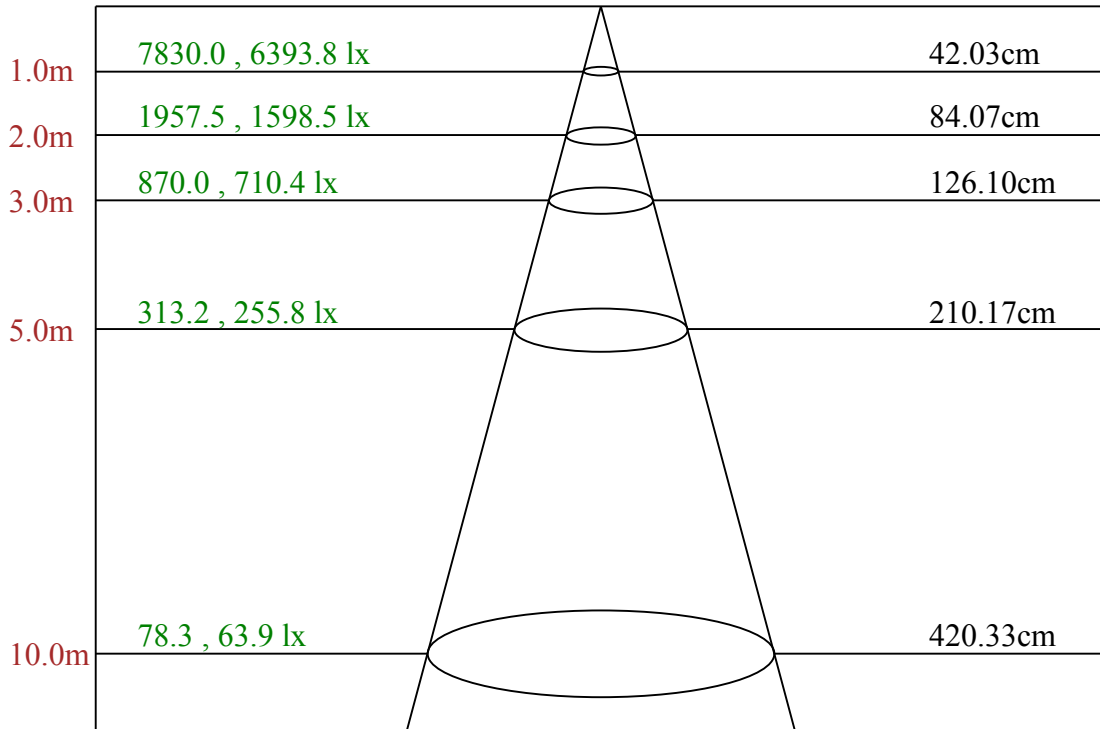
0-10	593.13
10-20	700.15
20-30	128.19
30-40	7.61
40-50	8.10
50-60	9.80
60-70	12.30
70-80	10.78
80-90	7.19
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00



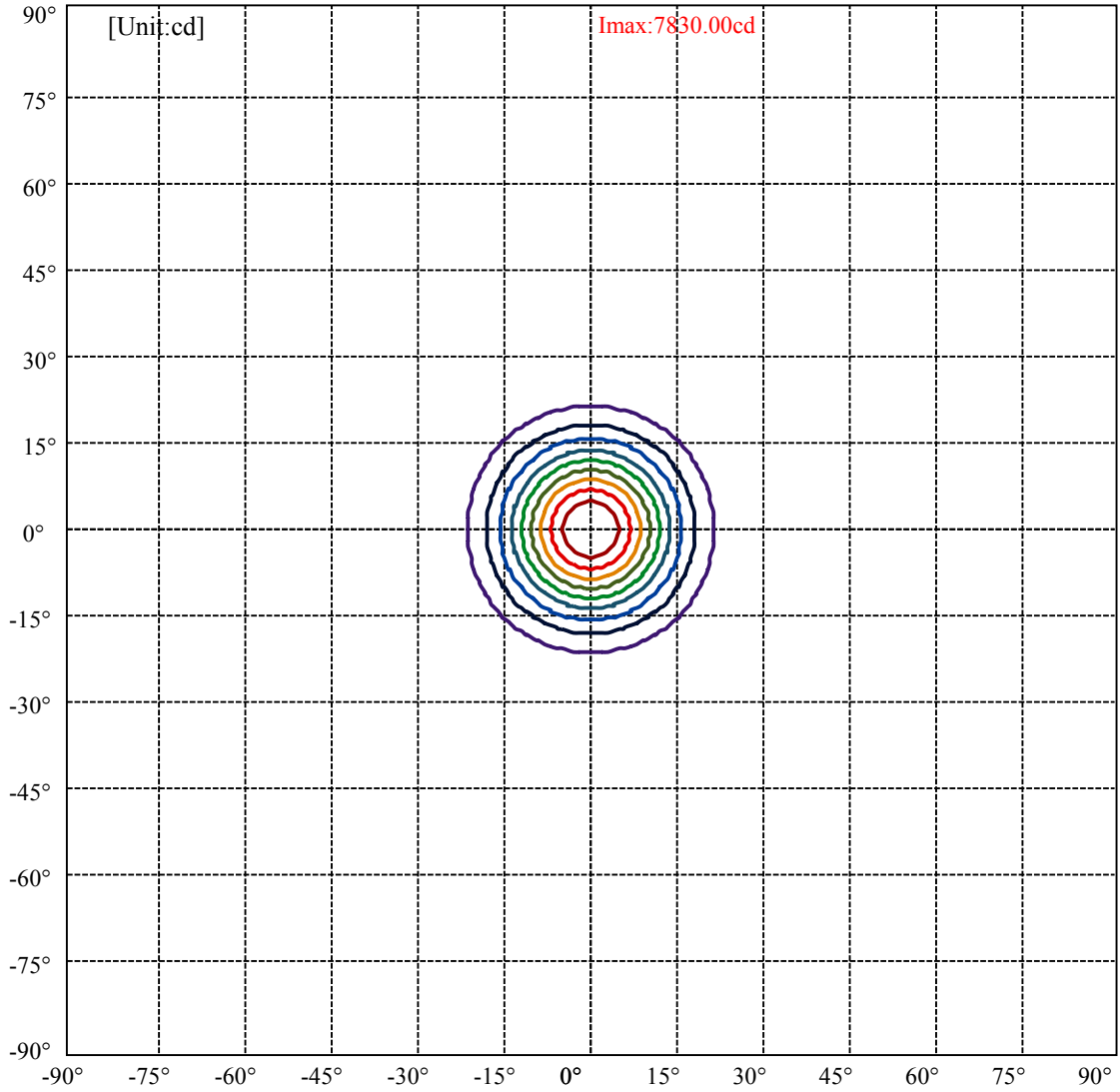
C0(Max): ———  
C0/C180: ———  
C90/C270: ———

Field angle(10%Imax):C0/180Left:21.1 Right:21.1  
:C90/270Left:21.1 Right:21.1

Beam Angle(50%Imax):C0/180Left:11.8 Right:11.8  
:C90/270Left:11.8 Right:11.8

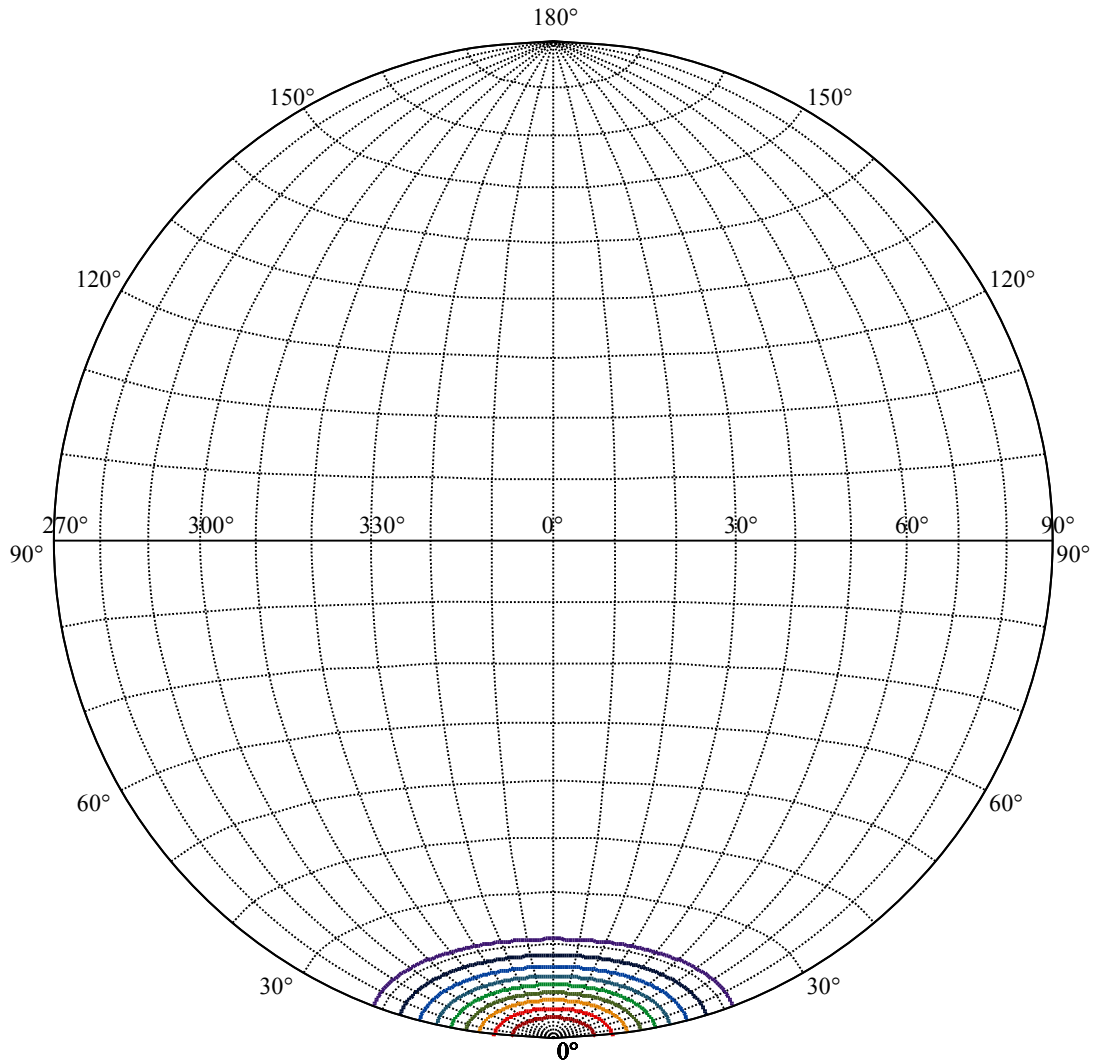


Max , Ave      Beam angle of C0 plane 23.74



(10%I <sub>max</sub> ) 783	—
(20%I <sub>max</sub> ) 1566	—
(30%I <sub>max</sub> ) 2349	—
(40%I <sub>max</sub> ) 3132	—
(50%I <sub>max</sub> ) 3915	—
(60%I <sub>max</sub> ) 4698	—
(70%I <sub>max</sub> ) 5481	—
(80%I <sub>max</sub> ) 6264	—
(90%I <sub>max</sub> ) 7047	—





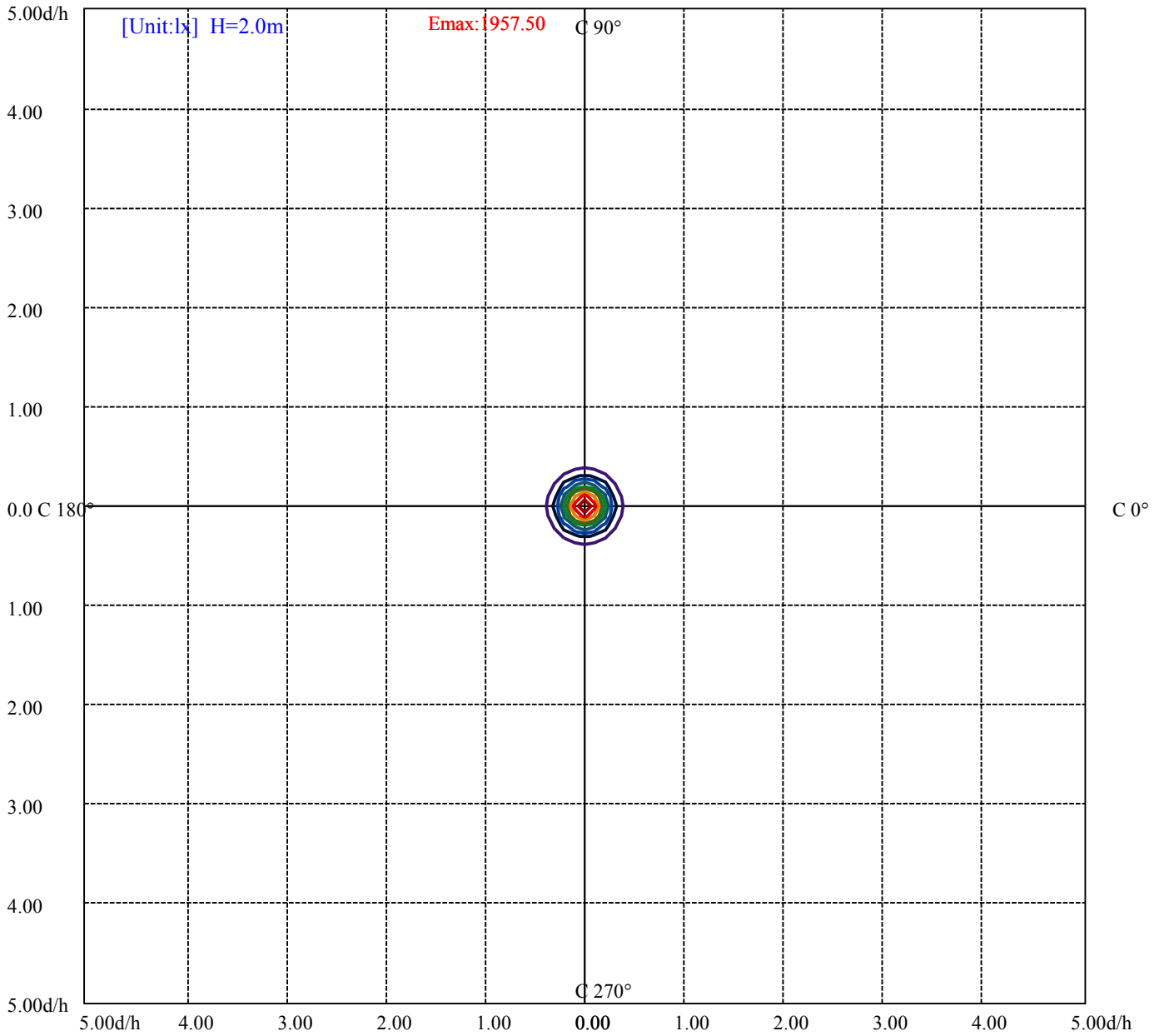
House

[Unit:cd]

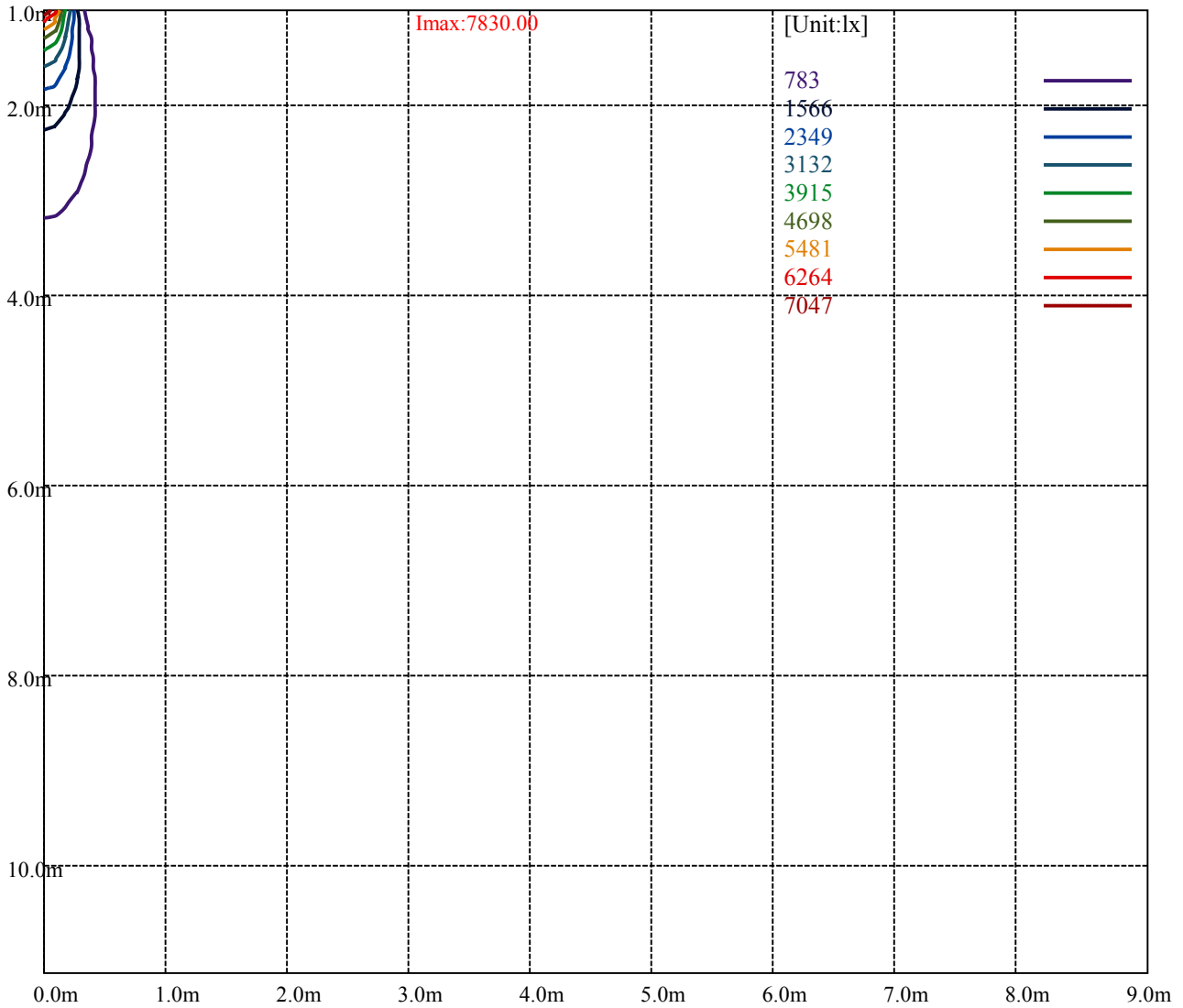
Road

I<sub>max</sub>:7830.00

(10%I <sub>max</sub> ) 783	—
(20%I <sub>max</sub> ) 1566	—
(30%I <sub>max</sub> ) 2349	—
(40%I <sub>max</sub> ) 3132	—
(50%I <sub>max</sub> ) 3915	—
(60%I <sub>max</sub> ) 4698	—
(70%I <sub>max</sub> ) 5481	—
(80%I <sub>max</sub> ) 6264	—
(90%I <sub>max</sub> ) 7047	—



(10%Emax) 195.7498	—
(20%Emax) 391.5	—
(30%Emax) 587.25	—
(40%Emax) 783	—
(50%Emax) 978.75	—
(60%Emax) 1174.5	—
(70%Emax) 1370.25	—
(80%Emax) 1566	—
(90%Emax) 1761.75	—



Luminance Table

$\gamma$	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

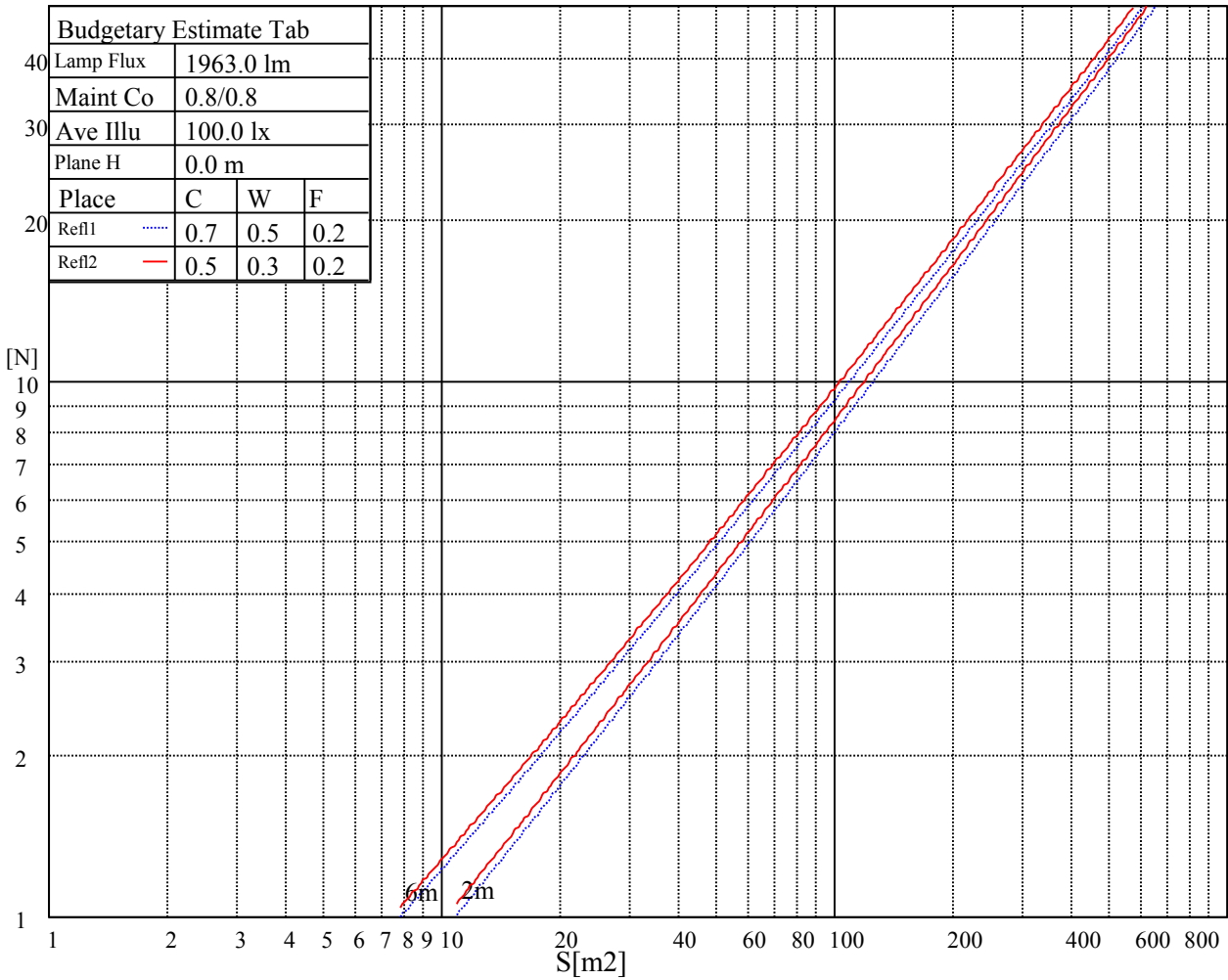
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

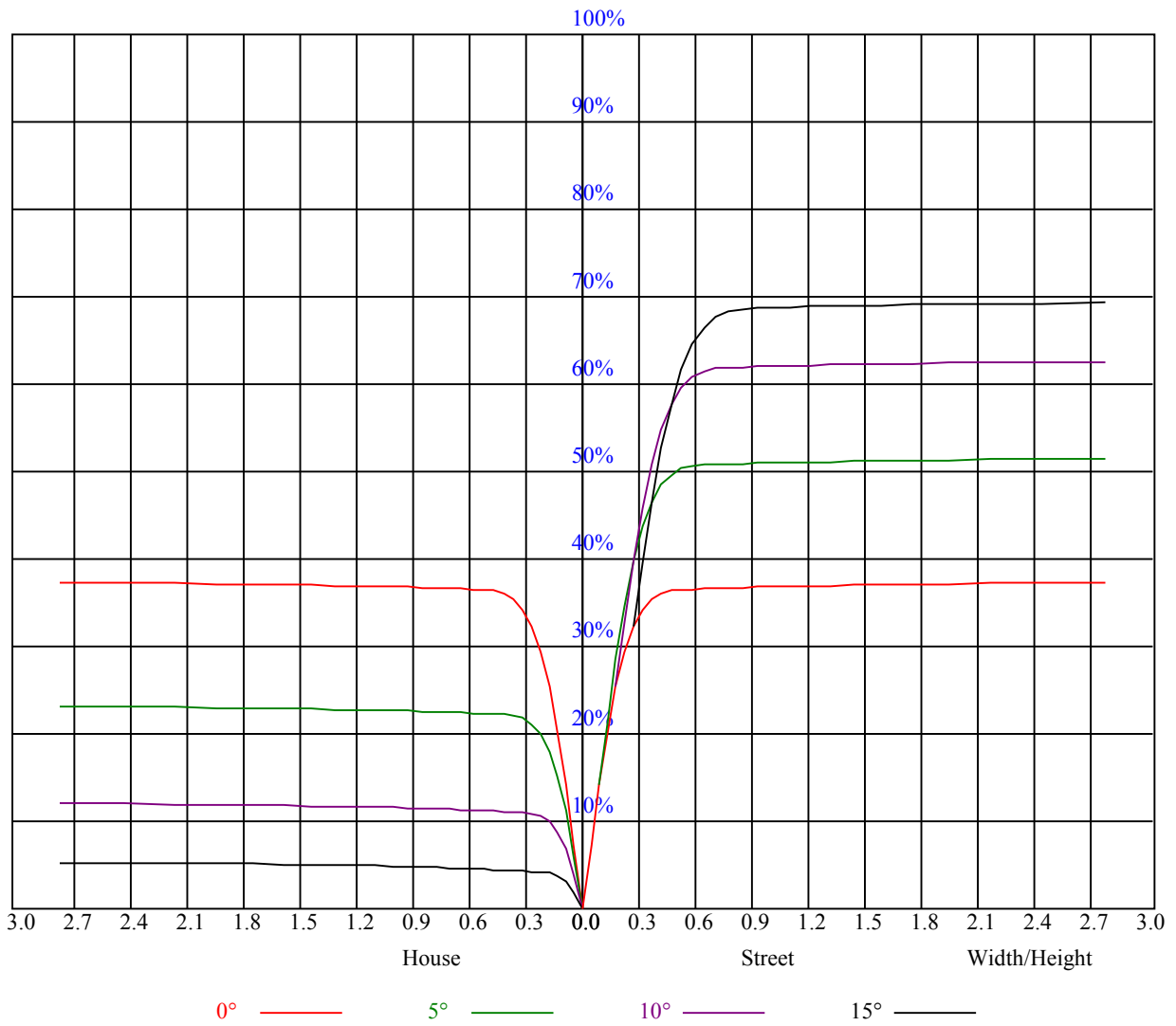
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.90	0.90	0.90	0.88	0.88	0.88	0.84	0.84	0.84	0.80	0.80	0.80	0.77	0.77	0.77	0.75
1	0.85	0.83	0.82	0.83	0.82	0.81	0.80	0.79	0.78	0.77	0.77	0.76	0.75	0.74	0.74	0.72
2	0.81	0.79	0.77	0.80	0.78	0.76	0.77	0.76	0.74	0.75	0.74	0.73	0.73	0.72	0.71	0.70
3	0.78	0.75	0.73	0.77	0.74	0.72	0.75	0.73	0.71	0.73	0.71	0.70	0.72	0.70	0.69	0.68
4	0.75	0.72	0.70	0.74	0.71	0.69	0.73	0.70	0.69	0.71	0.69	0.68	0.70	0.68	0.67	0.66
5	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.69	0.67	0.66	0.68	0.67	0.65	0.64
6	0.70	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.68	0.66	0.64	0.67	0.65	0.64	0.63
7	0.68	0.65	0.63	0.68	0.65	0.63	0.67	0.65	0.63	0.66	0.64	0.62	0.66	0.64	0.62	0.61
8	0.66	0.64	0.62	0.66	0.63	0.61	0.65	0.63	0.61	0.65	0.63	0.61	0.64	0.62	0.61	0.60
9	0.65	0.62	0.60	0.65	0.62	0.60	0.64	0.61	0.60	0.63	0.61	0.60	0.63	0.61	0.59	0.59
10	0.63	0.60	0.59	0.63	0.60	0.59	0.63	0.60	0.58	0.62	0.60	0.58	0.62	0.60	0.58	0.57



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	7820.44	7856.44	7817.63	7705.13	7544.81	7282.69	6951.94	6607.13	6284.81
45.0	7823.25	7819.88	7738.88	7594.88	7408.69	7160.63	6777.00	6404.63	6002.44
90.0	7826.63	7749.00	7620.19	7412.06	7128.00	6815.25	6402.38	5944.50	5513.63
135.0	7849.69	7790.06	7659.56	7452.56	7203.38	6858.00	6437.81	6027.75	5601.94
180.0	7820.44	7721.44	7568.44	7320.94	6993.56	6640.88	6253.88	5720.06	5265.00
225.0	7823.25	7755.19	7637.06	7428.38	7138.13	6814.13	6393.38	5929.88	5500.69
270.0	7826.63	7830.00	7756.31	7610.06	7414.88	7158.38	6754.50	6383.81	5990.63
315.0	7849.69	7840.69	7759.69	7614.56	7387.31	7120.13	6806.25	6333.19	5922.56
360.0	7820.44	7856.44	7817.63	7705.13	7544.81	7282.69	6951.94	6607.13	6284.81

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5721.19	5288.63	4895.44	4271.63	3834.00	3458.81	2950.88	2520.56	2215.69
45.0	5474.25	5029.31	4577.06	4068.56	3575.25	3160.69	2722.50	2366.44	2002.50
90.0	5065.88	4497.75	4049.44	3619.69	3105.00	2720.81	2367.56	2002.50	1667.25
135.0	5046.19	4595.63	4146.75	3593.25	3171.94	2783.25	2378.25	2014.31	1715.63
180.0	4806.00	4287.38	3792.38	3373.31	2972.25	2511.56	2176.31	1863.56	1542.38
225.0	5067.00	4506.75	4056.75	3624.75	3164.63	2737.13	2378.81	2009.25	1674.00
270.0	5457.94	5014.69	4573.13	4071.94	3597.19	3184.88	2746.13	2381.63	2009.81
315.0	5498.44	4944.94	4491.00	4044.94	3510.00	3107.81	2721.38	2314.13	1988.44
360.0	5721.19	5288.63	4895.44	4271.63	3834.00	3458.81	2950.88	2520.56	2215.69

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1821.38	1549.13	1308.94	1022.06	813.94	629.44	433.69	299.81	222.36
45.0	1663.88	1404.56	1144.69	896.06	689.63	532.13	351.00	288.00	128.36
90.0	1406.81	1078.43	914.68	697.61	512.33	371.59	235.01	123.02	54.68
135.0	1412.44	1174.50	924.75	700.31	513.56	375.19	295.88	124.99	55.35
180.0	1111.56	1031.29	795.32	592.26	440.72	294.13	182.08	87.47	35.66
225.0	1413.00	1115.27	926.04	707.85	519.81	375.24	236.87	126.68	59.57
270.0	1677.38	1420.31	1148.63	904.50	712.69	543.38	363.38	285.19	132.98
315.0	1658.25	1258.31	1106.49	888.53	693.73	503.66	358.82	224.78	117.73
360.0	1821.38	1549.13	1308.94	1022.06	813.94	629.44	433.69	299.81	222.36

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	76.28	35.49	21.83	18.17	16.20	15.13	14.18	13.50	12.99
45.0	58.73	24.41	18.84	16.54	15.13	14.40	13.84	13.33	12.88
90.0	24.41	16.31	14.34	13.28	12.54	12.04	11.64	11.31	11.03
135.0	21.83	15.98	13.56	12.15	11.36	10.80	10.24	9.84	9.51
180.0	21.60	17.27	14.91	14.06	13.44	12.77	12.38	12.09	11.76
225.0	31.56	21.83	18.45	16.88	15.47	14.68	14.01	13.39	13.05
270.0	61.03	27.28	20.87	17.55	15.58	14.40	13.67	12.99	12.49
315.0	53.16	26.89	18.62	15.75	14.06	12.60	11.76	11.08	10.46
360.0	76.28	35.49	21.83	18.17	16.20	15.13	14.18	13.50	12.99

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	12.54	12.26	11.98	11.76	11.59	11.53	11.36	11.31	11.19
45.0	12.60	12.38	12.21	12.04	11.93	11.81	11.76	11.70	11.59
90.0	10.86	10.69	10.52	10.41	10.29	10.18	10.13	10.01	9.96
135.0	9.28	9.11	8.94	8.83	8.72	8.66	8.61	8.55	8.49
180.0	11.59	11.48	11.36	11.25	11.19	11.14	11.08	11.03	10.97
225.0	12.77	12.43	12.32	12.15	12.04	11.87	11.87	11.81	11.81
270.0	12.09	11.76	11.48	11.25	11.08	10.91	10.80	10.63	10.58
315.0	10.07	9.79	9.51	9.34	9.17	9.06	8.94	8.89	8.83
360.0	12.54	12.26	11.98	11.76	11.59	11.53	11.36	11.31	11.19



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	11.14	11.08	11.03	10.97	10.86	10.80	10.74	10.69	10.58
45.0	11.53	11.53	11.48	11.48	11.48	11.53	11.70	11.98	12.38
90.0	9.90	9.84	9.79	9.73	9.68	9.62	9.62	9.56	9.51
135.0	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49	8.49
180.0	10.97	10.91	10.91	10.86	10.86	10.86	10.91	10.97	11.08
225.0	11.93	12.04	12.21	12.49	12.83	13.16	13.44	13.84	14.23
270.0	10.46	10.41	10.35	10.29	10.18	10.13	10.13	10.07	10.01
315.0	8.78	8.78	8.66	8.66	8.66	8.66	8.72	8.66	8.66
360.0	11.14	11.08	11.03	10.97	10.86	10.80	10.74	10.69	10.58
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	10.52	10.46	10.41	10.35	10.41	10.46	10.58	10.69	10.80
45.0	12.66	13.11	13.50	14.18	14.91	15.81	16.76	18.11	19.18
90.0	9.45	9.39	9.39	9.34	9.34	9.28	9.23	9.23	9.23
135.0	8.49	8.49	8.49	8.49	8.49	8.44	8.44	8.44	8.44
180.0	11.25	11.36	11.48	11.64	11.81	11.98	12.09	12.26	12.32
225.0	14.63	15.13	15.64	16.31	17.04	17.66	18.34	19.13	19.52
270.0	10.01	9.96	9.96	9.90	9.84	9.84	9.84	9.79	9.79
315.0	8.66	8.66	8.66	8.66	8.66	8.66	8.66	8.61	8.61
360.0	10.52	10.46	10.41	10.35	10.41	10.46	10.58	10.69	10.80
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.91	11.08	11.19	11.31	11.48	11.53	11.64	11.59	11.48
45.0	20.19	21.09	21.49	21.60	21.60	21.32	20.76	19.58	18.23
90.0	9.23	9.17	9.17	9.23	9.34	9.51	9.68	9.96	10.18
135.0	8.38	8.38	8.33	8.33	8.27	8.27	8.27	8.27	8.27
180.0	12.32	12.26	12.26	12.26	12.26	12.09	11.81	11.48	11.19
225.0	19.69	19.69	19.58	19.46	19.13	18.51	17.61	16.54	15.47
270.0	9.79	9.84	9.90	10.07	10.18	10.46	10.97	11.59	12.09
315.0	8.61	8.61	8.55	8.55	8.55	8.55	8.61	8.66	8.78
360.0	10.91	11.08	11.19	11.31	11.48	11.53	11.64	11.59	11.48
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	11.42	11.36	11.14	10.80	10.52	10.18	9.68	9.34	9.00
45.0	17.16	15.92	14.57	13.05	10.91	9.17	8.33	8.10	7.88
90.0	10.07	9.96	10.07	9.73	9.34	8.72	8.44	7.82	7.59
135.0	8.27	8.27	8.33	8.21	8.21	8.16	7.99	7.65	7.43
180.0	10.74	10.29	9.79	9.28	8.78	8.38	8.16	7.88	7.65
225.0	14.23	12.71	11.36	9.56	8.72	8.44	8.21	7.99	7.76
270.0	12.09	12.15	12.49	12.26	11.81	11.03	9.90	9.23	8.55
315.0	8.94	9.11	9.23	9.34	9.51	9.34	9.23	8.83	8.21
360.0	11.42	11.36	11.14	10.80	10.52	10.18	9.68	9.34	9.00
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.61	8.33	7.99	7.71	7.54	7.48	7.37	7.26	7.14
45.0	7.71	7.59	7.48	7.43	7.37	7.31	7.26	7.20	6.75
90.0	7.43	7.31	7.20	7.14	7.09	7.09	6.92	6.69	6.64
135.0	7.26	7.20	7.14	7.09	6.98	6.92	6.86	6.81	6.81
180.0	7.54	7.48	7.37	7.31	7.26	6.98	6.86	6.86	6.81
225.0	7.59	7.48	7.37	7.31	7.31	7.14	6.75	6.69	6.69
270.0	8.33	8.04	7.76	7.59	7.37	7.37	7.09	6.86	6.69
315.0	7.65	7.43	7.31	7.26	7.20	7.14	7.09	6.98	6.92
360.0	8.61	8.33	7.99	7.71	7.54	7.48	7.37	7.26	7.14

Intensity data(cd)

C/ $\gamma$ (°)	90.0
0.0	6.86
45.0	6.69
90.0	6.64
135.0	6.75
180.0	6.86
225.0	6.69
270.0	6.64
315.0	6.81
360.0	6.86