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## NATA

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LumCAT: 2-1258-N  
Luminaire: 92.70.065.00+92.70.059.00  
Report No: NATA0100  
Test No: GC2018111313  
LampCAT: OSRAM S15  
Lamp flux(lm): 2619.0  
Number of Lamps: 1  
Length(mm): 70  
Phm Type: C

Voltage(V): 36.2000  
Current(A): 0.5500  
Power (W): 19.9100  
PF: 0.0000  
Ballast type: DC  
Width(mm): 70  
Height(mm): 0

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## Photometric Results

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Lumens(lm): 2011.11  
Efficiency(%): 76.79%  
Lumens(lm)/Power(W): 101.14  
Central intensity(cd): 11169.990  
Maximum intensity(cd): 11169.990  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=18.9  
                                  [C90/270]Total=18.9  
Field angle(10%Imax): [C0/180]Total=37.4  
                                  [C90/270]Total=37.4  
Maximum s/h(1/2): C0\_180=0.33 C90\_270=0.33  
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(%): 76.89%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 97.581%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	11169.984	2.672	2.672	.102%	.133%
1.0	11141.297	21.323	23.995	.814%	1.193%
2.0	11023.945	42.190	66.185	1.611%	3.291%
3.0	10814.977	62.069	128.254	2.370%	6.377%
4.0	10480.148	80.168	208.423	3.061%	10.364%
5.0	9892.547	94.549	302.972	3.610%	15.065%
6.0	9169.102	105.103	408.074	4.013%	20.291%
7.0	8252.086	110.283	518.357	4.211%	25.775%
8.0	7167.164	109.384	627.742	4.177%	31.214%
9.0	6065.859	104.058	731.8	3.973%	36.388%
10.0	4966.945	94.583	826.382	3.611%	41.091%
11.0	4041.703	84.570	910.952	3.229%	45.296%
12.0	3282.820	74.848	985.8	2.858%	49.018%
13.0	2675.039	65.989	1051.788	2.520%	52.299%
14.0	2172.023	57.622	1109.411	2.200%	55.164%
15.0	1843.313	52.317	1161.728	1.998%	57.766%
16.0	1584.914	47.907	1209.635	1.829%	60.148%
17.0	1357.552	43.525	1253.16	1.662%	62.312%
18.0	1202.477	40.748	1293.909	1.556%	64.338%
19.0	1083.319	38.677	1332.586	1.477%	66.261%
20.0	979.488	36.737	1369.323	1.403%	68.088%
21.0	888.342	34.911	1404.233	1.333%	69.824%
22.0	818.515	33.624	1437.858	1.284%	71.496%
23.0	751.184	32.187	1470.044	1.229%	73.096%
24.0	693.000	30.910	1500.954	1.180%	74.633%
25.0	641.236	29.718	1530.672	1.135%	76.111%
26.0	592.488	28.482	1559.154	1.088%	77.527%
27.0	546.616	27.213	1586.368	1.039%	78.880%
28.0	504.773	25.987	1612.355	.992%	80.173%
29.0	462.101	24.567	1636.922	.938%	81.394%
30.0	425.081	23.307	1660.23	.890%	82.553%
31.0	391.282	22.099	1682.329	.844%	83.652%
32.0	355.957	20.685	1703.014	.790%	84.680%
33.0	327.277	19.547	1722.561	.746%	85.652%
34.0	302.280	18.536	1741.097	.708%	86.574%
35.0	275.970	17.358	1758.456	.663%	87.437%
36.0	254.820	16.425	1774.88	.627%	88.254%
37.0	235.596	15.548	1790.429	.594%	89.027%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	217.751	14.701	1805.13	.561%	89.758%
39.0	200.813	13.858	1818.988	.529%	90.447%
40.0	186.237	13.128	1832.116	.501%	91.100%
41.0	171.893	12.367	1844.483	.472%	91.715%
42.0	156.832	11.508	1855.991	.439%	92.287%
43.0	143.726	10.749	1866.74	.410%	92.822%
44.0	132.328	10.080	1876.82	.385%	93.323%
45.0	120.607	9.352	1886.172	.357%	93.788%
46.0	110.503	8.717	1894.889	.333%	94.221%
47.0	100.245	8.040	1902.929	.307%	94.621%
48.0	91.266	7.438	1910.366	.284%	94.991%
49.0	82.955	6.866	1917.232	.262%	95.332%
50.0	74.827	6.286	1923.518	.240%	95.645%
51.0	68.091	5.803	1929.32	.222%	95.933%
52.0	62.388	5.391	1934.712	.206%	96.201%
53.0	56.784	4.973	1939.685	.190%	96.449%
54.0	51.321	4.553	1944.238	.174%	96.675%
55.0	46.955	4.218	1948.456	.161%	96.885%
56.0	42.623	3.875	1952.331	.148%	97.077%
57.0	38.566	3.547	1955.878	.135%	97.254%
58.0	35.220	3.275	1959.153	.125%	97.417%
59.0	32.266	3.033	1962.186	.116%	97.567%
60.0	29.461	2.798	1964.984	.107%	97.707%
61.0	27.042	2.594	1967.578	.099%	97.836%
62.0	24.905	2.411	1969.989	.092%	97.955%
63.0	23.013	2.249	1972.238	.086%	98.067%
64.0	21.642	2.133	1974.371	.081%	98.173%
65.0	20.482	2.036	1976.406	.078%	98.275%
66.0	19.638	1.967	1978.374	.075%	98.372%
67.0	18.942	1.912	1980.286	.073%	98.467%
68.0	18.288	1.859	1982.145	.071%	98.560%
69.0	17.663	1.808	1983.953	.069%	98.650%
70.0	17.128	1.765	1985.718	.067%	98.738%
71.0	16.608	1.722	1987.44	.066%	98.823%
72.0	16.073	1.676	1989.117	.064%	98.907%
73.0	15.645	1.641	1990.757	.063%	98.988%
74.0	15.195	1.602	1992.359	.061%	99.068%
75.0	14.738	1.561	1993.92	.060%	99.145%

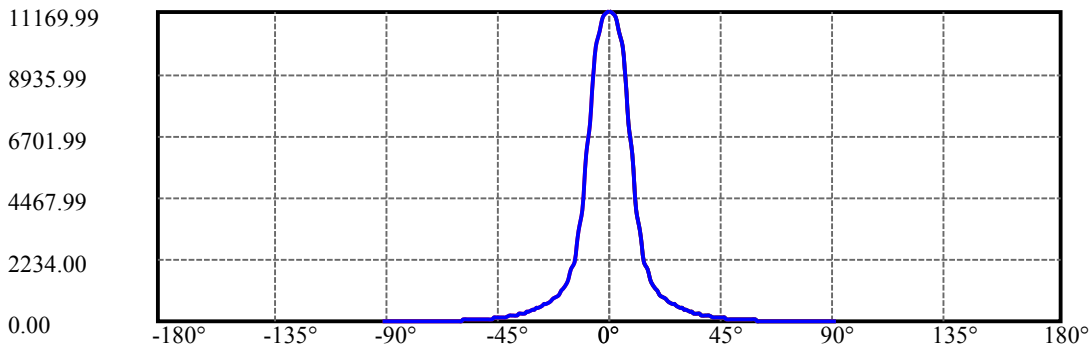
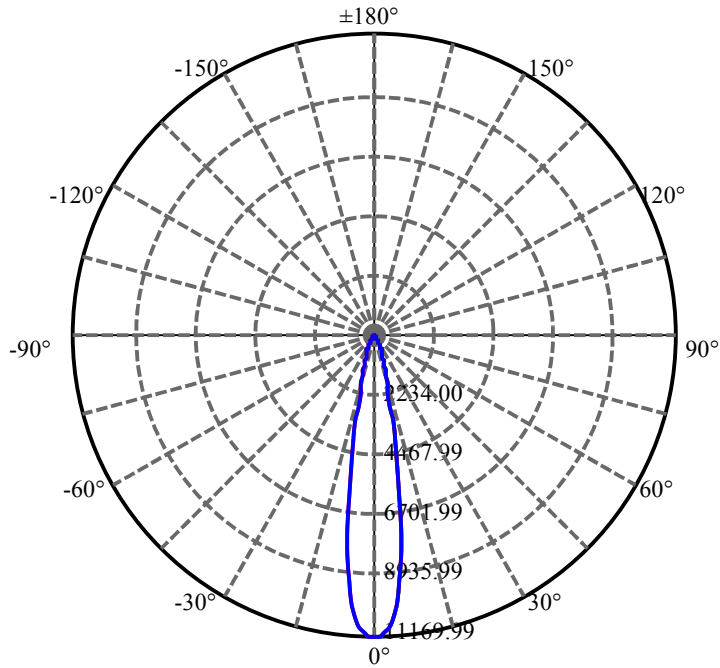
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	14.295	1.521	1995.441	.058%	99.221%
77.0	13.859	1.481	1996.922	.057%	99.295%
78.0	13.366	1.434	1998.356	.055%	99.366%
79.0	12.874	1.386	1999.742	.053%	99.435%
80.0	12.340	1.333	2001.074	.051%	99.501%
81.0	11.805	1.279	2002.353	.049%	99.565%
82.0	11.271	1.224	2003.577	.047%	99.626%
83.0	10.702	1.165	2004.742	.044%	99.684%
84.0	10.174	1.110	2005.851	.042%	99.739%
85.0	9.675	1.057	2006.908	.040%	99.791%
86.0	9.141	1.000	2007.908	.038%	99.841%
87.0	8.719	0.955	2008.863	.036%	99.888%
88.0	8.339	0.914	2009.777	.035%	99.934%
89.0	8.121	0.890	2010.667	.034%	99.978%
90.0	8.016	0.440	2011.107	.017%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1660.23	63.39%	82.55%
0-40	1832.12	69.95%	91.10%
0-60	1964.98	75.03%	97.71%
0-90	2010.67	76.77%	99.98%
0-120	2010.67	76.77%	99.98%
0-180	2011.11	76.79%	100.00%
60-90	48.48	1.85%	2.41%
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%
0-27.87	1608.89	61.43%	80.00%

ZONAL LUMEN SUMMARY

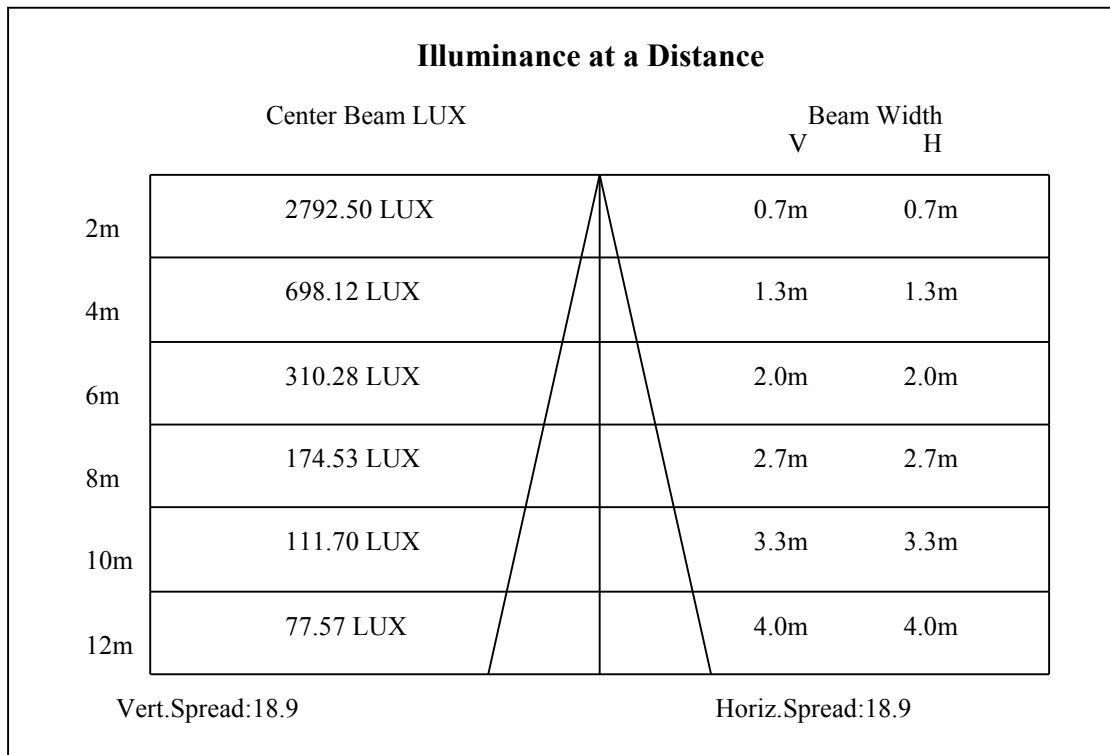
0-10	826.38
10-20	542.94
20-30	290.91
30-40	171.89
40-50	91.40
50-60	41.47
60-70	20.73
70-80	15.36
80-90	9.59
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

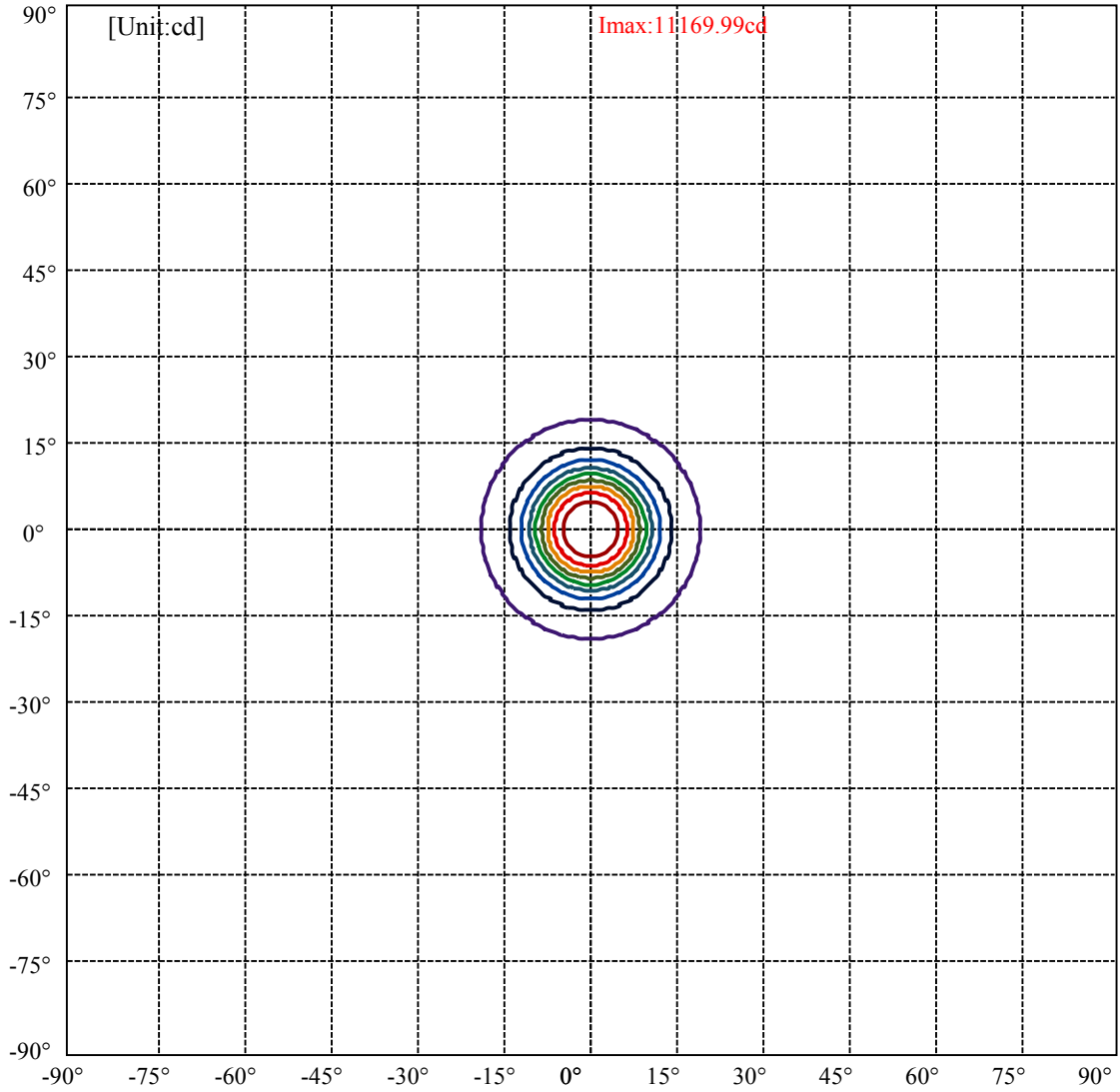


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:18.7 Right:18.7  
:C90/270Left:18.7 Right:18.7

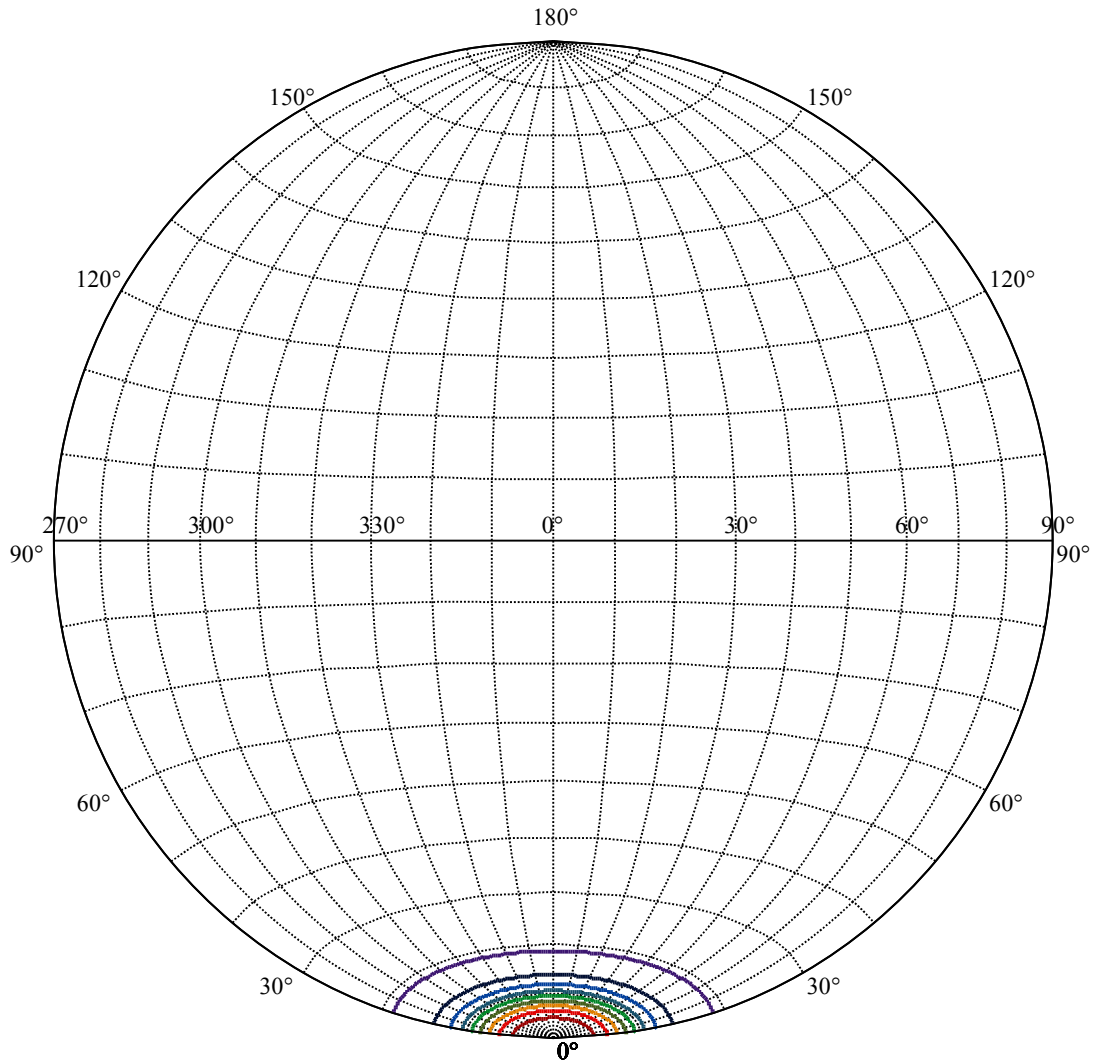
Beam Angle(50%Imax):C0/180Left:9.4 Right:9.4  
:C90/270Left:9.4 Right:9.4





(10%I <sub>max</sub> ) 1117	—
(20%I <sub>max</sub> ) 2234	—
(30%I <sub>max</sub> ) 3351	—
(40%I <sub>max</sub> ) 4467.99	—
(50%I <sub>max</sub> ) 5584.99	—
(60%I <sub>max</sub> ) 6701.99	—
(70%I <sub>max</sub> ) 7818.99	—
(80%I <sub>max</sub> ) 8935.99	—
(90%I <sub>max</sub> ) 10053	—





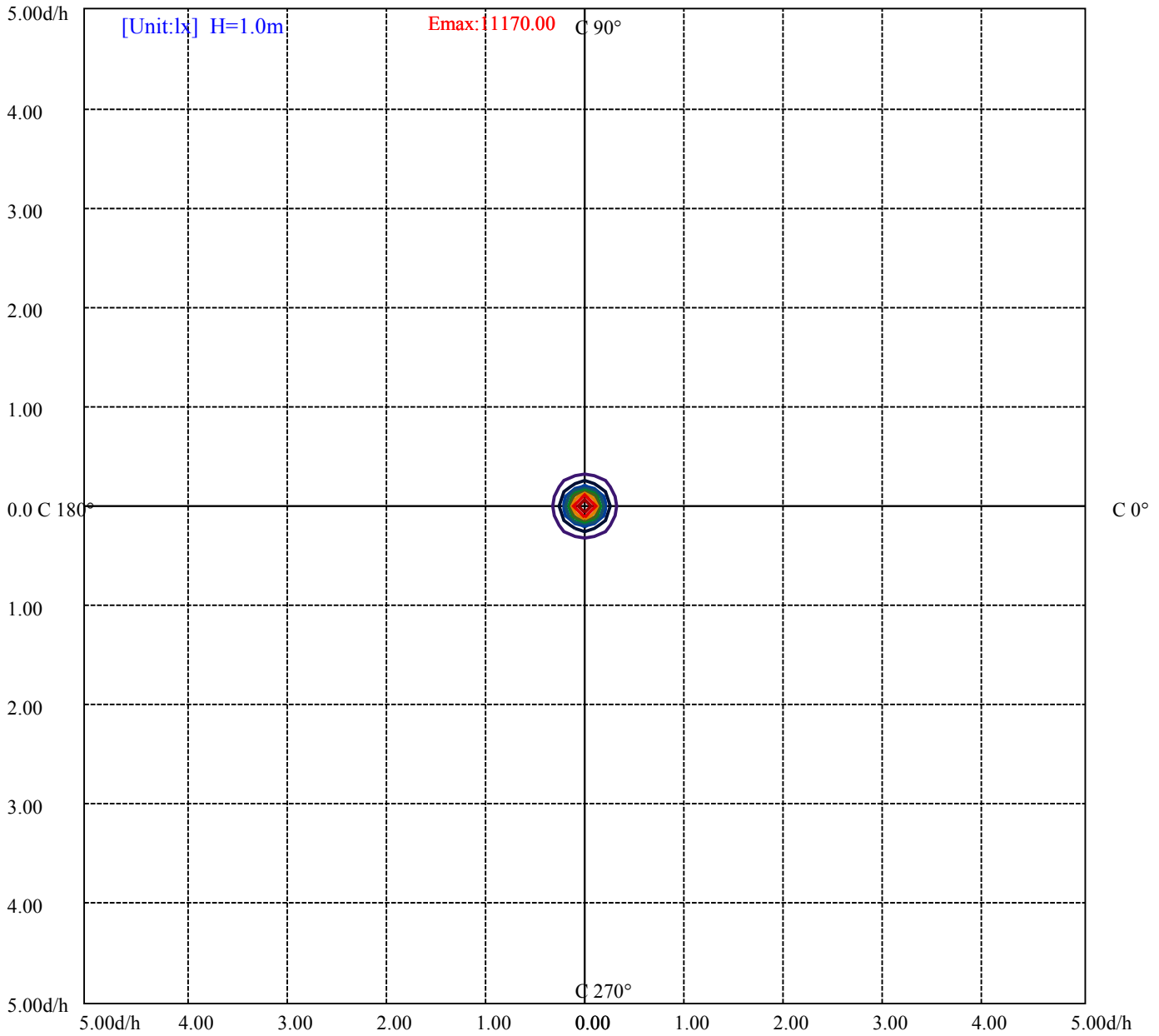
House

[Unit:cd]

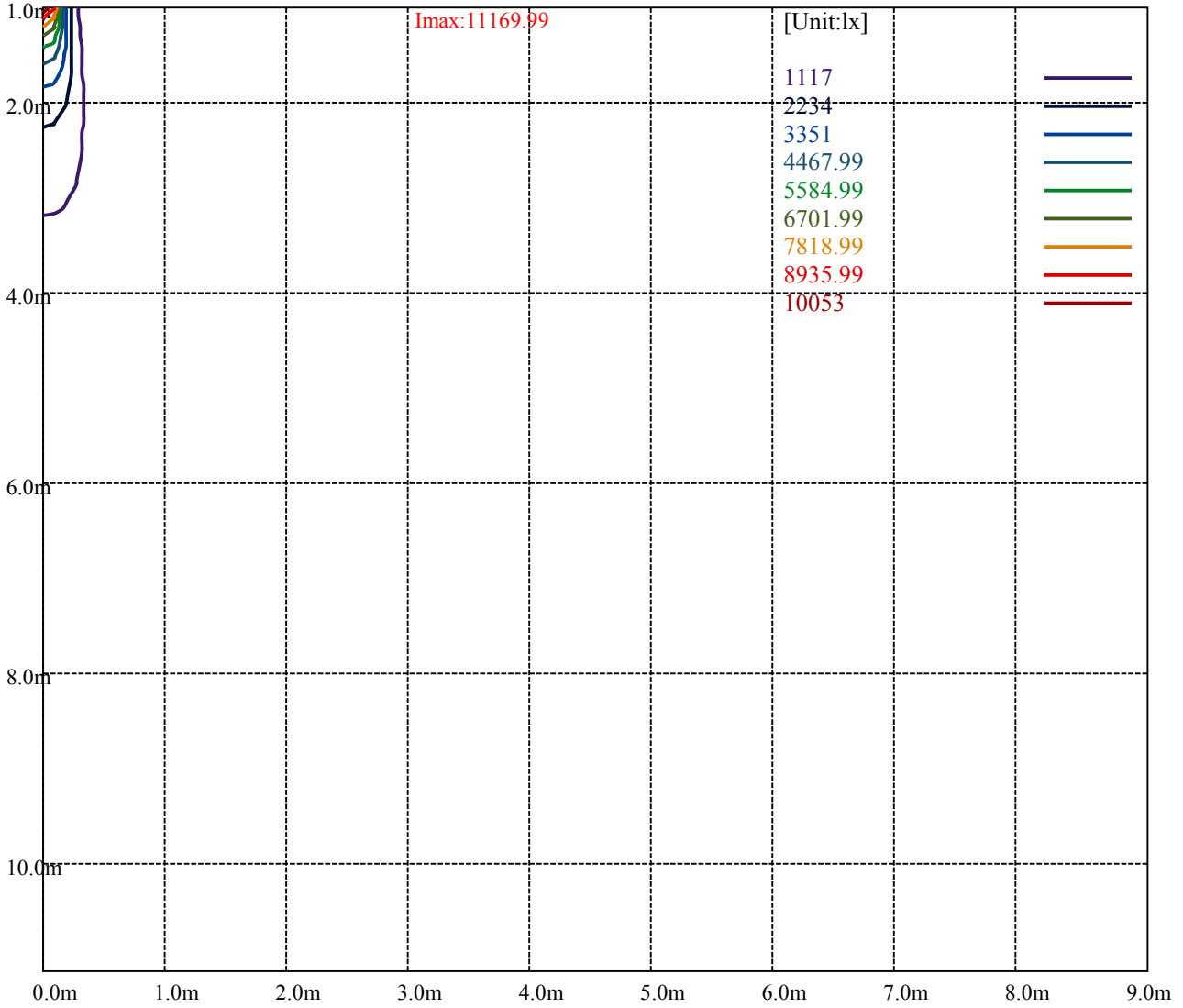
Road

**Imax:11169.99**

(10%Imax) 1117	—
(20%Imax) 2234	—
(30%Imax) 3351	—
(40%Imax) 4467.99	—
(50%Imax) 5584.99	—
(60%Imax) 6701.99	—
(70%Imax) 7818.99	—
(80%Imax) 8935.99	—
(90%Imax) 10053	—



- (10%Emax) 1117
- (20%Emax) 2234
- (30%Emax) 3350.99
- (40%Emax) 4467.99
- (50%Emax) 5584.99
- (60%Emax) 6701.99
- (70%Emax) 7818.99
- (80%Emax) 8935.99
- (90%Emax) 10053



Luminance Table

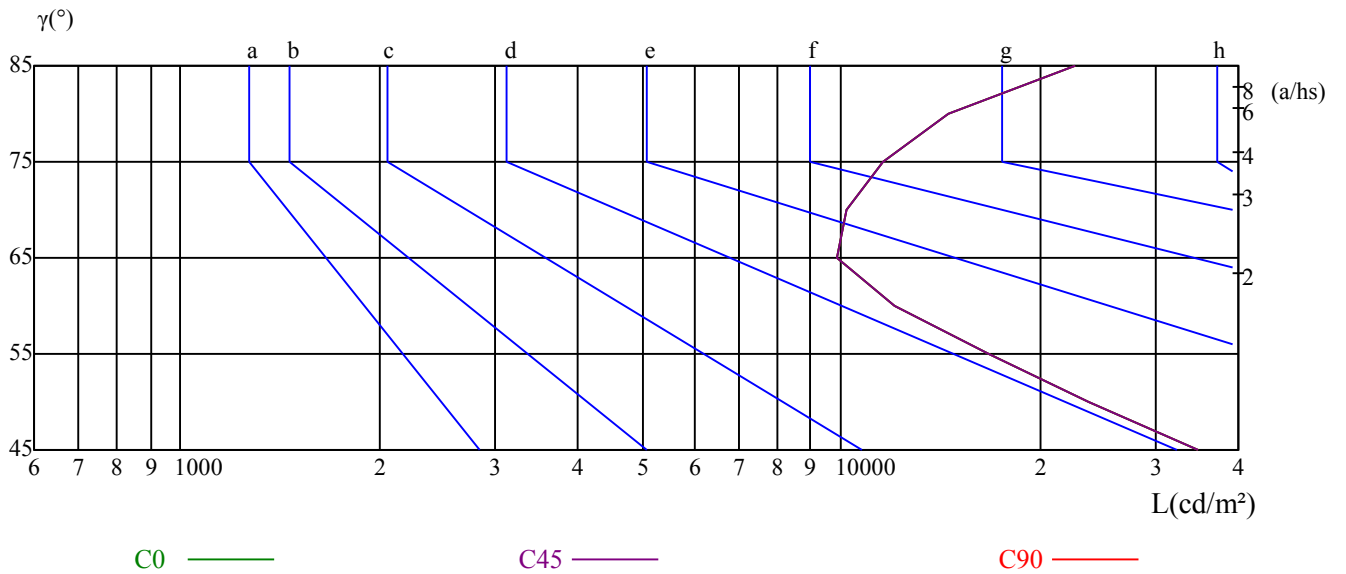
$\gamma$	45	50	55	60	65	70	75	80	85
C0	34809	23757	16707	12025	9891	10220	11621	14503	22655
C45	34809	23757	16707	12025	9891	10220	11621	14503	22655
C90	34809	23757	16707	12025	9891	10220	11621	14503	22655

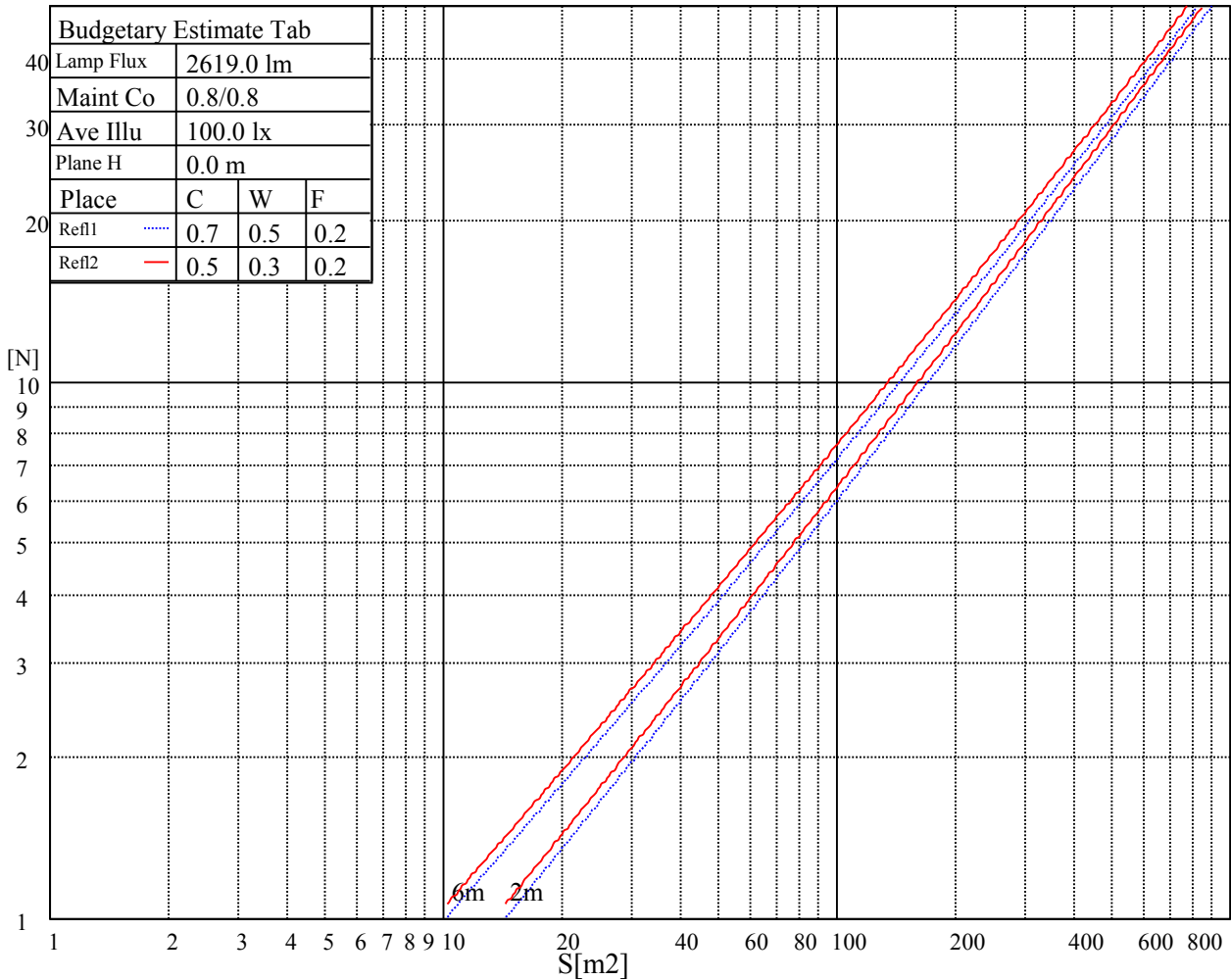
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
9891	9891	9891	11621	11621	11621	22655	22655	22655

Glare Table

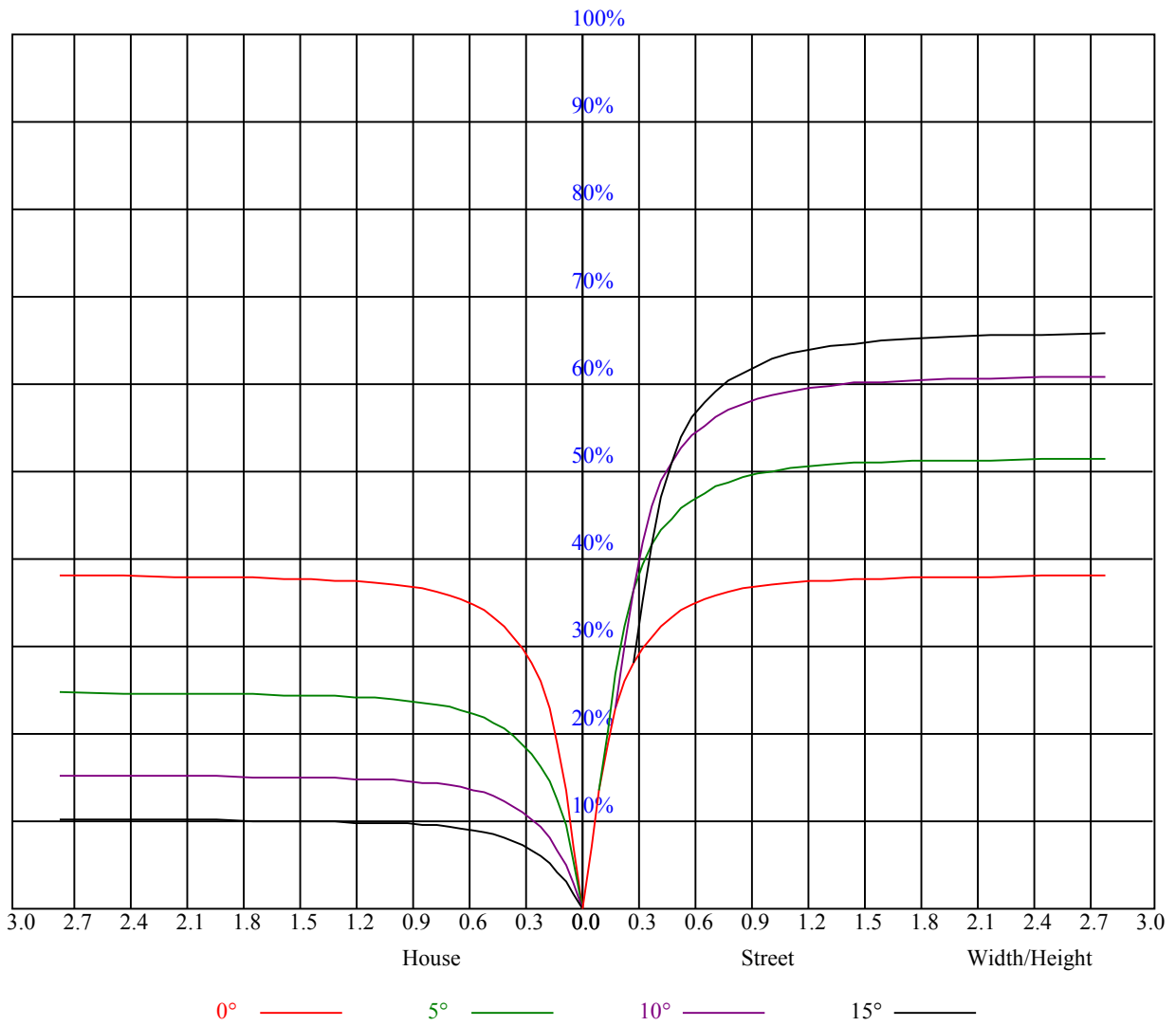
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.92	0.92	0.92	0.89	0.89	0.89	0.85	0.85	0.85	0.82	0.82	0.82	0.78	0.78	0.78	0.77
1	0.86	0.84	0.83	0.84	0.83	0.81	0.81	0.80	0.79	0.78	0.77	0.76	0.76	0.75	0.74	0.73
2	0.81	0.79	0.76	0.80	0.77	0.75	0.77	0.75	0.74	0.75	0.74	0.72	0.73	0.72	0.71	0.70
3	0.77	0.74	0.71	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	0.66	0.70	0.67	0.66	0.68	0.67	0.65	0.64
5	0.71	0.67	0.64	0.70	0.67	0.64	0.69	0.66	0.64	0.67	0.65	0.63	0.66	0.64	0.62	0.62
6	0.68	0.64	0.62	0.67	0.64	0.61	0.66	0.63	0.61	0.65	0.63	0.61	0.64	0.62	0.60	0.59
7	0.65	0.62	0.59	0.65	0.62	0.59	0.64	0.61	0.59	0.63	0.61	0.59	0.63	0.60	0.58	0.58
8	0.63	0.60	0.57	0.63	0.60	0.57	0.62	0.59	0.57	0.61	0.59	0.57	0.61	0.58	0.57	0.56
9	0.61	0.58	0.56	0.61	0.58	0.56	0.60	0.57	0.55	0.60	0.57	0.55	0.59	0.57	0.55	0.54
10	0.60	0.56	0.54	0.59	0.56	0.54	0.59	0.56	0.54	0.58	0.56	0.54	0.58	0.55	0.54	0.53



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	11156.06	11177.44	11197.69	11149.31	10970.44	10679.06	10186.31	9557.44	8638.88
45.0	11181.94	11162.25	11016.56	10769.06	10388.25	9744.19	8836.88	7874.44	6955.31
90.0	11162.25	11094.75	10908.56	10536.75	10034.44	9222.19	8282.81	7080.19	5801.06
135.0	11179.69	11133.56	10930.50	10665.56	10243.69	9450.56	8589.38	7584.75	6378.75
180.0	11156.06	11035.13	10716.19	10362.38	9835.88	8905.50	7949.25	6906.38	5554.13
225.0	11181.94	11172.94	11119.50	10946.25	10661.63	10260.00	9678.94	8705.81	7747.88
270.0	11162.25	11176.31	11149.88	11077.31	10909.13	10487.25	10002.38	9324.00	8336.25
315.0	11179.69	11178.00	11152.69	11013.19	10797.75	10391.63	9826.88	8983.69	7925.06
360.0	11156.06	11177.44	11197.69	11149.31	10970.44	10679.06	10186.31	9557.44	8638.88
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	7670.81	6357.38	5304.94	4340.25	3524.63	2747.81	2277.00	1929.94	1601.44
45.0	5467.50	4471.88	3720.38	2883.38	2331.56	1977.19	1679.06	1450.13	1302.19
90.0	4752.56	3756.38	2986.31	2473.31	2081.81	1720.13	1503.00	1326.38	1108.74
135.0	5160.94	4191.75	3308.63	2707.31	2198.25	1833.75	1595.81	1385.44	1219.50
180.0	4676.63	3724.88	2903.06	2466.56	2041.31	1707.19	1524.94	1346.63	1121.23
225.0	6719.06	5420.25	4461.75	3641.06	2984.06	2367.56	2007.56	1731.94	1492.31
270.0	7196.63	6134.06	5094.56	4063.50	3237.75	2668.50	2184.19	1823.63	1576.69
315.0	6882.75	5679.00	4554.00	3687.19	3000.94	2354.06	1974.94	1685.25	1438.31
360.0	7670.81	6357.38	5304.94	4340.25	3524.63	2747.81	2277.00	1929.94	1601.44
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1403.44	1243.13	1101.94	988.88	905.63	826.31	763.88	702.00	645.19
45.0	1136.25	1032.75	930.94	843.75	774.00	711.00	651.38	606.94	564.19
90.0	1046.14	960.36	876.99	805.78	750.38	693.79	646.59	597.04	550.91
135.0	1107.56	1013.63	914.06	843.75	780.19	714.94	662.63	617.63	569.25
180.0	1053.06	961.59	883.97	799.59	740.87	688.89	628.20	583.93	542.42
225.0	1302.19	1122.13	1043.33	940.16	862.59	784.80	724.56	664.31	610.14
270.0	1362.38	1212.19	1079.44	973.69	894.94	819.56	752.63	699.75	650.81
315.0	1208.81	1120.78	1005.24	911.14	839.53	770.18	714.15	658.29	606.99
360.0	1403.44	1243.13	1101.94	988.88	905.63	826.31	763.88	702.00	645.19
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	599.63	551.81	506.81	467.44	435.94	392.06	362.25	339.19	306.00
45.0	513.00	473.63	435.94	397.69	362.81	335.25	307.69	285.19	260.21
90.0	512.10	474.41	430.14	397.01	366.19	329.96	304.14	281.64	256.73
135.0	526.50	485.44	445.50	411.19	374.63	339.75	311.63	286.88	260.83
180.0	496.69	452.53	416.14	379.13	349.48	319.28	291.49	269.61	247.05
225.0	565.93	524.03	472.56	434.93	400.16	360.68	332.83	307.01	280.29
270.0	593.44	551.25	511.31	469.69	430.31	398.25	364.50	332.44	306.00
315.0	565.65	525.09	478.41	443.59	410.74	372.43	343.69	316.29	290.64
360.0	599.63	551.81	506.81	467.44	435.94	392.06	362.25	339.19	306.00
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	286.31	260.78	239.85	220.67	205.65	189.73	174.49	159.24	146.31
45.0	239.91	223.43	206.38	190.74	175.05	161.44	146.31	135.34	125.49
90.0	239.29	223.76	205.65	189.90	174.21	157.50	147.15	134.16	120.83
135.0	240.19	224.21	207.73	192.21	176.74	165.09	148.50	136.91	127.91
180.0	227.42	211.67	197.38	180.00	166.39	153.96	141.13	129.38	119.48
225.0	256.61	237.54	218.93	201.49	188.04	172.97	159.47	145.80	133.54
270.0	285.19	257.96	238.16	219.83	205.43	191.87	172.13	158.12	145.63
315.0	263.64	245.42	227.93	211.67	198.39	182.59	165.49	150.86	139.44
360.0	286.31	260.78	239.85	220.67	205.65	189.73	174.49	159.24	146.31



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	135.11	123.64	112.67	103.44	94.39	83.98	76.61	70.03	63.45
45.0	112.95	103.67	94.78	86.51	77.18	70.93	64.13	58.84	53.21
90.0	111.88	102.21	90.00	82.86	75.77	66.88	61.82	56.70	51.36
135.0	113.12	103.33	95.40	85.22	76.84	70.99	63.96	58.50	53.44
180.0	108.73	98.49	90.06	81.45	74.64	67.61	61.26	56.19	51.53
225.0	123.69	114.02	102.43	93.71	85.84	76.84	70.37	64.58	58.67
270.0	132.02	121.61	111.83	101.19	91.41	83.31	75.15	68.79	62.44
315.0	127.35	117.06	104.79	95.74	87.58	78.08	71.44	65.48	60.19
360.0	135.11	123.64	112.67	103.44	94.39	83.98	76.61	70.03	63.45
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	57.54	52.88	47.81	43.09	39.43	35.72	32.85	29.98	27.39
45.0	48.43	43.88	39.60	35.78	32.96	30.43	27.56	25.54	23.74
90.0	46.29	42.13	38.14	34.99	31.89	29.14	26.89	24.58	22.61
135.0	47.87	43.65	39.88	35.94	32.91	30.43	27.56	25.59	23.68
180.0	45.96	41.96	38.36	34.43	31.67	29.19	26.66	24.36	22.56
225.0	53.38	48.99	44.33	40.44	36.56	33.19	30.66	28.01	25.59
270.0	56.81	52.26	47.31	42.75	39.09	35.89	32.29	29.76	27.39
315.0	54.28	49.89	45.56	41.12	37.24	34.14	31.22	28.52	26.27
360.0	57.54	52.88	47.81	43.09	39.43	35.72	32.85	29.98	27.39
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	25.31	23.51	21.77	20.81	20.08	19.29	18.68	18.06	17.44
45.0	21.88	20.87	20.08	19.35	18.68	18.06	17.44	16.99	16.48
90.0	21.26	20.42	19.52	18.84	18.28	17.72	17.10	16.59	16.09
135.0	21.77	20.70	19.86	19.13	18.39	17.83	17.21	16.71	16.26
180.0	21.09	20.14	19.41	18.68	18.06	17.44	16.82	16.37	15.98
225.0	23.68	22.11	20.59	19.74	19.07	18.28	17.72	17.16	16.54
270.0	25.03	23.01	21.60	20.48	19.63	18.96	18.34	17.78	17.21
315.0	24.08	22.39	21.04	20.08	19.35	18.73	18.00	17.38	16.88
360.0	25.31	23.51	21.77	20.81	20.08	19.29	18.68	18.06	17.44
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	16.88	16.37	15.86	15.41	14.96	14.51	14.12	13.61	13.11
45.0	15.92	15.53	15.13	14.57	14.12	13.67	13.11	12.60	12.09
90.0	15.64	15.19	14.79	14.34	13.84	13.44	12.88	12.38	11.76
135.0	15.75	15.36	14.91	14.40	14.01	13.56	12.99	12.49	11.93
180.0	15.41	15.02	14.57	14.06	13.67	13.22	12.66	12.09	11.59
225.0	16.09	15.64	15.13	14.79	14.29	13.78	13.44	12.99	12.38
270.0	16.65	16.20	15.75	15.30	14.91	14.51	14.01	13.56	13.11
315.0	16.26	15.86	15.41	15.02	14.57	14.18	13.73	13.28	12.77
360.0	16.88	16.37	15.86	15.41	14.96	14.51	14.12	13.61	13.11
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	12.66	12.09	11.48	10.91	10.35	9.90	9.39	8.83	8.38
45.0	11.53	10.97	10.46	9.96	9.45	8.83	8.44	8.10	7.99
90.0	11.25	10.74	10.13	9.68	9.17	8.61	8.27	7.99	7.93
135.0	11.31	10.74	10.24	9.73	9.28	8.72	8.33	8.10	7.93
180.0	11.03	10.52	9.96	9.45	8.94	8.49	8.21	7.93	7.93
225.0	11.93	11.42	10.80	10.35	9.90	9.39	8.89	8.49	8.21
270.0	12.54	11.98	11.42	10.80	10.24	9.68	9.17	8.66	8.38
315.0	12.21	11.70	11.14	10.52	10.07	9.51	9.06	8.61	8.21
360.0	12.66	12.09	11.48	10.91	10.35	9.90	9.39	8.83	8.38

Intensity data(cd)

C/ $\gamma$ (°)	90.0
0.0	8.10
45.0	7.93
90.0	7.93
135.0	7.99
180.0	7.93
225.0	8.10
270.0	8.10
315.0	8.04
360.0	8.10