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## Nata

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LumCAT: 3-2383-M	
Luminaire: 92.70.129.00	
Report No: NATA0100	Voltage(V): 34.6500
Test No: GC2019092317	Current(A): 0.5000
LampCAT: CREE CXA1830	Power (W): 17.3300
Lamp flux(lm): 2266.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 74	Width(mm): 74
Phm Type: C	Height(mm): 0

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## Photometric Results

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Lumens(lm): 2198.92  
Efficiency(%): 97.04%  
Lumens(lm)/Power(W): 126.89  
Central intensity(cd): 10783.970  
Maximum intensity(cd): 10783.970  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=22.4  
                                  [C90/270]Total=22.4  
Field angle(10%Imax): [C0/180]Total=37.8  
                                  [C90/270]Total=37.8  
Maximum s/h(1/2): C0\_180=0.38 C90\_270=0.38  
Maximum s/h(1/4): C0\_180=0.35 C90\_270=0.35  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 97.04%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.385%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10783.969	0.000	0	.000%	.000%
1.0	10749.797	10.304	10.304	.455%	.469%
2.0	10658.109	30.727	41.03	1.356%	1.866%
3.0	10524.656	50.662	91.692	2.236%	4.170%
4.0	10372.922	69.951	161.643	3.087%	7.351%
5.0	10118.109	88.151	249.795	3.890%	11.360%
6.0	9692.297	104.109	353.904	4.594%	16.094%
7.0	9010.125	116.086	469.989	5.123%	21.374%
8.0	8284.219	123.772	593.761	5.462%	27.002%
9.0	7384.008	126.982	720.744	5.604%	32.777%
10.0	6427.969	124.993	845.737	5.516%	38.462%
11.0	5554.758	119.732	965.469	5.284%	43.907%
12.0	4661.016	111.673	1077.142	4.928%	48.985%
13.0	3707.156	99.309	1176.451	4.383%	53.501%
14.0	2919.586	84.822	1261.273	3.743%	57.359%
15.0	2266.523	71.197	1332.47	3.142%	60.597%
16.0	1723.219	58.461	1390.931	2.580%	63.255%
17.0	1420.664	48.959	1439.89	2.161%	65.482%
18.0	1186.882	42.993	1482.883	1.897%	67.437%
19.0	1064.904	39.176	1522.059	1.729%	69.219%
20.0	972.000	37.281	1559.34	1.645%	70.914%
21.0	906.827	36.077	1595.418	1.592%	72.555%
22.0	858.783	35.481	1630.898	1.566%	74.168%
23.0	826.263	35.357	1666.255	1.560%	75.776%
24.0	800.592	35.569	1701.824	1.570%	77.394%
25.0	778.528	35.906	1737.73	1.585%	79.027%
26.0	763.214	36.393	1774.123	1.606%	80.682%
27.0	749.299	37.004	1811.127	1.633%	82.364%
28.0	736.594	37.620	1848.746	1.660%	84.075%
29.0	724.725	38.232	1886.979	1.687%	85.814%
30.0	706.141	38.633	1925.612	1.705%	87.571%
31.0	654.117	37.854	1963.466	1.671%	89.292%
32.0	586.477	35.542	1999.007	1.568%	90.909%
33.0	511.650	32.351	2031.358	1.428%	92.380%
34.0	421.523	28.241	2059.599	1.246%	93.664%
35.0	337.366	23.568	2083.167	1.040%	94.736%
36.0	262.238	19.092	2102.259	.843%	95.604%
37.0	174.663	14.249	2116.508	.629%	96.252%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	101.545	9.219	2125.728	.407%	96.672%
39.0	54.323	5.320	2131.048	.235%	96.914%
40.0	34.137	3.085	2134.133	.136%	97.054%
41.0	29.257	2.257	2136.39	.100%	97.156%
42.0	24.722	1.961	2138.352	.087%	97.246%
43.0	22.711	1.757	2140.109	.078%	97.326%
44.0	21.558	1.671	2141.779	.074%	97.402%
45.0	20.566	1.619	2143.398	.071%	97.475%
46.0	19.252	1.557	2144.956	.069%	97.546%
47.0	18.302	1.494	2146.449	.066%	97.614%
48.0	17.564	1.450	2147.899	.064%	97.680%
49.0	16.854	1.413	2149.312	.062%	97.744%
50.0	16.186	1.378	2150.69	.061%	97.807%
51.0	15.602	1.345	2152.035	.059%	97.868%
52.0	15.138	1.319	2153.354	.058%	97.928%
53.0	14.709	1.298	2154.652	.057%	97.987%
54.0	14.407	1.283	2155.936	.057%	98.045%
55.0	14.013	1.269	2157.204	.056%	98.103%
56.0	13.746	1.254	2158.459	.055%	98.160%
57.0	13.486	1.245	2159.704	.055%	98.217%
58.0	13.268	1.237	2160.941	.055%	98.273%
59.0	13.155	1.235	2162.176	.055%	98.329%
60.0	13.057	1.238	2163.415	.055%	98.385%
61.0	12.916	1.240	2164.654	.055%	98.442%
62.0	12.881	1.243	2165.897	.055%	98.498%
63.0	12.867	1.252	2167.15	.055%	98.555%
64.0	12.797	1.259	2168.409	.056%	98.613%
65.0	12.684	1.261	2169.67	.056%	98.670%
66.0	12.516	1.257	2170.927	.055%	98.727%
67.0	12.291	1.247	2172.175	.055%	98.784%
68.0	12.080	1.235	2173.409	.054%	98.840%
69.0	11.911	1.224	2174.633	.054%	98.896%
70.0	11.728	1.214	2175.847	.054%	98.951%
71.0	11.538	1.203	2177.05	.053%	99.006%
72.0	11.334	1.189	2178.239	.052%	99.060%
73.0	11.194	1.178	2179.417	.052%	99.113%
74.0	11.081	1.171	2180.588	.052%	99.166%
75.0	11.004	1.167	2181.755	.051%	99.220%

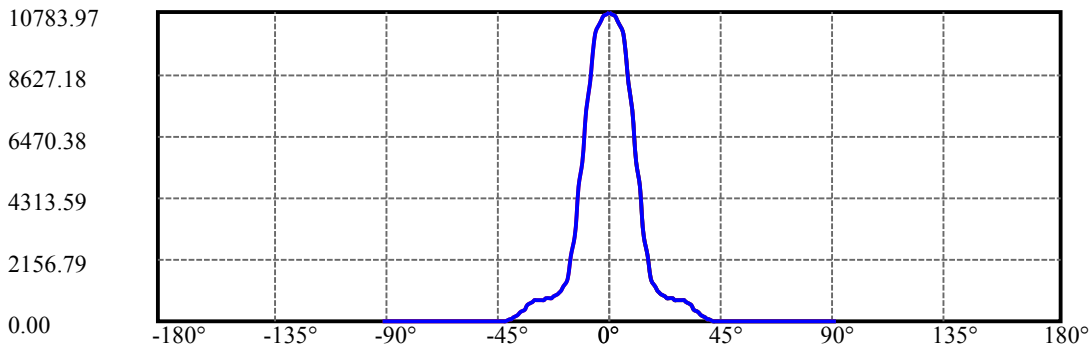
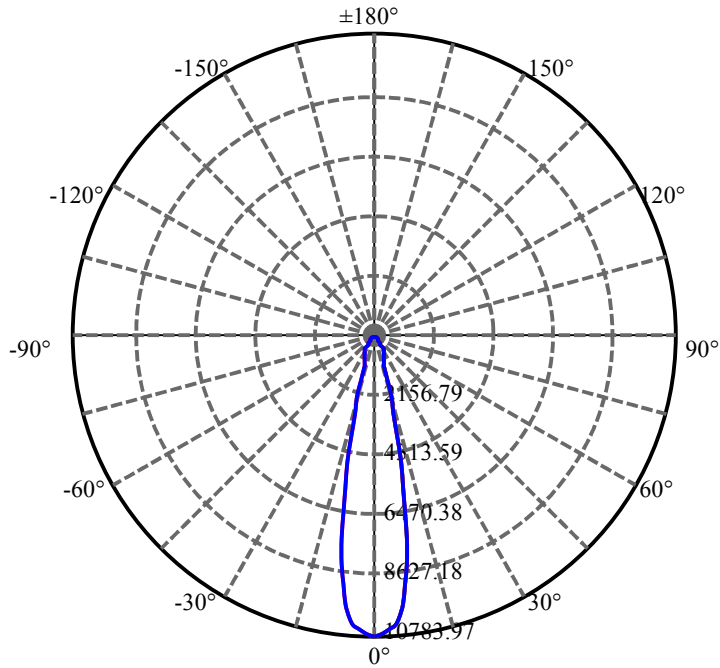
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.927	1.164	2182.919	.051%	99.272%
77.0	10.884	1.163	2184.082	.051%	99.325%
78.0	10.835	1.163	2185.245	.051%	99.378%
79.0	10.765	1.161	2186.405	.051%	99.431%
80.0	10.709	1.158	2187.563	.051%	99.484%
81.0	10.652	1.155	2188.718	.051%	99.536%
82.0	10.631	1.154	2189.872	.051%	99.589%
83.0	10.610	1.155	2191.027	.051%	99.641%
84.0	10.638	1.158	2192.184	.051%	99.694%
85.0	10.491	1.153	2193.338	.051%	99.746%
86.0	10.441	1.144	2194.482	.050%	99.798%
87.0	10.139	1.126	2195.608	.050%	99.850%
88.0	10.097	1.108	2196.717	.049%	99.900%
89.0	10.048	1.104	2197.821	.049%	99.950%
90.0	9.949	1.096	2198.917	.048%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1925.61	84.98%	87.57%
0-40	2134.13	94.18%	97.05%
0-60	2163.41	95.47%	98.39%
0-90	2197.82	96.99%	99.95%
0-120	2197.82	96.99%	99.95%
0-180	2198.92	97.04%	100.00%
60-90	35.64	1.57%	1.62%
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%
0-25.59	1759.13	77.63%	80.00%

ZONAL LUMEN SUMMARY

0-10	845.74
10-20	713.60
20-30	366.27
30-40	208.52
40-50	16.56
50-60	12.72
60-70	12.43
70-80	11.72
80-90	10.26
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: —————

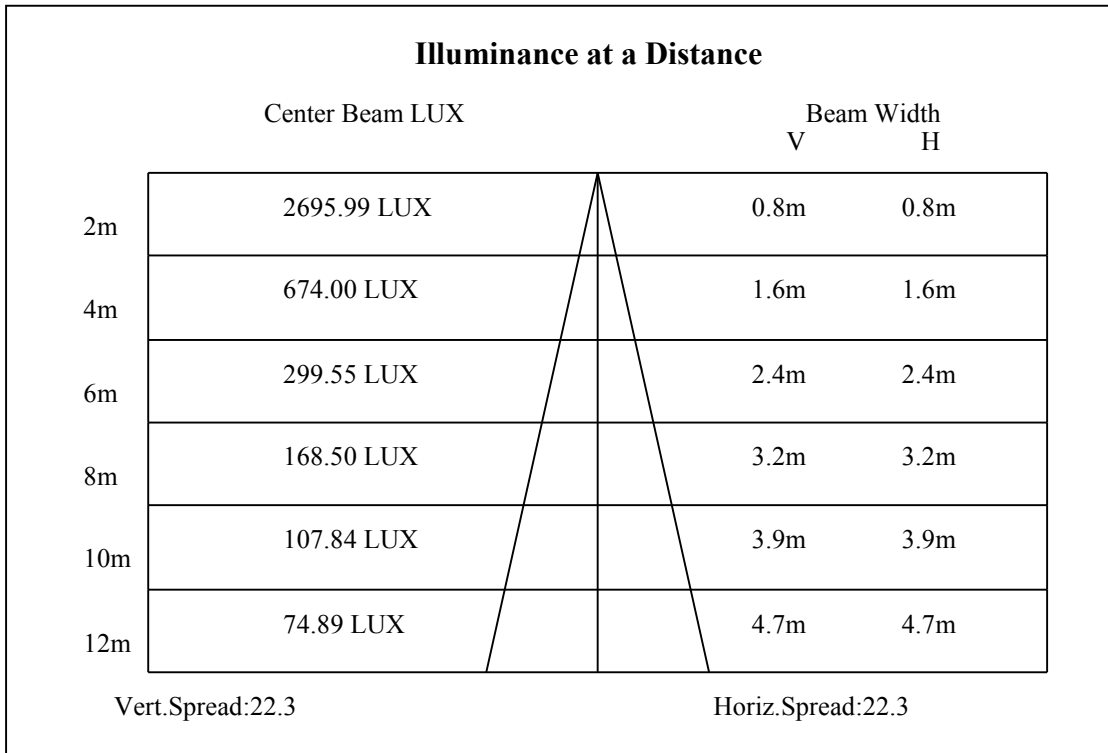
C90/C270: —————

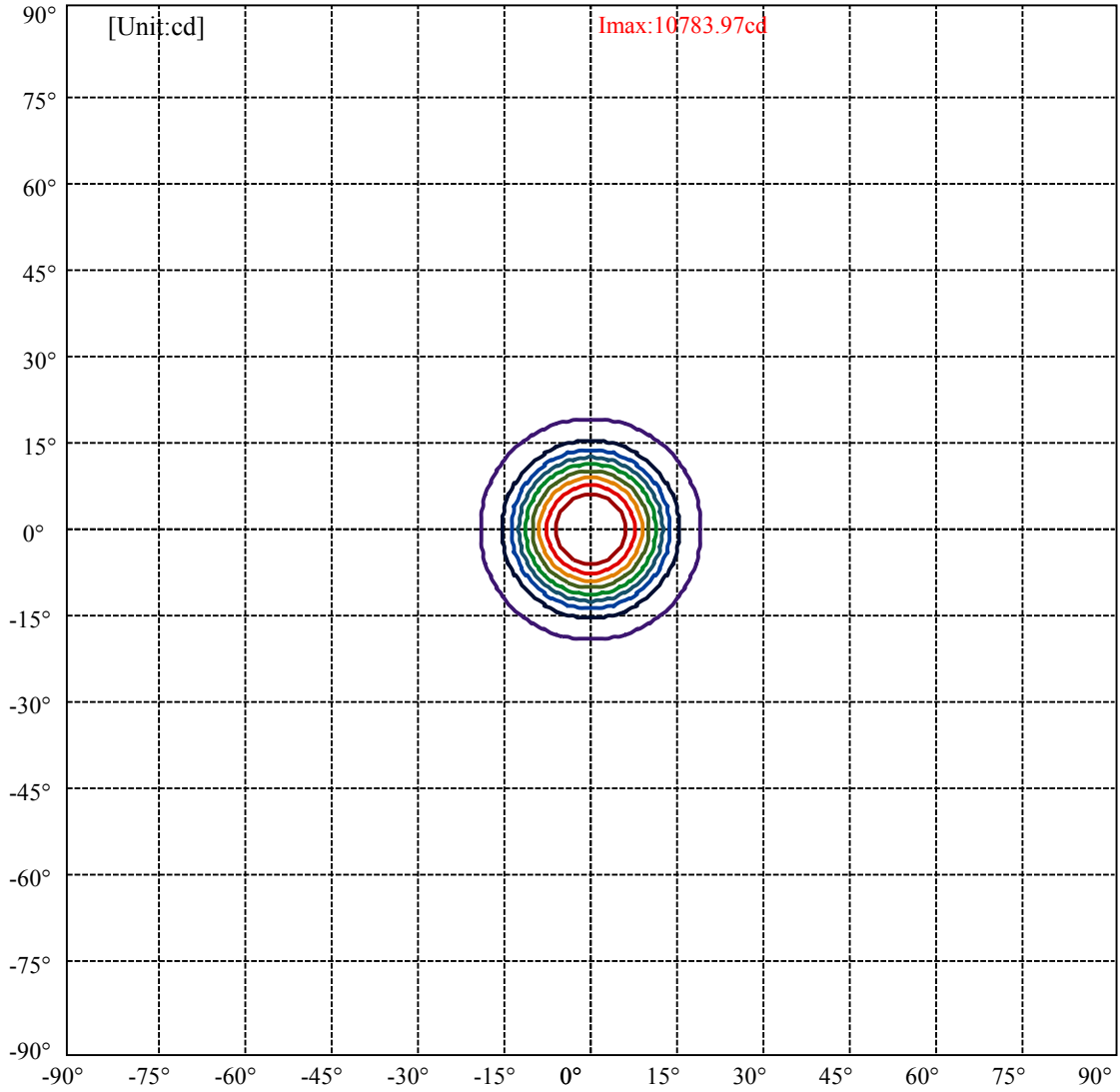
Field angle(10%Imax):C0/180Left:18.9 Right:18.9

:C90/270Left:18.9 Right:18.9

Beam Angle(50%Imax):C0/180Left:11.2 Right:11.2

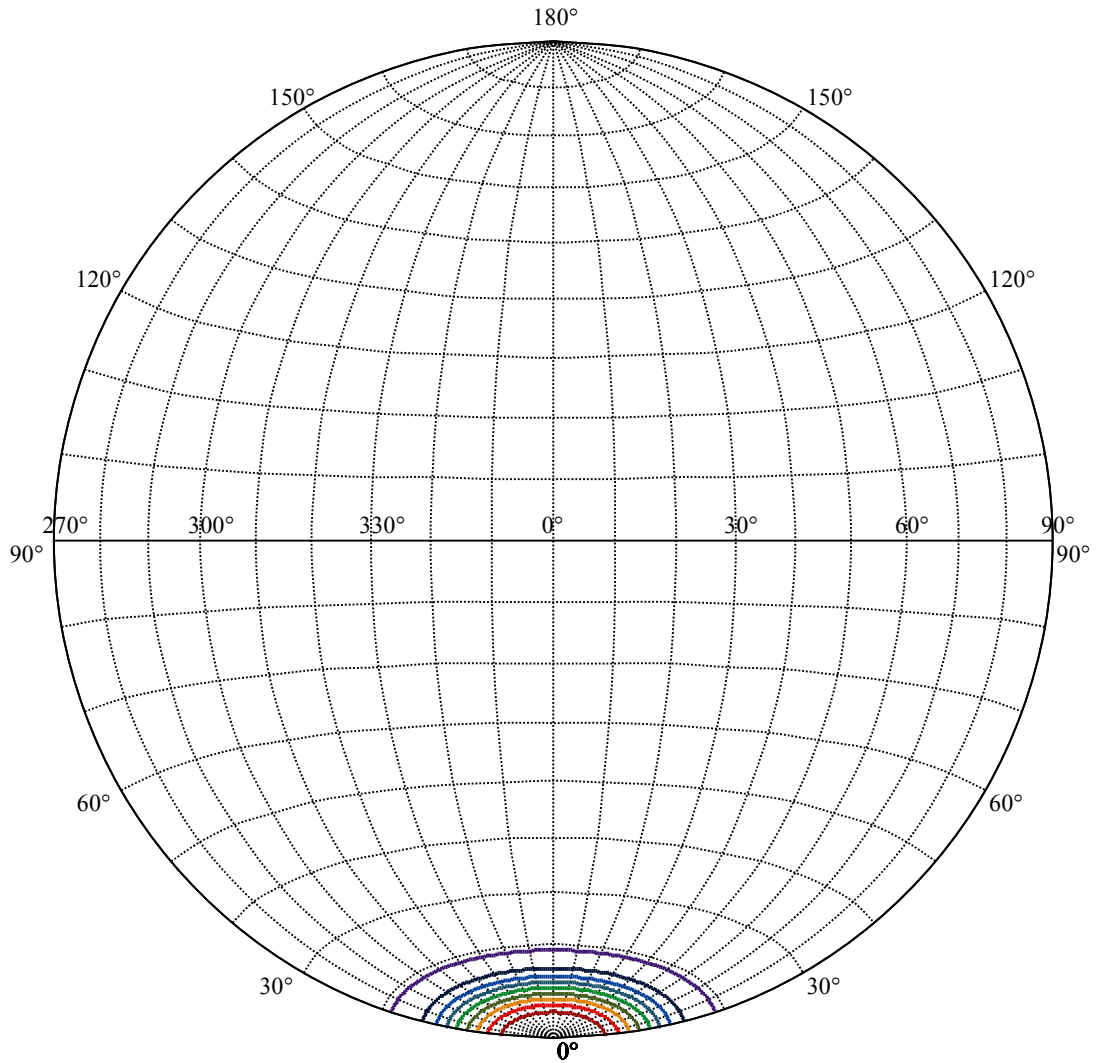
:C90/270Left:11.2 Right:11.2





(10%Imax) 1078.4	—
(20%Imax) 2156.79	—
(30%Imax) 3235.19	—
(40%Imax) 4313.59	—
(50%Imax) 5391.98	—
(60%Imax) 6470.38	—
(70%Imax) 7548.78	—
(80%Imax) 8627.18	—
(90%Imax) 9705.57	—





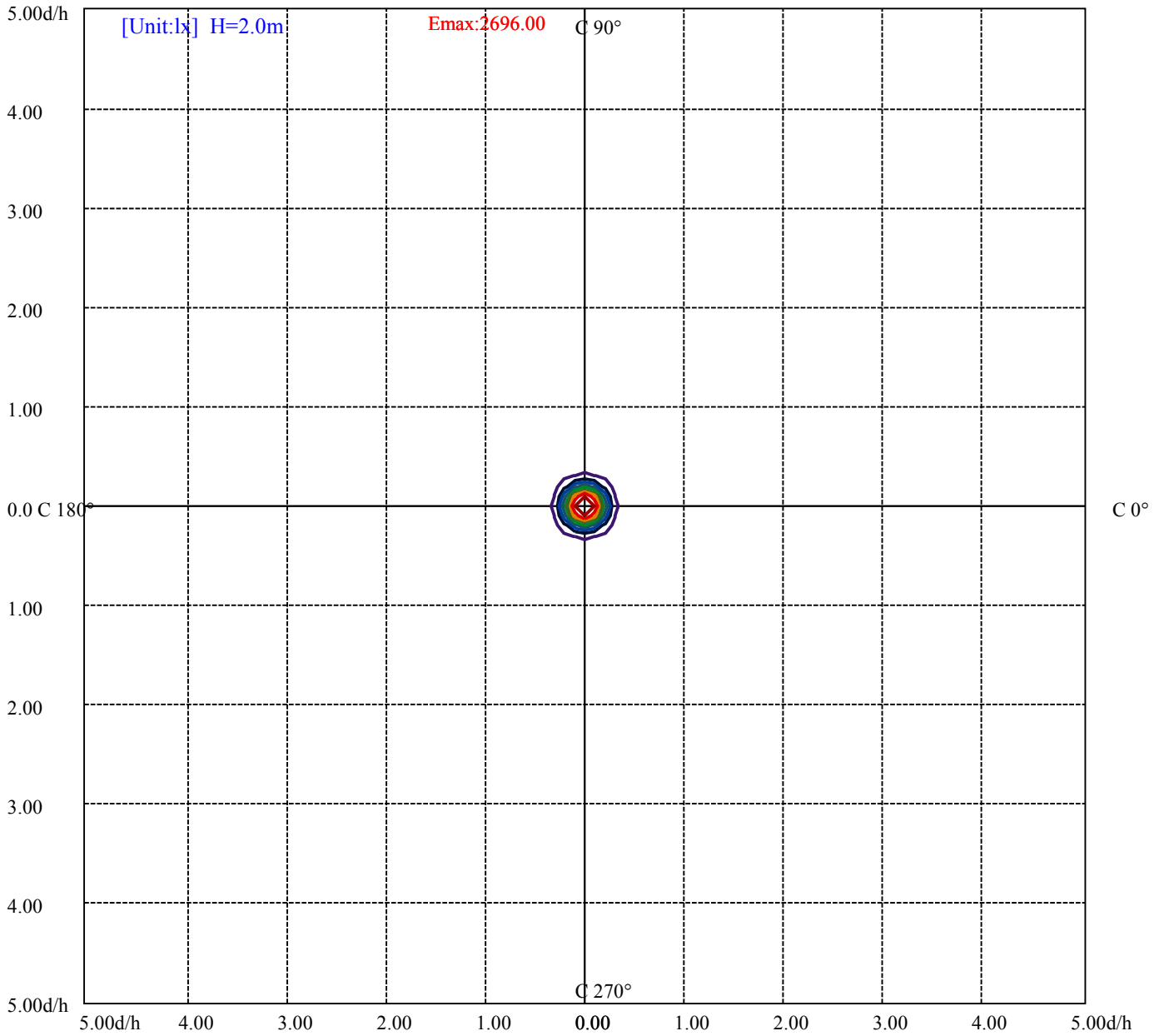
House

[Unit:cd]

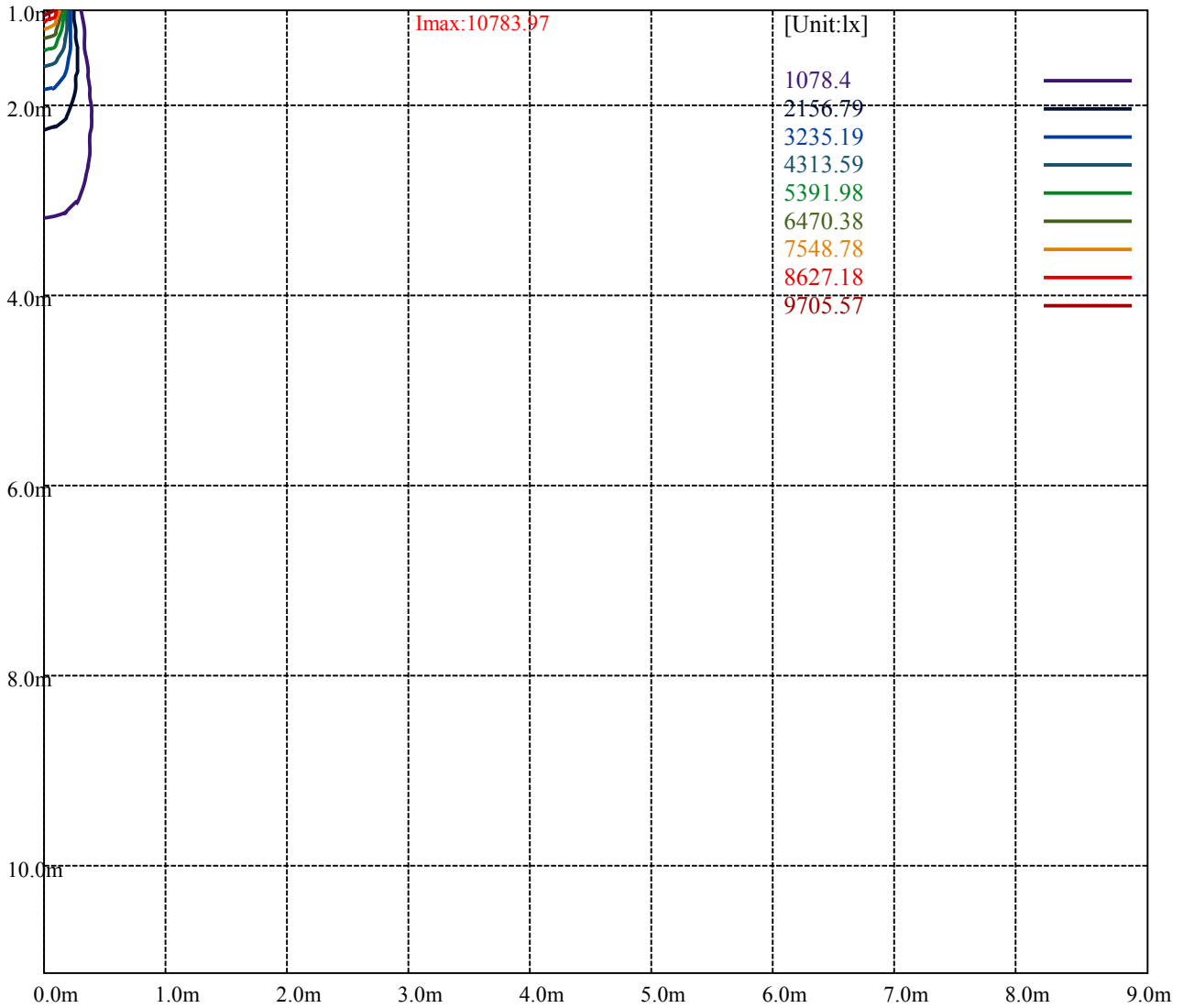
Road

**Imax:10783.97**

(10%Imax) 1078.4	—
(20%Imax) 2156.79	—
(30%Imax) 3235.19	—
(40%Imax) 4313.59	—
(50%Imax) 5391.98	—
(60%Imax) 6470.38	—
(70%Imax) 7548.78	—
(80%Imax) 8627.18	—
(90%Imax) 9705.57	—



- (10%Emax) 269.6
- (20%Emax) 539.1975
- (30%Emax) 808.7975
- (40%Emax) 1078.397
- (50%Emax) 1347.995
- (60%Emax) 1617.595
- (70%Emax) 1887.195
- (80%Emax) 2156.792
- (90%Emax) 2426.393



Luminance Table

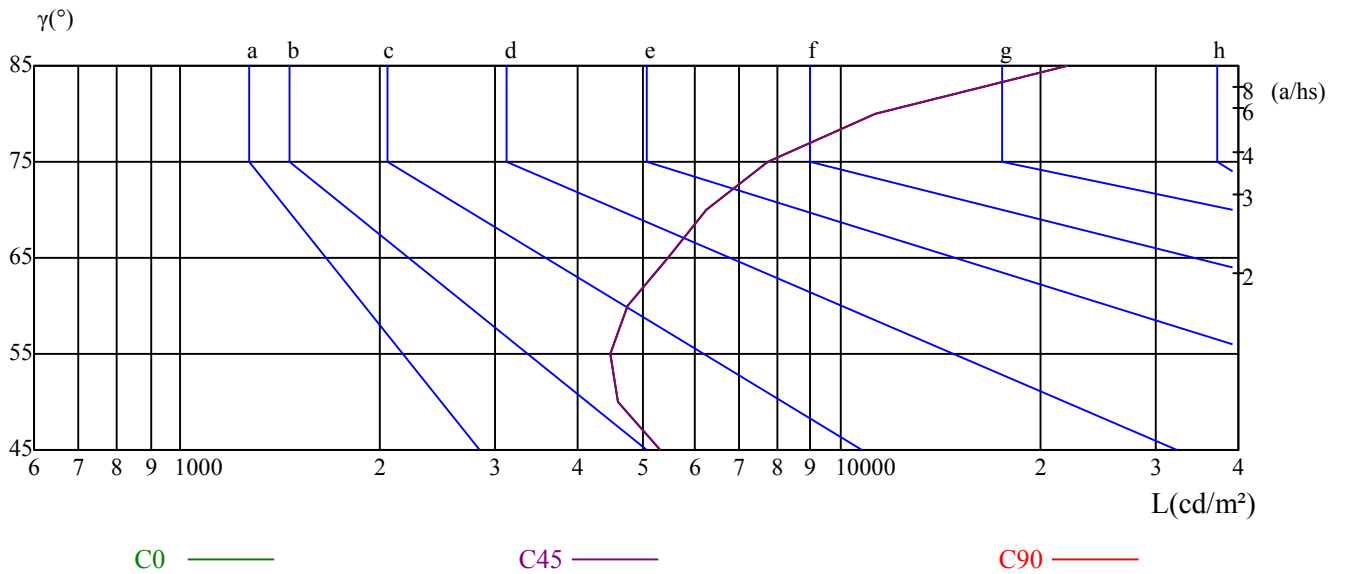
$\gamma$	45	50	55	60	65	70	75	80	85
C0	5311	4598	4462	4769	5481	6262	7764	11262	21981
C45	5311	4598	4462	4769	5481	6262	7764	11262	21981
C90	5311	4598	4462	4769	5481	6262	7764	11262	21981

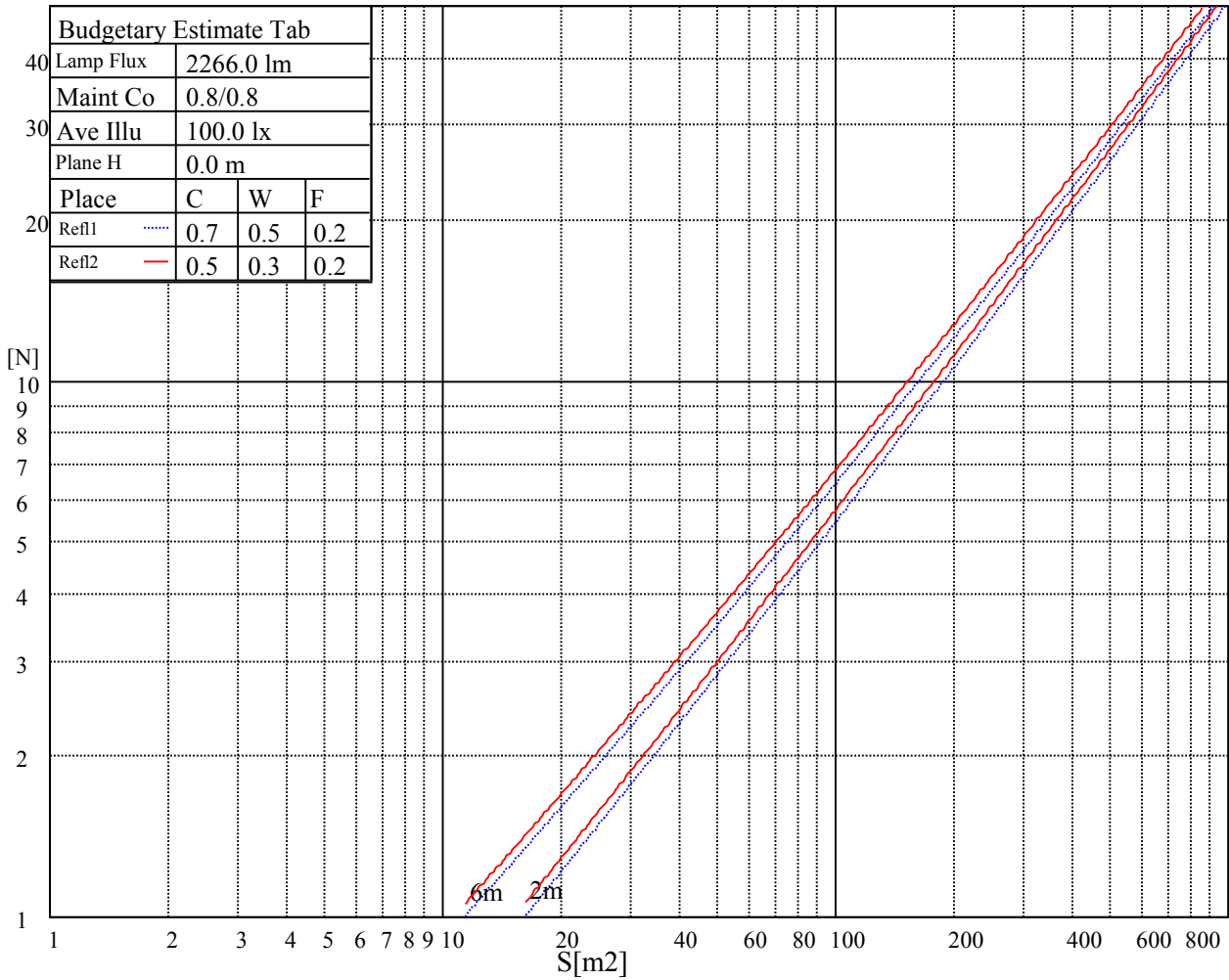
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
5481	5481	5481	7764	7764	7764	21981	21981	21981

Glare Table

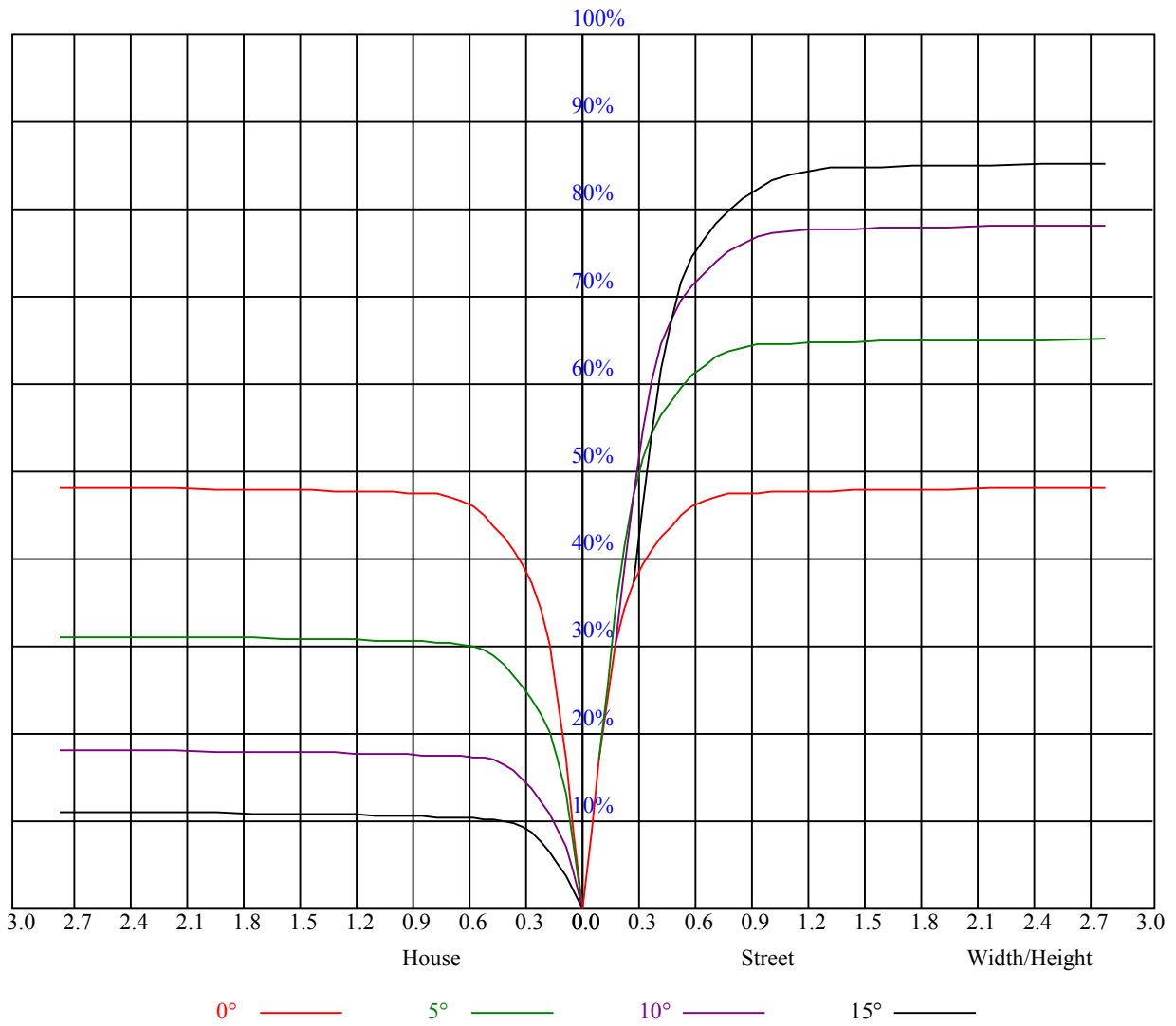
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.16	1.16	1.16	1.13	1.13	1.13	1.08	1.08	1.08	1.03	1.03	1.03	0.99	0.99	0.99	0.97
1	1.09	1.07	1.05	1.07	1.05	1.03	1.03	1.02	1.00	0.99	0.98	0.97	0.96	0.95	0.94	0.93
2	1.03	1.00	0.98	1.02	0.99	0.96	0.99	0.96	0.94	0.96	0.94	0.92	0.93	0.92	0.90	0.89
3	0.99	0.95	0.92	0.97	0.94	0.91	0.95	0.92	0.90	0.93	0.90	0.88	0.91	0.89	0.87	0.86
4	0.94	0.90	0.87	0.93	0.90	0.87	0.91	0.88	0.86	0.90	0.87	0.85	0.88	0.86	0.84	0.83
5	0.91	0.86	0.83	0.90	0.86	0.83	0.88	0.85	0.82	0.87	0.84	0.82	0.85	0.83	0.81	0.80
6	0.87	0.83	0.80	0.87	0.83	0.80	0.85	0.82	0.79	0.84	0.81	0.79	0.83	0.80	0.78	0.77
7	0.84	0.80	0.77	0.84	0.80	0.77	0.83	0.79	0.76	0.82	0.78	0.76	0.81	0.78	0.76	0.75
8	0.82	0.77	0.74	0.81	0.77	0.74	0.80	0.77	0.74	0.79	0.76	0.74	0.79	0.76	0.73	0.73
9	0.79	0.75	0.72	0.79	0.75	0.72	0.78	0.74	0.72	0.77	0.74	0.72	0.77	0.74	0.71	0.70
10	0.77	0.73	0.70	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.70	0.75	0.72	0.69	0.69



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	10798.31	10755.00	10650.38	10500.75	10347.75	10096.88	9623.25	9019.69	8291.81
45.0	10774.69	10752.19	10643.06	10519.88	10368.56	10155.94	9871.31	9207.00	8529.75
90.0	10776.38	10708.88	10602.00	10454.06	10281.94	10018.69	9572.06	8806.50	8039.81
135.0	10786.50	10773.00	10697.63	10599.19	10498.50	10272.94	9840.38	9279.56	8583.19
180.0	10798.31	10770.75	10710.00	10626.19	10506.38	10248.19	9808.31	8991.00	8193.94
225.0	10774.69	10738.69	10648.69	10502.44	10355.63	10067.06	9537.19	8820.00	8058.38
270.0	10776.38	10779.19	10697.63	10563.19	10384.31	10136.81	9779.06	9209.81	8552.81
315.0	10786.50	10720.69	10615.50	10431.56	10240.31	9948.38	9506.81	8747.44	8024.06
360.0	10798.31	10755.00	10650.38	10500.75	10347.75	10096.88	9623.25	9019.69	8291.81
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	7317.00	6531.75	5726.81	4800.94	3890.81	3132.00	2358.56	1767.94	1443.38
45.0	7664.06	6726.38	5861.81	4987.13	3937.50	3166.31	2477.25	1851.75	1506.94
90.0	7187.63	6064.88	5157.56	4285.69	3400.31	2628.56	2083.50	1635.19	1360.69
135.0	7577.44	6688.13	5774.63	4765.50	3810.94	3036.94	2302.88	1767.38	1449.00
180.0	7326.56	6271.88	5414.63	4561.31	3630.94	2786.63	2149.31	1637.44	1359.56
225.0	7126.88	6161.06	5283.56	4316.06	3493.13	2662.31	1986.75	1575.00	1309.50
270.0	7624.69	6779.81	5897.81	5115.38	3935.81	3172.50	2600.44	1869.75	1535.06
315.0	7247.81	6199.88	5321.25	4456.13	3557.81	2771.44	2173.50	1681.31	1401.19
360.0	7317.00	6531.75	5726.81	4800.94	3890.81	3132.00	2358.56	1767.94	1443.38
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1218.94	1089.56	984.94	914.06	868.50	835.88	805.50	786.94	771.75
45.0	1279.69	1113.75	1002.94	937.13	882.56	845.44	814.50	792.56	774.00
90.0	1116.90	1021.73	943.93	881.10	833.18	800.33	777.09	751.44	734.51
135.0	1210.50	1076.63	975.38	907.88	865.13	834.75	810.56	792.00	779.63
180.0	1114.43	1033.20	954.79	893.81	852.19	822.88	798.64	776.93	760.22
225.0	1114.65	987.36	909.73	845.61	806.23	776.03	756.11	736.03	725.91
270.0	1330.31	1140.75	1030.50	968.06	902.25	865.69	837.00	810.56	793.13
315.0	1109.64	1056.26	973.80	906.98	860.23	829.13	805.33	781.76	766.58
360.0	1218.94	1089.56	984.94	914.06	868.50	835.88	805.50	786.94	771.75
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	754.88	743.63	731.81	709.31	655.31	592.31	509.06	417.38	334.69
45.0	758.25	743.63	732.38	715.50	663.19	597.94	525.38	435.94	345.94
90.0	719.66	704.76	688.56	663.86	608.46	535.33	460.86	375.08	301.67
135.0	766.69	754.88	741.94	727.88	682.31	618.75	545.06	454.50	363.94
180.0	746.61	734.06	719.66	702.11	658.18	580.16	505.46	424.46	333.45
225.0	717.36	711.23	704.76	688.16	638.33	569.25	498.88	411.08	330.64
270.0	779.06	765.00	756.00	744.75	698.63	640.13	568.13	464.63	381.38
315.0	751.89	735.58	722.70	697.56	628.54	557.94	480.38	389.14	307.24
360.0	754.88	743.63	731.81	709.31	655.31	592.31	509.06	417.38	334.69
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	294.19	164.98	93.26	47.53	26.89	22.84	18.28	16.88	16.03
45.0	290.81	182.64	105.36	55.29	29.64	24.41	19.74	17.83	17.27
90.0	216.68	141.36	87.36	48.66	36.17	31.50	27.34	25.71	24.19
135.0	289.13	193.44	116.49	63.23	33.69	27.90	24.36	21.77	20.76
180.0	243.84	170.38	101.31	50.34	31.89	27.17	22.84	21.09	19.91
225.0	242.72	164.19	102.21	57.83	44.16	39.26	33.98	31.73	29.36
270.0	300.94	240.81	127.41	74.64	45.68	39.38	33.19	29.76	28.63
315.0	219.60	139.50	78.98	37.07	24.98	21.60	18.06	16.93	16.31
360.0	294.19	164.98	93.26	47.53	26.89	22.84	18.28	16.88	16.03



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	15.30	14.57	13.89	13.56	13.11	12.83	12.60	12.38	12.21
45.0	16.76	15.81	15.13	14.74	14.18	13.61	13.33	12.88	12.54
90.0	23.40	22.22	21.43	20.70	19.86	19.18	18.51	17.61	17.33
135.0	19.86	18.84	18.06	17.38	16.82	16.20	15.75	15.58	14.96
180.0	19.13	17.89	17.21	16.20	15.81	14.96	14.57	14.46	14.18
225.0	27.62	25.31	23.29	21.77	20.42	19.29	18.00	17.21	16.43
270.0	26.78	24.53	23.18	22.28	21.21	20.25	19.24	18.39	17.66
315.0	15.69	14.85	14.23	13.89	13.44	13.16	12.83	12.60	12.38
360.0	15.30	14.57	13.89	13.56	13.11	12.83	12.60	12.38	12.21
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	12.04	11.93	11.76	11.70	11.64	11.53	11.48	11.42	11.36
45.0	12.32	12.21	12.04	11.93	11.87	11.81	11.81	11.76	11.81
90.0	16.71	16.03	15.58	15.08	14.57	14.29	14.06	13.89	13.95
135.0	14.96	14.40	14.34	13.89	13.67	13.39	13.16	12.88	12.83
180.0	13.95	13.78	13.44	13.28	13.05	13.11	12.99	13.05	12.99
225.0	15.98	15.24	14.91	14.51	14.40	14.23	14.34	13.84	13.73
270.0	17.10	16.48	15.98	15.64	15.19	15.13	14.91	14.79	14.63
315.0	12.21	12.04	11.93	11.87	11.76	11.76	11.70	11.70	11.76
360.0	12.04	11.93	11.76	11.70	11.64	11.53	11.48	11.42	11.36
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	11.36	11.36	11.31	11.31	11.31	11.31	11.31	11.36	11.36
45.0	11.76	11.93	11.98	12.15	11.93	11.64	11.48	11.36	11.25
90.0	13.95	13.78	13.61	13.28	12.94	12.66	12.38	12.09	11.81
135.0	12.77	12.71	12.66	12.38	12.15	11.98	11.98	11.87	11.70
180.0	13.22	13.11	12.88	12.49	12.26	11.93	11.76	11.59	11.31
225.0	13.44	13.16	12.83	12.54	12.26	12.09	11.70	11.48	11.19
270.0	14.68	14.51	14.40	14.18	13.73	13.33	13.11	12.60	12.32
315.0	11.76	11.81	11.81	11.81	11.76	11.70	11.59	11.48	11.36
360.0	11.36	11.36	11.31	11.31	11.31	11.31	11.31	11.36	11.36
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	11.31	11.19	11.08	10.97	10.91	10.80	10.80	10.69	10.63
45.0	11.14	11.08	10.97	10.97	10.97	10.97	10.97	10.86	10.80
90.0	11.53	11.36	11.25	11.19	11.14	11.08	11.03	10.97	10.86
135.0	11.36	11.14	11.08	11.03	10.97	11.03	10.97	10.97	10.91
180.0	11.08	10.91	10.80	10.69	10.58	10.52	10.46	10.41	10.35
225.0	10.97	10.86	10.74	10.63	10.52	10.46	10.41	10.29	10.29
270.0	11.98	11.76	11.53	11.42	11.31	11.25	11.14	11.08	11.03
315.0	11.31	11.25	11.19	11.14	11.03	10.97	10.91	10.86	10.80
360.0	11.31	11.19	11.08	10.97	10.91	10.80	10.80	10.69	10.63
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.52	10.46	10.41	10.35	10.35	10.29	10.24	10.13	10.13
45.0	10.74	10.69	10.69	10.63	10.46	10.35	10.29	10.13	10.01
90.0	10.86	10.91	10.91	11.03	10.69	10.80	10.07	10.01	9.90
135.0	10.74	10.80	10.97	11.19	11.14	11.25	10.13	10.13	10.07
180.0	10.35	10.29	10.24	10.24	10.18	10.18	10.13	10.13	10.13
225.0	10.24	10.24	10.18	10.18	10.13	10.13	10.07	10.07	10.07
270.0	10.97	10.86	10.80	10.80	10.46	10.24	10.07	10.13	10.07
315.0	10.80	10.80	10.69	10.69	10.52	10.29	10.13	10.07	10.01
360.0	10.52	10.46	10.41	10.35	10.35	10.29	10.24	10.13	10.13

Intensity data(cd)

C/ $\gamma$ ( $^{\circ}$ )	90.0
0.0	9.90
45.0	9.96
90.0	9.90
135.0	9.96
180.0	10.07
225.0	10.01
270.0	9.90
315.0	9.90
360.0	9.90