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## Nata

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LumCAT: 2-2077-M	
Luminaire: 92.70.129.00	
Report No: NATA0100	Voltage(V): 34.6700
Test No: GC2019092007	Current(A): 0.4470
LampCAT: CREE CXA1830	Power (W): 15.5000
Lamp flux(lm): 2331.0	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): 1832.28  
Efficiency(%): 78.60%  
Lumens(lm)/Power(W): 118.21  
Central intensity(cd): 10021.920  
Maximum intensity(cd): 10021.920  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=23.4  
                                  [C90/270]Total=23.4  
Field angle(10%Imax): [C0/180]Total=41.7  
                                  [C90/270]Total=41.7  
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(%): 78.60%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.513%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10021.922	0.000	0	.000%	.000%
1.0	9975.445	9.568	9.568	.410%	.522%
2.0	9851.695	28.458	38.026	1.221%	2.075%
3.0	9625.852	46.584	84.61	1.998%	4.618%
4.0	9326.180	63.439	148.049	2.722%	8.080%
5.0	8919.070	78.490	226.539	3.367%	12.364%
6.0	8437.148	91.212	317.75	3.913%	17.342%
7.0	7876.547	101.259	419.009	4.344%	22.868%
8.0	7313.063	108.709	527.718	4.664%	28.801%
9.0	6678.000	113.390	641.108	4.864%	34.990%
10.0	6034.078	115.040	756.148	4.935%	41.268%
11.0	5418.563	114.435	870.583	4.909%	47.514%
12.0	4819.992	111.922	982.505	4.801%	53.622%
13.0	4213.477	107.205	1089.71	4.599%	59.473%
14.0	3665.813	100.854	1190.564	4.327%	64.977%
15.0	3166.102	93.792	1284.356	4.024%	70.096%
16.0	2683.336	85.711	1370.066	3.677%	74.774%
17.0	2294.086	77.512	1447.578	3.325%	79.004%
18.0	1895.555	69.078	1516.656	2.963%	82.774%
19.0	1573.102	60.348	1577.004	2.589%	86.068%
20.0	1207.751	50.897	1627.901	2.183%	88.846%
21.0	967.359	41.767	1669.667	1.792%	91.125%
22.0	726.173	34.032	1703.7	1.460%	92.983%
23.0	525.403	26.261	1729.961	1.127%	94.416%
24.0	342.640	18.979	1748.94	.814%	95.452%
25.0	232.587	13.079	1762.019	.561%	96.166%
26.0	96.623	7.771	1769.79	.333%	96.590%
27.0	41.632	3.382	1773.173	.145%	96.774%
28.0	29.355	1.797	1774.97	.077%	96.872%
29.0	25.228	1.428	1776.398	.061%	96.950%
30.0	22.725	1.295	1777.693	.056%	97.021%
31.0	20.728	1.209	1778.902	.052%	97.087%
32.0	19.104	1.141	1780.043	.049%	97.149%
33.0	17.852	1.089	1781.132	.047%	97.209%
34.0	16.713	1.046	1782.178	.045%	97.266%
35.0	15.743	1.008	1783.186	.043%	97.321%
36.0	14.913	0.976	1784.162	.042%	97.374%
37.0	14.231	0.951	1785.112	.041%	97.426%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	13.591	0.929	1786.041	.040%	97.477%
39.0	13.071	0.910	1786.951	.039%	97.526%
40.0	12.607	0.896	1787.847	.038%	97.575%
41.0	12.206	0.884	1788.73	.038%	97.623%
42.0	11.862	0.874	1789.605	.038%	97.671%
43.0	11.538	0.867	1790.472	.037%	97.718%
44.0	11.250	0.860	1791.332	.037%	97.765%
45.0	10.997	0.855	1792.187	.037%	97.812%
46.0	10.800	0.852	1793.039	.037%	97.859%
47.0	10.596	0.851	1793.89	.037%	97.905%
48.0	10.413	0.849	1794.739	.036%	97.951%
49.0	10.259	0.849	1795.588	.036%	97.998%
50.0	10.097	0.849	1796.437	.036%	98.044%
51.0	9.984	0.850	1797.287	.036%	98.090%
52.0	9.872	0.852	1798.139	.037%	98.137%
53.0	9.752	0.854	1798.992	.037%	98.183%
54.0	9.654	0.855	1799.848	.037%	98.230%
55.0	9.563	0.858	1800.705	.037%	98.277%
56.0	9.471	0.860	1801.565	.037%	98.324%
57.0	9.394	0.863	1802.428	.037%	98.371%
58.0	9.316	0.865	1803.293	.037%	98.418%
59.0	9.253	0.868	1804.161	.037%	98.466%
60.0	9.190	0.871	1805.033	.037%	98.513%
61.0	9.127	0.874	1805.907	.037%	98.561%
62.0	9.070	0.877	1806.784	.038%	98.609%
63.0	9.014	0.880	1807.663	.038%	98.657%
64.0	8.979	0.883	1808.546	.038%	98.705%
65.0	8.930	0.886	1809.432	.038%	98.753%
66.0	8.888	0.889	1810.321	.038%	98.802%
67.0	8.852	0.892	1811.213	.038%	98.850%
68.0	8.824	0.895	1812.109	.038%	98.899%
69.0	8.789	0.899	1813.007	.039%	98.948%
70.0	8.761	0.901	1813.909	.039%	98.998%
71.0	8.719	0.903	1814.812	.039%	99.047%
72.0	8.698	0.906	1815.718	.039%	99.096%
73.0	8.663	0.908	1816.625	.039%	99.146%
74.0	8.648	0.910	1817.536	.039%	99.195%
75.0	8.620	0.912	1818.448	.039%	99.245%

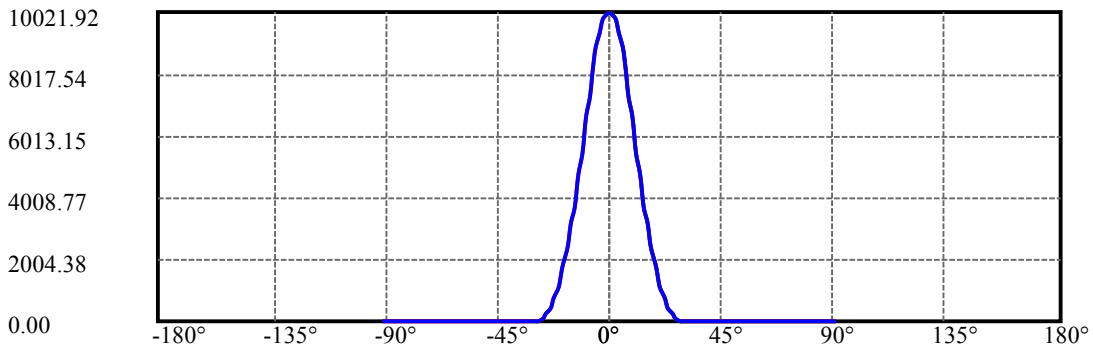
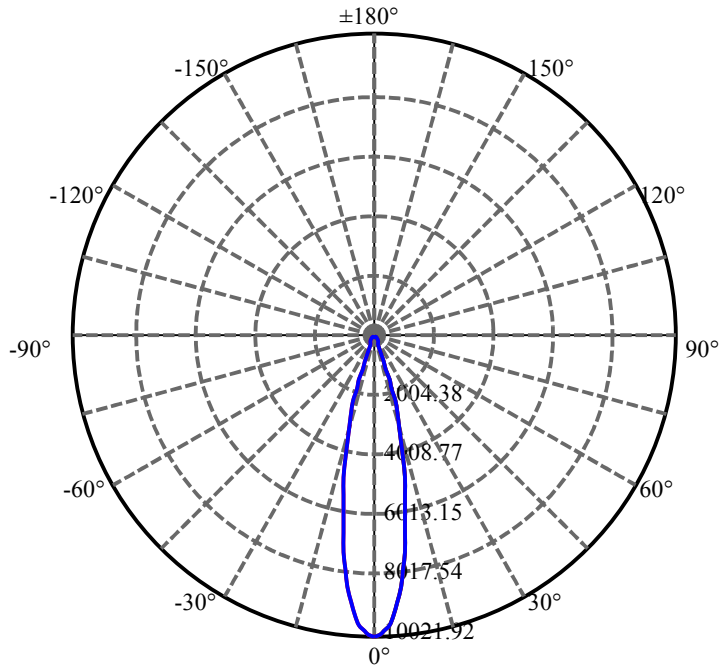
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.613	0.915	1819.363	.039%	99.295%
77.0	8.585	0.917	1820.28	.039%	99.345%
78.0	8.571	0.918	1821.198	.039%	99.395%
79.0	8.557	0.920	1822.118	.039%	99.446%
80.0	8.536	0.922	1823.04	.040%	99.496%
81.0	8.522	0.922	1823.962	.040%	99.546%
82.0	8.508	0.923	1824.886	.040%	99.597%
83.0	8.508	0.925	1825.811	.040%	99.647%
84.0	8.494	0.926	1826.737	.040%	99.698%
85.0	8.494	0.927	1827.664	.040%	99.748%
86.0	8.466	0.927	1828.591	.040%	99.799%
87.0	8.409	0.924	1829.515	.040%	99.849%
88.0	8.395	0.921	1830.435	.039%	99.900%
89.0	8.395	0.920	1831.356	.039%	99.950%
90.0	8.402	0.921	1832.277	.040%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1777.69	76.26%	97.02%
0-40	1787.85	76.70%	97.58%
0-60	1805.03	77.44%	98.51%
0-90	1831.36	78.57%	99.95%
0-120	1831.36	78.57%	99.95%
0-180	1832.28	78.60%	100.00%
60-90	27.19	1.17%	1.48%
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%
0-17.26	1465.82	62.88%	80.00%

ZONAL LUMEN SUMMARY

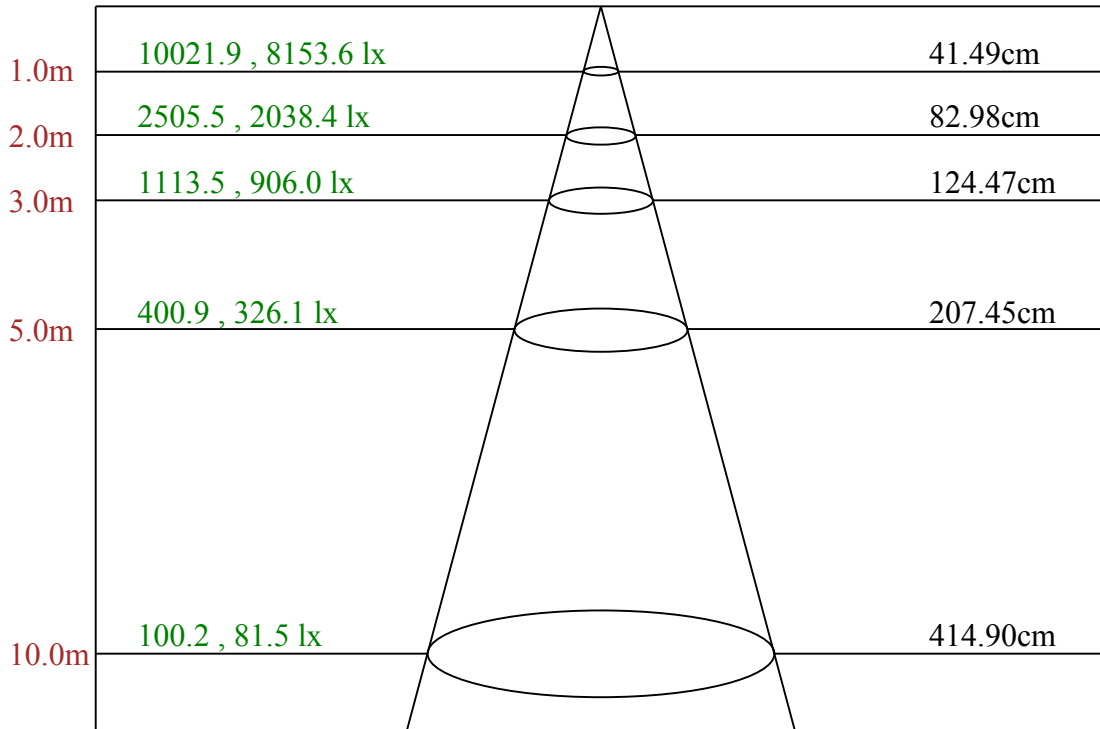
0-10	756.15
10-20	871.75
20-30	149.79
30-40	10.15
40-50	8.59
50-60	8.60
60-70	8.88
70-80	9.13
80-90	8.32
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00



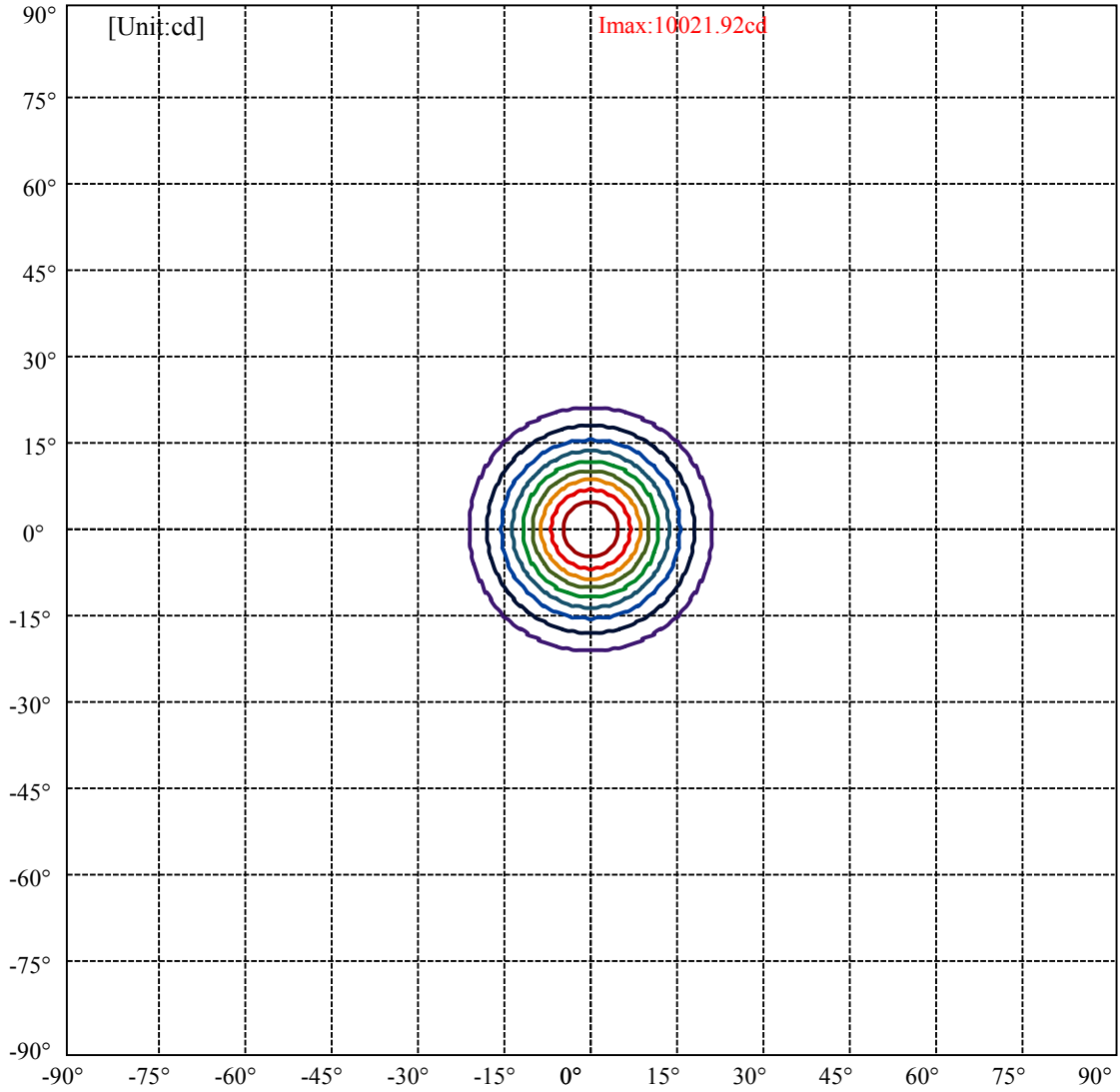
C0(Max): ———  
C0/C180: ———  
C90/C270: ———

Field angle(10%Imax):C0/180Left:20.9 Right:20.9  
:C90/270Left:20.9 Right:20.9

Beam Angle(50%Imax):C0/180Left:11.7 Right:11.7  
:C90/270Left:11.7 Right:11.7

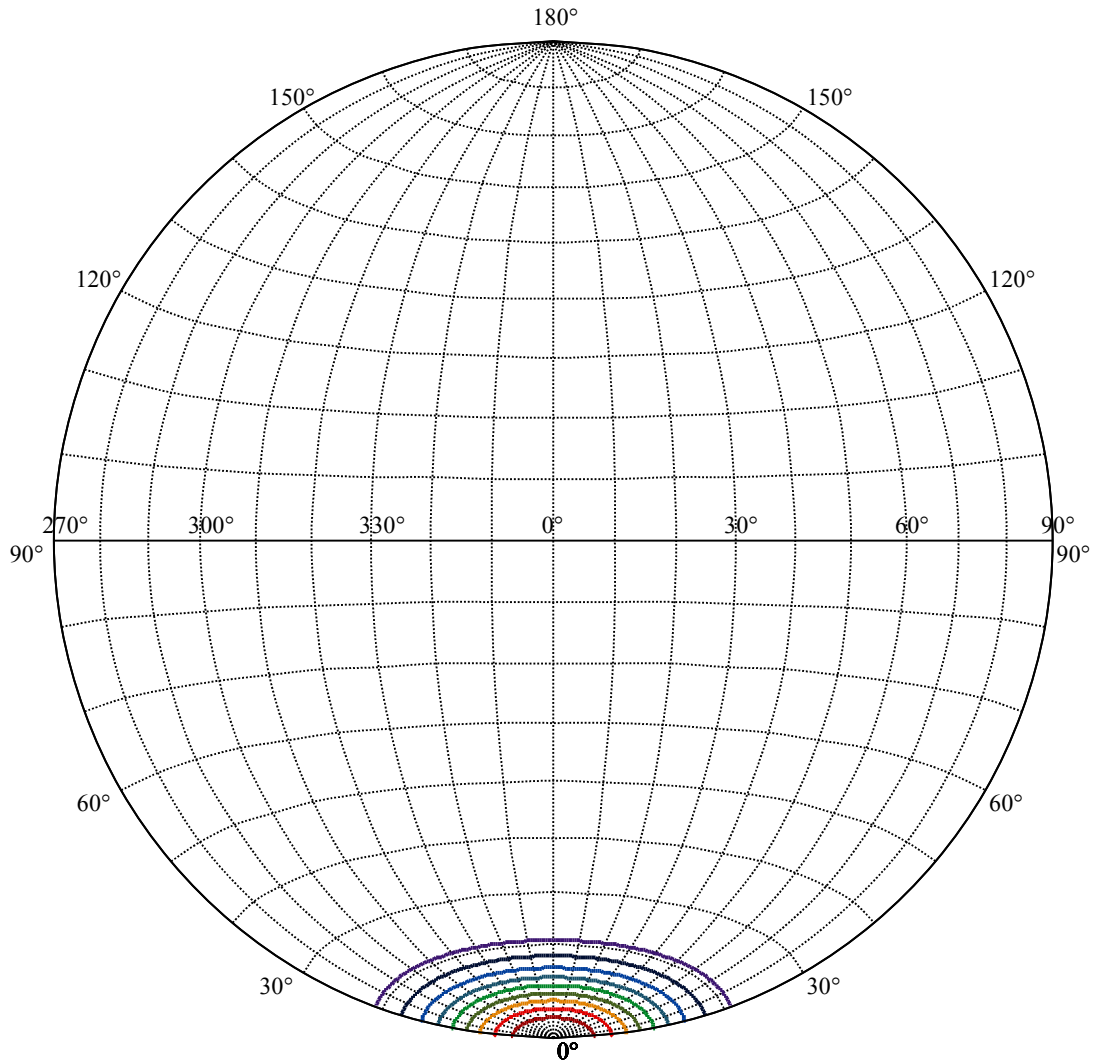


Max , Ave      Beam angle of C0 plane 23.44



(10%Imax) 1002.19	—
(20%Imax) 2004.38	—
(30%Imax) 3006.58	—
(40%Imax) 4008.77	—
(50%Imax) 5010.96	—
(60%Imax) 6013.15	—
(70%Imax) 7015.35	—
(80%Imax) 8017.54	—
(90%Imax) 9019.73	—





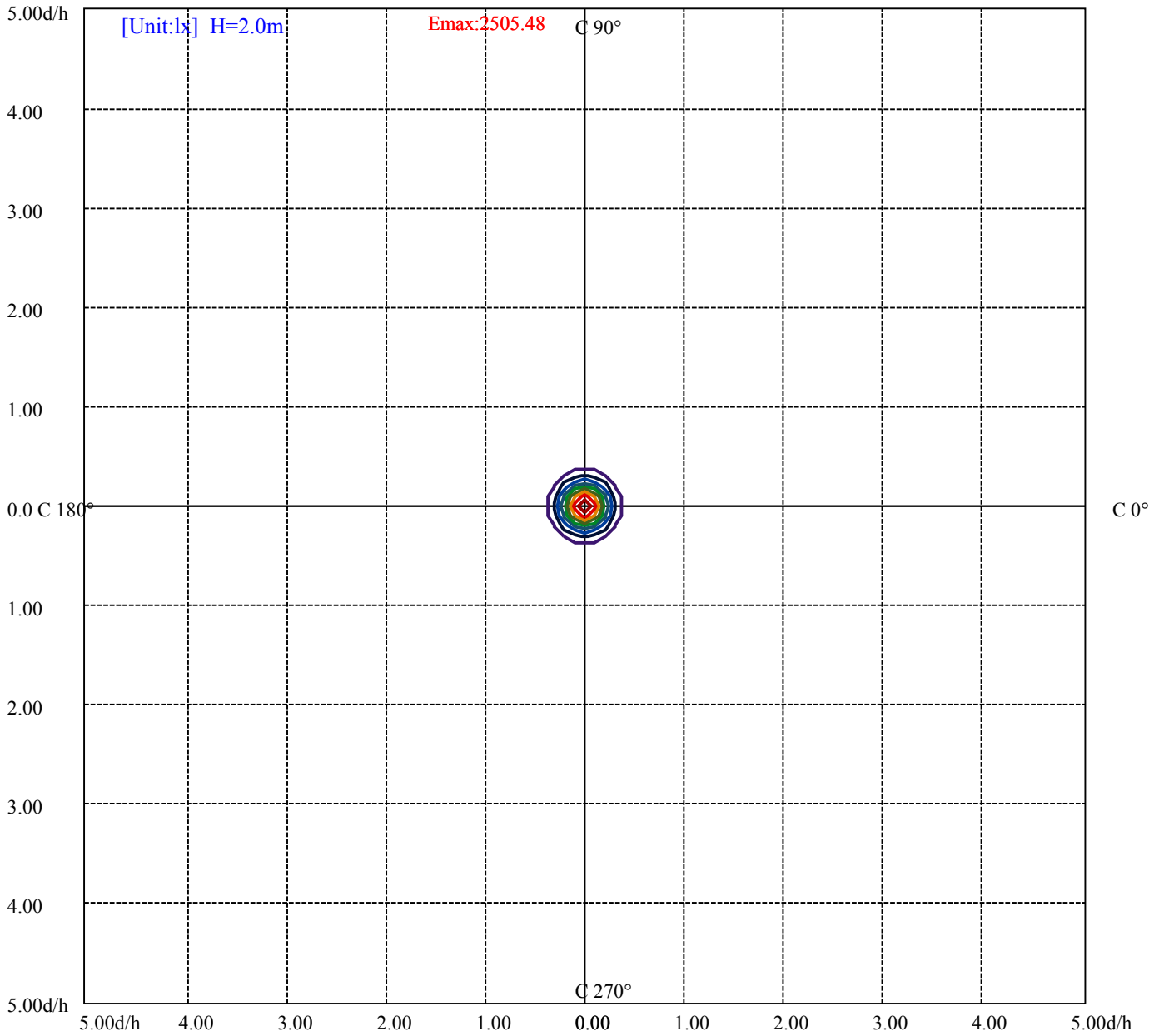
House

[Unit:cd]

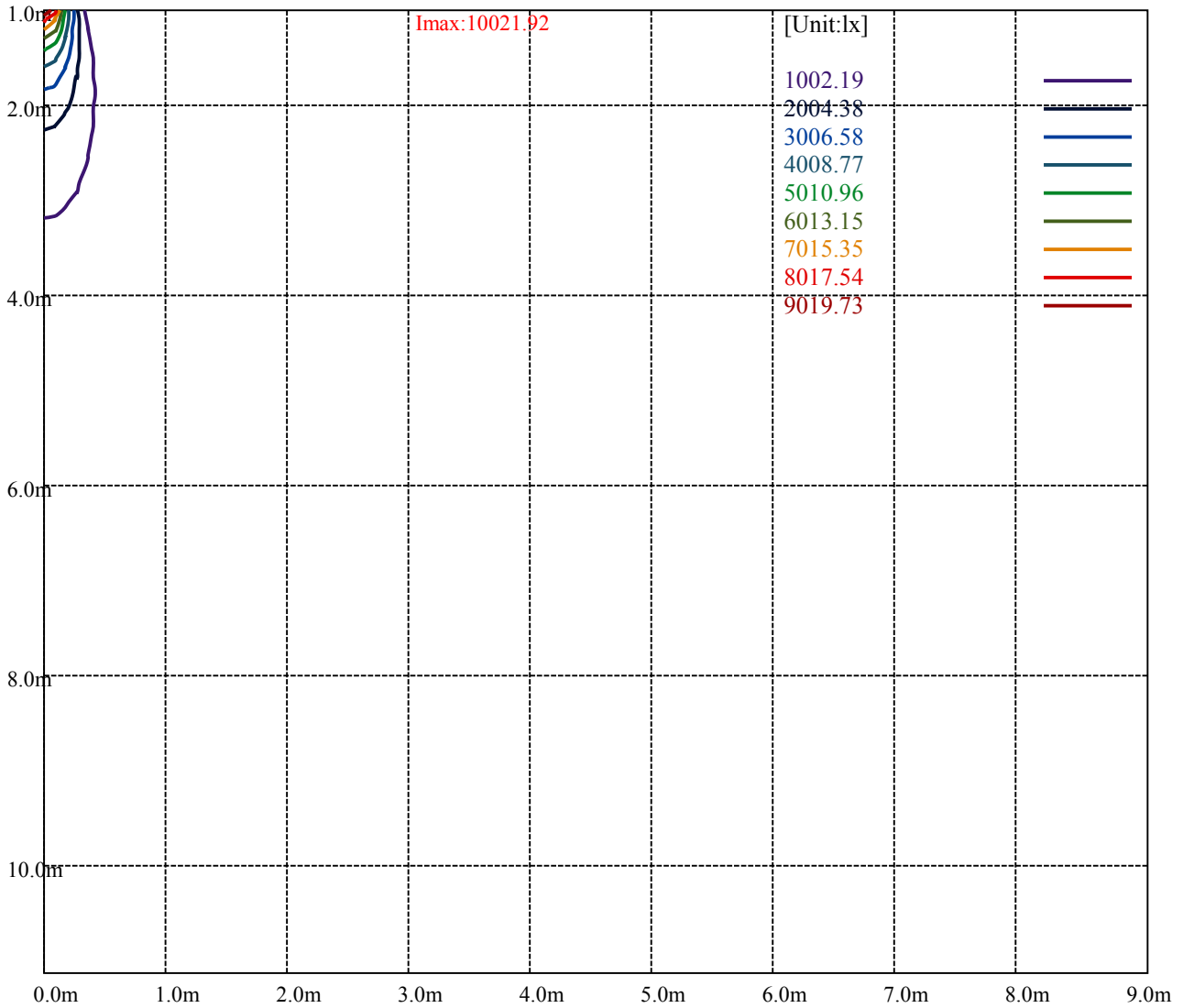
Road

**Imax:10021.92**

(10%Imax)	1002.19	—
(20%Imax)	2004.38	—
(30%Imax)	3006.58	—
(40%Imax)	4008.77	—
(50%Imax)	5010.96	—
(60%Imax)	6013.15	—
(70%Imax)	7015.35	—
(80%Imax)	8017.54	—
(90%Imax)	9019.73	—



- (10%Emax) 250.5475
- (20%Emax) 501.095
- (30%Emax) 751.6425
- (40%Emax) 1002.193
- (50%Emax) 1252.74
- (60%Emax) 1503.287
- (70%Emax) 1753.835
- (80%Emax) 2004.382
- (90%Emax) 2254.93



Luminance Table

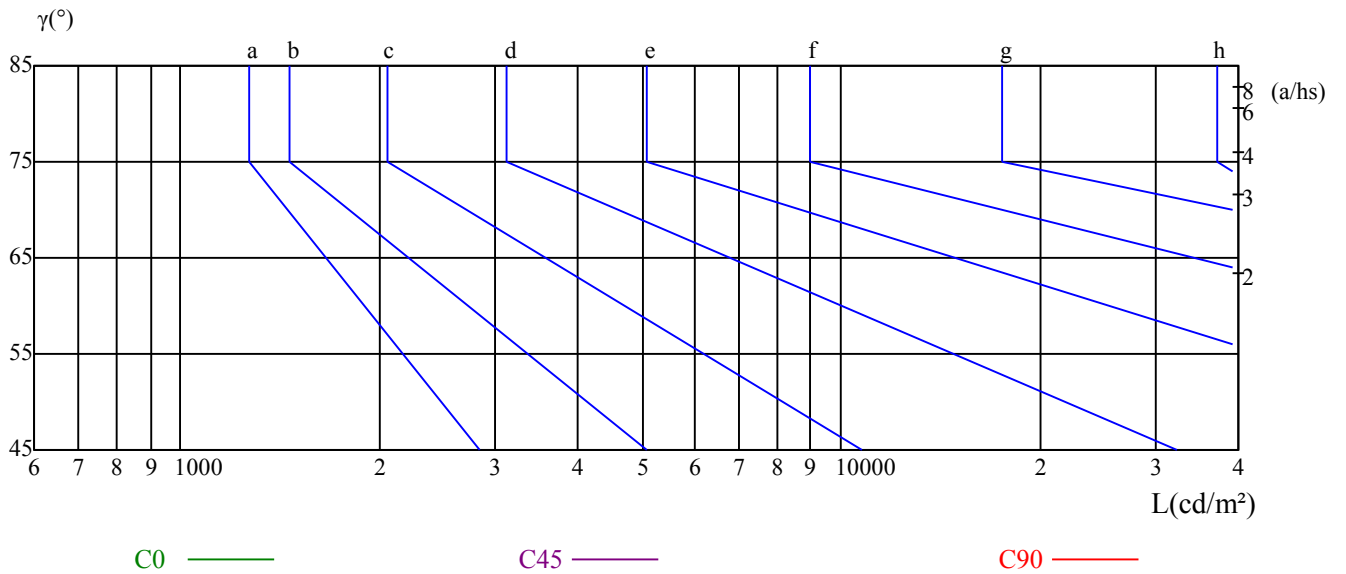
$\gamma$	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

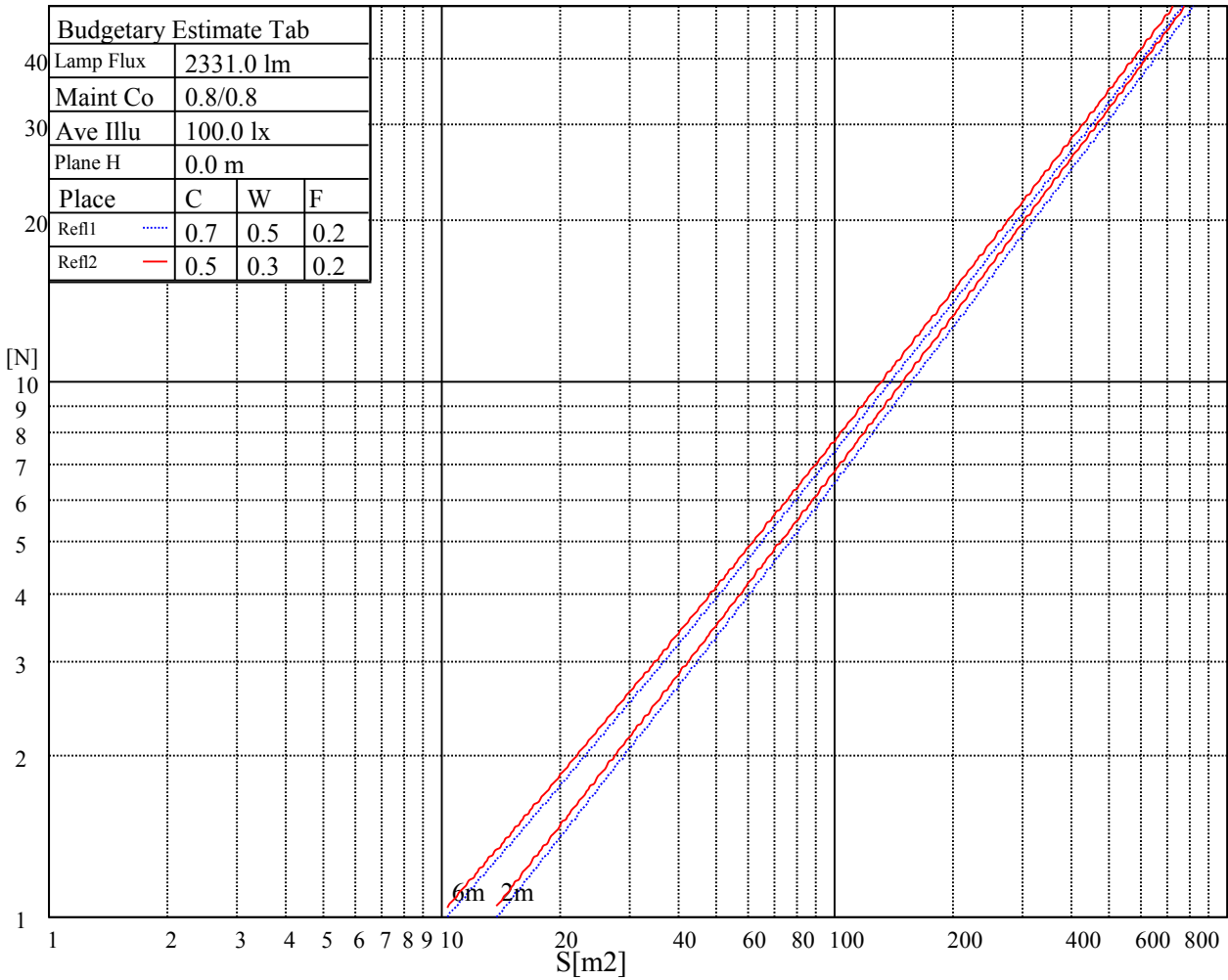
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

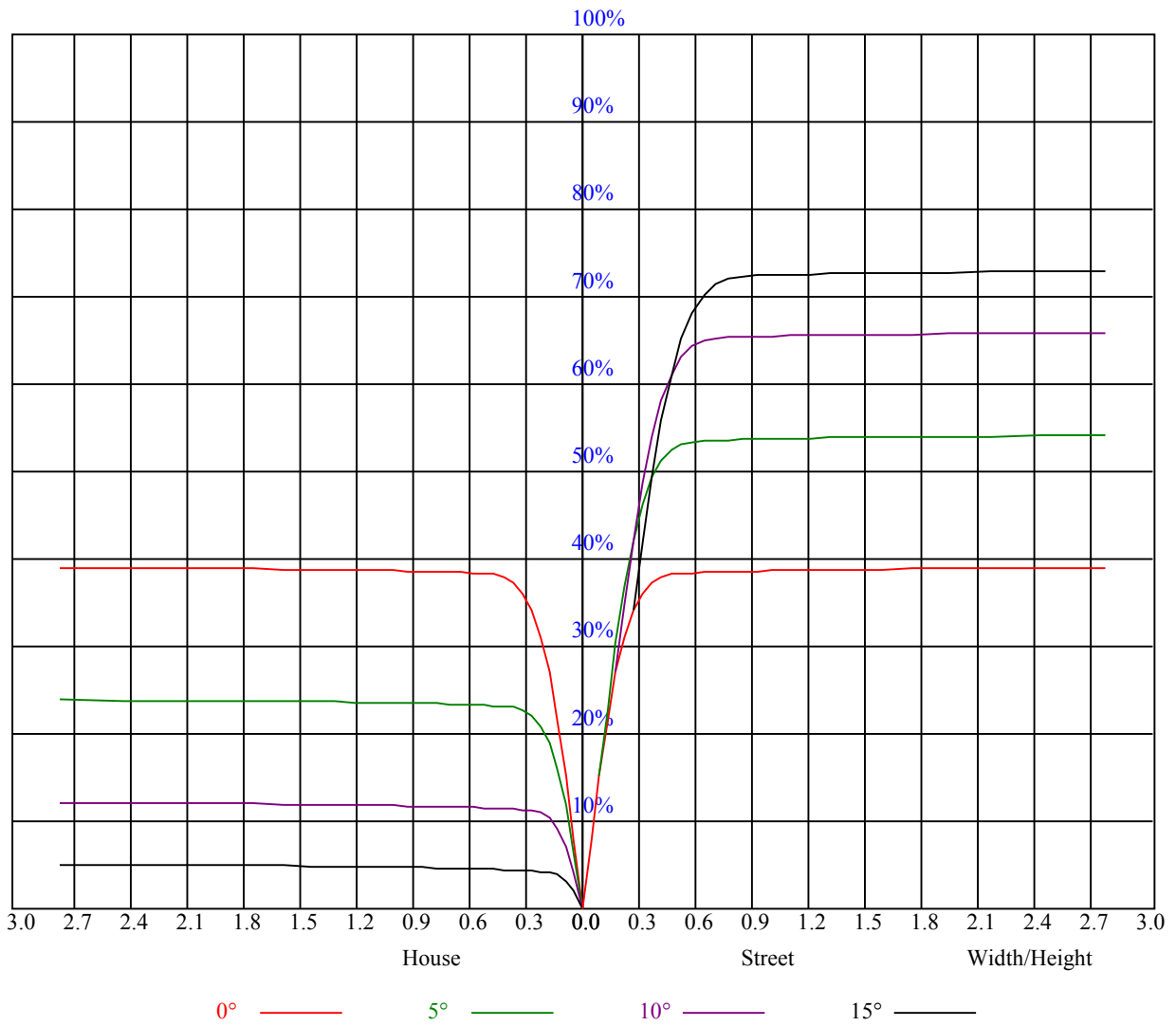
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.94	0.94	0.94	0.91	0.91	0.91	0.87	0.87	0.87	0.84	0.84	0.84	0.80	0.80	0.80	0.79
1	0.89	0.87	0.86	0.87	0.86	0.84	0.84	0.83	0.82	0.81	0.80	0.79	0.78	0.78	0.77	0.76
2	0.85	0.82	0.81	0.83	0.81	0.80	0.81	0.79	0.78	0.79	0.77	0.76	0.77	0.76	0.75	0.74
3	0.81	0.79	0.77	0.80	0.78	0.76	0.79	0.77	0.75	0.77	0.75	0.74	0.75	0.74	0.73	0.72
4	0.79	0.76	0.73	0.78	0.75	0.73	0.76	0.74	0.72	0.75	0.73	0.71	0.74	0.72	0.71	0.70
5	0.76	0.73	0.71	0.76	0.73	0.71	0.74	0.72	0.70	0.73	0.71	0.69	0.72	0.70	0.69	0.68
6	0.74	0.71	0.69	0.73	0.71	0.68	0.72	0.70	0.68	0.71	0.69	0.68	0.71	0.69	0.67	0.66
7	0.72	0.69	0.67	0.71	0.69	0.67	0.71	0.68	0.66	0.70	0.68	0.66	0.69	0.67	0.66	0.65
8	0.70	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.65	0.68	0.66	0.64	0.68	0.66	0.64	0.63
9	0.68	0.65	0.63	0.68	0.65	0.63	0.67	0.65	0.63	0.67	0.65	0.63	0.66	0.64	0.63	0.62
10	0.67	0.64	0.62	0.66	0.64	0.62	0.66	0.63	0.62	0.66	0.63	0.62	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	10045.13	9995.06	9858.94	9662.63	9374.63	8902.69	8470.69	7961.63	7344.56
45.0	10027.13	9987.75	9877.50	9680.63	9405.56	9009.56	8525.25	8022.38	7488.56
90.0	10008.56	9938.81	9799.88	9548.44	9212.63	8820.56	8359.88	7733.81	7189.31
135.0	10006.88	10002.94	9904.50	9706.50	9463.50	9147.38	8611.31	8103.94	7581.38
180.0	10045.13	9985.50	9843.19	9605.81	9328.50	8888.06	8366.63	7842.38	7216.31
225.0	10027.13	9974.25	9840.94	9586.69	9248.63	8829.00	8371.13	7715.81	7164.00
270.0	10008.56	9992.25	9898.31	9691.88	9414.56	9010.13	8514.00	8011.13	7465.50
315.0	10006.88	9927.00	9790.31	9524.25	9161.44	8745.19	8278.31	7621.31	7054.88
360.0	10045.13	9995.06	9858.94	9662.63	9374.63	8902.69	8470.69	7961.63	7344.56
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	6717.38	6135.19	5481.00	4896.56	4278.38	3761.44	3222.00	2723.06	2331.00
45.0	6785.44	6207.19	5612.06	4952.25	4319.44	3801.94	3265.88	2748.38	2373.75
90.0	6589.69	5850.56	5266.13	4701.38	4028.06	3526.31	3066.75	2544.19	2203.88
135.0	6878.25	6299.44	5711.06	5060.25	4420.13	3892.50	3342.38	2824.88	2443.50
180.0	6627.94	5961.38	5298.19	4739.06	4199.06	3569.63	3109.50	2688.19	2250.00
225.0	6587.44	5843.81	5258.81	4695.19	4095.00	3535.88	3078.00	2604.94	2227.50
270.0	6753.94	6167.81	5579.44	4932.56	4320.56	3804.19	3262.50	2766.94	2373.75
315.0	6483.94	5807.25	5141.81	4582.69	4047.19	3434.63	2981.81	2566.13	2149.31
360.0	6717.38	6135.19	5481.00	4896.56	4278.38	3761.44	3222.00	2723.06	2331.00
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1927.69	1616.06	1256.63	1000.13	765.56	586.69	352.69	297.56	109.69
45.0	1960.31	1641.94	1306.69	1002.38	757.69	560.81	354.94	300.38	112.22
90.0	1807.88	1438.31	1093.33	902.03	655.20	474.98	318.32	177.30	80.21
135.0	2029.50	1699.88	1361.25	1046.25	802.13	573.19	383.06	291.38	126.62
180.0	1852.31	1540.13	1119.71	930.32	704.14	488.53	327.54	182.31	83.53
225.0	1841.06	1509.75	1095.24	937.58	662.23	494.16	330.58	154.01	77.91
270.0	1974.94	1663.31	1335.38	1039.50	800.44	573.75	377.44	299.25	116.10
315.0	1770.75	1475.44	1093.78	880.71	662.01	451.13	296.55	158.51	66.71
360.0	1927.69	1616.06	1256.63	1000.13	765.56	586.69	352.69	297.56	109.69
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	41.91	30.32	26.38	23.40	21.32	19.74	18.34	17.21	16.14
45.0	48.21	29.93	25.93	23.46	20.98	19.52	18.39	16.93	16.03
90.0	38.64	27.96	24.24	22.16	20.48	18.73	17.55	16.54	15.64
135.0	48.49	30.71	26.16	23.06	21.09	19.46	18.11	16.93	15.98
180.0	39.43	28.46	24.47	22.16	20.48	18.73	17.55	16.59	15.53
225.0	38.08	29.25	24.75	22.44	20.42	18.84	17.61	16.48	15.53
270.0	43.48	30.21	25.88	23.23	20.87	19.35	17.94	16.71	15.81
315.0	34.82	28.01	24.02	21.88	20.19	18.45	17.33	16.31	15.30
360.0	41.91	30.32	26.38	23.40	21.32	19.74	18.34	17.21	16.14
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	15.19	14.46	13.78	13.22	12.71	12.32	11.93	11.64	11.36
45.0	15.24	14.51	13.89	13.39	12.88	12.43	12.09	11.70	11.42
90.0	14.79	14.18	13.56	12.99	12.60	12.21	11.87	11.53	11.25
135.0	15.13	14.46	13.78	13.22	12.83	12.43	12.04	11.70	11.42
180.0	14.85	14.18	13.50	13.05	12.60	12.15	11.87	11.53	11.19
225.0	14.68	13.95	13.39	12.94	12.38	12.04	11.70	11.36	11.08
270.0	14.91	14.23	13.56	13.05	12.54	12.15	11.76	11.48	11.25
315.0	14.51	13.89	13.28	12.71	12.32	11.93	11.64	11.36	11.03
360.0	15.19	14.46	13.78	13.22	12.71	12.32	11.93	11.64	11.36



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	11.03	10.86	10.69	10.46	10.29	10.13	10.01	9.90	9.79
45.0	11.19	10.91	10.74	10.58	10.41	10.24	10.13	10.01	9.84
90.0	11.03	10.86	10.58	10.41	10.29	10.13	10.01	9.90	9.79
135.0	11.08	10.91	10.74	10.52	10.35	10.18	10.07	9.96	9.84
180.0	10.97	10.80	10.58	10.41	10.24	10.07	9.96	9.84	9.73
225.0	10.86	10.69	10.46	10.29	10.13	10.01	9.90	9.79	9.68
270.0	10.97	10.74	10.58	10.41	10.24	10.07	9.96	9.84	9.73
315.0	10.86	10.63	10.41	10.24	10.13	9.96	9.84	9.73	9.62
360.0	11.03	10.86	10.69	10.46	10.29	10.13	10.01	9.90	9.79
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	9.68	9.56	9.51	9.39	9.34	9.28	9.17	9.11	9.11
45.0	9.79	9.68	9.62	9.51	9.39	9.34	9.28	9.23	9.17
90.0	9.68	9.56	9.51	9.39	9.39	9.28	9.23	9.17	9.06
135.0	9.73	9.62	9.51	9.45	9.34	9.28	9.23	9.17	9.11
180.0	9.62	9.56	9.45	9.39	9.28	9.23	9.17	9.11	9.06
225.0	9.56	9.51	9.39	9.34	9.28	9.23	9.17	9.06	9.00
270.0	9.62	9.56	9.45	9.39	9.28	9.23	9.17	9.11	9.06
315.0	9.56	9.45	9.34	9.28	9.23	9.17	9.11	9.06	9.00
360.0	9.68	9.56	9.51	9.39	9.34	9.28	9.17	9.11	9.11
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.00	9.00	8.94	8.89	8.83	8.83	8.78	8.72	8.72
45.0	9.11	9.06	9.00	8.94	8.94	8.89	8.89	8.83	8.78
90.0	9.00	9.00	9.00	8.94	8.89	8.89	8.83	8.83	8.78
135.0	9.06	9.00	8.94	8.89	8.89	8.83	8.78	8.78	8.72
180.0	9.00	8.94	8.89	8.83	8.78	8.78	8.72	8.72	8.66
225.0	8.94	8.94	8.89	8.89	8.83	8.78	8.72	8.72	8.66
270.0	9.06	8.94	8.94	8.89	8.89	8.83	8.83	8.78	8.78
315.0	8.94	8.94	8.83	8.83	8.78	8.78	8.78	8.72	8.66
360.0	9.00	9.00	8.94	8.89	8.83	8.83	8.78	8.72	8.72
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	8.66	8.66	8.66	8.61	8.61	8.61	8.55	8.55	8.49
45.0	8.72	8.72	8.72	8.66	8.66	8.66	8.61	8.61	8.61
90.0	8.78	8.72	8.72	8.72	8.72	8.66	8.66	8.66	8.66
135.0	8.72	8.66	8.66	8.61	8.61	8.55	8.61	8.55	8.55
180.0	8.66	8.61	8.55	8.55	8.55	8.49	8.49	8.44	8.44
225.0	8.66	8.61	8.61	8.55	8.55	8.55	8.49	8.49	8.44
270.0	8.72	8.72	8.72	8.72	8.66	8.66	8.66	8.66	8.61
315.0	8.66	8.61	8.55	8.55	8.55	8.49	8.49	8.49	8.49
360.0	8.66	8.66	8.66	8.61	8.61	8.61	8.55	8.55	8.49
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.49	8.49	8.49	8.44	8.49	8.49	8.44	8.38	8.38
45.0	8.55	8.55	8.55	8.49	8.49	8.49	8.44	8.44	8.44
90.0	8.66	8.61	8.66	8.66	8.61	8.49	8.38	8.38	8.38
135.0	8.49	8.49	8.49	8.44	8.44	8.44	8.44	8.38	8.38
180.0	8.44	8.44	8.38	8.38	8.38	8.38	8.33	8.33	8.38
225.0	8.49	8.44	8.44	8.44	8.44	8.44	8.44	8.44	8.44
270.0	8.61	8.61	8.61	8.66	8.66	8.61	8.44	8.44	8.38
315.0	8.44	8.44	8.44	8.44	8.44	8.38	8.38	8.38	8.38
360.0	8.49	8.49	8.49	8.44	8.49	8.49	8.44	8.38	8.38

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>8.38</b>
<b>45.0</b>	<b>8.44</b>
<b>90.0</b>	<b>8.44</b>
<b>135.0</b>	<b>8.38</b>
<b>180.0</b>	<b>8.38</b>
<b>225.0</b>	<b>8.38</b>
<b>270.0</b>	<b>8.44</b>
<b>315.0</b>	<b>8.38</b>
<b>360.0</b>	<b>8.38</b>