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## Nata

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LumCAT: 2-2430-M	
Luminaire: 99.70.131.00	
Report No: 220816-B006	Voltage(V): 35.4500
Test No: 220816-C006	Current(A): 0.4810
LampCAT: CITIZEN CLU038	Power (W): 17.0510
Lamp flux(lm): 2249.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 43	Width(mm): 43
Phm Type: C	Height(mm): 0

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## Photometric Results

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Lumens(lm): 1889.28  
Efficiency(%): 84.01%  
Lumens(lm)/Power(W): 110.80  
Central intensity(cd): 6819.747  
Maximum intensity(cd): 6819.747  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=23.8  
                                  [C90/270]Total=23.8  
Field angle(10%Imax): [C0/180]Total=56.4  
                                  [C90/270]Total=56.4  
Maximum s/h(1/2): C0\_180=0.40 C90\_270=0.40  
Maximum s/h(1/4): C0\_180=0.45 C90\_270=0.45  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 84.01%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 97.959%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6819.748	0.000	0	.000%	.000%
1.0	6783.971	6.509	6.509	.289%	.345%
2.0	6668.050	19.308	25.817	.859%	1.366%
3.0	6476.916	31.438	57.255	1.398%	3.031%
4.0	6230.659	42.536	99.791	1.891%	5.282%
5.0	5922.110	52.281	152.072	2.325%	8.049%
6.0	5544.994	60.263	212.335	2.680%	11.239%
7.0	5182.892	66.588	278.923	2.961%	14.763%
8.0	4817.951	71.574	350.497	3.183%	18.552%
9.0	4413.723	74.818	425.314	3.327%	22.512%
10.0	4046.317	76.560	501.875	3.404%	26.564%
11.0	3711.477	77.516	579.391	3.447%	30.667%
12.0	3382.612	77.549	656.939	3.448%	34.772%
13.0	3065.174	76.519	733.458	3.402%	38.822%
14.0	2796.884	75.034	808.492	3.336%	42.794%
15.0	2544.801	73.333	881.825	3.261%	46.675%
16.0	2326.778	71.382	953.208	3.174%	50.453%
17.0	2105.393	69.021	1022.228	3.069%	54.107%
18.0	1928.002	66.502	1088.73	2.957%	57.627%
19.0	1772.196	64.376	1153.106	2.862%	61.034%
20.0	1617.138	62.034	1215.14	2.758%	64.318%
21.0	1463.505	59.155	1274.295	2.630%	67.449%
22.0	1346.913	56.477	1330.772	2.511%	70.438%
23.0	1208.958	53.629	1384.401	2.385%	73.277%
24.0	1119.590	50.910	1435.311	2.264%	75.971%
25.0	1020.893	48.670	1483.981	2.164%	78.547%
26.0	920.464	45.826	1529.807	2.038%	80.973%
27.0	814.671	42.450	1572.257	1.888%	83.220%
28.0	701.723	38.392	1610.649	1.707%	85.252%
29.0	598.806	34.026	1644.675	1.513%	87.053%
30.0	506.817	29.852	1674.526	1.327%	88.633%
31.0	416.508	25.695	1700.221	1.143%	89.993%
32.0	335.102	21.533	1721.754	.957%	91.133%
33.0	261.598	17.579	1739.333	.782%	92.063%
34.0	206.924	14.179	1753.512	.630%	92.814%
35.0	147.425	11.005	1764.517	.489%	93.396%
36.0	119.424	8.497	1773.013	.378%	93.846%
37.0	102.065	7.224	1780.237	.321%	94.228%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	89.443	6.392	1786.629	.284%	94.567%
39.0	78.560	5.734	1792.363	.255%	94.870%
40.0	69.799	5.174	1797.538	.230%	95.144%
41.0	62.509	4.711	1802.249	.209%	95.393%
42.0	55.757	4.297	1806.546	.191%	95.621%
43.0	50.245	3.927	1810.473	.175%	95.829%
44.0	45.562	3.616	1814.089	.161%	96.020%
45.0	41.476	3.345	1817.434	.149%	96.197%
46.0	37.719	3.097	1820.531	.138%	96.361%
47.0	34.649	2.878	1823.409	.128%	96.513%
48.0	32.005	2.695	1826.103	.120%	96.656%
49.0	29.757	2.536	1828.64	.113%	96.790%
50.0	27.606	2.392	1831.031	.106%	96.917%
51.0	25.948	2.266	1833.297	.101%	97.037%
52.0	24.551	2.167	1835.464	.096%	97.151%
53.0	23.281	2.081	1837.545	.093%	97.262%
54.0	22.206	2.005	1839.55	.089%	97.368%
55.0	21.362	1.945	1841.494	.086%	97.471%
56.0	20.622	1.897	1843.392	.084%	97.571%
57.0	20.010	1.858	1845.249	.083%	97.669%
58.0	19.577	1.831	1847.08	.081%	97.766%
59.0	19.323	1.819	1848.899	.081%	97.863%
60.0	19.143	1.817	1850.716	.081%	97.959%
61.0	18.957	1.818	1852.534	.081%	98.055%
62.0	18.815	1.820	1854.354	.081%	98.151%
63.0	18.419	1.811	1856.165	.081%	98.247%
64.0	17.694	1.772	1857.937	.079%	98.341%
65.0	16.932	1.714	1859.651	.076%	98.432%
66.0	16.044	1.645	1861.296	.073%	98.519%
67.0	15.207	1.571	1862.867	.070%	98.602%
68.0	14.386	1.499	1864.366	.067%	98.681%
69.0	13.713	1.433	1865.8	.064%	98.757%
70.0	13.228	1.384	1867.183	.062%	98.830%
71.0	12.705	1.340	1868.524	.060%	98.901%
72.0	12.339	1.302	1869.826	.058%	98.970%
73.0	12.055	1.276	1871.102	.057%	99.038%
74.0	11.749	1.251	1872.353	.056%	99.104%
75.0	11.450	1.226	1873.579	.055%	99.169%

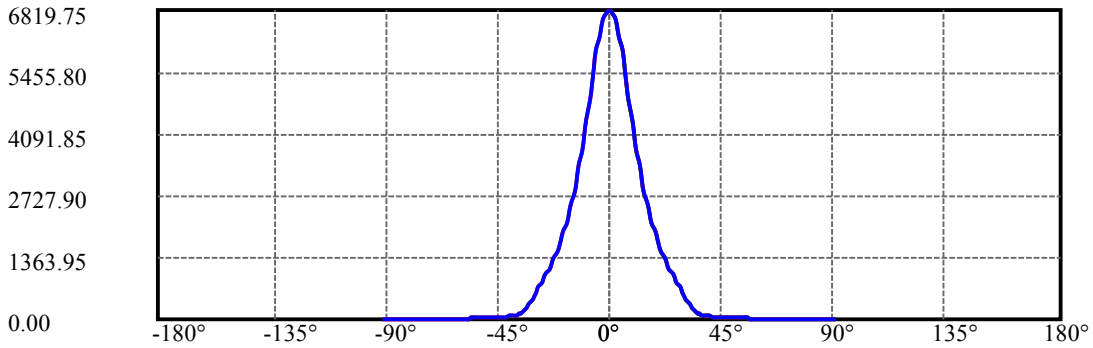
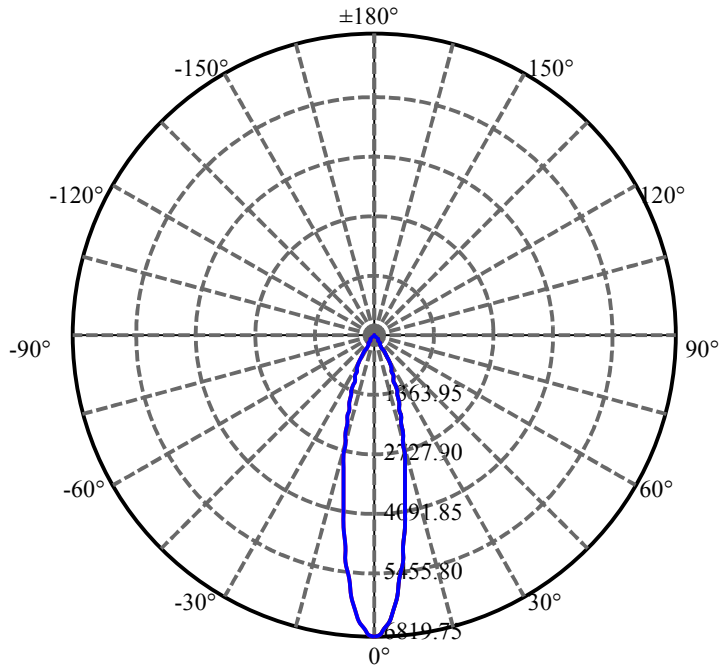
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	11.174	1.201	1874.78	.053%	99.232%
77.0	10.912	1.178	1875.957	.052%	99.295%
78.0	10.643	1.154	1877.111	.051%	99.356%
79.0	10.375	1.129	1878.241	.050%	99.416%
80.0	10.113	1.105	1879.345	.049%	99.474%
81.0	9.897	1.082	1880.427	.048%	99.531%
82.0	9.687	1.062	1881.489	.047%	99.588%
83.0	9.456	1.041	1882.53	.046%	99.643%
84.0	9.239	1.018	1883.548	.045%	99.697%
85.0	9.045	0.998	1884.546	.044%	99.749%
86.0	8.851	0.978	1885.524	.043%	99.801%
87.0	8.687	0.960	1886.484	.043%	99.852%
88.0	8.545	0.944	1887.428	.042%	99.902%
89.0	8.403	0.929	1888.357	.041%	99.951%
90.0	8.455	0.924	1889.281	.041%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1674.53	74.46%	88.63%
0-40	1797.54	79.93%	95.14%
0-60	1850.72	82.29%	97.96%
0-90	1888.36	83.97%	99.95%
0-120	1888.36	83.97%	99.95%
0-180	1889.28	84.01%	100.00%
60-90	39.46	1.75%	2.09%
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%
0-25.60	1511.43	67.21%	80.00%

ZONAL LUMEN SUMMARY

0-10	501.87
10-20	713.27
20-30	459.39
30-40	123.01
40-50	33.49
50-60	19.68
60-70	16.47
70-80	12.16
80-90	9.01
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: ———

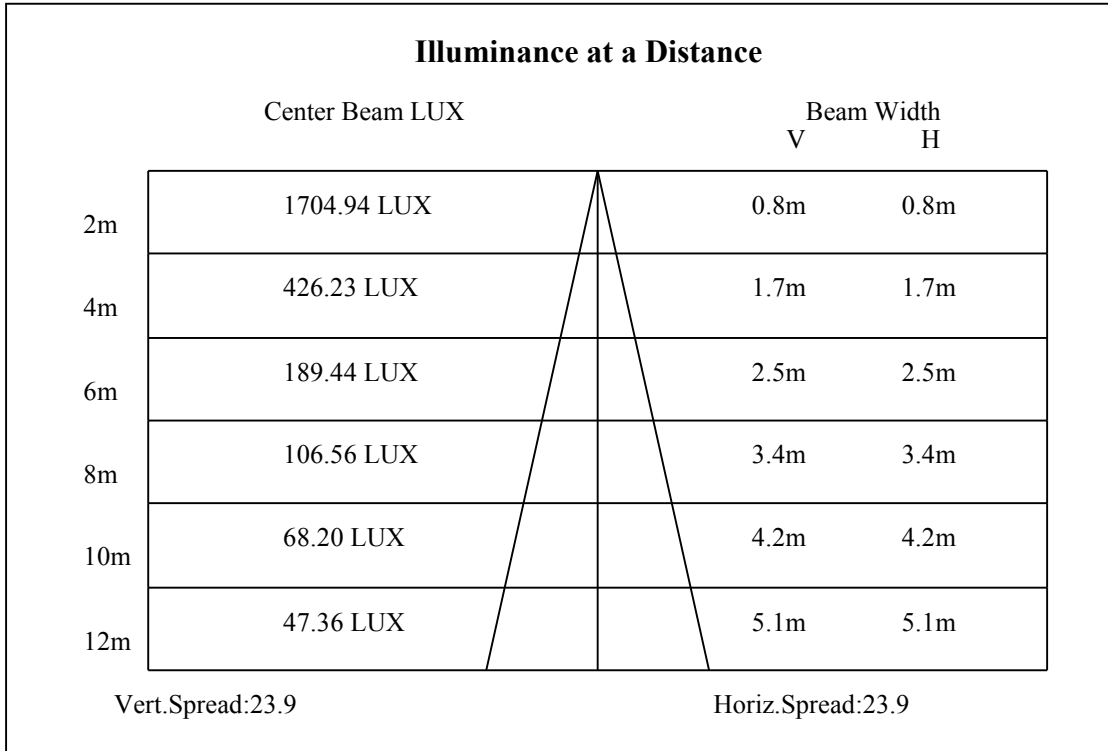
C90/C270: ———

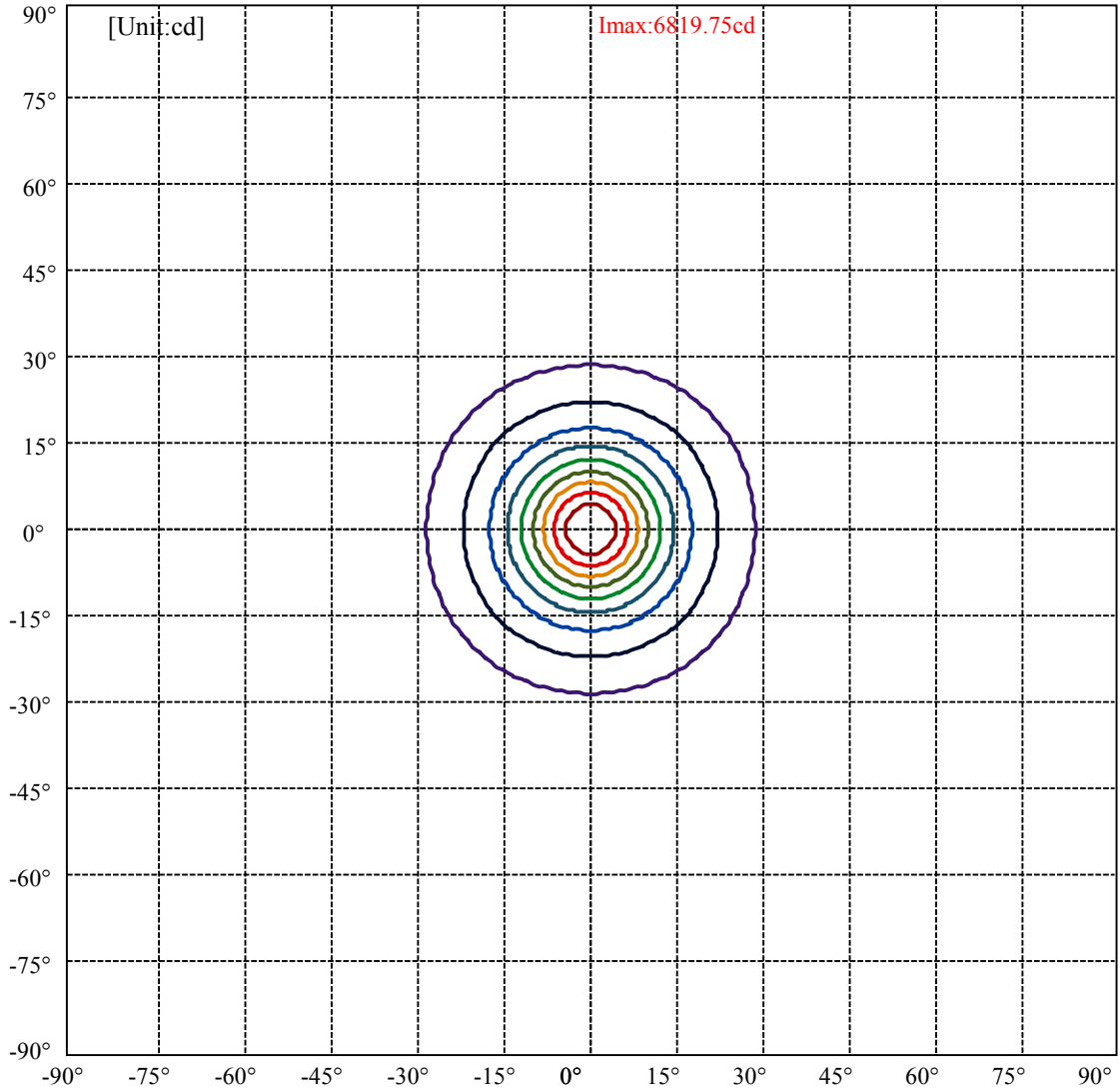
Field angle(10%Imax):C0/180Left:28.2 Right:28.2

:C90/270Left:28.2 Right:28.2

Beam Angle(50%Imax):C0/180Left:11.9 Right:11.9

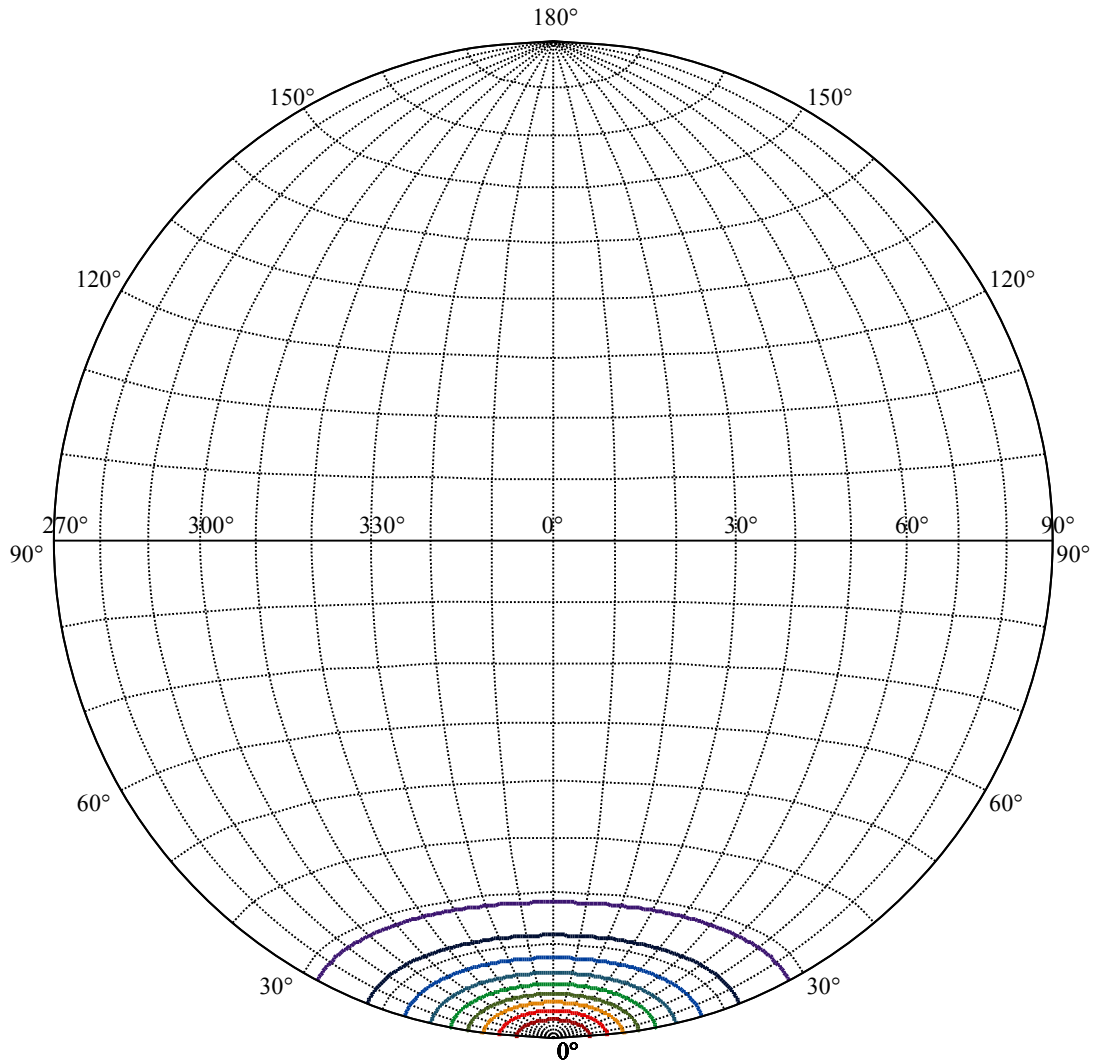
:C90/270Left:11.9 Right:11.9





(10%Imax) 681.975	—
(20%Imax) 1363.95	—
(30%Imax) 2045.92	—
(40%Imax) 2727.9	—
(50%Imax) 3409.87	—
(60%Imax) 4091.85	—
(70%Imax) 4773.82	—
(80%Imax) 5455.8	—
(90%Imax) 6137.77	—





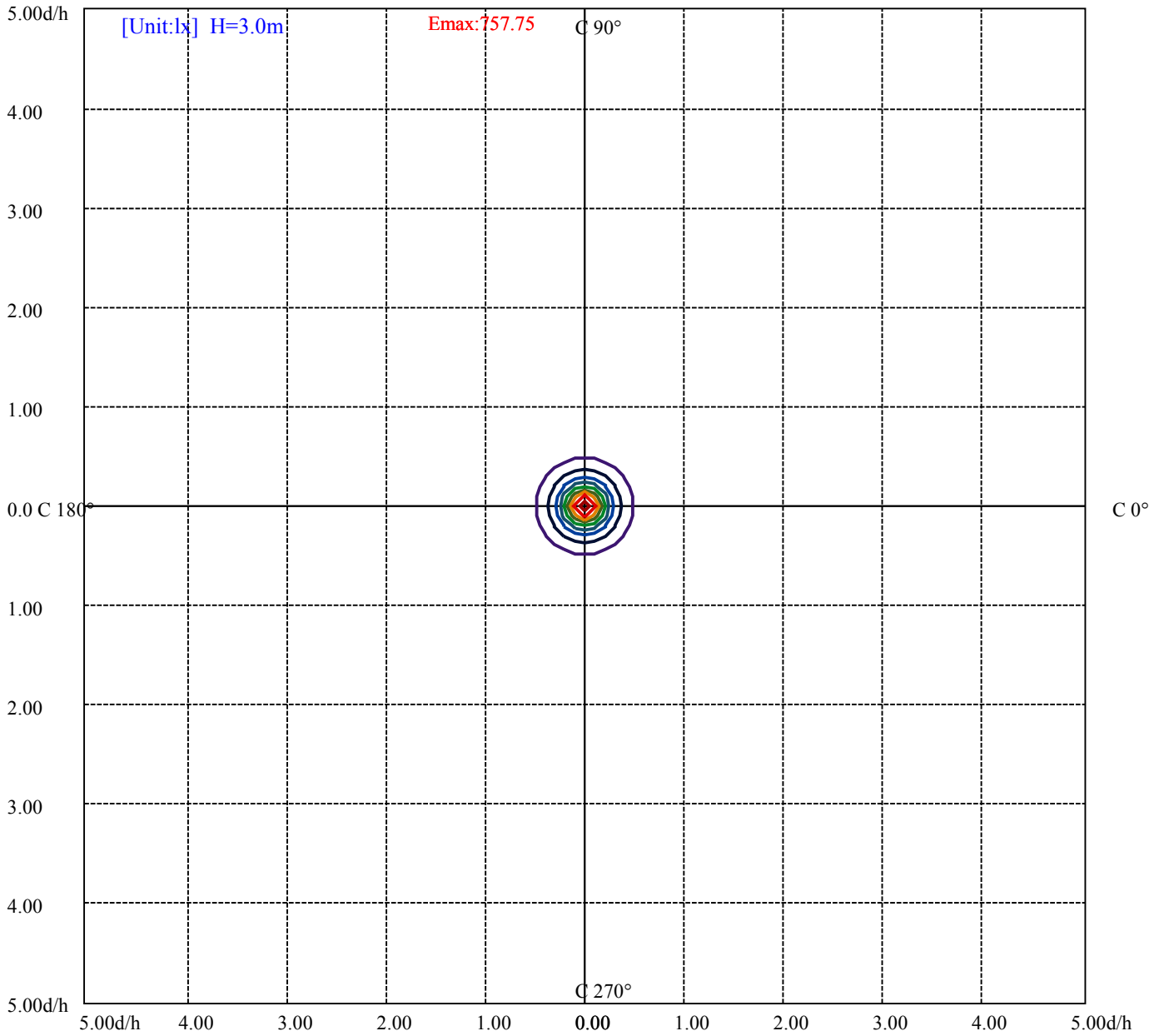
House

[Unit:cd]

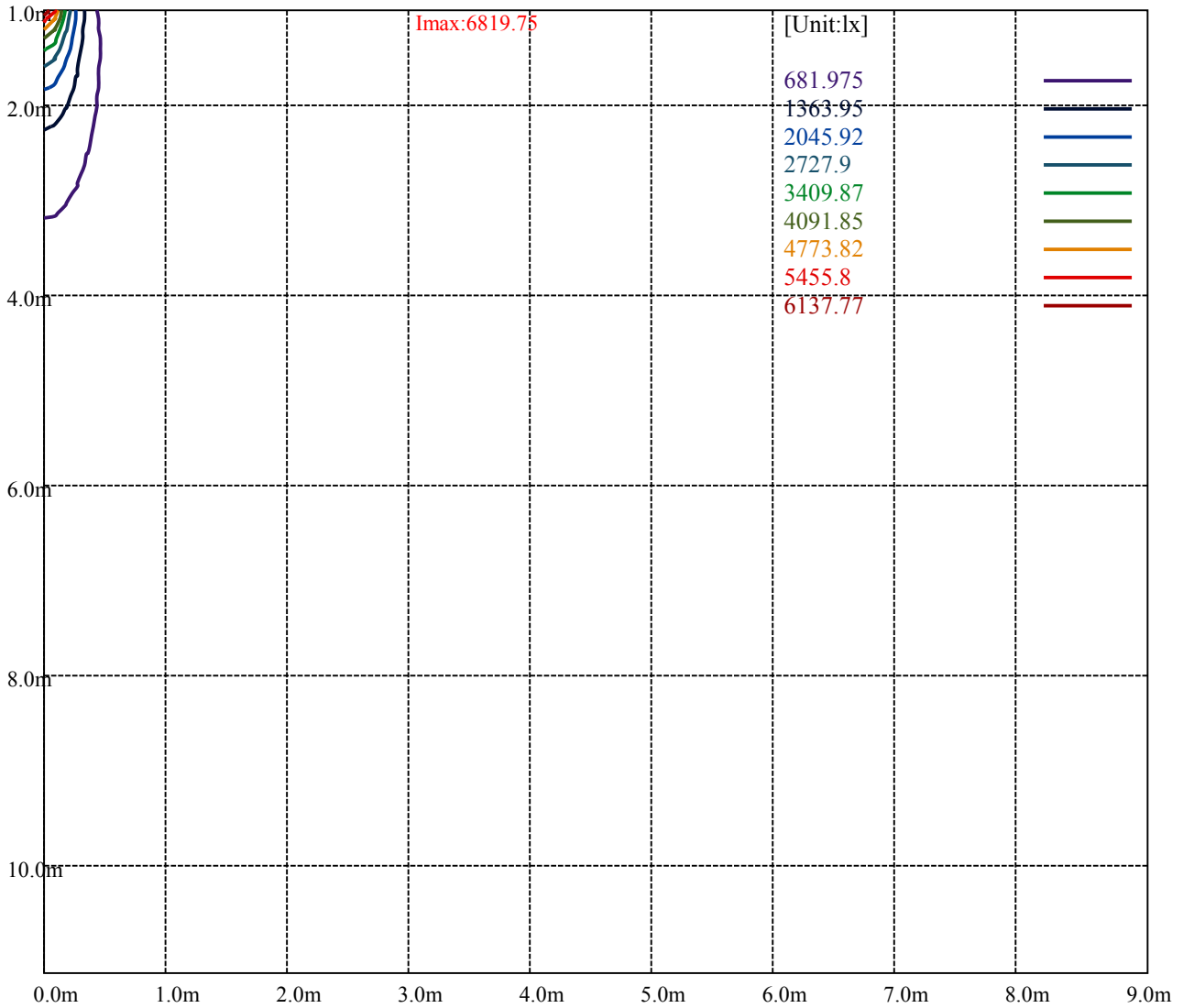
Road

Imax:6819.75

(10%Imax) 681.975	—
(20%Imax) 1363.95	—
(30%Imax) 2045.92	—
(40%Imax) 2727.9	—
(50%Imax) 3409.87	—
(60%Imax) 4091.85	—
(70%Imax) 4773.82	—
(80%Imax) 5455.8	—
(90%Imax) 6137.77	—



- (10%Emax) 75.77489
- (20%Emax) 151.55
- (30%Emax) 227.3244
- (40%Emax) 303.1
- (50%Emax) 378.8745
- (60%Emax) 454.6489
- (70%Emax) 530.4244
- (80%Emax) 606.1989
- (90%Emax) 681.9744



Luminance Table

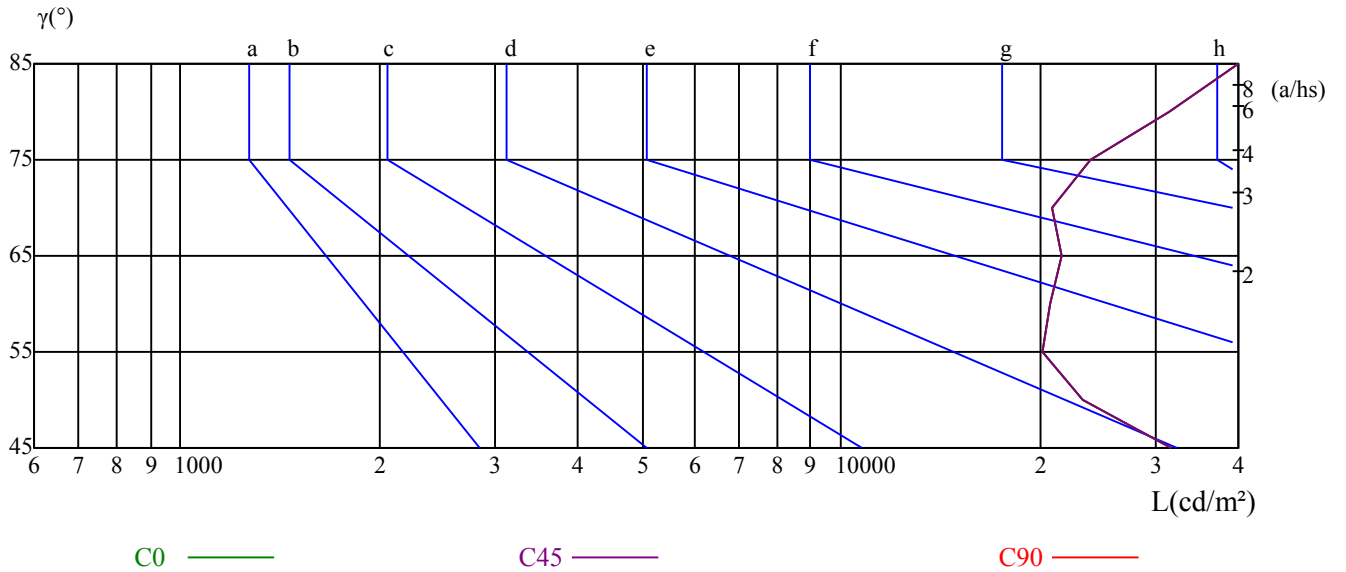
$\gamma$	45	50	55	60	65	70	75	80	85
C0	31723	23227	20142	20707	21669	20917	23926	31498	56128
C45	31723	23227	20142	20707	21669	20917	23926	31498	56128
C90	31723	23227	20142	20707	21669	20917	23926	31498	56128

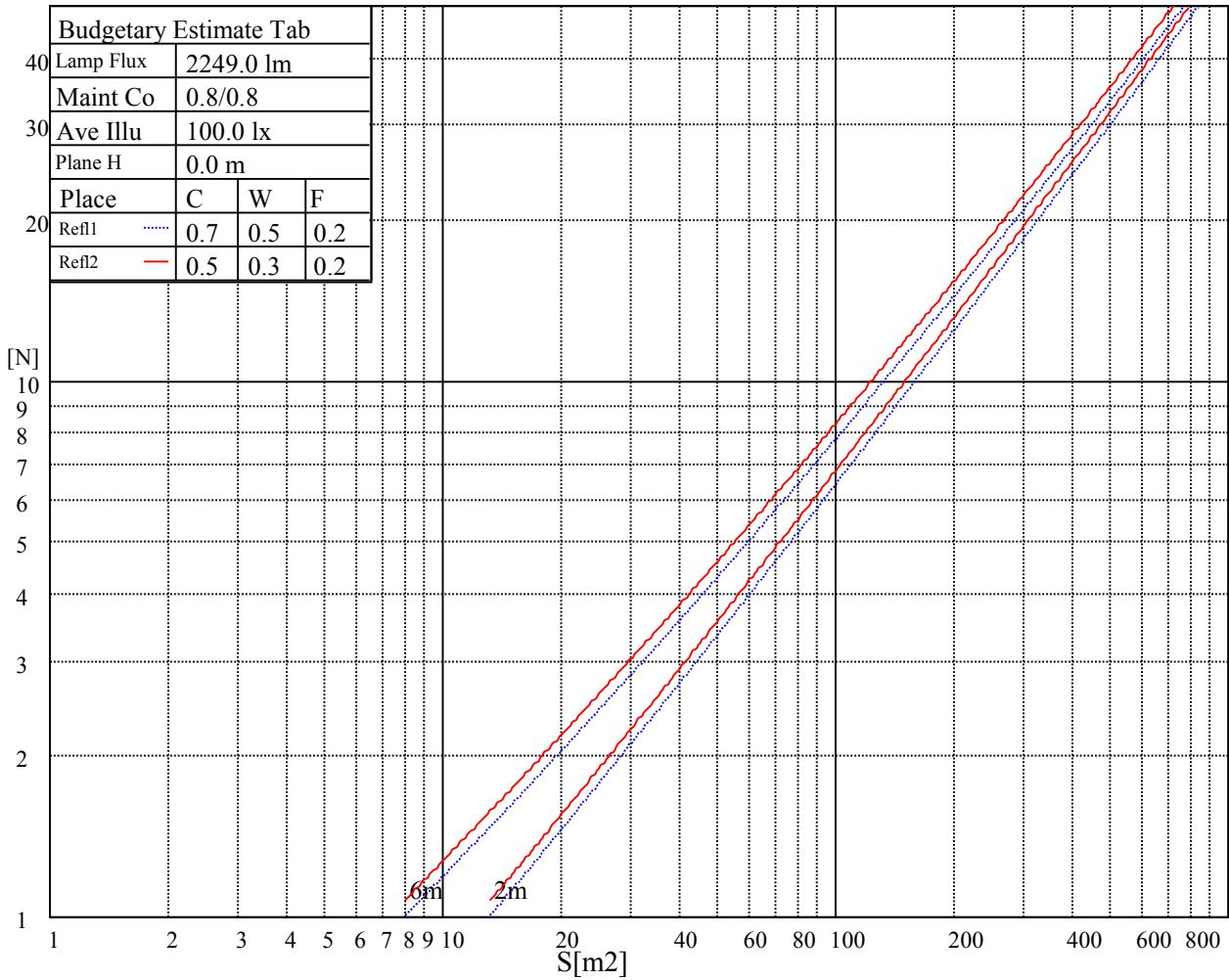
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
21669	21669	21669	23926	23926	23926	56128	56128	56128

Glare Table

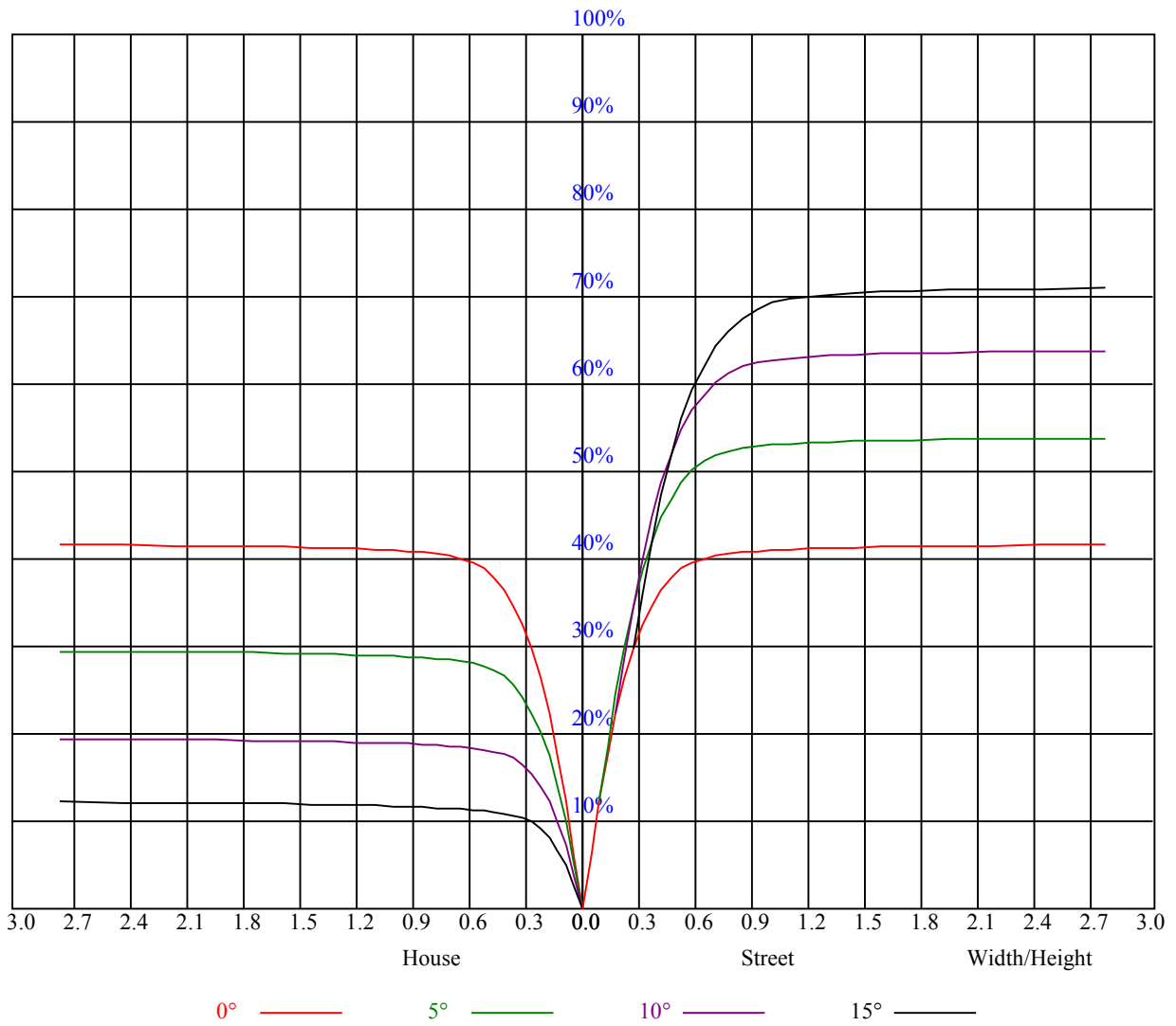
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.00	1.00	1.00	0.98	0.98	0.98	0.93	0.93	0.93	0.89	0.89	0.89	0.86	0.86	0.86	0.84
1	0.94	0.92	0.90	0.92	0.90	0.89	0.89	0.87	0.86	0.86	0.84	0.84	0.83	0.82	0.81	0.80
2	0.89	0.86	0.83	0.87	0.84	0.82	0.84	0.82	0.80	0.82	0.80	0.79	0.80	0.78	0.77	0.76
3	0.84	0.80	0.78	0.83	0.80	0.77	0.81	0.78	0.76	0.79	0.76	0.75	0.77	0.75	0.73	0.72
4	0.80	0.76	0.73	0.79	0.75	0.73	0.77	0.74	0.72	0.76	0.73	0.71	0.74	0.72	0.70	0.69
5	0.76	0.72	0.69	0.76	0.72	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.66
6	0.73	0.69	0.66	0.72	0.69	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.69	0.67	0.65	0.64
7	0.70	0.66	0.63	0.70	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.62	0.67	0.64	0.62	0.61
8	0.67	0.63	0.61	0.67	0.63	0.60	0.66	0.63	0.60	0.65	0.62	0.60	0.65	0.62	0.60	0.59
9	0.65	0.61	0.58	0.65	0.61	0.58	0.64	0.60	0.58	0.63	0.60	0.58	0.63	0.60	0.58	0.57
10	0.63	0.59	0.56	0.62	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.55



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	6759.85	6850.07	6852.46	6783.75	6624.80	6405.51	6098.98	5730.90	5384.93
45.0	6863.82	6804.06	6657.67	6424.03	6162.32	5889.84	5405.84	5052.71	4739.00
90.0	6819.00	6697.70	6517.85	6250.75	5949.60	5572.56	5217.62	4810.11	4400.20
135.0	6836.33	6752.68	6551.91	6329.62	6049.98	5691.46	5301.87	4949.33	4548.99
180.0	6759.85	6624.21	6403.72	6083.44	5758.39	5417.20	4972.64	4612.92	4257.39
225.0	6863.82	6839.91	6764.03	6600.90	6339.78	6052.97	5684.29	5305.46	4949.93
270.0	6819.00	6854.85	6804.06	6696.51	6518.44	6191.60	5880.28	5548.06	5200.89
315.0	6836.33	6848.28	6792.71	6646.32	6441.96	6155.74	5798.42	5453.65	5062.27
360.0	6759.85	6850.07	6852.46	6783.75	6624.80	6405.51	6098.98	5730.90	5384.93
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4974.43	4572.89	4220.94	3883.94	3480.61	3196.18	2918.33	2638.09	2378.17
45.0	4244.25	3898.28	3616.84	3237.41	2933.87	2712.18	2430.75	2223.41	2021.44
90.0	4052.44	3687.35	3356.32	3071.30	2816.15	2521.57	2313.63	2124.22	1933.01
135.0	4152.83	3811.64	3465.67	3175.27	2869.93	2604.03	2388.92	2188.75	1971.25
180.0	3832.55	3527.81	3244.58	2906.98	2663.78	2443.89	2194.72	2042.95	1857.12
225.0	4595.60	4157.61	3823.59	3509.29	3150.77	2885.47	2643.47	2422.98	2175.60
270.0	4759.92	4413.95	4059.01	3693.33	3359.91	3077.87	2780.90	2515.60	2301.68
315.0	4697.77	4301.61	3904.85	3583.38	3246.38	2933.87	2687.69	2458.23	2204.88
360.0	4974.43	4572.89	4220.94	3883.94	3480.61	3196.18	2918.33	2638.09	2378.17
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2204.88	1982.00	1809.32	1670.69	1527.28	1403.60	1269.15	1155.62	1068.38
45.0	1846.96	1699.97	1553.58	1417.94	1297.24	1189.08	1074.95	984.13	883.15
90.0	1762.71	1627.07	1486.65	1349.22	1185.50	1127.54	1041.13	938.42	823.34
135.0	1820.07	1671.89	1510.55	1391.05	1271.54	1155.02	1051.05	959.63	863.43
180.0	1676.07	1563.73	1434.67	1187.35	1176.00	1087.38	982.99	869.46	768.12
225.0	1999.93	1845.77	1685.03	1534.45	1411.36	1182.21	1158.07	1065.10	955.63
270.0	2090.16	1924.64	1756.74	1603.17	1475.30	1336.67	1212.98	1119.17	1039.10
315.0	2023.23	1862.50	1700.57	1554.17	1431.08	1190.16	1166.38	1075.61	962.56
360.0	2204.88	1982.00	1809.32	1670.69	1527.28	1403.60	1269.15	1155.62	1068.38
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	976.36	846.10	740.94	642.94	531.80	446.95	369.27	305.34	211.88
45.0	772.60	663.85	566.46	470.26	383.02	310.72	258.91	173.16	127.57
90.0	723.25	627.94	513.76	429.32	349.14	258.49	195.39	147.83	117.89
135.0	752.89	640.55	547.34	452.33	362.70	313.11	205.43	157.03	125.36
180.0	670.91	554.45	467.45	387.68	302.83	226.76	169.94	128.89	108.63
225.0	851.06	730.48	621.91	534.85	450.06	353.14	280.48	214.57	151.71
270.0	896.29	791.13	700.90	584.38	485.79	414.09	320.28	302.35	181.05
315.0	874.01	759.28	631.71	552.77	466.73	357.56	293.09	226.22	155.30
360.0	976.36	846.10	740.94	642.94	531.80	446.95	369.27	305.34	211.88
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	159.24	122.97	106.18	93.04	81.56	73.26	65.55	58.62	53.30
45.0	108.15	96.02	83.71	73.74	66.15	59.51	52.52	47.74	43.56
90.0	101.82	90.29	78.75	70.09	61.55	54.43	48.52	43.92	39.62
135.0	103.31	91.18	80.37	69.85	62.08	55.81	48.94	44.58	40.39
180.0	96.14	83.30	73.85	64.83	57.18	51.45	46.55	41.35	37.82
225.0	123.27	108.15	94.65	82.52	73.68	65.31	58.74	52.52	47.20
270.0	136.06	114.90	100.80	88.85	79.35	71.52	62.98	57.18	52.10
315.0	127.39	109.71	97.22	85.57	76.84	68.78	62.26	56.05	50.49
360.0	159.24	122.97	106.18	93.04	81.56	73.26	65.55	58.62	53.30



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	48.64	43.62	40.03	36.93	34.18	31.13	29.16	27.43	25.63
45.0	39.56	36.03	33.34	30.71	28.68	26.71	25.04	23.78	22.59
90.0	36.33	33.40	30.41	28.32	26.53	24.68	23.36	22.23	21.09
135.0	36.81	33.46	31.01	28.56	26.59	25.10	23.60	22.41	21.33
180.0	34.78	31.61	29.40	27.49	25.69	24.08	22.89	21.69	20.91
225.0	43.08	39.08	35.49	32.86	30.53	28.20	26.53	25.16	23.78
270.0	46.43	42.66	39.32	35.91	33.04	30.83	28.68	27.01	25.51
315.0	46.19	41.89	38.18	35.25	32.80	30.12	28.32	26.71	25.39
360.0	48.64	43.62	40.03	36.93	34.18	31.13	29.16	27.43	25.63
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	24.38	23.30	22.23	21.33	20.67	20.14	19.66	19.48	19.42
45.0	21.57	20.85	20.26	19.72	19.30	19.12	19.12	18.94	18.70
90.0	20.32	19.66	19.06	18.82	18.52	18.52	18.46	18.22	18.11
135.0	20.50	19.78	19.30	18.82	18.58	18.46	18.58	18.46	18.22
180.0	20.08	19.42	19.06	18.76	18.58	18.58	18.58	18.22	17.99
225.0	22.65	21.81	20.91	20.26	19.84	19.48	19.24	19.18	19.12
270.0	24.20	23.12	22.11	21.27	20.61	20.20	19.78	19.60	19.54
315.0	23.96	22.95	22.05	21.09	20.50	20.08	19.72	19.54	19.42
360.0	24.38	23.30	22.23	21.33	20.67	20.14	19.66	19.48	19.42
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	19.24	18.88	18.40	17.57	16.79	15.72	14.82	14.34	13.44
45.0	18.40	17.33	16.49	15.77	14.70	14.10	13.50	12.91	12.55
90.0	17.57	16.55	15.66	14.70	14.04	13.38	12.79	12.43	12.07
135.0	17.87	16.85	16.01	15.18	14.22	13.62	12.91	12.55	12.13
180.0	17.21	16.13	15.42	14.52	13.74	13.09	12.67	12.31	12.01
225.0	18.88	18.46	17.33	16.67	15.77	14.76	14.22	13.56	13.03
270.0	19.18	18.76	18.22	17.09	16.25	15.36	14.52	13.98	13.27
315.0	19.00	18.58	17.93	16.85	16.13	15.06	14.28	13.74	13.15
360.0	19.24	18.88	18.40	17.57	16.79	15.72	14.82	14.34	13.44
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	12.97	12.67	12.25	11.95	11.65	11.35	11.05	10.82	10.52
45.0	12.25	11.95	11.65	11.41	11.11	10.88	10.58	10.28	10.04
90.0	11.83	11.53	11.23	10.99	10.70	10.46	10.22	9.98	9.68
135.0	11.83	11.59	11.35	10.99	10.76	10.52	10.28	9.98	9.74
180.0	11.65	11.41	11.17	10.88	10.58	10.34	10.10	9.86	9.62
225.0	12.67	12.43	12.13	11.83	11.59	11.29	11.05	10.82	10.52
270.0	12.85	12.49	12.13	11.83	11.59	11.29	10.99	10.70	10.46
315.0	12.67	12.37	12.07	11.71	11.41	11.17	10.88	10.58	10.34
360.0	12.97	12.67	12.25	11.95	11.65	11.35	11.05	10.82	10.52
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.28	10.04	9.74	9.56	9.38	9.20	8.96	8.72	8.54
45.0	9.86	9.62	9.44	9.14	8.96	8.72	8.54	8.60	8.25
90.0	9.50	9.38	9.08	8.90	8.78	8.60	8.48	8.43	8.25
135.0	9.56	9.38	9.14	8.90	8.78	8.60	8.48	8.60	8.25
180.0	9.44	9.20	9.02	8.78	8.60	8.54	8.54	8.25	8.43
225.0	10.28	10.10	9.80	9.62	9.26	8.90	8.72	8.54	8.54
270.0	10.16	9.92	9.80	9.56	9.32	9.14	8.90	8.66	8.48
315.0	10.10	9.86	9.62	9.44	9.26	9.08	8.84	8.54	8.48
360.0	10.28	10.04	9.74	9.56	9.38	9.20	8.96	8.72	8.54

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>8.54</b>
<b>45.0</b>	<b>8.54</b>
<b>90.0</b>	<b>8.43</b>
<b>135.0</b>	<b>8.54</b>
<b>180.0</b>	<b>8.37</b>
<b>225.0</b>	<b>8.31</b>
<b>270.0</b>	<b>8.43</b>
<b>315.0</b>	<b>8.48</b>
<b>360.0</b>	<b>8.54</b>