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## Nata

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LumCAT: 3-1938-M	
Luminaire: BJB 47.319.2021	
Report No: GC2017070602	Voltage(V): 34.5600
Test No: NT-0010	Current(A): 0.5000
LampCAT: SEOUL SAWx15	Power (W): 17.2800
Lamp flux(lm): 2402.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 78	Width(mm): 78
Phm Type: C	Height(mm): 0

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## Photometric Results

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Lumens(lm): 2128.75  
Efficiency(%): 88.62%  
Lumens(lm)/Power(W): 123.19  
Central intensity(cd): 8442.208  
Maximum intensity(cd): 8442.208  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=17.2  
                                  [C90/270]Total=17.2  
Field angle(10%Imax): [C0/180]Total=61.8  
                                  [C90/270]Total=61.8  
Maximum s/h(1/2): C0\_180=0.29 C90\_270=0.29  
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(%): 88.62%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.684%

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Equipment: GMS1980  
Temperature(°C): 25.0

Date: 2017/7/5  
Humidity(%): 60.0%

Operator: NT07  
Distance(m): 7.46

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	8442.209	0.000	0	.000%	.000%
1.0	8388.018	8.053	8.053	.335%	.378%
2.0	8206.385	23.818	31.871	.992%	1.497%
3.0	7907.118	38.538	70.409	1.604%	3.308%
4.0	7449.106	51.402	121.811	2.140%	5.722%
5.0	6799.721	61.298	183.109	2.552%	8.602%
6.0	6036.529	67.458	250.567	2.808%	11.771%
7.0	5287.737	70.290	320.856	2.926%	15.072%
8.0	4568.022	70.536	391.392	2.937%	18.386%
9.0	3966.707	69.169	460.561	2.880%	21.635%
10.0	3490.955	67.489	528.051	2.810%	24.806%
11.0	3153.637	66.393	594.444	2.764%	27.924%
12.0	2920.109	66.395	660.838	2.764%	31.043%
13.0	2728.389	67.033	727.872	2.791%	34.192%
14.0	2576.808	67.906	795.778	2.827%	37.382%
15.0	2448.601	68.991	864.769	2.872%	40.623%
16.0	2322.272	69.907	934.676	2.910%	43.907%
17.0	2184.325	70.180	1004.855	2.922%	47.204%
18.0	2061.683	70.007	1074.863	2.915%	50.493%
19.0	1945.997	69.725	1144.588	2.903%	53.768%
20.0	1824.051	69.002	1213.591	2.873%	57.009%
21.0	1708.713	67.836	1281.427	2.824%	60.196%
22.0	1610.279	66.697	1348.124	2.777%	63.329%
23.0	1511.289	65.499	1413.622	2.727%	66.406%
24.0	1410.281	63.876	1477.498	2.659%	69.407%
25.0	1324.717	62.188	1539.686	2.589%	72.328%
26.0	1237.733	60.487	1600.173	2.518%	75.169%
27.0	1158.889	58.634	1658.807	2.441%	77.924%
28.0	1078.187	56.638	1715.445	2.358%	80.584%
29.0	1014.529	54.751	1770.197	2.279%	83.156%
30.0	934.056	52.611	1822.808	2.190%	85.628%
31.0	835.532	49.245	1872.053	2.050%	87.941%
32.0	722.406	44.633	1916.686	1.858%	90.038%
33.0	608.536	39.210	1955.896	1.632%	91.880%
34.0	498.214	33.494	1989.39	1.394%	93.453%
35.0	386.285	27.469	2016.859	1.144%	94.744%
36.0	293.513	21.645	2038.504	.901%	95.760%
37.0	198.071	16.033	2054.537	.667%	96.514%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	132.173	11.023	2065.56	.459%	97.031%
39.0	69.544	6.885	2072.445	.287%	97.355%
40.0	43.485	3.942	2076.387	.164%	97.540%
41.0	30.782	2.645	2079.031	.110%	97.664%
42.0	26.351	2.076	2081.107	.086%	97.762%
43.0	22.789	1.820	2082.928	.076%	97.847%
44.0	19.854	1.609	2084.537	.067%	97.923%
45.0	17.482	1.435	2085.972	.060%	97.990%
46.0	15.409	1.286	2087.258	.054%	98.051%
47.0	13.906	1.166	2088.424	.049%	98.105%
48.0	12.869	1.082	2089.506	.045%	98.156%
49.0	12.132	1.027	2090.533	.043%	98.205%
50.0	11.534	0.987	2091.52	.041%	98.251%
51.0	11.172	0.961	2092.48	.040%	98.296%
52.0	10.908	0.947	2093.428	.039%	98.341%
53.0	10.643	0.937	2094.365	.039%	98.385%
54.0	10.386	0.927	2095.292	.039%	98.428%
55.0	10.191	0.919	2096.211	.038%	98.471%
56.0	10.003	0.913	2097.123	.038%	98.514%
57.0	9.836	0.907	2098.03	.038%	98.557%
58.0	9.711	0.904	2098.934	.038%	98.599%
59.0	9.565	0.901	2099.836	.038%	98.642%
60.0	9.461	0.899	2100.734	.037%	98.684%
61.0	9.336	0.897	2101.631	.037%	98.726%
62.0	9.252	0.896	2102.527	.037%	98.768%
63.0	9.189	0.897	2103.424	.037%	98.810%
64.0	9.148	0.900	2104.324	.037%	98.852%
65.0	9.092	0.903	2105.227	.038%	98.895%
66.0	9.050	0.905	2106.132	.038%	98.937%
67.0	9.016	0.908	2107.04	.038%	98.980%
68.0	8.974	0.911	2107.951	.038%	99.023%
69.0	8.967	0.915	2108.867	.038%	99.066%
70.0	8.932	0.919	2109.786	.038%	99.109%
71.0	8.904	0.922	2110.708	.038%	99.152%
72.0	8.904	0.926	2111.634	.039%	99.196%
73.0	8.883	0.930	2112.564	.039%	99.239%
74.0	8.883	0.934	2113.498	.039%	99.283%
75.0	8.876	0.938	2114.436	.039%	99.327%

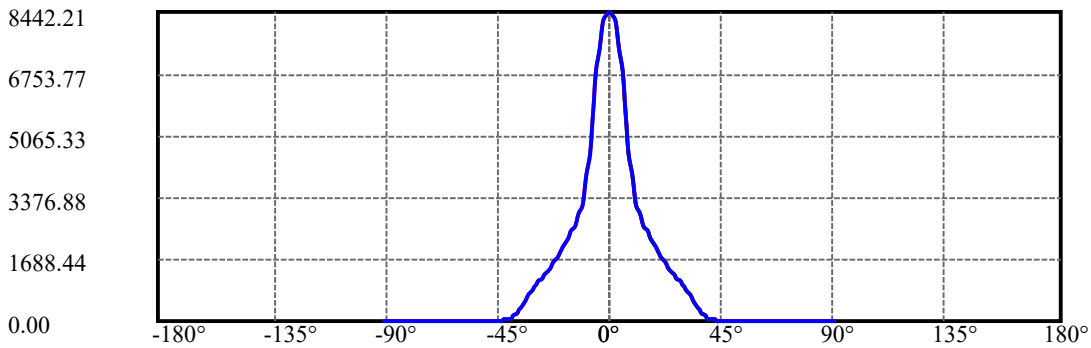
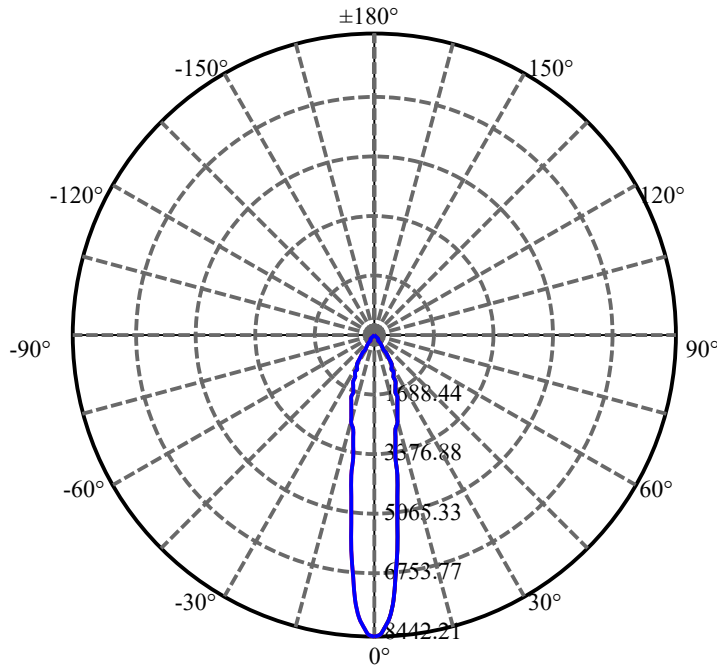
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.842	0.941	2115.377	.039%	99.372%
77.0	8.821	0.942	2116.319	.039%	99.416%
78.0	8.814	0.944	2117.263	.039%	99.460%
79.0	8.807	0.947	2118.209	.039%	99.505%
80.0	8.828	0.951	2119.16	.040%	99.549%
81.0	8.814	0.954	2120.114	.040%	99.594%
82.0	8.814	0.956	2121.07	.040%	99.639%
83.0	8.842	0.960	2122.03	.040%	99.684%
84.0	8.821	0.962	2122.992	.040%	99.729%
85.0	8.800	0.962	2123.954	.040%	99.775%
86.0	8.814	0.963	2124.916	.040%	99.820%
87.0	8.765	0.962	2125.879	.040%	99.865%
88.0	8.737	0.959	2126.837	.040%	99.910%
89.0	8.737	0.958	2127.795	.040%	99.955%
90.0	8.744	0.958	2128.754	.040%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1822.81	75.89%	85.63%
0-40	2076.39	86.44%	97.54%
0-60	2100.73	87.46%	98.68%
0-90	2127.80	88.58%	99.95%
0-120	2127.80	88.58%	99.95%
0-180	2128.75	88.62%	100.00%
60-90	27.96	1.16%	1.31%
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%
0-27.78	1703.00	70.90%	80.00%

ZONAL LUMEN SUMMARY

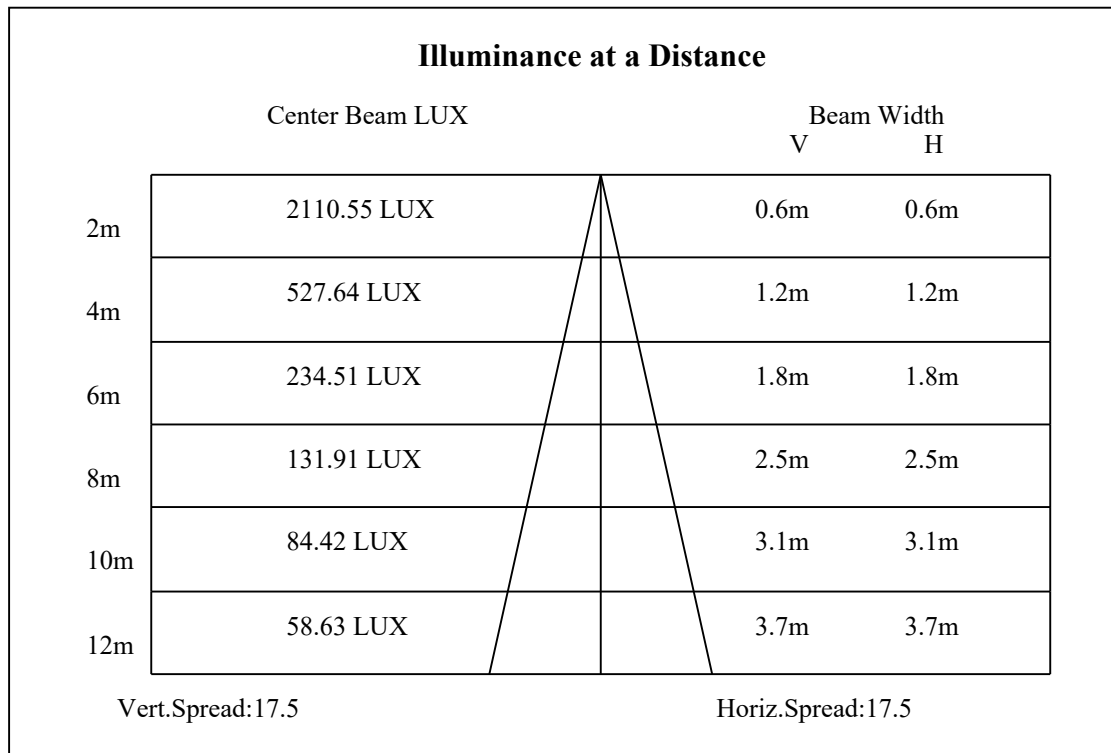
0-10	528.05
10-20	685.54
20-30	609.22
30-40	253.58
40-50	15.13
50-60	9.21
60-70	9.05
70-80	9.37
80-90	8.64
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

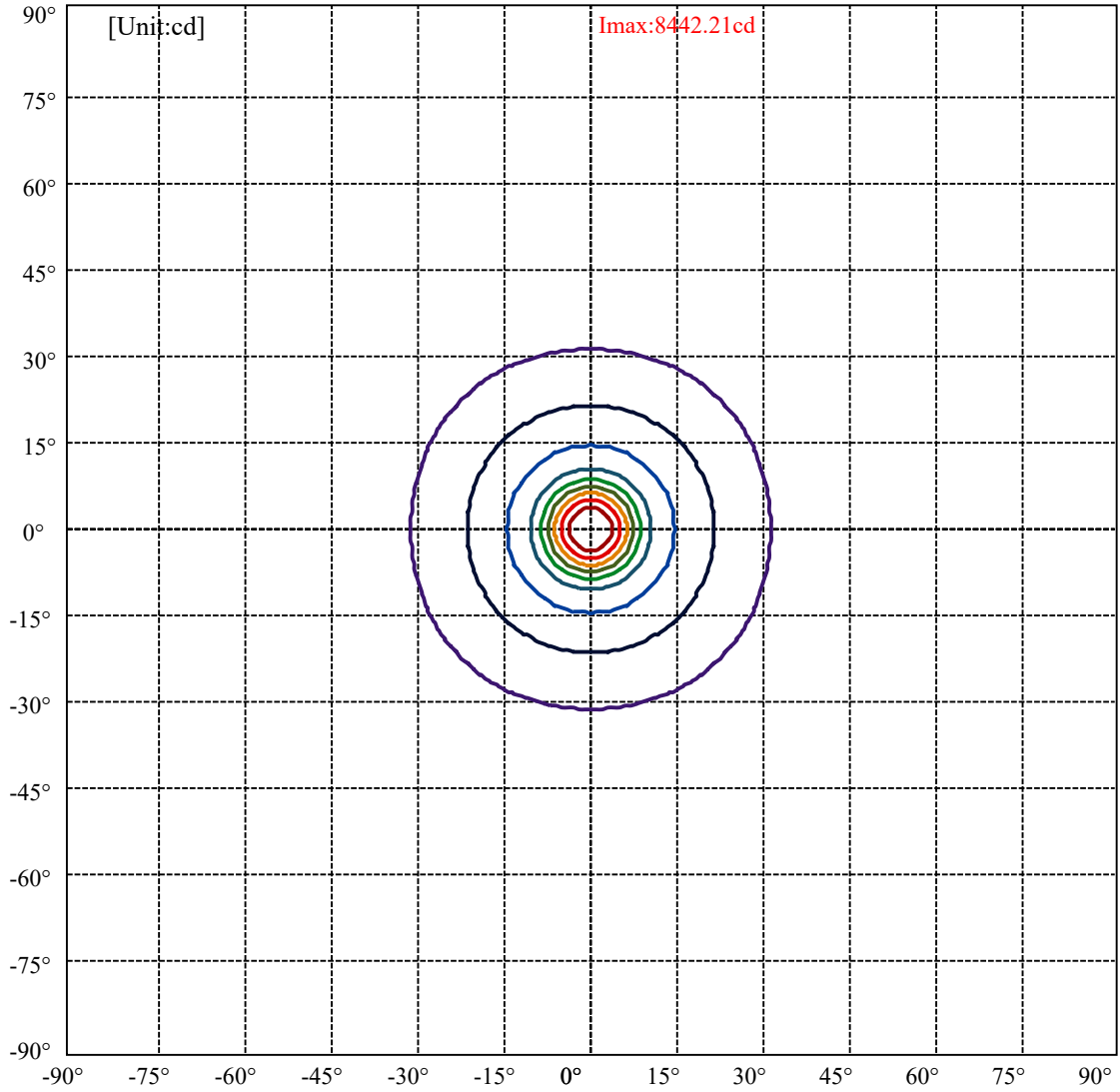


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:30.9 Right:30.9  
:C90/270Left:30.9 Right:30.9

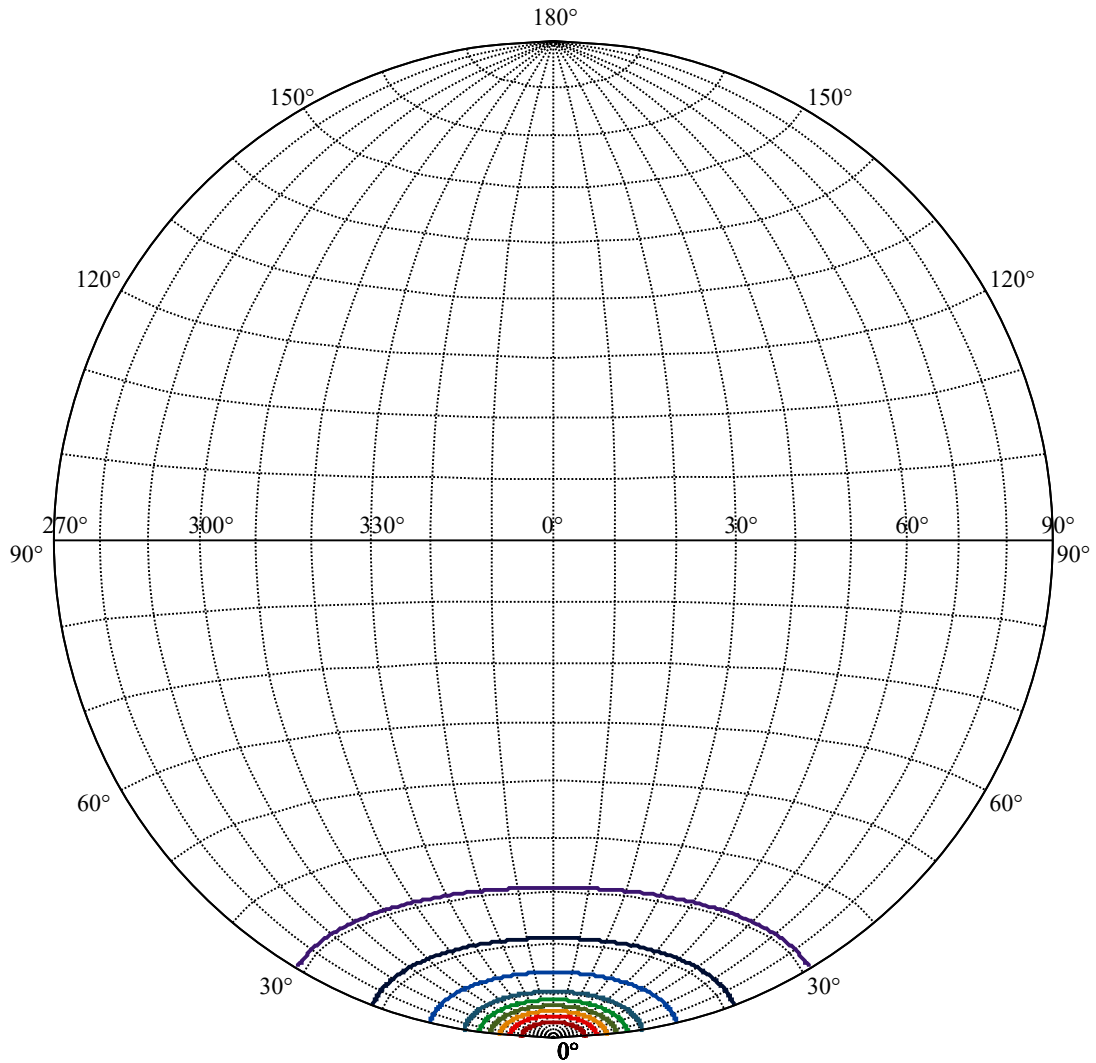
Beam Angle(50%Imax):C0/180Left:8.6 Right:8.6  
:C90/270Left:8.6 Right:8.6





(10%Imax) 844.221	—
(20%Imax) 1688.44	—
(30%Imax) 2532.66	—
(40%Imax) 3376.88	—
(50%Imax) 4221.1	—
(60%Imax) 5065.32	—
(70%Imax) 5909.55	—
(80%Imax) 6753.77	—
(90%Imax) 7597.99	—





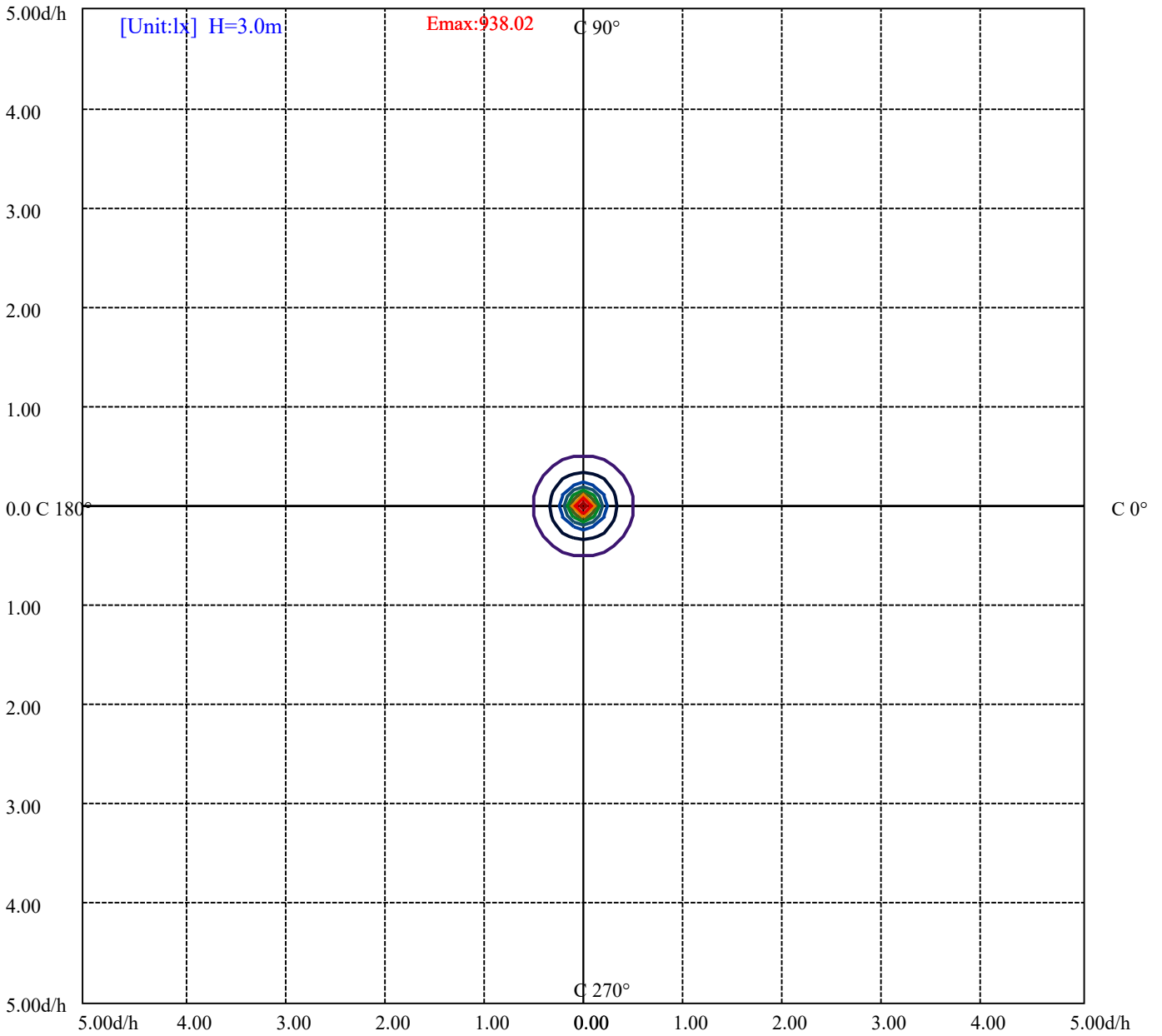
House

[Unit:cd]

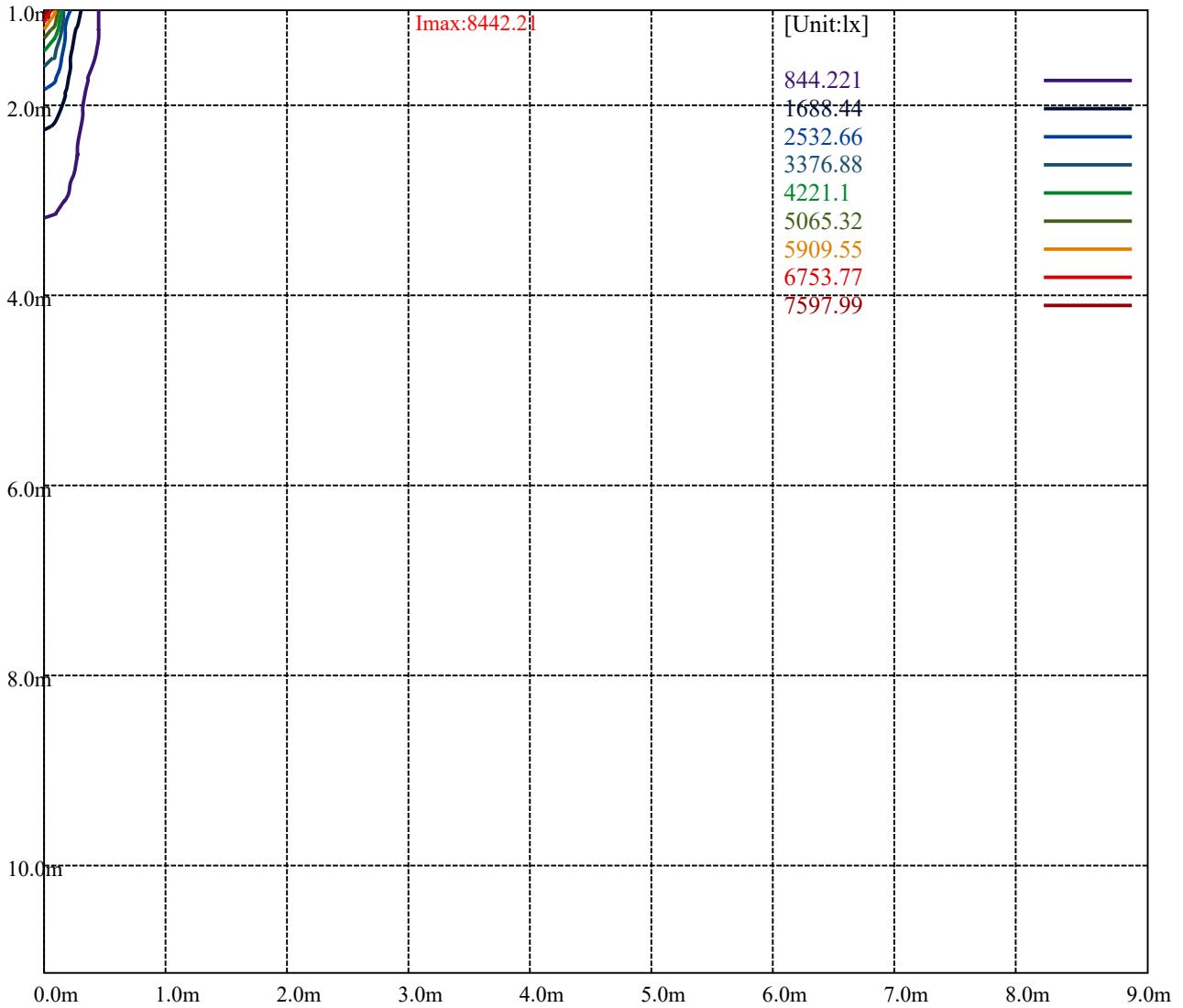
Road

Imax:8442.21

(10%Imax)	844.221	—
(20%Imax)	1688.44	—
(30%Imax)	2532.66	—
(40%Imax)	3376.88	—
(50%Imax)	4221.1	—
(60%Imax)	5065.32	—
(70%Imax)	5909.55	—
(80%Imax)	6753.77	—
(90%Imax)	7597.99	—



- (10%Emax) 93.80222
- (20%Emax) 187.6044
- (30%Emax) 281.4066
- (40%Emax) 375.2089
- (50%Emax) 469.0111
- (60%Emax) 562.8133
- (70%Emax) 656.6155
- (80%Emax) 750.4177
- (90%Emax) 844.22



Luminance Table

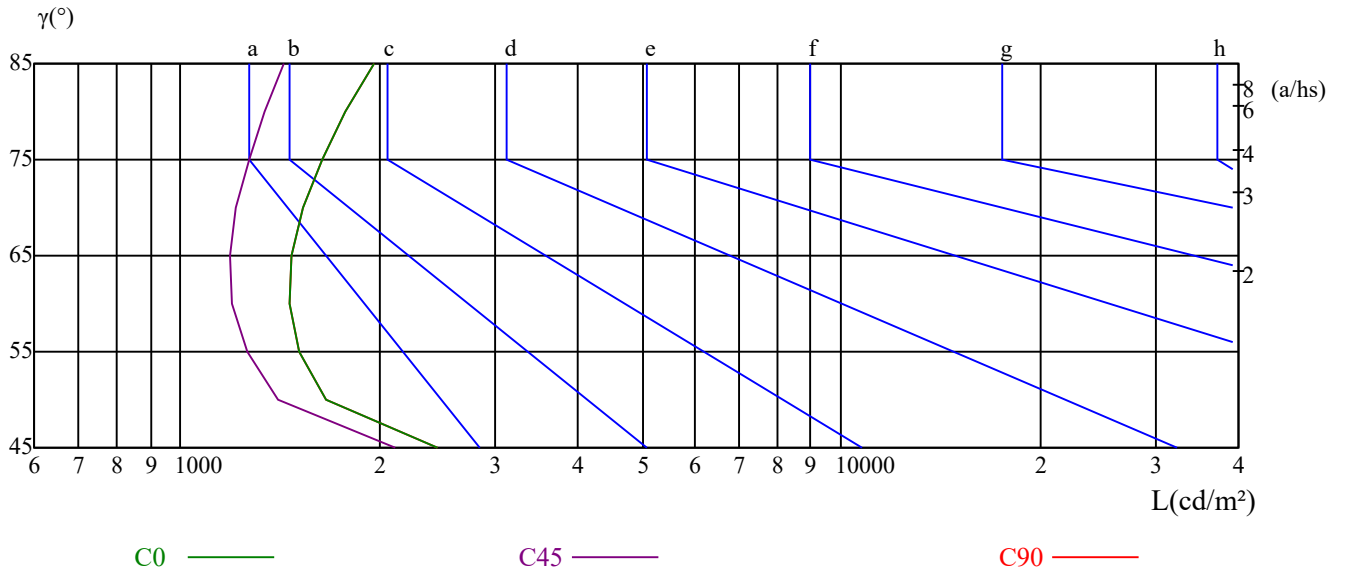
$\gamma$	45	50	55	60	65	70	75	80	85
C0	2457	1658	1510	1458	1472	1535	1639	1775	1959
C45	2111	1403	1258	1195	1185	1212	1266	1338	1434
C90	2457	1658	1510	1458	1472	1535	1639	1775	1959

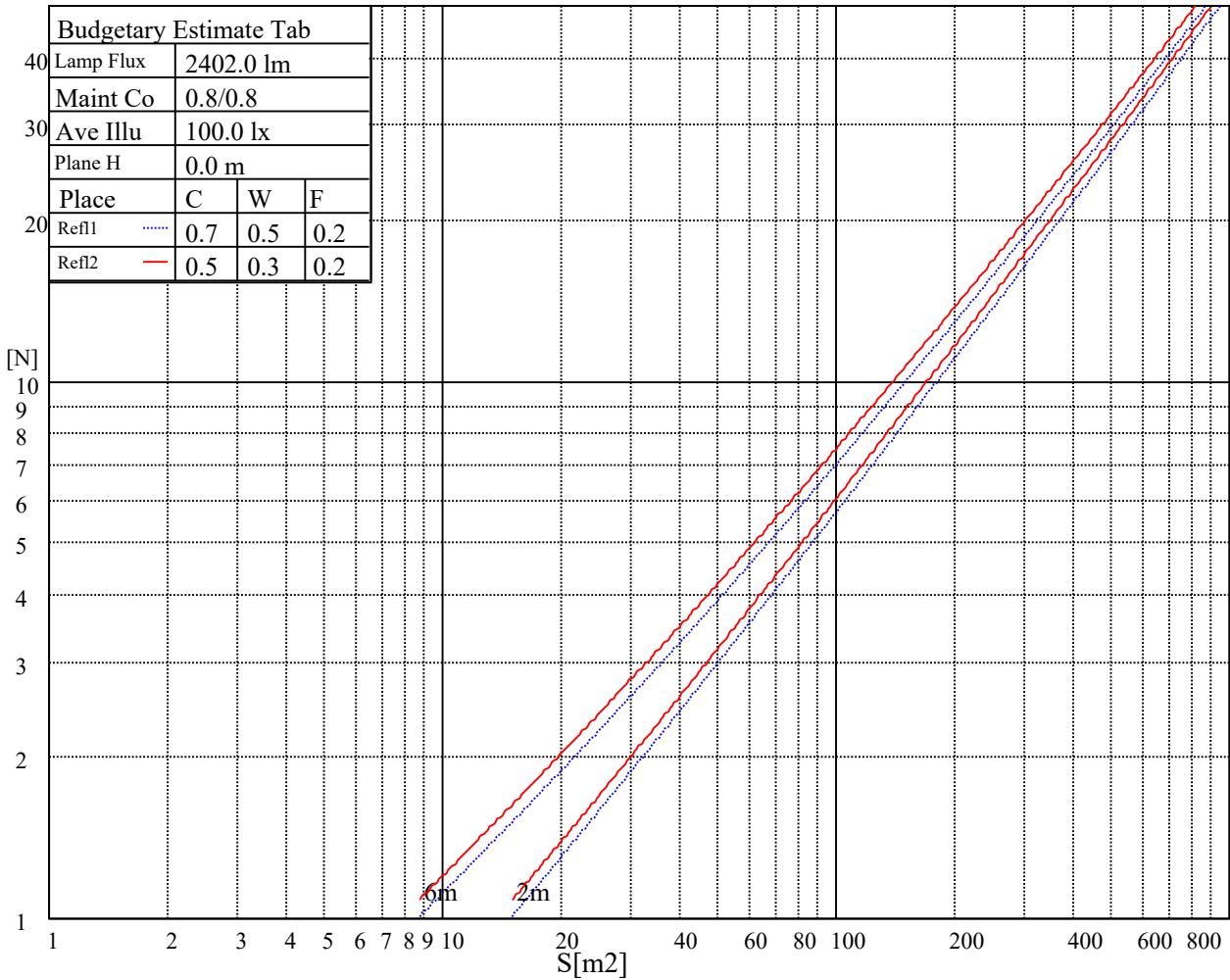
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3536	3536	3536	5637	5637	5637	16596	16596	16596

Glare Table

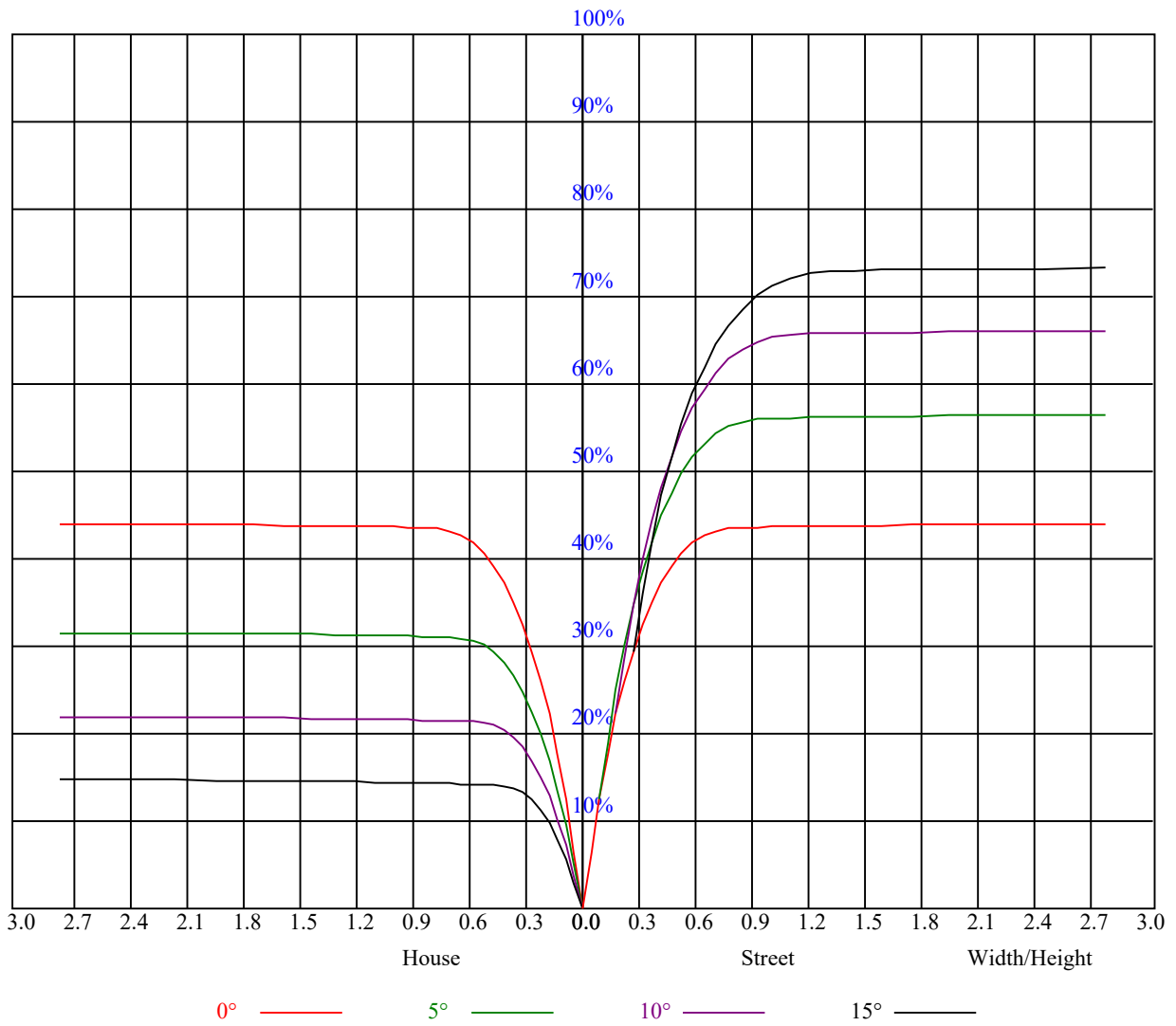
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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 RHOF=20 CU															
0	1.06	1.06	1.06	1.03	1.03	1.03	0.98	0.98	0.98	0.94	0.94	0.94	0.90	0.90	0.90	0.89
1	0.99	0.97	0.95	0.97	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87	0.86	0.86	0.84
2	0.93	0.90	0.87	0.92	0.89	0.86	0.89	0.87	0.85	0.86	0.84	0.83	0.84	0.82	0.81	0.80
3	0.88	0.84	0.81	0.87	0.84	0.81	0.85	0.82	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.76
4	0.84	0.80	0.76	0.83	0.79	0.76	0.81	0.78	0.75	0.79	0.76	0.74	0.78	0.75	0.73	0.72
5	0.80	0.75	0.72	0.79	0.75	0.72	0.77	0.74	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.69
6	0.76	0.72	0.68	0.75	0.71	0.68	0.74	0.71	0.68	0.73	0.70	0.67	0.72	0.69	0.67	0.66
7	0.73	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.64	0.69	0.66	0.64	0.63
8	0.70	0.65	0.62	0.69	0.65	0.62	0.68	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.61	0.60
9	0.67	0.63	0.60	0.67	0.62	0.60	0.66	0.62	0.59	0.65	0.62	0.59	0.64	0.61	0.59	0.58
10	0.64	0.60	0.57	0.64	0.60	0.57	0.63	0.60	0.57	0.63	0.59	0.57	0.62	0.59	0.57	0.56



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	8464.05	8285.97	7983.78	7515.19	6787.27	6037.64	5186.73	4421.52	3862.22
45.0	8461.27	8353.31	8081.17	7705.52	7149.00	6366.54	5518.97	4793.83	4088.17
90.0	8447.36	8422.87	8235.88	7964.86	7506.84	6795.62	6056.01	5202.31	4417.07
135.0	8396.16	8485.76	8476.30	8407.29	8189.13	7853.55	7263.65	6478.40	5722.65
180.0	8464.05	8482.42	8487.43	8344.96	8104.54	7743.36	7009.32	6280.84	5508.40
225.0	8461.27	8473.51	8363.32	8178.00	7859.68	7184.07	6497.88	5752.71	4850.59
270.0	8447.36	8408.96	8214.18	7930.91	7473.45	6655.37	5910.76	5163.91	4401.49
315.0	8396.16	8191.36	7809.03	7210.22	6522.92	5761.61	4848.92	4208.37	3693.60
360.0	8464.05	8285.97	7983.78	7515.19	6787.27	6037.64	5186.73	4421.52	3862.22
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3399.20	3081.43	2879.41	2720.81	2549.40	2419.18	2294.52	2158.73	2027.94
45.0	3548.35	3203.31	2935.62	2760.32	2601.16	2462.58	2344.05	2229.40	2083.04
90.0	3835.51	3354.68	3032.46	2834.89	2680.74	2523.24	2406.38	2292.29	2165.96
135.0	4896.78	4169.97	3665.21	3299.03	2989.60	2814.86	2672.95	2529.37	2399.70
180.0	4691.99	4016.38	3565.04	3178.26	2963.45	2799.28	2640.67	2512.67	2367.98
225.0	4288.51	3706.40	3253.95	3036.91	2829.88	2653.47	2544.39	2423.07	2260.01
270.0	3795.44	3399.20	3086.44	2886.65	2713.57	2564.43	2442.55	2307.87	2175.98
315.0	3277.88	2996.28	2810.96	2644.01	2499.31	2377.44	2243.32	2124.78	1994.00
360.0	3399.20	3081.43	2879.41	2720.81	2549.40	2419.18	2294.52	2158.73	2027.94
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1918.87	1804.78	1692.92	1596.64	1496.47	1410.77	1315.05	1226.56	1154.21
45.0	1965.06	1854.87	1727.98	1630.04	1534.87	1436.37	1337.86	1255.50	1173.69
90.0	2029.61	1913.86	1790.87	1677.34	1582.17	1483.12	1400.19	1310.60	1227.67
135.0	2278.93	2138.69	2011.25	1890.48	1768.61	1665.10	1554.91	1455.85	1366.25
180.0	2210.48	2099.18	1970.62	1813.69	1721.30	1625.03	1497.58	1419.67	1336.75
225.0	2157.61	2036.85	1907.74	1786.42	1685.69	1576.61	1471.98	1383.50	1299.56
270.0	2058.55	1946.69	1814.80	1713.51	1618.91	1503.15	1414.66	1330.07	1242.70
315.0	1874.35	1773.06	1676.23	1561.58	1474.21	1390.18	1290.00	1215.99	1110.03
360.0	1918.87	1804.78	1692.92	1596.64	1496.47	1410.77	1315.05	1226.56	1154.21
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	1085.76	1006.18	927.16	827.54	697.87	589.91	485.28	380.66	284.94
45.0	1105.80	1037.90	968.89	882.08	769.66	649.45	529.80	438.53	313.88
90.0	1106.69	1090.77	1021.99	946.75	852.92	732.60	607.33	499.47	397.80
135.0	1285.55	1186.49	1113.03	1049.03	964.44	874.84	767.99	647.78	527.02
180.0	1246.04	1105.35	1088.10	1021.99	946.08	836.89	735.66	609.66	492.74
225.0	1212.09	1108.69	1059.44	989.60	915.91	801.33	680.23	570.32	450.72
270.0	1159.22	1090.77	1021.21	954.98	846.46	726.25	614.39	493.07	379.54
315.0	1069.96	999.34	916.41	800.49	690.91	567.98	447.61	346.21	243.64
360.0	1085.76	1006.18	927.16	827.54	697.87	589.91	485.28	380.66	284.94
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	186.54	114.53	54.04	34.34	29.61	25.38	21.87	19.26	16.86
45.0	290.50	141.36	75.57	36.23	30.50	26.66	22.93	19.98	17.59
90.0	277.03	191.94	118.59	55.60	34.11	29.72	25.71	22.09	19.53
135.0	419.06	318.33	283.27	137.46	83.20	39.62	32.89	28.99	24.32
180.0	394.29	291.95	212.31	126.72	62.16	36.34	31.00	25.99	22.76
225.0	338.70	250.65	169.68	82.75	44.47	33.56	28.72	24.88	21.76
270.0	291.61	190.77	98.56	49.75	34.84	29.94	25.93	22.82	19.87
315.0	150.37	85.04	45.36	33.50	28.99	25.04	21.76	18.31	16.14
360.0	186.54	114.53	54.04	34.34	29.61	25.38	21.87	19.26	16.86



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	13.75	12.41	11.74	11.30	10.91	10.63	10.41	10.18
45.0	15.58	13.91	12.80	12.02	11.46	11.13	10.80	10.57	10.41
90.0	17.09	15.08	13.63	12.58	11.97	11.46	11.19	10.96	10.69
135.0	21.31	18.81	16.42	15.14	13.75	12.41	11.85	11.52	11.19
180.0	19.92	17.09	15.42	14.02	12.97	12.08	11.63	11.30	10.96
225.0	18.64	16.08	14.36	13.08	12.35	11.80	11.41	11.13	10.85
270.0	17.36	15.30	13.80	12.58	11.91	11.46	11.13	10.85	10.52
315.0	14.64	13.25	12.41	11.80	11.35	11.02	10.74	10.52	10.35
360.0	15.30	13.75	12.41	11.74	11.30	10.91	10.63	10.41	10.18
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	9.96	9.79	9.68	9.52	9.46	9.24	9.24	9.13	9.07
45.0	10.24	10.07	9.96	9.74	9.63	9.46	9.41	9.29	9.29
90.0	10.35	10.18	10.02	9.91	9.79	9.63	9.52	9.41	9.29
135.0	10.96	10.74	10.41	10.18	10.02	9.91	9.74	9.63	9.46
180.0	10.69	10.41	10.18	9.96	9.79	9.63	9.52	9.41	9.29
225.0	10.46	10.30	10.07	9.96	9.79	9.68	9.52	9.35	9.29
270.0	10.30	10.13	10.02	9.85	9.74	9.63	9.46	9.35	9.24
315.0	10.13	9.91	9.68	9.57	9.46	9.35	9.29	9.13	9.07
360.0	9.96	9.79	9.68	9.52	9.46	9.24	9.24	9.13	9.07
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.02	8.96	8.90	8.90	8.85	8.85	8.85	8.79	8.74
45.0	9.18	9.18	9.13	9.07	9.07	9.02	9.02	9.02	9.02
90.0	9.29	9.24	9.13	9.07	9.02	9.02	9.02	9.02	8.96
135.0	9.29	9.29	9.24	9.18	9.13	9.07	9.02	9.02	8.96
180.0	9.18	9.07	9.02	9.02	9.02	8.90	8.90	8.85	8.79
225.0	9.24	9.24	9.18	9.13	9.07	9.02	9.02	8.96	8.96
270.0	9.24	9.18	9.13	9.07	9.02	9.02	9.02	9.02	9.02
315.0	9.07	9.02	9.02	8.96	8.96	8.90	8.90	8.79	8.79
360.0	9.02	8.96	8.90	8.90	8.85	8.85	8.85	8.79	8.74
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	8.79	8.74	8.79	8.74	8.74	8.68	8.68	8.68	8.74
45.0	8.96	8.90	8.90	8.96	8.96	8.90	8.90	8.85	8.85
90.0	8.96	8.96	8.96	8.96	8.85	8.85	8.85	8.85	8.90
135.0	8.96	8.90	8.85	8.90	8.90	8.85	8.85	8.79	8.85
180.0	8.85	8.85	8.85	8.74	8.74	8.74	8.74	8.74	8.74
225.0	8.96	8.96	8.96	8.90	8.85	8.90	8.90	8.90	8.90
270.0	8.90	8.90	8.90	8.96	8.90	8.85	8.85	8.85	8.85
315.0	8.85	8.85	8.85	8.85	8.79	8.79	8.74	8.79	8.79
360.0	8.79	8.74	8.79	8.74	8.74	8.68	8.68	8.68	8.74
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.74	8.74	8.79	8.79	8.79	8.90	8.68	8.57	8.68
45.0	8.90	8.96	8.90	8.90	8.90	9.02	8.85	8.79	8.79
90.0	8.85	8.85	8.90	8.90	8.79	8.79	8.79	8.74	8.79
135.0	8.79	8.85	8.85	8.74	8.79	8.74	8.79	8.74	8.74
180.0	8.74	8.68	8.74	8.74	8.63	8.68	8.63	8.63	8.63
225.0	8.79	8.85	8.85	8.90	8.85	8.79	8.85	8.85	8.79
270.0	8.90	8.85	8.90	8.85	8.85	8.79	8.79	8.85	8.79
315.0	8.79	8.74	8.79	8.74	8.79	8.79	8.74	8.74	8.68
360.0	8.74	8.74	8.79	8.79	8.79	8.90	8.68	8.57	8.68

Intensity data(cd)

<i>C/γ</i> (°)	90.0
0.0	8.63
45.0	8.79
90.0	8.85
135.0	8.68
180.0	8.68
225.0	8.79
270.0	8.85
315.0	8.68
360.0	8.63