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## Nata

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LumCAT: 2-2188-M  
Luminaire: 92.70.131.00  
Report No: NATA0100  
Test No: GC20200211723  
LampCAT: CITIZEN CLU038  
Lamp flux(lm): 2507.0  
Number of Lamps: 1  
Length(mm): 0  
Phm Type: C

Voltage(V): 36.0000  
Current(A): 0.6000  
Power (W): 21.6000  
PF: 0.0000  
Ballast type: DC  
Width(mm): 0  
Height(mm): 0

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## Photometric Results

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Lumens(lm): 1978.37  
Efficiency(%): 78.91%  
Lumens(lm)/Power(W): 91.59  
Central intensity(cd): 5763.656  
Maximum intensity(cd): 5763.656  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=35.7  
                                  [C90/270]Total=35.7  
Field angle(10%Imax): [C0/180]Total=53.6  
                                  [C90/270]Total=53.6  
Maximum s/h(1/2): C0\_180=0.59 C90\_270=0.59  
Maximum s/h(1/4): C0\_180=0.57 C90\_270=0.57  
Up flux rate of lamp(%): 0.00%  
Down flux rate of lamp(%): 78.91%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.704%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5763.656	0.000	0	.000%	.000%
1.0	5753.391	5.511	5.511	.220%	.279%
2.0	5719.430	16.467	21.978	.657%	1.111%
3.0	5656.852	27.208	49.186	1.085%	2.486%
4.0	5580.633	37.615	86.801	1.500%	4.388%
5.0	5485.641	47.607	134.408	1.899%	6.794%
6.0	5355.211	56.972	191.379	2.272%	9.674%
7.0	5209.875	65.577	256.957	2.616%	12.988%
8.0	5057.648	73.483	330.439	2.931%	16.703%
9.0	4876.383	80.510	410.949	3.211%	20.772%
10.0	4676.766	86.452	497.402	3.448%	25.142%
11.0	4487.344	91.568	588.97	3.653%	29.771%
12.0	4281.820	95.860	684.83	3.824%	34.616%
13.0	4050.422	98.883	783.712	3.944%	39.614%
14.0	3840.328	101.001	884.713	4.029%	44.719%
15.0	3617.156	102.380	987.093	4.084%	49.894%
16.0	3382.945	102.571	1089.664	4.091%	55.079%
17.0	3111.117	101.130	1190.794	4.034%	60.191%
18.0	2836.828	98.069	1288.863	3.912%	65.148%
19.0	2567.320	94.021	1382.884	3.750%	69.900%
20.0	2285.367	88.818	1471.702	3.543%	74.390%
21.0	2002.641	82.338	1554.04	3.284%	78.552%
22.0	1751.836	75.448	1629.488	3.009%	82.365%
23.0	1458.928	67.371	1696.858	2.687%	85.771%
24.0	1197.260	58.074	1754.932	2.316%	88.706%
25.0	967.746	49.228	1804.16	1.964%	91.194%
26.0	741.586	40.349	1844.509	1.609%	93.234%
27.0	532.969	31.182	1875.691	1.244%	94.810%
28.0	336.045	22.002	1897.692	.878%	95.922%
29.0	229.163	14.787	1912.48	.590%	96.670%
30.0	104.400	9.006	1921.486	.359%	97.125%
31.0	54.809	4.431	1925.917	.177%	97.349%
32.0	36.253	2.609	1928.525	.104%	97.481%
33.0	26.346	1.844	1930.37	.074%	97.574%
34.0	20.060	1.404	1931.774	.056%	97.645%
35.0	16.298	1.129	1932.903	.045%	97.702%
36.0	14.372	0.977	1933.88	.039%	97.751%
37.0	13.085	0.895	1934.775	.036%	97.797%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	12.291	0.847	1935.622	.034%	97.839%
39.0	11.651	0.817	1936.439	.033%	97.881%
40.0	11.173	0.796	1937.235	.032%	97.921%
41.0	10.821	0.783	1938.018	.031%	97.961%
42.0	10.484	0.774	1938.793	.031%	98.000%
43.0	10.216	0.767	1939.559	.031%	98.038%
44.0	9.984	0.762	1940.322	.030%	98.077%
45.0	9.788	0.760	1941.082	.030%	98.115%
46.0	9.619	0.759	1941.841	.030%	98.154%
47.0	9.457	0.759	1942.599	.030%	98.192%
48.0	9.345	0.760	1943.359	.030%	98.231%
49.0	9.239	0.763	1944.122	.030%	98.269%
50.0	9.105	0.765	1944.887	.031%	98.308%
51.0	9.021	0.767	1945.654	.031%	98.347%
52.0	8.944	0.771	1946.425	.031%	98.386%
53.0	8.845	0.774	1947.199	.031%	98.425%
54.0	8.768	0.776	1947.975	.031%	98.464%
55.0	8.698	0.780	1948.755	.031%	98.503%
56.0	8.627	0.783	1949.538	.031%	98.543%
57.0	8.599	0.788	1950.325	.031%	98.583%
58.0	8.557	0.793	1951.119	.032%	98.623%
59.0	8.487	0.797	1951.916	.032%	98.663%
60.0	8.459	0.801	1952.716	.032%	98.704%
61.0	8.402	0.805	1953.521	.032%	98.744%
62.0	8.374	0.808	1954.329	.032%	98.785%
63.0	8.311	0.811	1955.141	.032%	98.826%
64.0	8.297	0.815	1955.956	.033%	98.867%
65.0	8.262	0.819	1956.775	.033%	98.909%
66.0	8.255	0.824	1957.599	.033%	98.950%
67.0	8.248	0.830	1958.429	.033%	98.992%
68.0	8.213	0.834	1959.263	.033%	99.034%
69.0	8.191	0.837	1960.1	.033%	99.077%
70.0	8.191	0.841	1960.941	.034%	99.119%
71.0	8.191	0.847	1961.788	.034%	99.162%
72.0	8.184	0.851	1962.639	.034%	99.205%
73.0	8.184	0.856	1963.495	.034%	99.248%
74.0	8.170	0.860	1964.355	.034%	99.292%
75.0	8.177	0.864	1965.219	.034%	99.335%

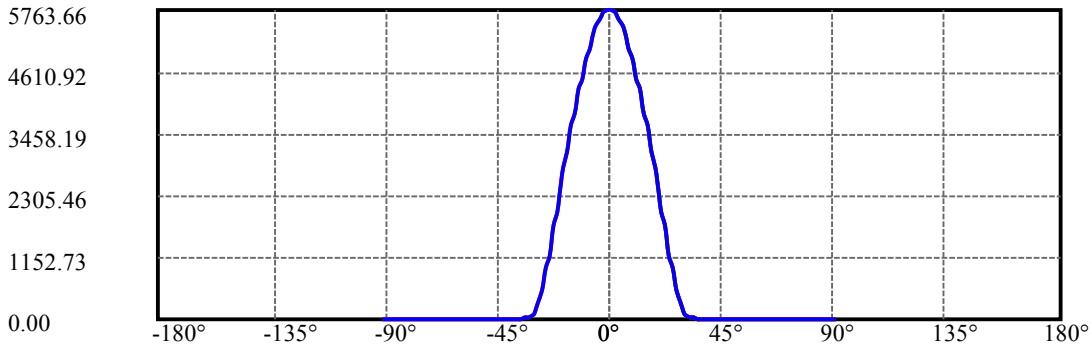
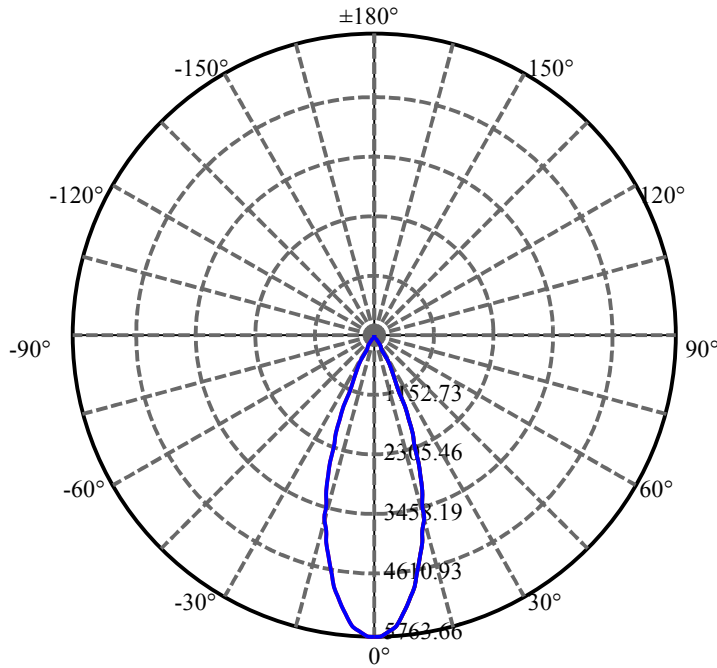
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.156	0.867	1966.086	.035%	99.379%
77.0	8.170	0.870	1966.956	.035%	99.423%
78.0	8.149	0.874	1967.83	.035%	99.467%
79.0	8.142	0.875	1968.705	.035%	99.512%
80.0	8.142	0.878	1969.583	.035%	99.556%
81.0	8.135	0.880	1970.463	.035%	99.601%
82.0	8.128	0.882	1971.345	.035%	99.645%
83.0	8.156	0.885	1972.23	.035%	99.690%
84.0	8.191	0.891	1973.121	.036%	99.735%
85.0	8.079	0.888	1974.009	.035%	99.780%
86.0	7.988	0.878	1974.887	.035%	99.824%
87.0	7.931	0.871	1975.758	.035%	99.868%
88.0	7.924	0.869	1976.627	.035%	99.912%
89.0	7.924	0.869	1977.496	.035%	99.956%
90.0	7.931	0.869	1978.365	.035%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1921.49	76.64%	97.12%
0-40	1937.24	77.27%	97.92%
0-60	1952.72	77.89%	98.70%
0-90	1977.50	78.88%	99.96%
0-120	1977.50	78.88%	99.96%
0-180	1978.37	78.91%	100.00%
60-90	25.58	1.02%	1.29%
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%
0-21.38	1582.69	63.13%	80.00%

ZONAL LUMEN SUMMARY

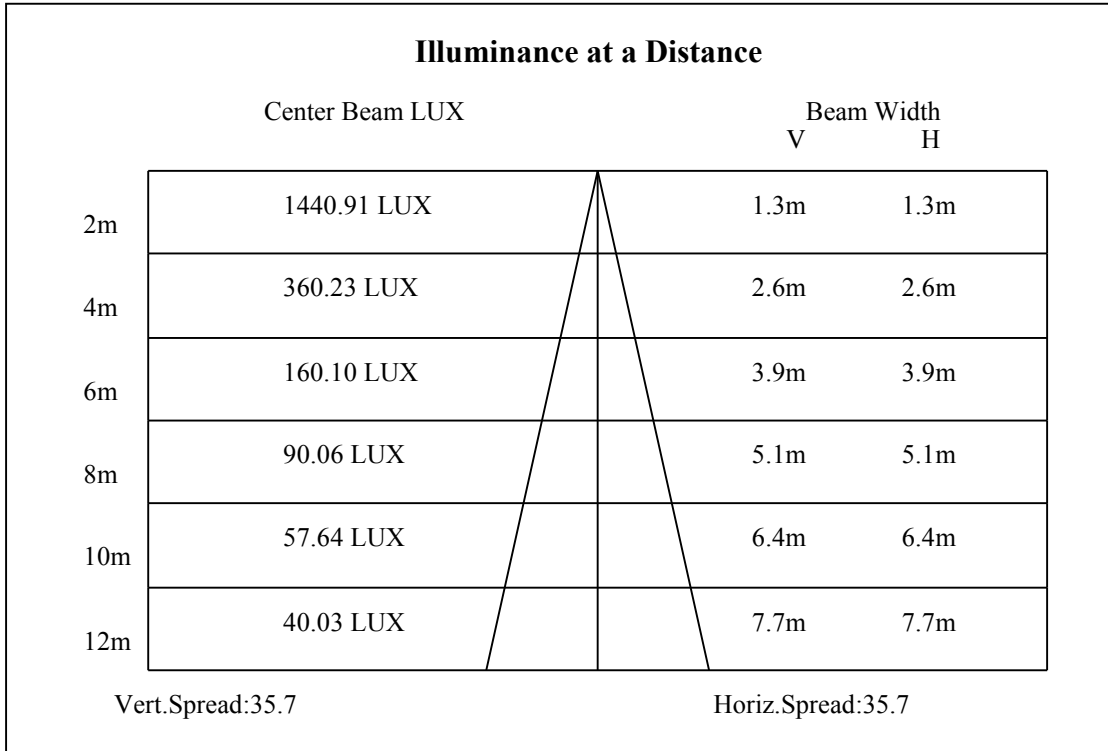
0-10	497.40
10-20	974.30
20-30	449.78
30-40	15.75
40-50	7.65
50-60	7.83
60-70	8.22
70-80	8.64
80-90	7.91
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

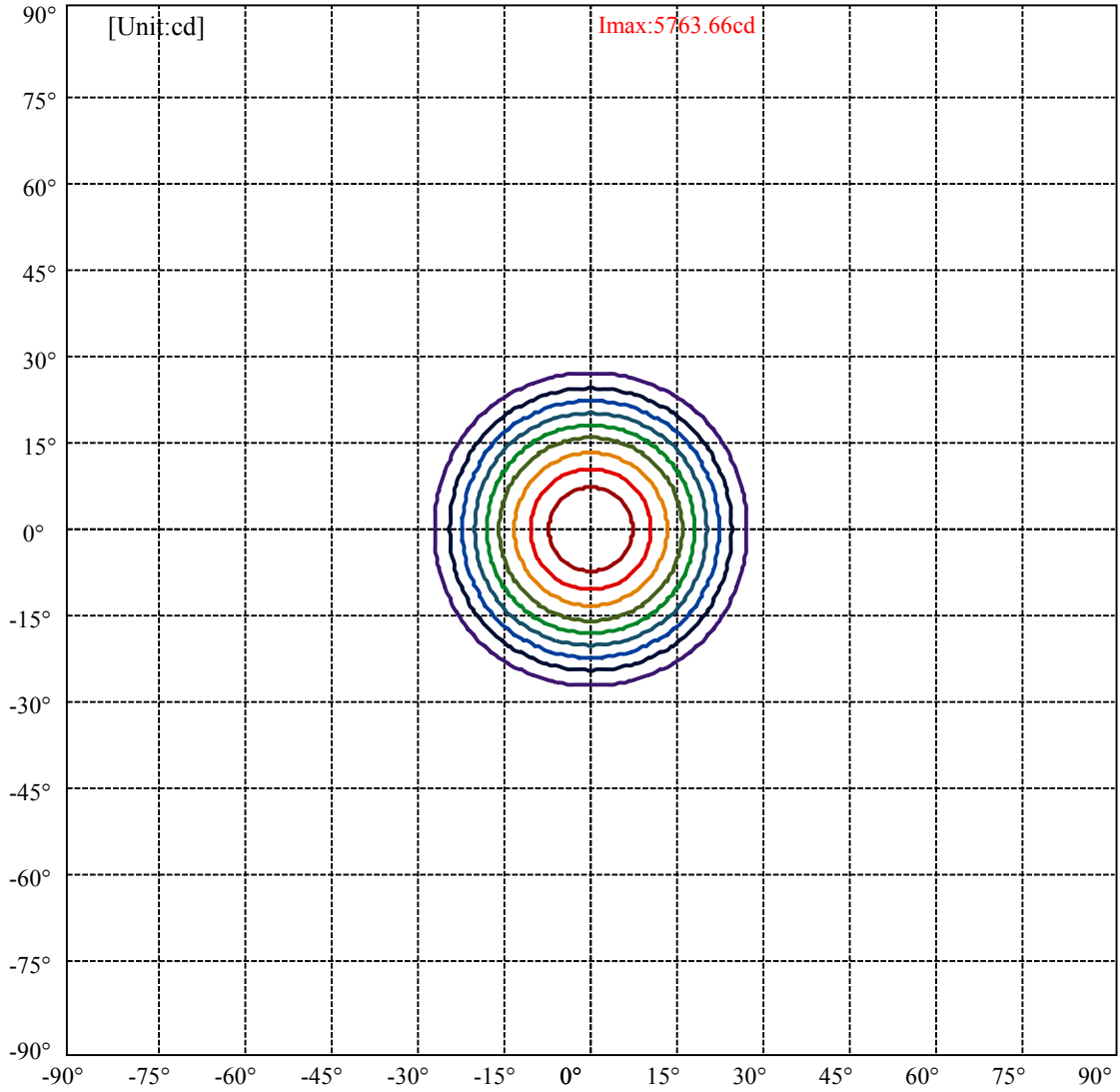


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:26.8 Right:26.8  
:C90/270Left:26.8 Right:26.8

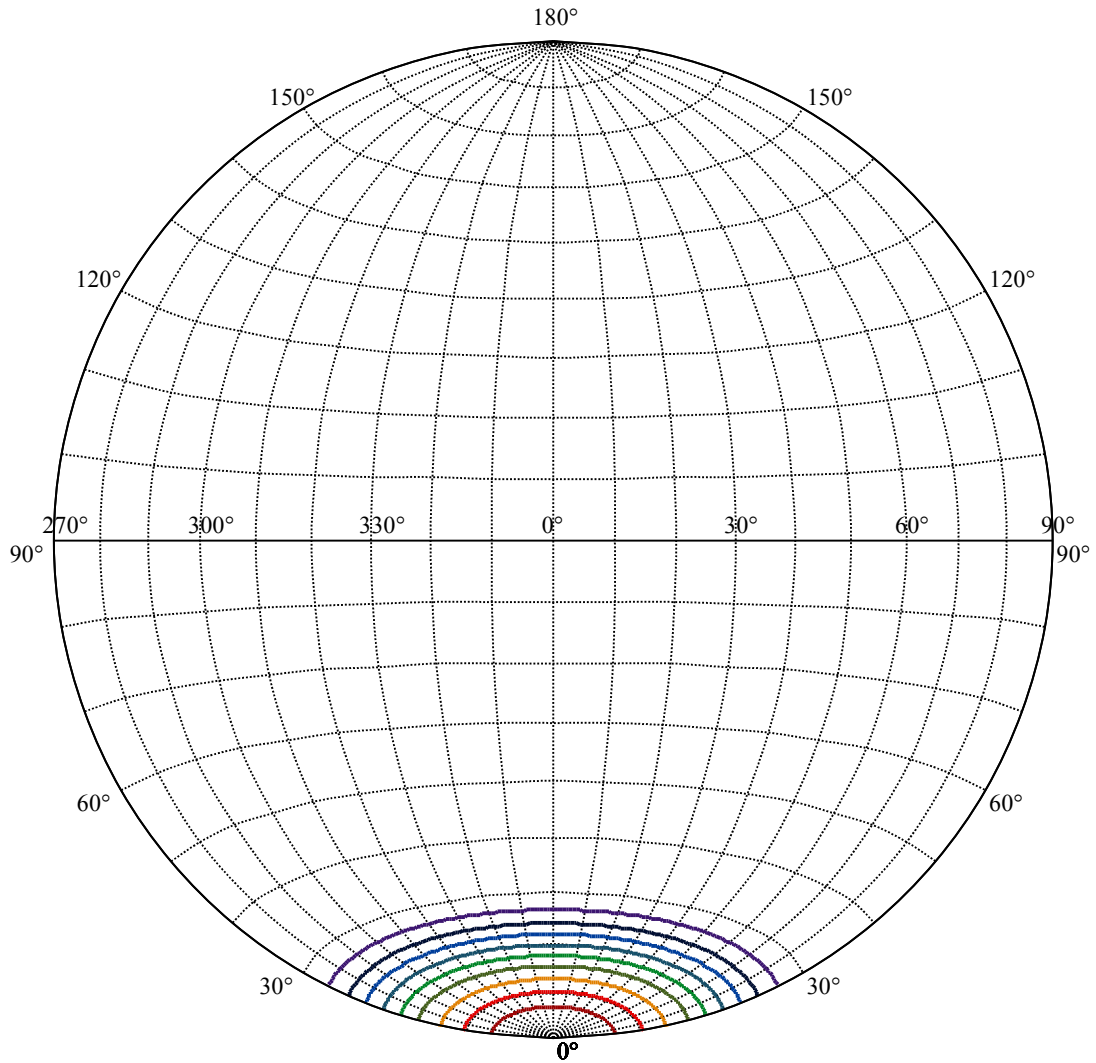
Beam Angle(50%Imax):C0/180Left:17.8 Right:17.8  
:C90/270Left:17.8 Right:17.8





(10%Imax) 576.366	—
(20%Imax) 1152.73	—
(30%Imax) 1729.1	—
(40%Imax) 2305.46	—
(50%Imax) 2881.83	—
(60%Imax) 3458.19	—
(70%Imax) 4034.56	—
(80%Imax) 4610.92	—
(90%Imax) 5187.29	—





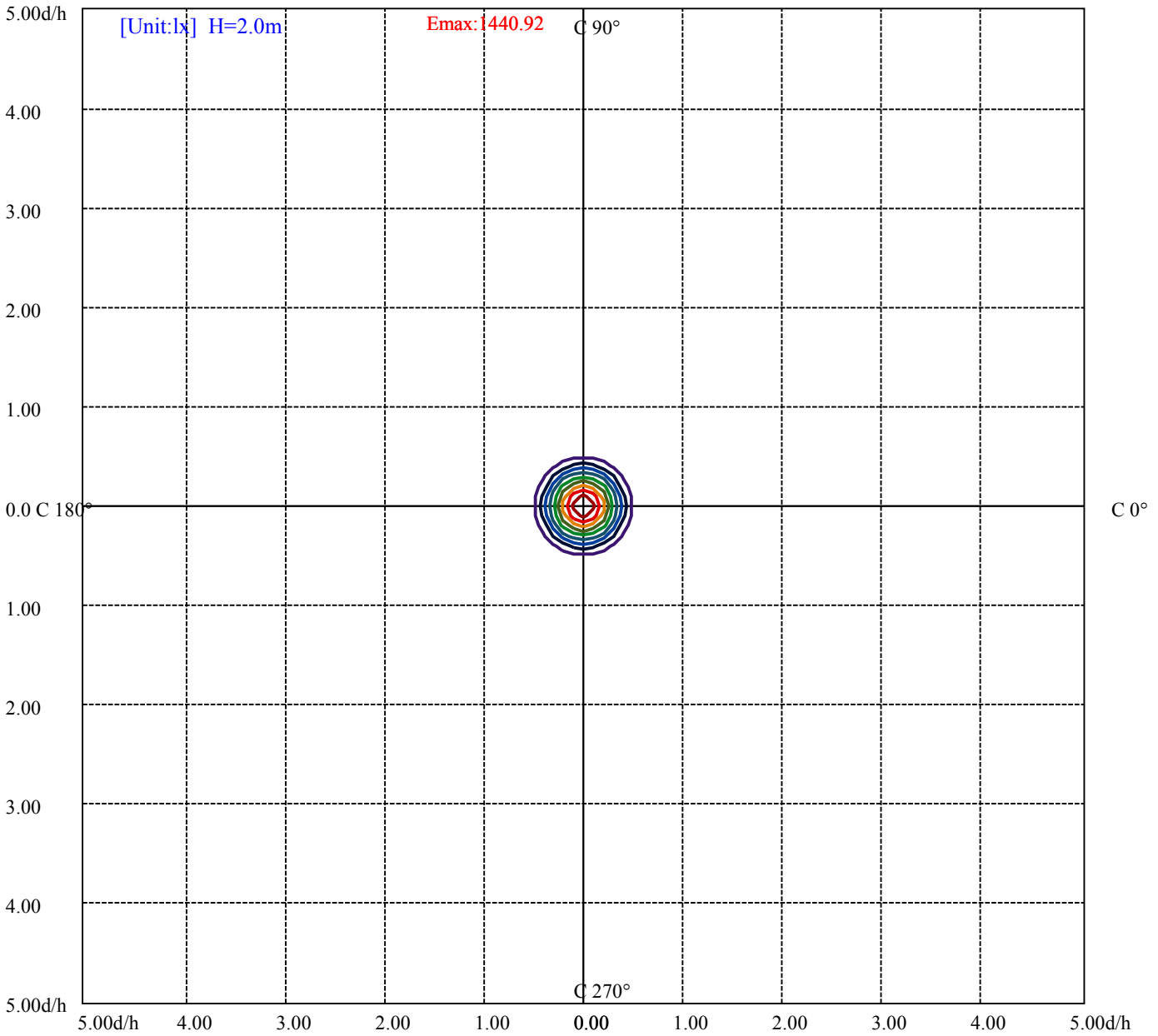
House

[Unit:cd]

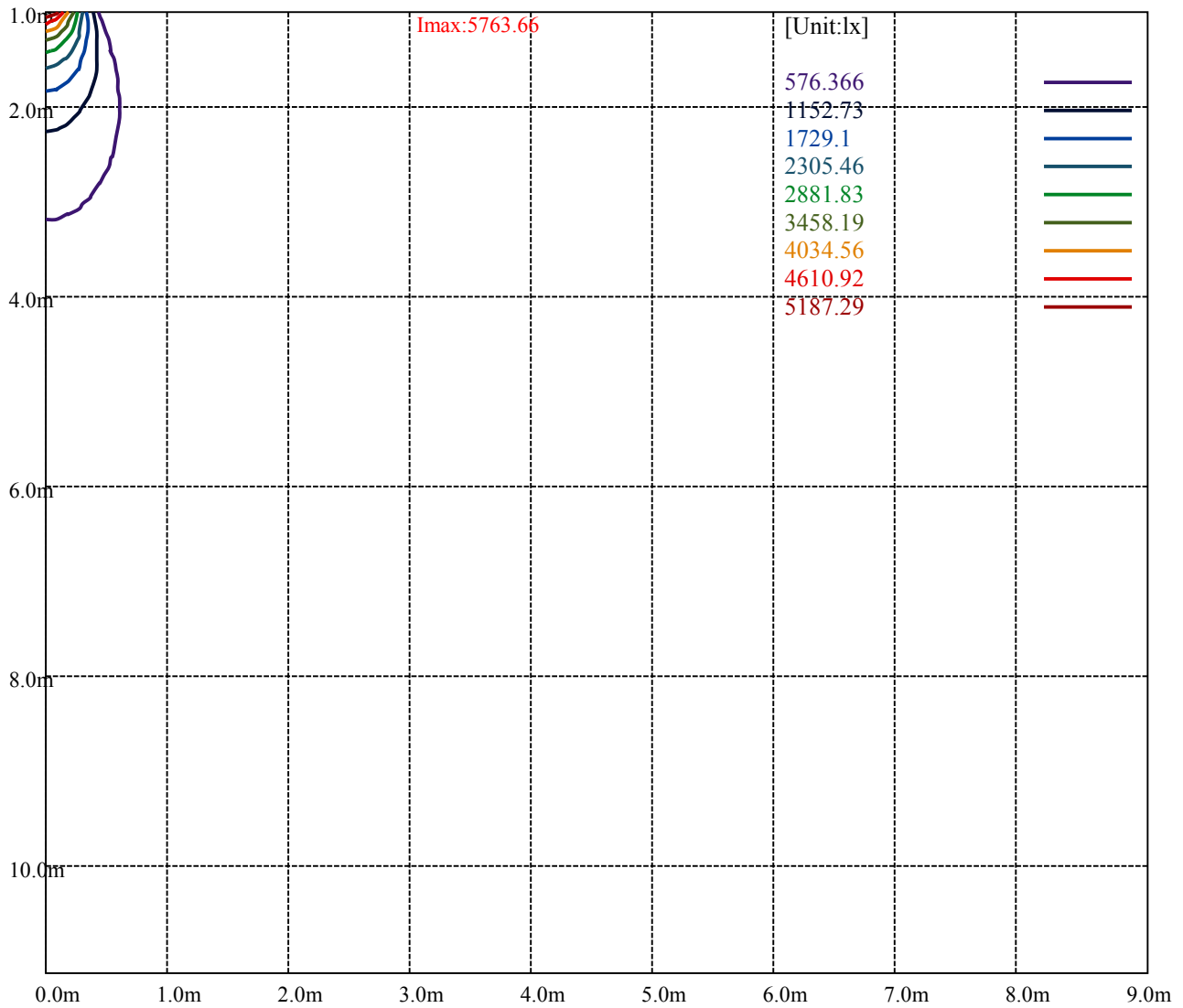
Road

**Imax:5763.66**

(10%Imax) 576.366	—
(20%Imax) 1152.73	—
(30%Imax) 1729.1	—
(40%Imax) 2305.46	—
(50%Imax) 2881.83	—
(60%Imax) 3458.19	—
(70%Imax) 4034.56	—
(80%Imax) 4610.92	—
(90%Imax) 5187.29	—



- (10%Emax) 144.0912
- (20%Emax) 288.1825
- (30%Emax) 432.275
- (40%Emax) 576.365
- (50%Emax) 720.4575
- (60%Emax) 864.5475
- (70%Emax) 1008.64
- (80%Emax) 1152.73
- (90%Emax) 1296.823



Luminance Table

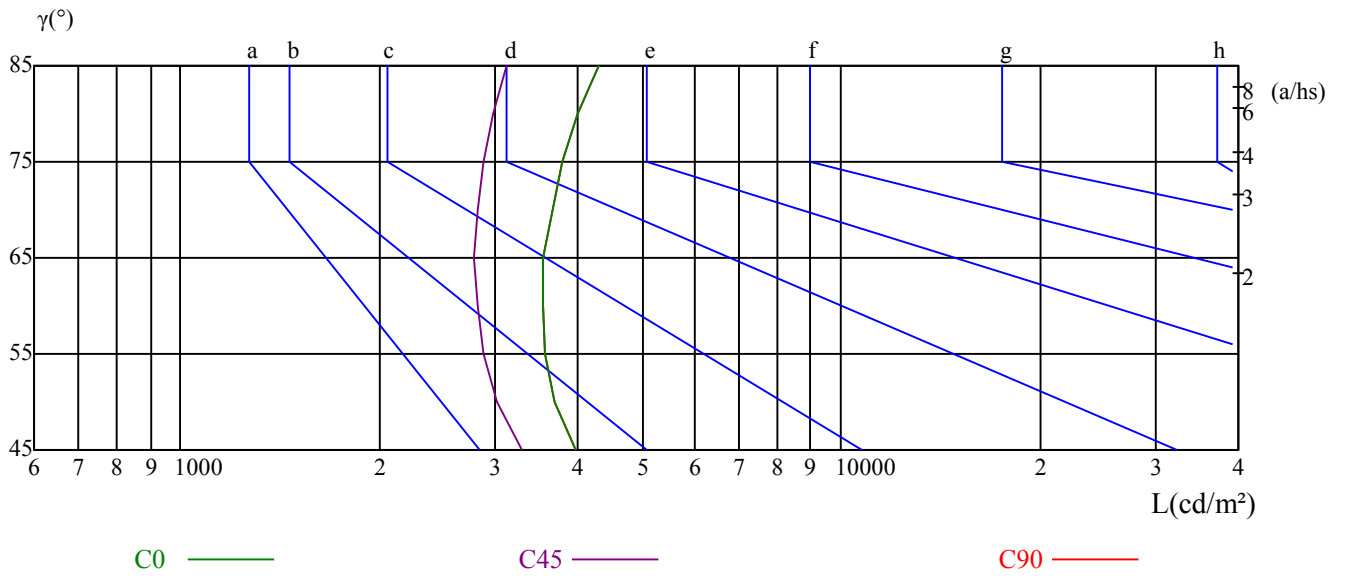
$\gamma$	45	50	55	60	65	70	75	80	85
C0	3955	3683	3556	3535	3547	3659	3797	4003	4302
C45	3296	3023	2875	2815	2780	2819	2873	2969	3120
C90	3955	3683	3556	3535	3547	3659	3797	4003	4302

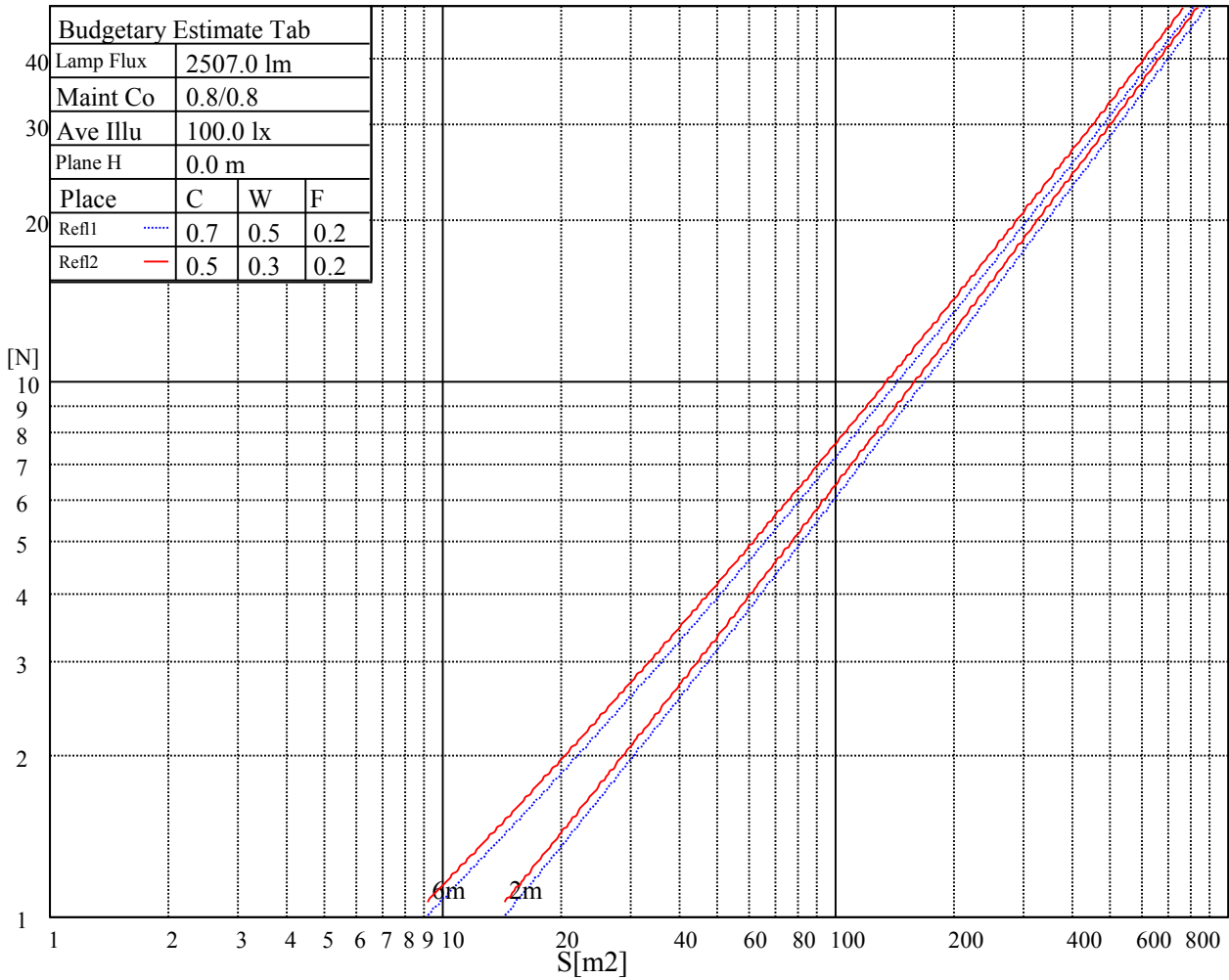
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
10648	10648	10648	17024	17024	17024	50197	50197	50197

Glare Table

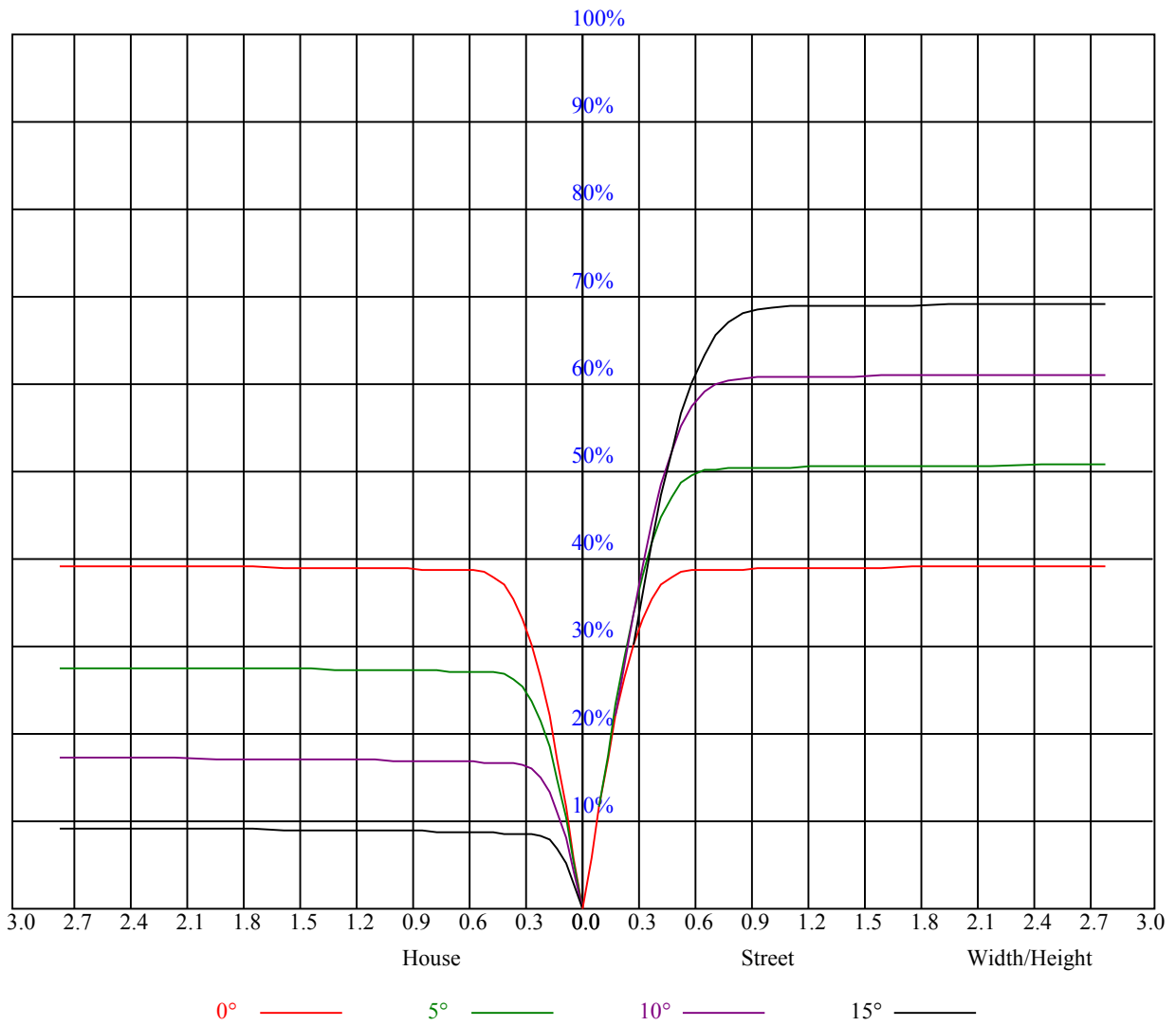
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84	0.81	0.81	0.81	0.79
1	0.89	0.87	0.85	0.87	0.85	0.84	0.84	0.83	0.81	0.81	0.80	0.79	0.78	0.77	0.77	0.75
2	0.84	0.81	0.79	0.83	0.80	0.78	0.80	0.78	0.77	0.78	0.76	0.75	0.76	0.75	0.74	0.72
3	0.80	0.77	0.75	0.79	0.76	0.74	0.77	0.75	0.73	0.75	0.73	0.72	0.74	0.72	0.71	0.70
4	0.77	0.73	0.71	0.76	0.73	0.70	0.74	0.72	0.70	0.73	0.71	0.69	0.71	0.70	0.68	0.67
5	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.67	0.70	0.68	0.66	0.69	0.67	0.65	0.65
6	0.71	0.67	0.65	0.70	0.67	0.64	0.69	0.66	0.64	0.68	0.66	0.64	0.67	0.65	0.63	0.62
7	0.68	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.62	0.66	0.63	0.61	0.65	0.63	0.61	0.60
8	0.66	0.62	0.60	0.65	0.62	0.60	0.65	0.62	0.59	0.64	0.61	0.59	0.63	0.61	0.59	0.58
9	0.64	0.60	0.58	0.63	0.60	0.58	0.63	0.60	0.57	0.62	0.59	0.57	0.61	0.59	0.57	0.56
10	0.61	0.58	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.60	0.57	0.55	0.60	0.57	0.55	0.55



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	5760.00	5770.69	5756.63	5727.38	5659.31	5571.00	5487.19	5341.50	5205.38
45.0	5760.56	5766.19	5745.38	5703.75	5642.44	5554.13	5439.94	5313.94	5154.19
90.0	5765.63	5754.38	5722.31	5653.69	5578.31	5486.06	5339.25	5198.06	5044.50
135.0	5768.44	5758.31	5722.88	5667.75	5586.19	5496.19	5371.31	5217.75	5065.88
180.0	5760.00	5729.63	5676.75	5588.44	5497.88	5388.19	5259.38	5071.50	4904.44
225.0	5760.56	5736.38	5689.69	5603.63	5517.56	5411.81	5254.88	5113.13	4957.31
270.0	5765.63	5754.94	5718.38	5662.69	5580.56	5487.75	5360.06	5212.13	5066.44
315.0	5768.44	5756.63	5723.44	5647.50	5582.81	5490.00	5329.69	5211.00	5063.06
360.0	5760.00	5770.69	5756.63	5727.38	5659.31	5571.00	5487.19	5341.50	5205.38
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5054.63	4843.69	4663.13	4474.69	4224.94	4021.88	3814.88	3545.44	3311.44
45.0	4978.13	4807.13	4602.38	4413.38	4193.44	3966.19	3762.00	3576.38	3261.94
90.0	4856.63	4658.06	4474.13	4259.25	4038.19	3837.94	3574.69	3377.25	3101.06
135.0	4883.06	4680.56	4491.56	4295.81	4044.94	3842.44	3635.44	3388.50	3125.25
180.0	4703.63	4488.19	4291.31	4066.88	3864.94	3633.19	3417.19	3156.75	2909.81
225.0	4768.31	4563.56	4372.31	4150.13	3920.06	3714.19	3474.00	3241.69	2958.19
270.0	4889.25	4695.75	4514.63	4325.63	4077.56	3873.94	3664.13	3411.00	3135.38
315.0	4877.44	4677.19	4489.31	4268.81	4039.31	3832.88	3594.94	3366.56	3085.88
360.0	5054.63	4843.69	4663.13	4474.69	4224.94	4021.88	3814.88	3545.44	3311.44
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	3064.50	2783.25	2495.25	2241.00	1956.94	1684.69	1440.00	1161.00	920.25
45.0	3005.44	2767.50	2400.19	2161.13	1943.44	1622.25	1355.06	1149.19	869.63
90.0	2774.25	2542.50	2284.31	1934.44	1724.06	1482.19	1096.09	955.24	740.19
135.0	2870.44	2561.63	2272.50	2020.50	1756.13	1502.44	1231.31	977.63	759.38
180.0	2620.69	2327.06	2071.69	1794.38	1526.63	1107.11	1048.50	765.23	560.48
225.0	2674.13	2418.19	2165.06	1852.88	1613.25	1276.31	1059.13	832.44	626.34
270.0	2881.69	2592.00	2303.44	2045.25	1770.75	1522.69	1247.06	977.63	752.06
315.0	2803.50	2546.44	2290.50	1971.56	1723.50	1473.75	1100.93	923.63	704.36
360.0	3064.50	2783.25	2495.25	2241.00	1956.94	1684.69	1440.00	1161.00	920.25
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	662.63	443.25	300.94	158.96	73.52	45.79	32.23	22.61	18.39
45.0	648.00	463.50	302.63	142.59	72.23	45.23	32.40	24.24	18.28
90.0	545.91	338.12	203.85	108.34	60.24	41.06	30.09	22.44	17.78
135.0	551.25	338.06	302.06	104.46	53.78	37.58	27.51	21.26	16.76
180.0	384.86	227.19	118.52	65.36	39.94	27.34	20.81	16.65	14.46
225.0	419.63	248.79	137.93	69.13	43.82	29.42	21.26	17.10	14.51
270.0	545.63	332.44	297.00	99.45	48.26	32.91	23.79	18.51	15.13
315.0	505.86	297.00	170.38	86.91	46.69	30.71	22.67	17.66	15.08
360.0	662.63	443.25	300.94	158.96	73.52	45.79	32.23	22.61	18.39
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	15.81	14.12	13.05	12.38	11.87	11.42	10.97	10.63	10.41
45.0	15.64	14.01	12.94	12.15	11.64	11.19	10.86	10.58	10.29
90.0	15.30	13.50	12.54	11.81	11.31	10.86	10.52	10.29	10.01
135.0	14.74	13.28	12.43	11.76	11.19	10.86	10.52	10.24	10.01
180.0	13.05	12.21	11.64	11.19	10.69	10.46	10.18	9.96	9.73
225.0	13.05	12.21	11.64	11.03	10.69	10.41	10.07	9.84	9.73
270.0	13.61	12.60	11.93	11.36	10.86	10.58	10.24	10.01	9.73
315.0	13.78	12.77	12.15	11.53	11.14	10.80	10.52	10.18	9.96
360.0	15.81	14.12	13.05	12.38	11.87	11.42	10.97	10.63	10.41



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	10.18	9.96	9.79	9.68	9.51	9.28	9.28	9.17	8.94
45.0	10.07	9.84	9.73	9.62	9.51	9.28	9.17	9.11	9.00
90.0	9.84	9.68	9.45	9.34	9.28	9.11	9.06	8.94	8.83
135.0	9.84	9.62	9.45	9.34	9.23	9.11	9.00	8.94	8.83
180.0	9.56	9.45	9.23	9.17	9.06	9.00	8.89	8.83	8.78
225.0	9.45	9.34	9.28	9.11	9.00	9.00	8.83	8.83	8.78
270.0	9.56	9.51	9.34	9.23	9.11	9.00	8.94	8.83	8.78
315.0	9.79	9.56	9.39	9.28	9.23	9.06	9.00	8.89	8.83
360.0	10.18	9.96	9.79	9.68	9.51	9.28	9.28	9.17	8.94
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	8.94	8.83	8.72	8.66	8.61	8.55	8.55	8.44	8.44
45.0	8.89	8.83	8.78	8.72	8.66	8.61	8.55	8.49	8.49
90.0	8.78	8.72	8.66	8.66	8.61	8.49	8.49	8.44	8.44
135.0	8.78	8.66	8.61	8.55	8.55	8.44	8.49	8.38	8.33
180.0	8.66	8.61	8.55	8.55	8.49	8.44	8.38	8.33	8.33
225.0	8.61	8.61	8.49	8.49	8.49	8.38	8.38	8.33	8.27
270.0	8.72	8.66	8.61	8.55	8.55	8.49	8.44	8.44	8.38
315.0	8.78	8.66	8.61	8.61	8.49	8.49	8.38	8.38	8.33
360.0	8.94	8.83	8.72	8.66	8.61	8.55	8.55	8.44	8.44
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	8.33	8.33	8.27	8.27	8.27	8.21	8.21	8.16	8.16
45.0	8.44	8.38	8.33	8.27	8.27	8.21	8.21	8.16	8.16
90.0	8.38	8.33	8.33	8.33	8.33	8.33	8.33	8.33	8.33
135.0	8.27	8.27	8.27	8.21	8.21	8.21	8.10	8.16	8.10
180.0	8.27	8.27	8.21	8.16	8.16	8.16	8.16	8.10	8.10
225.0	8.21	8.21	8.21	8.21	8.21	8.16	8.10	8.10	8.10
270.0	8.33	8.33	8.33	8.38	8.38	8.33	8.33	8.38	8.49
315.0	8.27	8.27	8.16	8.21	8.16	8.04	8.10	8.16	8.10
360.0	8.33	8.33	8.27	8.27	8.27	8.21	8.21	8.16	8.16
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	8.10	8.10	8.10	8.04	8.04	8.04	7.99	7.99	7.99
45.0	8.16	8.10	8.10	8.10	8.04	8.10	8.10	8.04	8.04
90.0	8.38	8.38	8.38	8.38	8.38	8.38	8.38	8.38	8.33
135.0	8.10	8.10	8.04	8.04	8.04	8.04	8.04	7.99	7.99
180.0	8.10	8.04	8.04	8.04	8.04	7.99	7.99	7.93	8.04
225.0	8.04	8.10	8.04	8.04	8.04	8.10	7.99	8.04	8.04
270.0	8.55	8.61	8.61	8.72	8.66	8.72	8.72	8.78	8.72
315.0	8.04	8.04	8.04	8.04	7.99	7.99	7.99	7.99	7.99
360.0	8.10	8.10	8.10	8.04	8.04	8.04	7.99	7.99	7.99
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	7.99	7.93	7.99	7.99	7.93	7.93	7.93	7.93	7.93
45.0	8.04	8.04	8.04	8.04	8.04	8.04	8.04	7.93	7.99
90.0	8.33	8.38	8.49	8.66	8.38	8.16	7.93	7.93	7.93
135.0	7.99	7.99	7.99	7.99	7.93	7.93	7.93	7.93	7.88
180.0	7.99	7.99	7.99	7.93	7.99	7.93	7.93	7.93	7.88
225.0	8.04	8.04	7.99	7.99	7.99	7.99	7.93	7.99	7.99
270.0	8.72	8.66	8.78	8.94	8.38	7.93	7.88	7.88	7.93
315.0	7.99	7.99	7.99	7.99	7.99	7.99	7.88	7.88	7.88
360.0	7.99	7.93	7.99	7.99	7.93	7.93	7.93	7.93	7.93

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>7.93</b>
<b>45.0</b>	<b>7.99</b>
<b>90.0</b>	<b>7.93</b>
<b>135.0</b>	<b>7.88</b>
<b>180.0</b>	<b>7.93</b>
<b>225.0</b>	<b>7.99</b>
<b>270.0</b>	<b>7.93</b>
<b>315.0</b>	<b>7.88</b>
<b>360.0</b>	<b>7.93</b>