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Nata

LumCAT: 2-2181-M
Luminaire: BJB 47.360.1010
Report No: NATA0100
Test No: GC2020021308
LampCAT: CITIZEN CLU038
Lamp flux(lm): 2617.0
Number of Lamps: 1
Length(mm): 0
Phm Type: C

Voltage(V): 35.6900
Current(A): 0.5970
Power (W): 21.3000
PF: 0.0000
Ballast type: DC
Width(mm): 0
Height(mm): 0

Photometric Results

Lumens(lm): 2015.44
Efficiency(%): 77.01%
Lumens(lm)/Power(W): 94.62
Central intensity(cd): 9330.188
Maximum intensity(cd): 9330.188
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=24.3
 [C90/270]Total=24.3
Field angle(10%Imax): [C0/180]Total=46.9
 [C90/270]Total=46.9
Maximum s/h(1/2): C0_180=0.41 C90_270=0.41
Maximum s/h(1/4): C0_180=0.42 C90_270=0.42
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 77.01%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.910%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	9330.188	0.000	0	.000%	.000%
1.0	9286.313	8.908	8.908	.340%	.442%
2.0	9156.023	26.470	35.378	1.011%	1.755%
3.0	8950.781	43.306	78.683	1.655%	3.904%
4.0	8666.930	58.972	137.655	2.253%	6.830%
5.0	8343.563	73.178	210.834	2.796%	10.461%
6.0	7902.070	85.375	296.209	3.262%	14.697%
7.0	7410.867	95.047	391.256	3.632%	19.413%
8.0	6931.195	102.643	493.899	3.922%	24.506%
9.0	6410.180	108.125	602.024	4.132%	29.871%
10.0	5771.039	110.236	712.26	4.212%	35.340%
11.0	5252.625	110.149	822.409	4.209%	40.805%
12.0	4754.953	109.397	931.806	4.180%	46.233%
13.0	4168.758	105.902	1037.708	4.047%	51.488%
14.0	3733.734	101.151	1138.859	3.865%	56.507%
15.0	3331.688	96.997	1235.856	3.706%	61.320%
16.0	2918.039	91.576	1327.432	3.499%	65.863%
17.0	2546.367	85.095	1412.528	3.252%	70.085%
18.0	2249.367	79.071	1491.599	3.021%	74.009%
19.0	1949.133	73.045	1564.644	2.791%	77.633%
20.0	1697.203	66.738	1631.382	2.550%	80.944%
21.0	1438.678	60.215	1691.598	2.301%	83.932%
22.0	1201.978	53.065	1744.663	2.028%	86.565%
23.0	1025.325	46.735	1791.398	1.786%	88.884%
24.0	827.571	40.511	1831.909	1.548%	90.894%
25.0	629.782	33.137	1865.046	1.266%	92.538%
26.0	471.347	25.992	1891.038	.993%	93.828%
27.0	340.158	19.854	1910.891	.759%	94.813%
28.0	196.355	13.583	1924.475	.519%	95.487%
29.0	106.425	7.922	1932.396	.303%	95.880%
30.0	46.069	4.117	1936.514	.157%	96.084%
31.0	22.205	1.900	1938.414	.073%	96.178%
32.0	18.098	1.155	1939.568	.044%	96.236%
33.0	17.191	1.040	1940.608	.040%	96.287%
34.0	16.552	1.021	1941.629	.039%	96.338%
35.0	16.003	1.011	1942.64	.039%	96.388%
36.0	15.630	1.007	1943.647	.038%	96.438%
37.0	15.272	1.008	1944.655	.039%	96.488%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	15.033	1.012	1945.667	.039%	96.538%
39.0	14.787	1.018	1946.685	.039%	96.589%
40.0	14.597	1.025	1947.709	.039%	96.640%
41.0	14.484	1.036	1948.745	.040%	96.691%
42.0	14.400	1.049	1949.794	.040%	96.743%
43.0	14.365	1.066	1950.86	.041%	96.796%
44.0	14.358	1.084	1951.944	.041%	96.850%
45.0	14.400	1.105	1953.049	.042%	96.904%
46.0	14.498	1.130	1954.179	.043%	96.961%
47.0	14.618	1.158	1955.337	.044%	97.018%
48.0	14.709	1.186	1956.523	.045%	97.077%
49.0	14.857	1.214	1957.737	.046%	97.137%
50.0	15.019	1.246	1958.983	.048%	97.199%
51.0	15.152	1.276	1960.259	.049%	97.262%
52.0	15.328	1.308	1961.567	.050%	97.327%
53.0	15.525	1.342	1962.909	.051%	97.394%
54.0	15.715	1.377	1964.286	.053%	97.462%
55.0	15.954	1.414	1965.7	.054%	97.532%
56.0	16.151	1.451	1967.15	.055%	97.604%
57.0	16.369	1.487	1968.637	.057%	97.678%
58.0	16.594	1.524	1970.162	.058%	97.754%
59.0	16.791	1.561	1971.722	.060%	97.831%
60.0	16.980	1.595	1973.318	.061%	97.910%
61.0	17.255	1.634	1974.952	.062%	97.991%
62.0	17.409	1.670	1976.622	.064%	98.074%
63.0	17.522	1.699	1978.321	.065%	98.158%
64.0	17.592	1.723	1980.044	.066%	98.244%
65.0	17.620	1.743	1981.787	.067%	98.330%
66.0	17.585	1.757	1983.543	.067%	98.417%
67.0	17.515	1.765	1985.308	.067%	98.505%
68.0	17.409	1.769	1987.077	.068%	98.593%
69.0	17.276	1.769	1988.847	.068%	98.681%
70.0	17.009	1.761	1990.607	.067%	98.768%
71.0	16.587	1.736	1992.344	.066%	98.854%
72.0	16.031	1.696	1994.04	.065%	98.938%
73.0	15.258	1.636	1995.676	.063%	99.019%
74.0	14.400	1.559	1997.235	.060%	99.097%
75.0	13.430	1.470	1998.706	.056%	99.170%

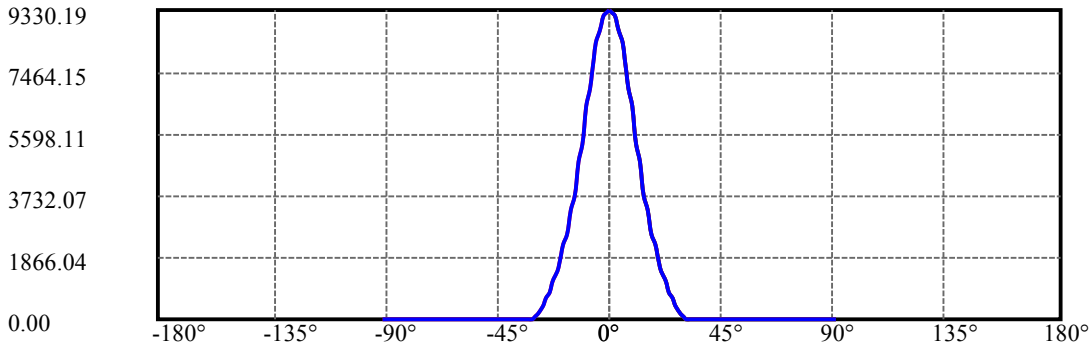
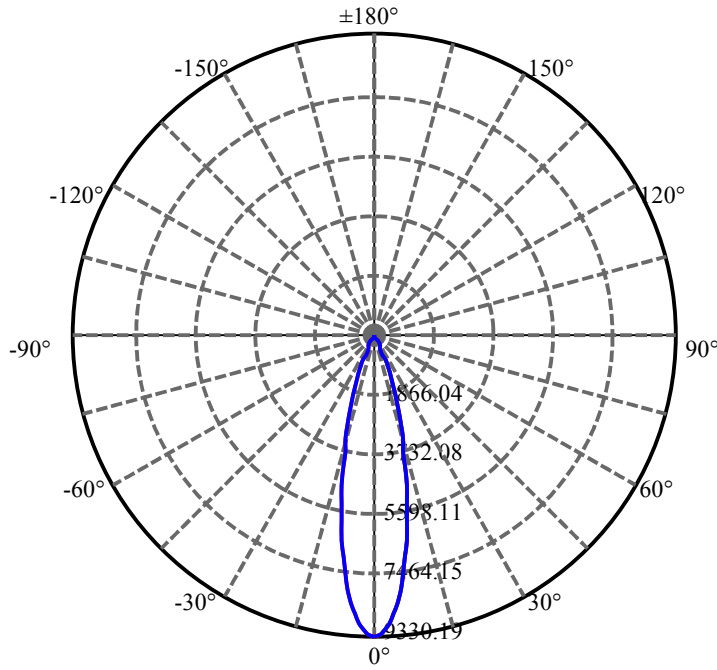
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	12.888	1.397	2000.103	.053%	99.239%
77.0	12.417	1.349	2001.452	.052%	99.306%
78.0	11.848	1.299	2002.751	.050%	99.371%
79.0	11.032	1.229	2003.98	.047%	99.432%
80.0	10.659	1.169	2005.149	.045%	99.490%
81.0	10.392	1.138	2006.288	.044%	99.546%
82.0	10.104	1.111	2007.399	.042%	99.601%
83.0	9.886	1.087	2008.486	.042%	99.655%
84.0	9.830	1.074	2009.56	.041%	99.708%
85.0	9.584	1.060	2010.62	.040%	99.761%
86.0	9.457	1.041	2011.66	.040%	99.813%
87.0	8.817	1.000	2012.661	.038%	99.862%
88.0	8.543	0.951	2013.612	.036%	99.909%
89.0	8.283	0.922	2014.534	.035%	99.955%
90.0	8.198	0.904	2015.437	.035%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1936.51	74.00%	96.08%
0-40	1947.71	74.43%	96.64%
0-60	1973.32	75.40%	97.91%
0-90	2014.53	76.98%	99.96%
0-120	2014.53	76.98%	99.96%
0-180	2015.44	77.01%	100.00%
60-90	42.81	1.64%	2.12%
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%
0-19.71	1612.35	61.61%	80.00%

ZONAL LUMEN SUMMARY

0-10	712.26
10-20	919.12
20-30	305.13
30-40	11.20
40-50	11.27
50-60	14.34
60-70	17.29
70-80	14.54
80-90	9.38
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: ———

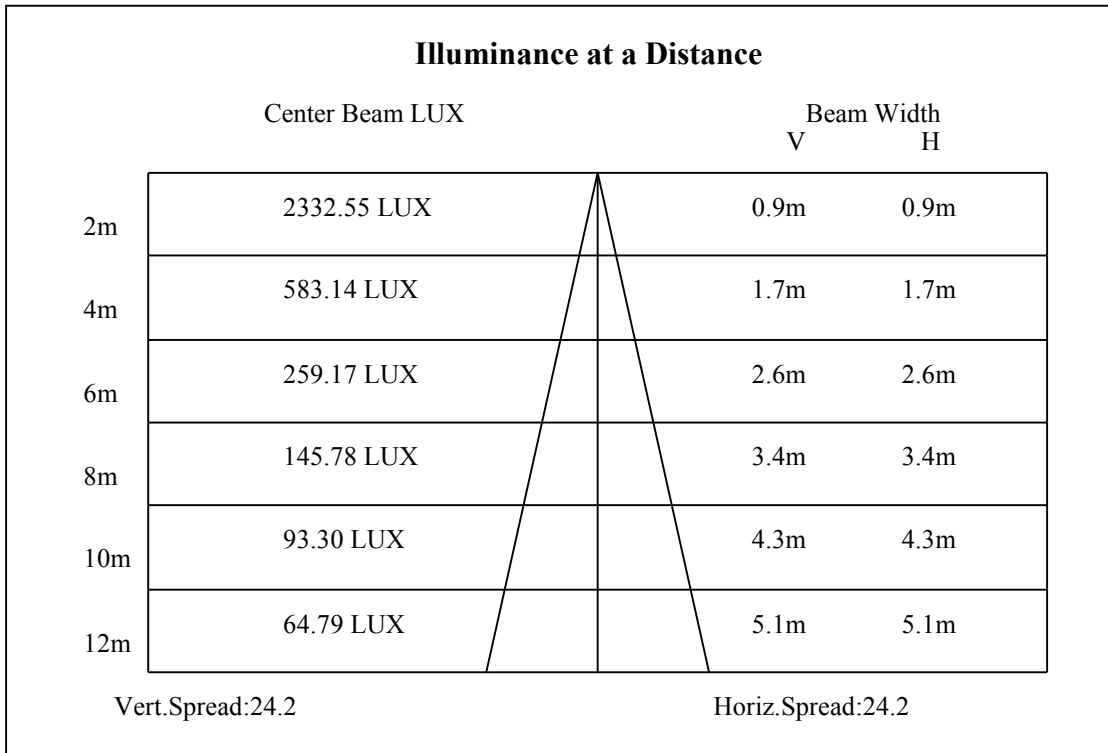
C90/C270: ———

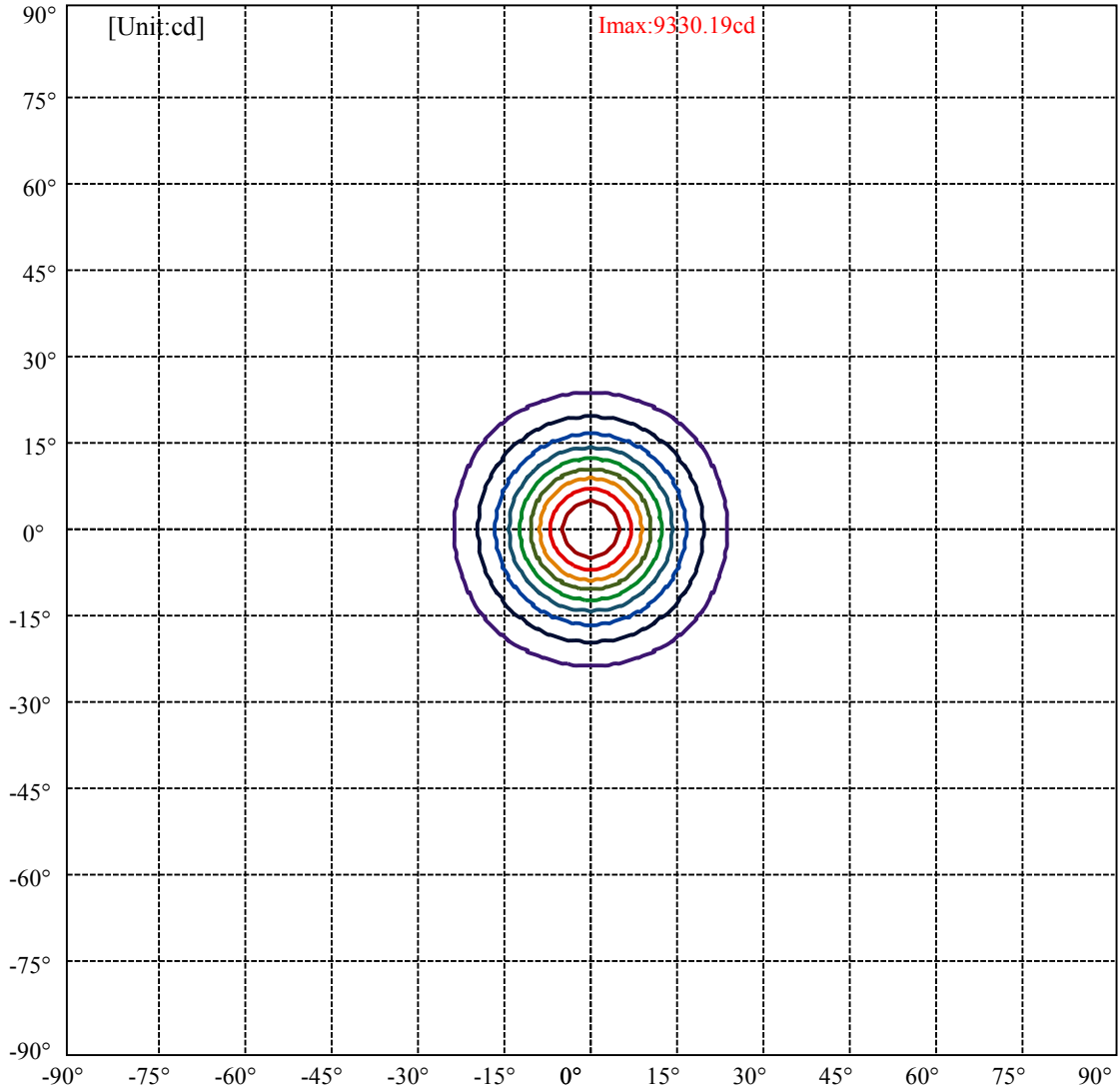
Field angle(10%Imax):C0/180Left:23.5 Right:23.5

:C90/270Left:23.5 Right:23.5

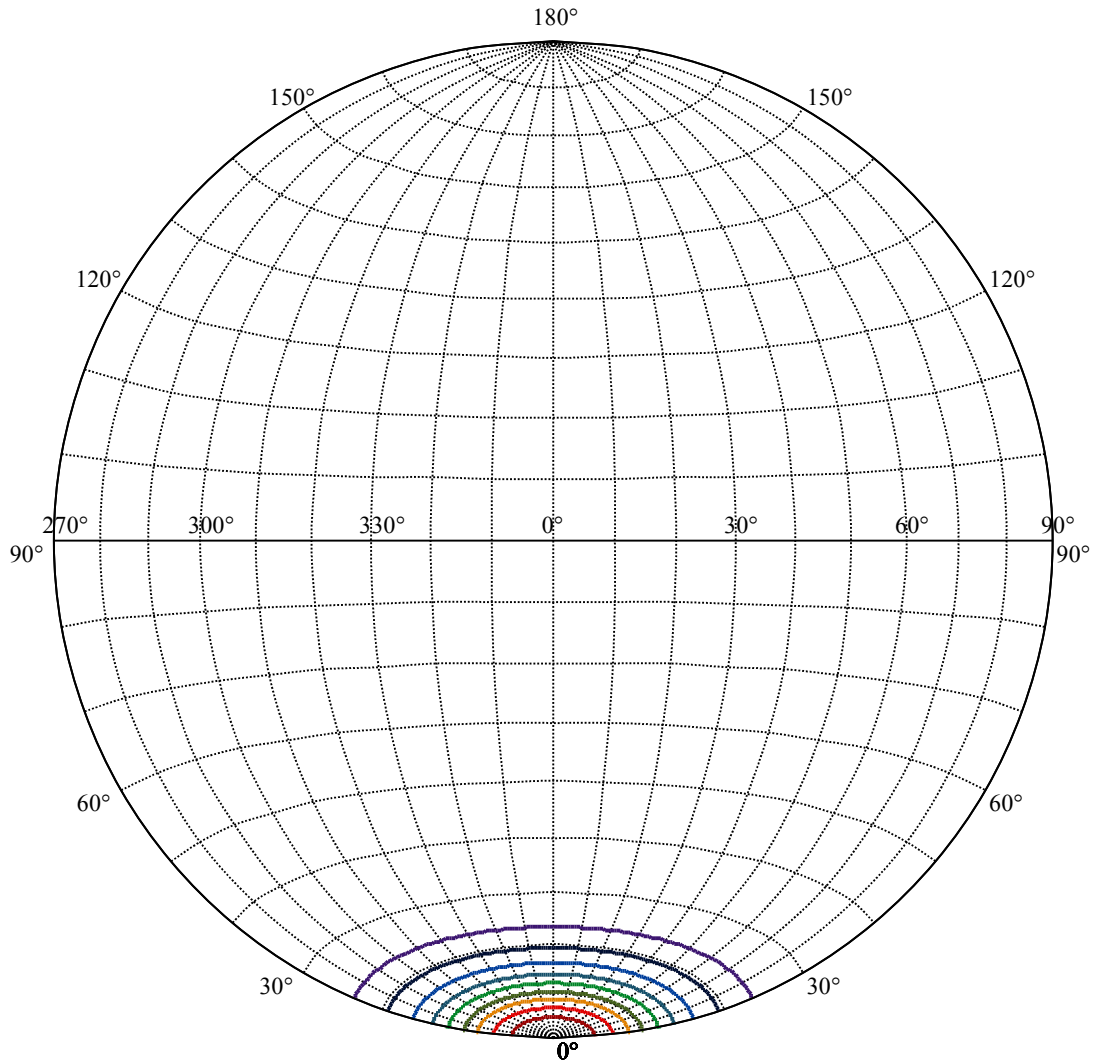
Beam Angle(50%Imax):C0/180Left:12.2 Right:12.2

:C90/270Left:12.2 Right:12.2





(10%Imax) 933.019	—
(20%Imax) 1866.04	—
(30%Imax) 2799.06	—
(40%Imax) 3732.07	—
(50%Imax) 4665.09	—
(60%Imax) 5598.11	—
(70%Imax) 6531.13	—
(80%Imax) 7464.15	—
(90%Imax) 8397.17	—



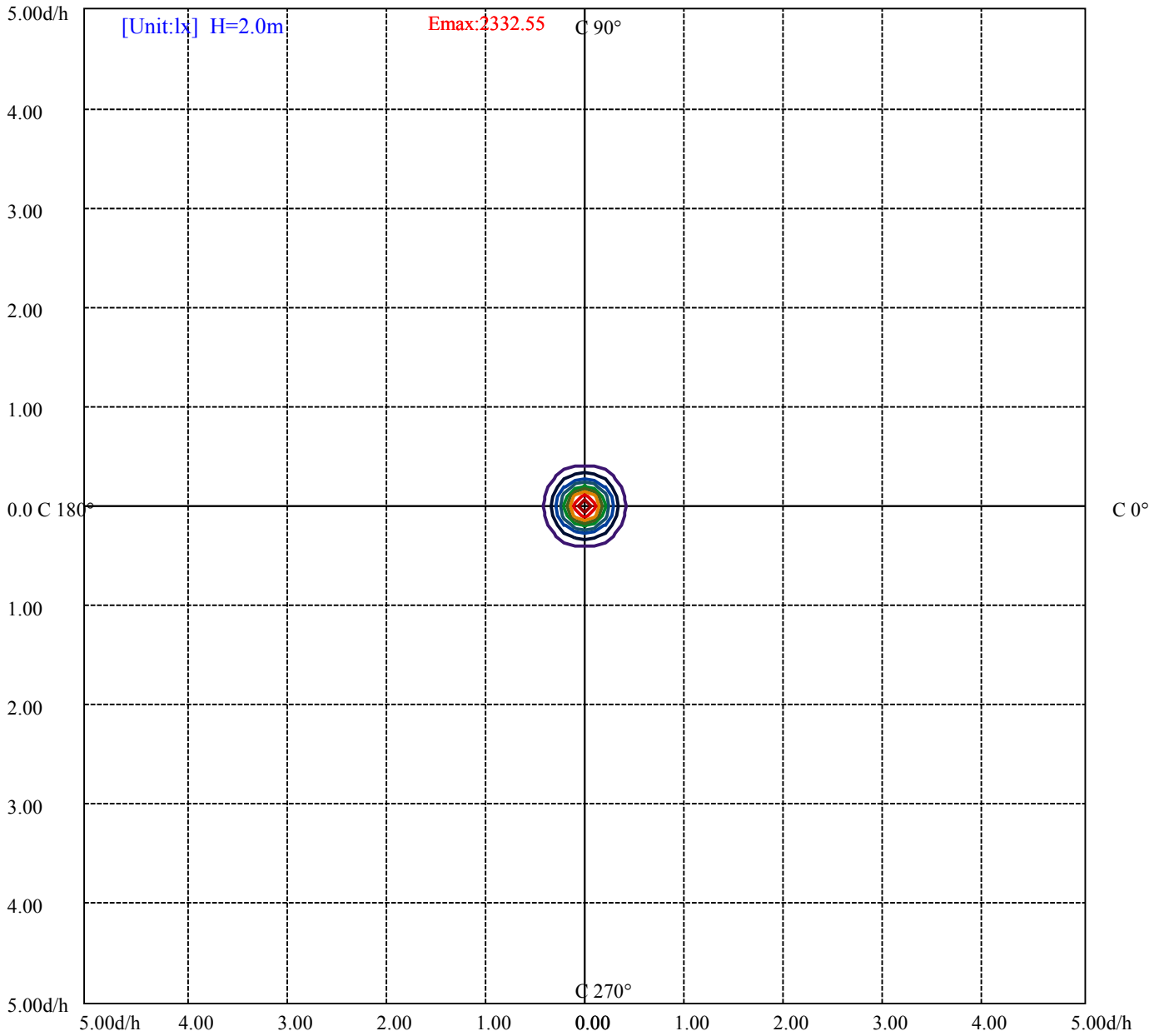
House

[Unit:cd]

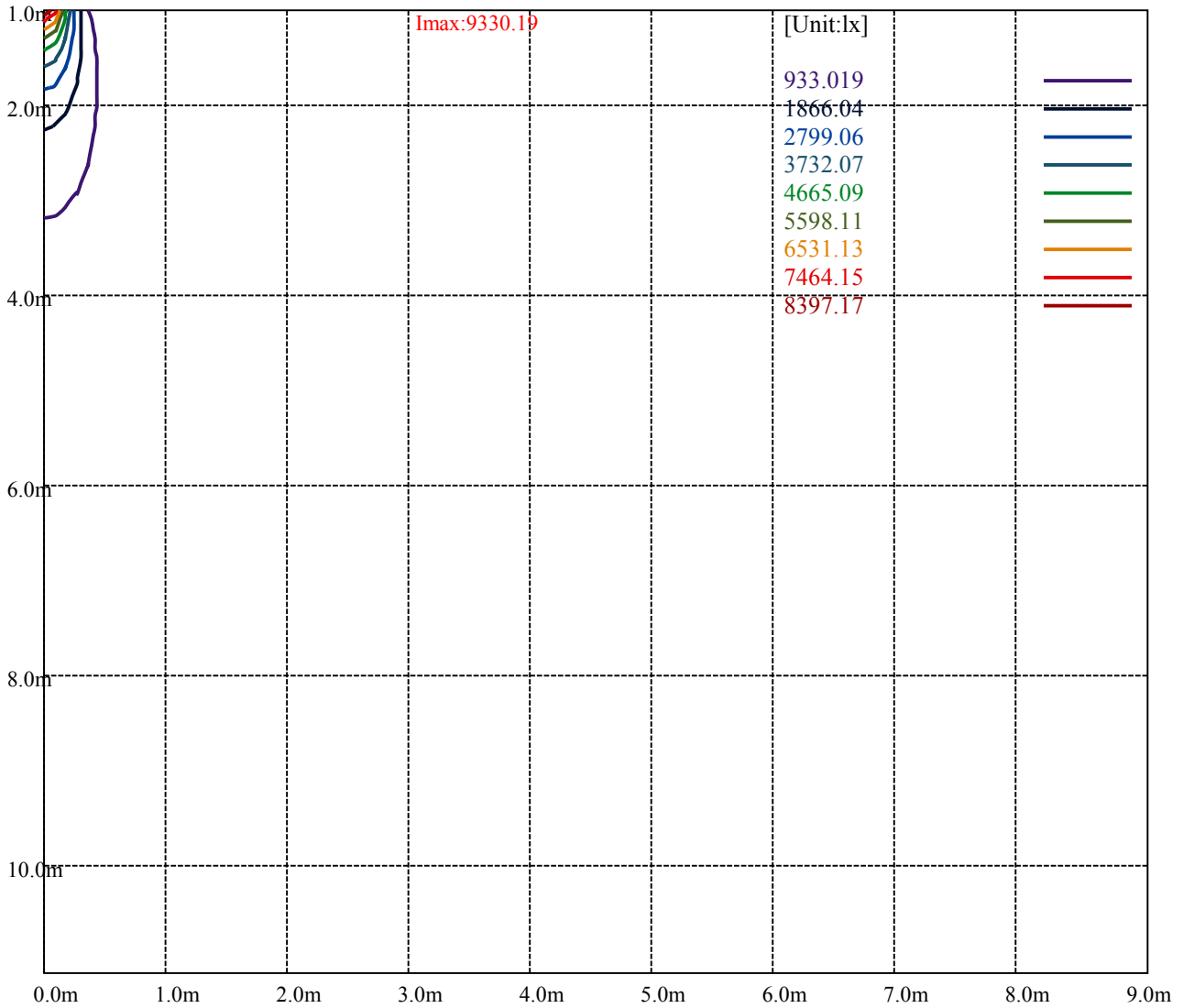
Road

I_{max}:9330.19

(10%I _{max}) 933.019	—
(20%I _{max}) 1866.04	—
(30%I _{max}) 2799.06	—
(40%I _{max}) 3732.07	—
(50%I _{max}) 4665.09	—
(60%I _{max}) 5598.11	—
(70%I _{max}) 6531.13	—
(80%I _{max}) 7464.15	—
(90%I _{max}) 8397.17	—



- (10%Emax) 233.2545
- (20%Emax) 466.51
- (30%Emax) 699.7625
- (40%Emax) 933.0175
- (50%Emax) 1166.272
- (60%Emax) 1399.527
- (70%Emax) 1632.782
- (80%Emax) 1866.035
- (90%Emax) 2099.29



Luminance Table

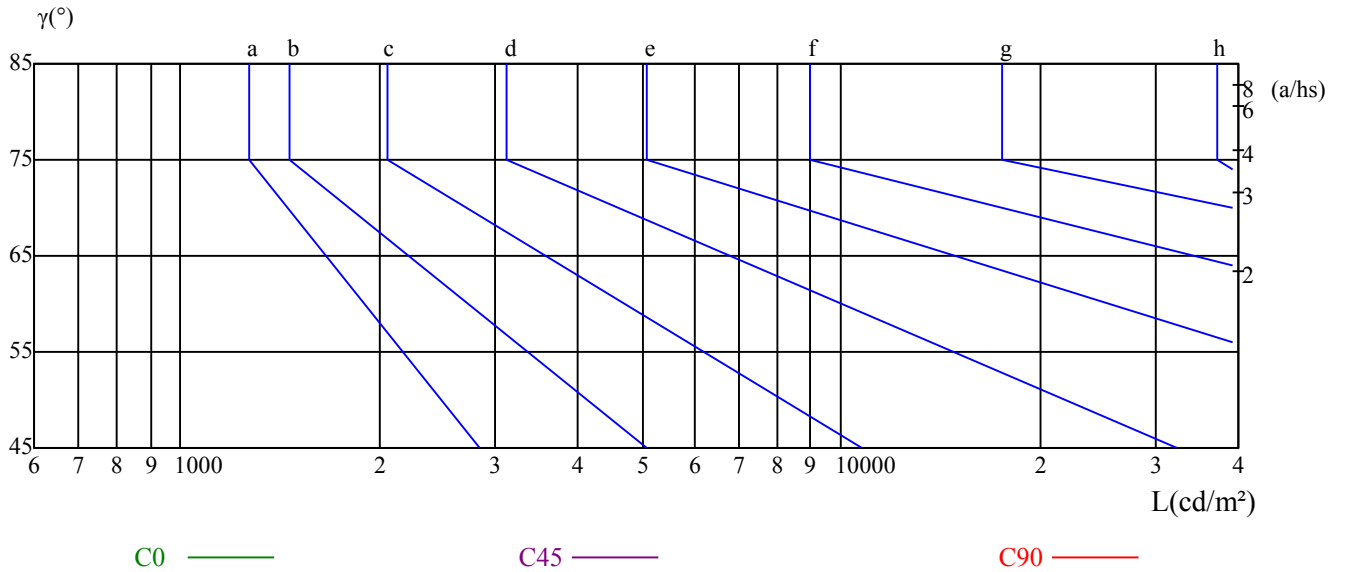
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

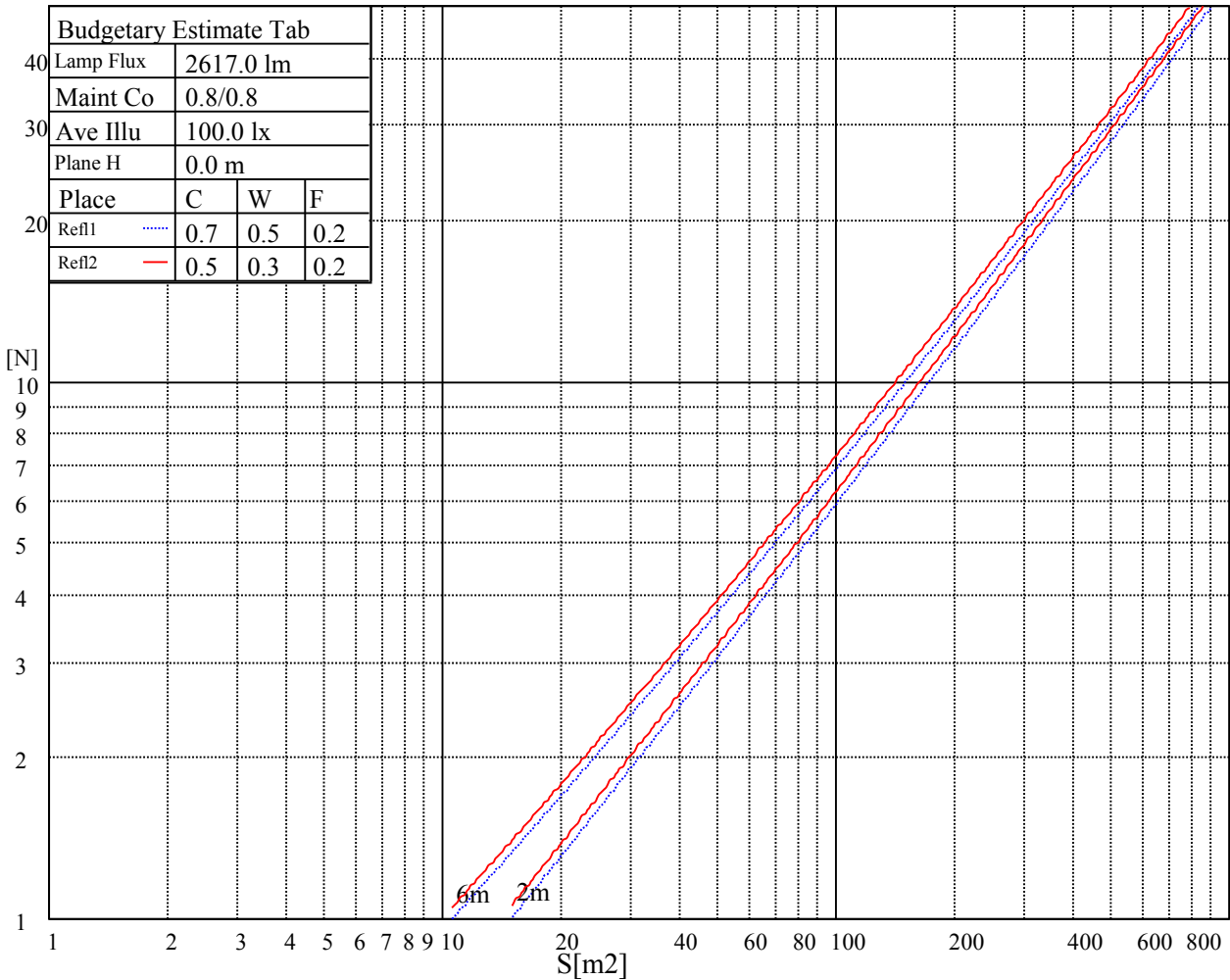
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

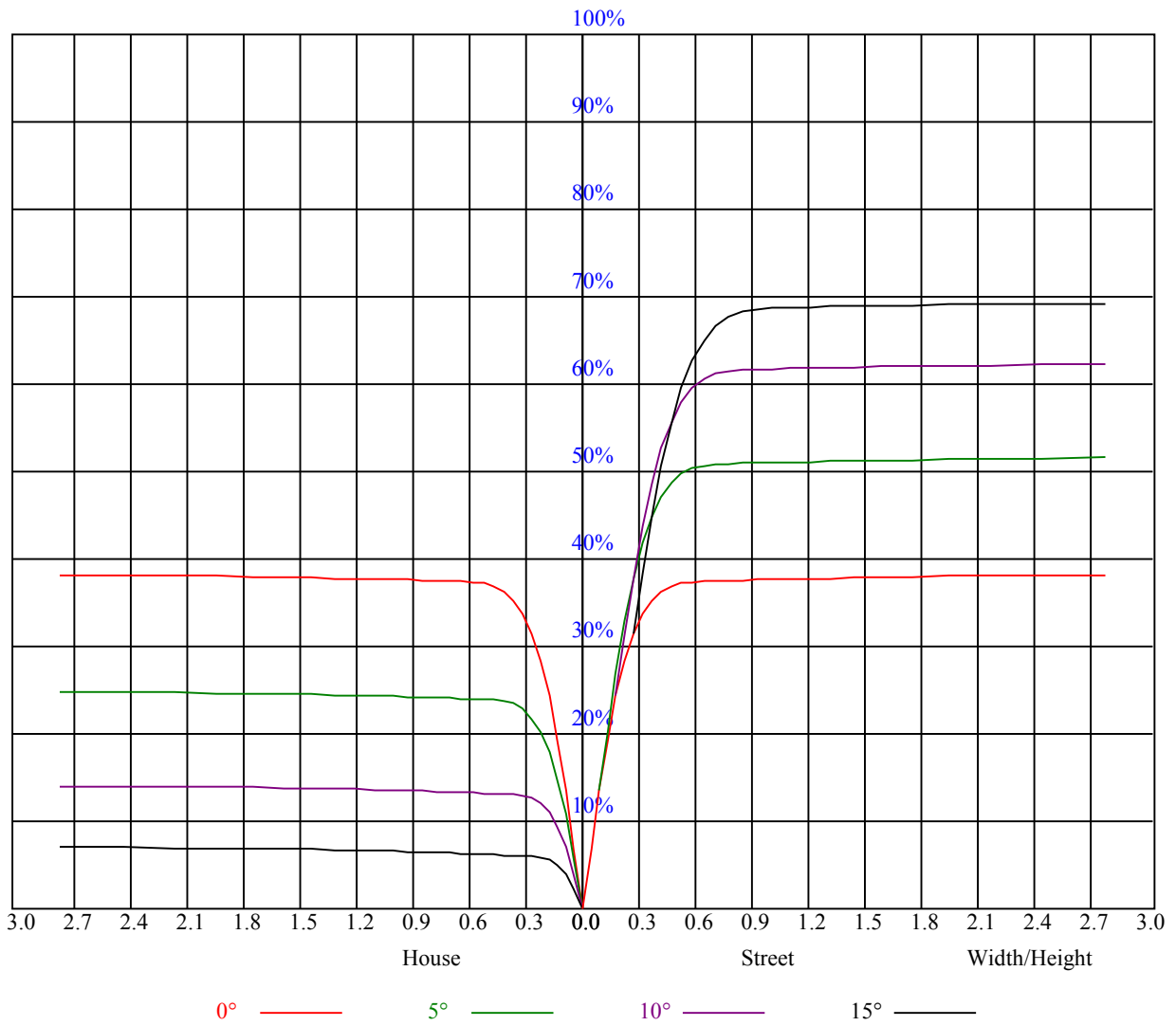
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.92	0.92	0.92	0.90	0.90	0.90	0.86	0.86	0.86	0.82	0.82	0.82	0.79	0.79	0.79	0.77
1	0.87	0.85	0.84	0.85	0.84	0.82	0.82	0.81	0.80	0.79	0.78	0.77	0.76	0.76	0.75	0.74
2	0.82	0.80	0.78	0.81	0.79	0.77	0.79	0.77	0.75	0.76	0.75	0.74	0.74	0.73	0.72	0.71
3	0.79	0.76	0.74	0.78	0.75	0.73	0.76	0.74	0.72	0.74	0.72	0.71	0.72	0.71	0.70	0.69
4	0.76	0.73	0.70	0.75	0.72	0.70	0.73	0.71	0.69	0.72	0.70	0.68	0.71	0.69	0.68	0.67
5	0.73	0.70	0.67	0.72	0.69	0.67	0.71	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	0.65	0.69	0.66	0.64	0.68	0.66	0.64	0.67	0.65	0.64	0.63
7	0.68	0.65	0.63	0.68	0.65	0.63	0.67	0.64	0.62	0.66	0.64	0.62	0.66	0.63	0.62	0.61
8	0.66	0.63	0.61	0.66	0.63	0.61	0.65	0.63	0.61	0.65	0.62	0.60	0.64	0.62	0.60	0.59
9	0.64	0.61	0.59	0.64	0.61	0.59	0.64	0.61	0.59	0.63	0.61	0.59	0.62	0.60	0.59	0.58
10	0.63	0.60	0.58	0.62	0.60	0.58	0.62	0.59	0.57	0.61	0.59	0.57	0.61	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	9345.38	9275.06	9112.50	8925.19	8578.13	8223.19	7814.25	7245.56	6755.63
45.0	9356.06	9232.31	9031.50	8817.19	8429.63	8055.56	7570.69	7022.25	6514.31
90.0	9292.50	9189.00	9009.00	8699.06	8380.69	8006.06	7462.69	6973.31	6460.31
135.0	9326.81	9304.88	9189.00	9019.13	8755.31	8467.31	8118.00	7586.44	7121.81
180.0	9345.38	9317.81	9219.38	9008.44	8770.50	8473.50	8010.00	7574.63	7098.19
225.0	9356.06	9366.75	9298.69	9097.31	8902.13	8619.19	8179.31	7772.06	7323.19
270.0	9292.50	9344.81	9282.94	9174.38	8926.31	8655.75	8320.50	7827.19	7383.38
315.0	9326.81	9259.88	9105.19	8865.56	8592.75	8247.94	7741.13	7285.50	6792.75
360.0	9345.38	9275.06	9112.50	8925.19	8578.13	8223.19	7814.25	7245.56	6755.63
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	6242.06	5586.75	5072.06	4582.13	4007.25	3579.19	3186.00	2783.81	2424.38
45.0	5933.25	5342.06	4829.63	4348.13	3798.00	3391.31	3016.69	2642.06	2306.81
90.0	5933.81	5278.50	4779.56	4312.13	3772.13	3371.06	2999.25	2623.50	2283.75
135.0	6633.56	5978.25	5448.94	4937.06	4334.63	3886.31	3469.50	3042.00	2662.88
180.0	6597.00	5939.44	5420.81	4921.88	4331.25	3890.81	3477.38	3047.63	2660.06
225.0	6832.69	6187.50	5664.94	5153.06	4532.06	4074.75	3653.44	3209.06	2802.38
270.0	6902.44	6253.31	5726.81	5207.06	4582.69	4111.31	3675.94	3221.44	2813.63
315.0	6206.63	5602.50	5078.25	4578.19	3992.06	3565.13	3175.31	2774.81	2417.06
360.0	6242.06	5586.75	5072.06	4582.13	4007.25	3579.19	3186.00	2783.81	2424.38
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2144.25	1864.13	1608.75	1392.75	1173.94	982.13	774.00	578.25	421.31
45.0	2031.75	1746.00	1500.75	1278.56	1065.94	868.50	675.00	481.50	336.94
90.0	2007.56	1725.19	1500.19	1094.74	1045.58	856.41	658.74	477.11	338.51
135.0	2347.88	2027.25	1755.00	1523.81	1276.88	1083.94	875.81	671.06	504.56
180.0	2345.06	2030.06	1781.44	1528.88	1122.41	1097.94	885.71	686.59	522.51
225.0	2483.44	2161.69	1905.19	1639.69	1393.88	1120.56	978.53	772.43	599.74
270.0	2493.00	2177.44	1892.81	1659.38	1418.06	1221.75	1006.88	795.94	621.00
315.0	2142.00	1861.31	1633.50	1391.63	1119.15	971.38	765.90	575.38	426.21
360.0	2144.25	1864.13	1608.75	1392.75	1173.94	982.13	774.00	578.25	421.31
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	285.19	144.23	66.09	28.52	16.14	15.08	14.23	13.44	12.77
45.0	289.69	101.31	46.24	21.99	17.72	17.21	16.82	16.37	15.98
90.0	220.16	104.85	44.55	23.63	20.03	19.18	18.68	18.17	17.83
135.0	360.56	285.19	120.99	47.59	20.93	18.28	17.66	17.21	16.88
180.0	376.43	223.65	123.36	51.75	21.38	16.20	15.30	14.51	13.84
225.0	437.74	262.80	155.42	77.40	31.84	20.36	18.62	17.89	17.16
270.0	459.56	290.25	218.03	86.57	31.44	21.32	19.69	18.79	18.06
315.0	291.94	158.57	76.73	31.11	18.17	17.16	16.54	16.03	15.53
360.0	285.19	144.23	66.09	28.52	16.14	15.08	14.23	13.44	12.77
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	12.32	11.87	11.59	11.31	11.03	10.86	10.74	10.63	10.58
45.0	15.64	15.41	15.24	15.02	14.96	14.85	14.74	14.68	14.63
90.0	17.61	17.44	17.33	17.27	17.44	17.61	17.89	18.17	18.56
135.0	16.59	16.31	16.09	15.86	15.64	15.47	15.30	15.19	15.02
180.0	13.44	12.99	12.71	12.38	12.15	11.98	11.81	11.76	11.64
225.0	16.65	16.14	15.81	15.47	15.13	14.96	14.74	14.57	14.46
270.0	17.61	17.16	16.88	16.59	16.31	16.20	16.14	16.20	16.37
315.0	15.19	14.85	14.63	14.40	14.12	13.95	13.84	13.73	13.61
360.0	12.32	11.87	11.59	11.31	11.03	10.86	10.74	10.63	10.58

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	10.52	10.52	10.58	10.52	10.52	10.58	10.58	10.63	10.63
45.0	14.63	14.63	14.63	14.63	14.68	14.74	14.85	14.96	15.13
90.0	19.01	19.74	20.42	21.04	21.83	22.56	23.18	23.91	24.64
135.0	14.91	14.91	14.79	14.74	14.68	14.63	14.63	14.57	14.57
180.0	11.64	11.53	11.53	11.53	11.48	11.53	11.59	11.59	11.64
225.0	14.34	14.29	14.23	14.12	14.06	14.01	13.95	13.95	14.01
270.0	16.59	16.93	17.33	17.72	18.34	18.84	19.29	19.86	20.48
315.0	13.56	13.44	13.44	13.39	13.28	13.28	13.16	13.16	13.11
360.0	10.52	10.52	10.58	10.52	10.52	10.58	10.58	10.63	10.63
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	10.63	10.69	10.69	10.80	10.74	10.80	10.74	10.80	10.80
45.0	15.24	15.36	15.58	15.64	15.75	15.69	15.69	15.69	15.69
90.0	25.54	26.38	27.17	27.96	28.80	29.48	30.21	31.11	31.61
135.0	14.57	14.63	14.63	14.63	14.74	14.79	14.91	15.02	15.13
180.0	11.59	11.70	11.64	11.64	11.70	11.70	11.70	11.76	11.76
225.0	14.06	14.18	14.23	14.29	14.40	14.46	14.46	14.46	14.34
270.0	20.98	21.60	22.16	22.84	23.46	24.08	24.81	25.76	26.55
315.0	13.11	13.11	13.11	13.16	13.16	13.33	13.33	13.44	13.39
360.0	10.63	10.69	10.69	10.80	10.74	10.80	10.74	10.80	10.80
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.80	10.80	10.80	10.86	10.86	10.97	11.14	11.36	11.76
45.0	15.64	15.58	15.53	15.36	15.30	15.08	14.79	14.51	13.95
90.0	31.89	32.12	32.12	31.73	30.66	29.48	28.18	26.27	24.53
135.0	15.24	15.41	15.69	15.86	16.31	16.99	17.72	18.34	18.45
180.0	11.81	11.81	11.93	11.98	12.38	12.66	13.05	13.73	14.01
225.0	14.34	14.18	14.01	13.95	13.78	13.67	13.56	13.44	13.28
270.0	27.06	27.28	27.34	27.23	26.83	26.04	25.03	23.85	22.28
315.0	13.39	13.56	13.56	13.73	14.01	14.40	14.74	14.57	14.46
360.0	10.80	10.80	10.80	10.86	10.86	10.97	11.14	11.36	11.76
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	11.87	12.09	12.15	12.09	11.87	10.97	10.01	9.45	9.23
45.0	13.56	13.16	12.66	12.21	11.93	11.59	11.31	10.86	10.46
90.0	21.77	17.89	15.13	12.38	12.04	11.81	11.53	11.14	11.03
135.0	18.51	18.84	18.90	18.23	17.44	16.76	15.47	13.56	12.94
180.0	14.40	14.63	14.63	14.57	14.18	13.56	12.71	10.63	9.96
225.0	12.99	12.66	12.38	12.15	11.87	11.64	11.48	11.08	10.74
270.0	20.76	18.62	15.41	12.32	11.70	11.53	11.25	10.91	10.58
315.0	14.40	14.18	13.95	13.50	12.09	11.48	11.03	10.63	10.35
360.0	11.87	12.09	12.15	12.09	11.87	10.97	10.01	9.45	9.23
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.17	9.06	9.00	8.89	8.78	8.78	8.49	8.38	8.27
45.0	10.13	9.90	9.62	9.39	9.23	9.00	8.38	8.21	8.21
90.0	10.74	10.41	10.13	9.96	10.01	9.28	8.44	8.16	8.21
135.0	12.66	12.09	11.81	12.38	11.08	11.19	9.23	8.72	8.27
180.0	9.73	9.68	9.51	9.45	9.34	9.34	8.89	8.61	8.38
225.0	10.46	10.07	9.79	9.62	9.39	9.23	9.11	8.89	8.38
270.0	10.29	10.01	9.79	9.62	9.51	9.39	9.23	9.00	8.33
315.0	9.96	9.62	9.45	9.34	9.34	9.45	8.78	8.38	8.21
360.0	9.17	9.06	9.00	8.89	8.78	8.78	8.49	8.38	8.27

Intensity data(cd)

C/γ(°)	90.0
0.0	8.27
45.0	8.21
90.0	8.16
135.0	8.21
180.0	8.21
225.0	8.21
270.0	8.16
315.0	8.16
360.0	8.27