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## Nata

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LumCAT: LN01D04524DA-N

Luminaire: 97.70.234.00

Report No: 201231-B007

Test No: 201231-C007

LampCAT: CITIZEN CLU028 LES9.8

Lamp flux(lm): 1520.7

Number of Lamps: 1

Length(mm): 92

Phm Type: C

Voltage(V): 36.9700

Current(A): 0.3800

Power (W): 14.0480

PF: 0.0000

Ballast type: DC

Width(mm): 92

Height(mm): 50

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## Photometric Results

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Lumens(lm): 1328.10

Efficiency(%): 87.33%

Lumens(lm)/Power(W): 94.54

Central intensity(cd): 4638.094

Maximum intensity(cd): 4638.094

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=28.6

[C90/270]Total=28.6

Field angle(10%Imax): [C0/180]Total=48.2

[C90/270]Total=48.2

Maximum s/h(1/2): C0\_180=0.48 C90\_270=0.48

Maximum s/h(1/4): C0\_180=0.46 C90\_270=0.46

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 87.33%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 96.305%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4638.094	0.000	0	.000%	.000%
1.0	4626.984	4.433	4.433	.292%	.334%
2.0	4585.781	13.223	17.656	.870%	1.329%
3.0	4520.742	21.780	39.436	1.432%	2.969%
4.0	4434.750	29.977	69.413	1.971%	5.226%
5.0	4314.797	37.640	107.053	2.475%	8.061%
6.0	4171.500	44.598	151.651	2.933%	11.419%
7.0	4015.195	50.815	202.465	3.342%	15.245%
8.0	3838.078	56.204	258.67	3.696%	19.477%
9.0	3635.930	60.573	319.243	3.983%	24.038%
10.0	3421.898	63.871	383.113	4.200%	28.847%
11.0	3191.625	66.083	449.196	4.346%	33.822%
12.0	2946.375	67.097	516.293	4.412%	38.875%
13.0	2674.828	66.710	583.003	4.387%	43.897%
14.0	2392.523	64.862	647.864	4.265%	48.781%
15.0	2126.953	62.045	709.91	4.080%	53.453%
16.0	1870.172	58.569	768.479	3.851%	57.863%
17.0	1601.156	54.058	822.537	3.555%	61.933%
18.0	1358.213	48.794	871.33	3.209%	65.607%
19.0	1139.738	43.459	914.789	2.858%	68.879%
20.0	970.425	38.622	953.411	2.540%	71.788%
21.0	807.307	34.136	987.547	2.245%	74.358%
22.0	681.398	29.916	1017.464	1.967%	76.610%
23.0	566.388	26.182	1043.645	1.722%	78.582%
24.0	470.222	22.664	1066.31	1.490%	80.288%
25.0	397.427	19.728	1086.038	1.297%	81.774%
26.0	335.827	17.309	1103.346	1.138%	83.077%
27.0	288.077	15.264	1118.61	1.004%	84.226%
28.0	250.010	13.623	1132.234	.896%	85.252%
29.0	207.942	11.981	1144.215	.788%	86.154%
30.0	181.920	10.526	1154.741	.692%	86.947%
31.0	160.552	9.530	1164.272	.627%	87.664%
32.0	141.490	8.653	1172.925	.569%	88.316%
33.0	126.555	7.897	1180.822	.519%	88.910%
34.0	114.363	7.291	1188.112	.479%	89.459%
35.0	102.867	6.746	1194.859	.444%	89.967%
36.0	93.227	6.244	1201.102	.411%	90.438%
37.0	85.584	5.832	1206.934	.383%	90.877%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	78.321	5.471	1212.405	.360%	91.289%
39.0	71.255	5.105	1217.511	.336%	91.673%
40.0	65.925	4.784	1222.295	.315%	92.033%
41.0	60.933	4.517	1226.812	.297%	92.373%
42.0	56.123	4.253	1231.065	.280%	92.694%
43.0	52.080	4.008	1235.073	.264%	92.995%
44.0	48.396	3.792	1238.866	.249%	93.281%
45.0	44.817	3.582	1242.448	.236%	93.551%
46.0	41.695	3.383	1245.831	.222%	93.805%
47.0	38.707	3.198	1249.029	.210%	94.046%
48.0	36.007	3.020	1252.049	.199%	94.274%
49.0	33.623	2.859	1254.909	.188%	94.489%
50.0	31.219	2.703	1257.612	.178%	94.692%
51.0	29.159	2.554	1260.167	.168%	94.885%
52.0	27.492	2.431	1262.598	.160%	95.068%
53.0	25.875	2.321	1264.919	.153%	95.243%
54.0	24.469	2.219	1267.138	.146%	95.410%
55.0	23.365	2.135	1269.273	.140%	95.571%
56.0	22.380	2.067	1271.34	.136%	95.726%
57.0	21.396	2.002	1273.342	.132%	95.877%
58.0	20.623	1.943	1275.285	.128%	96.023%
59.0	19.891	1.894	1277.179	.125%	96.166%
60.0	19.160	1.845	1279.024	.121%	96.305%
61.0	18.506	1.798	1280.822	.118%	96.440%
62.0	17.909	1.755	1282.576	.115%	96.572%
63.0	17.332	1.714	1284.29	.113%	96.701%
64.0	16.840	1.677	1285.967	.110%	96.827%
65.0	16.552	1.653	1287.62	.109%	96.952%
66.0	16.488	1.648	1289.268	.108%	97.076%
67.0	16.699	1.669	1290.937	.110%	97.202%
68.0	17.220	1.718	1292.655	.113%	97.331%
69.0	17.831	1.788	1294.443	.118%	97.466%
70.0	18.506	1.866	1296.309	.123%	97.606%
71.0	19.238	1.951	1298.26	.128%	97.753%
72.0	19.983	2.039	1300.3	.134%	97.907%
73.0	20.749	2.130	1302.43	.140%	98.067%
74.0	21.488	2.220	1304.65	.146%	98.234%
75.0	21.987	2.297	1306.947	.151%	98.407%

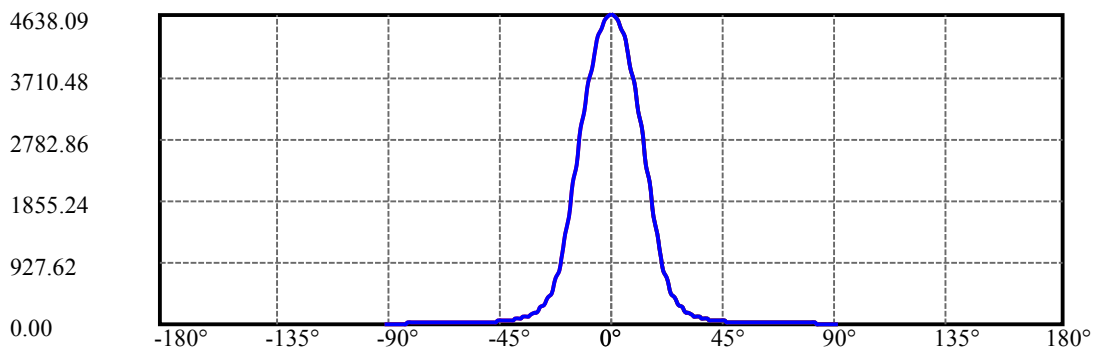
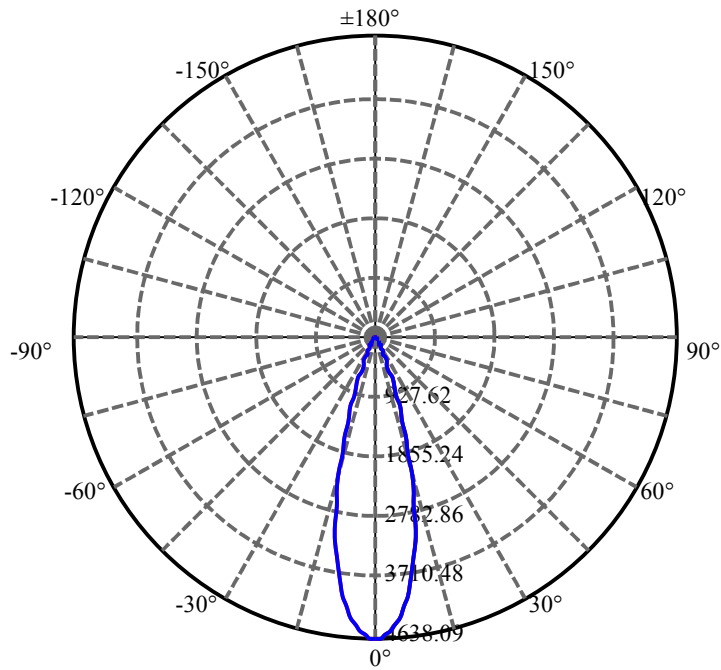
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	21.952	2.332	1309.279	.153%	98.583%
77.0	21.361	2.309	1311.589	.152%	98.757%
78.0	20.130	2.221	1313.81	.146%	98.924%
79.0	18.570	2.079	1315.889	.137%	99.080%
80.0	16.826	1.908	1317.797	.125%	99.224%
81.0	14.963	1.719	1319.516	.113%	99.354%
82.0	12.994	1.516	1321.032	.100%	99.468%
83.0	10.645	1.285	1322.317	.085%	99.564%
84.0	9.148	1.078	1323.396	.071%	99.646%
85.0	8.339	0.954	1324.35	.063%	99.718%
86.0	7.432	0.862	1325.212	.057%	99.782%
87.0	6.905	0.785	1325.997	.052%	99.842%
88.0	6.476	0.733	1326.73	.048%	99.897%
89.0	6.230	0.696	1327.426	.046%	99.949%
90.0	6.089	0.675	1328.102	.044%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1154.74	75.93%	86.95%
0-40	1222.30	80.38%	92.03%
0-60	1279.02	84.11%	96.30%
0-90	1327.43	87.29%	99.95%
0-120	1327.43	87.29%	99.95%
0-180	1328.10	87.33%	100.00%
60-90	50.25	3.30%	3.78%
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%
0-23.83	1062.48	69.87%	80.00%

ZONAL LUMEN SUMMARY

0-10	383.11
10-20	570.30
20-30	201.33
30-40	67.55
40-50	35.32
50-60	21.41
60-70	17.29
70-80	21.49
80-90	9.63
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:24.1 Right:24.1

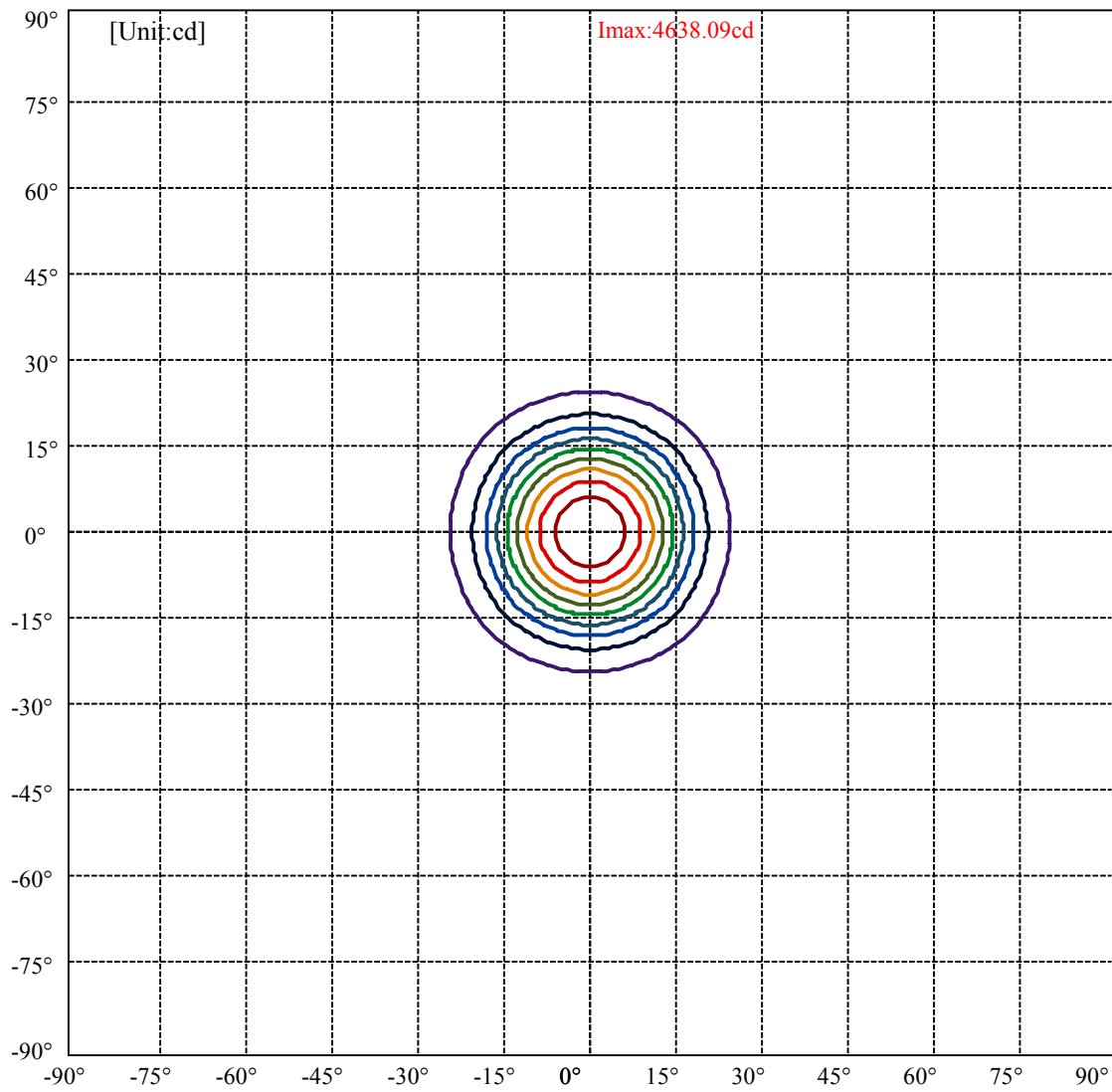
:C90/270Left:24.1 Right:24.1

Beam Angle(50%Imax):C0/180Left:14.3 Right:14.3

:C90/270Left:14.3 Right:14.3

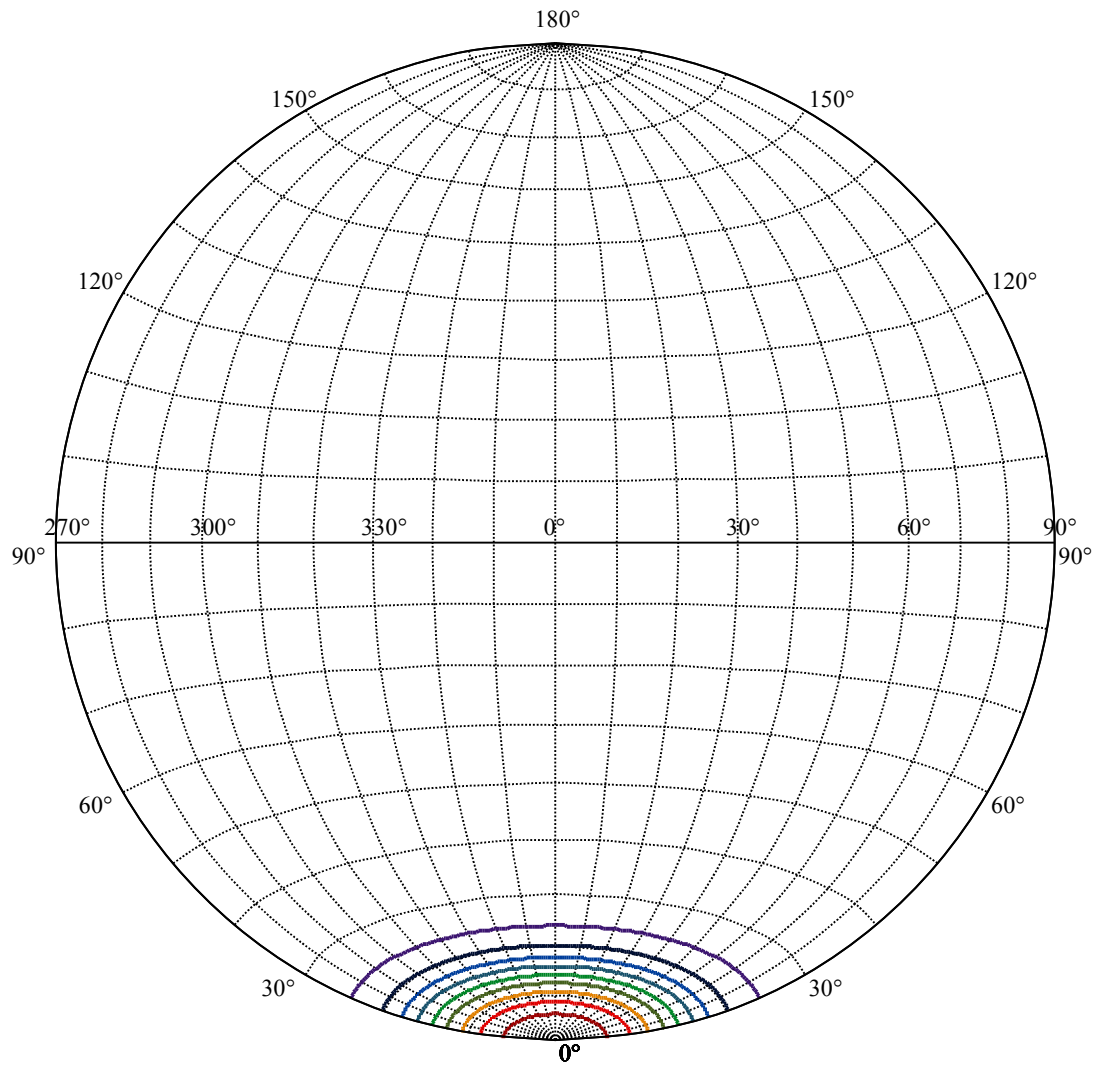


ISO-Intensity(V-H)



(10%Imax) 463.809	—
(20%Imax) 927.619	—
(30%Imax) 1391.43	—
(40%Imax) 1855.24	—
(50%Imax) 2319.05	—
(60%Imax) 2782.86	—
(70%Imax) 3246.67	—
(80%Imax) 3710.48	—
(90%Imax) 4174.28	—





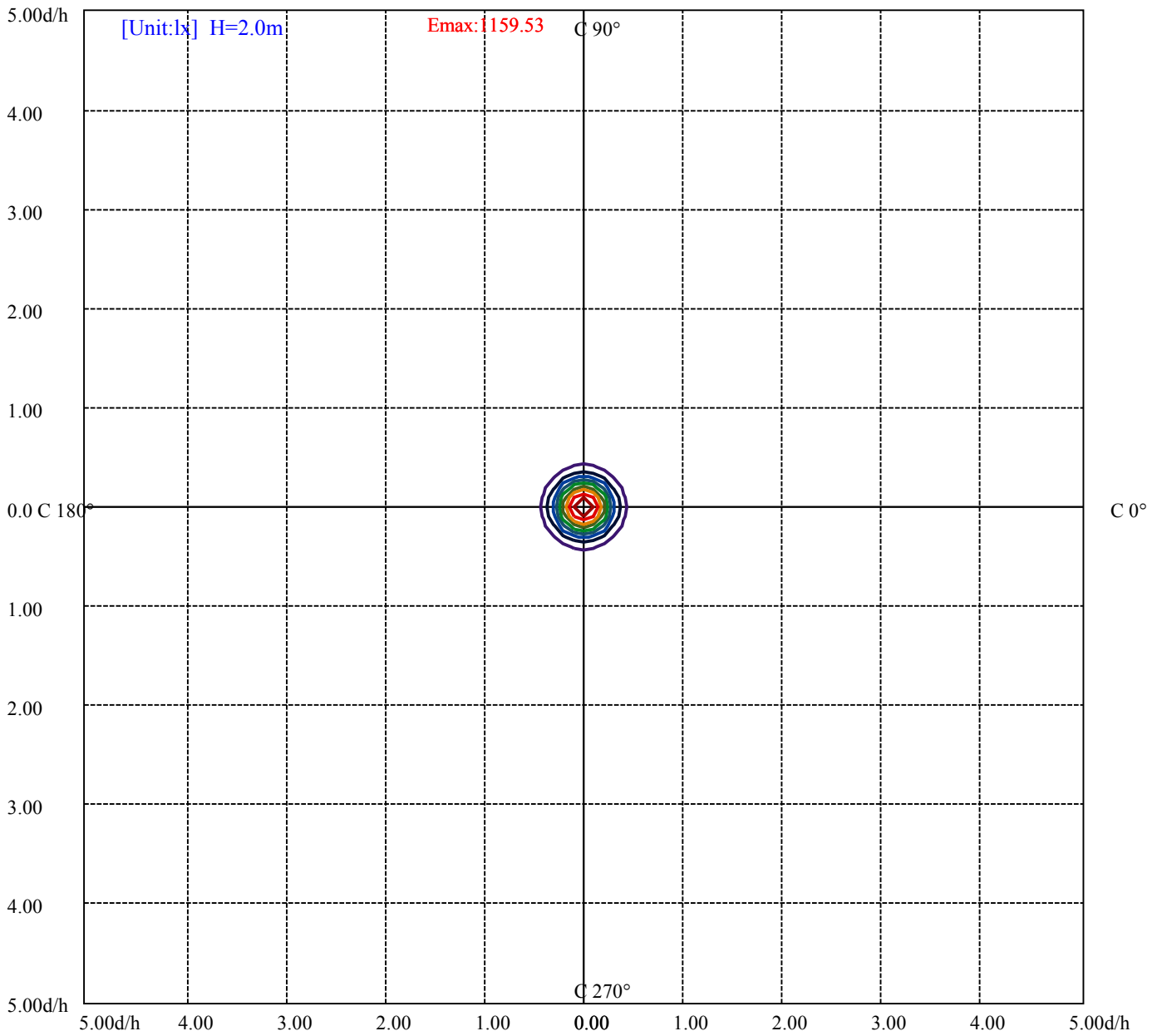
House

[Unit:cd]

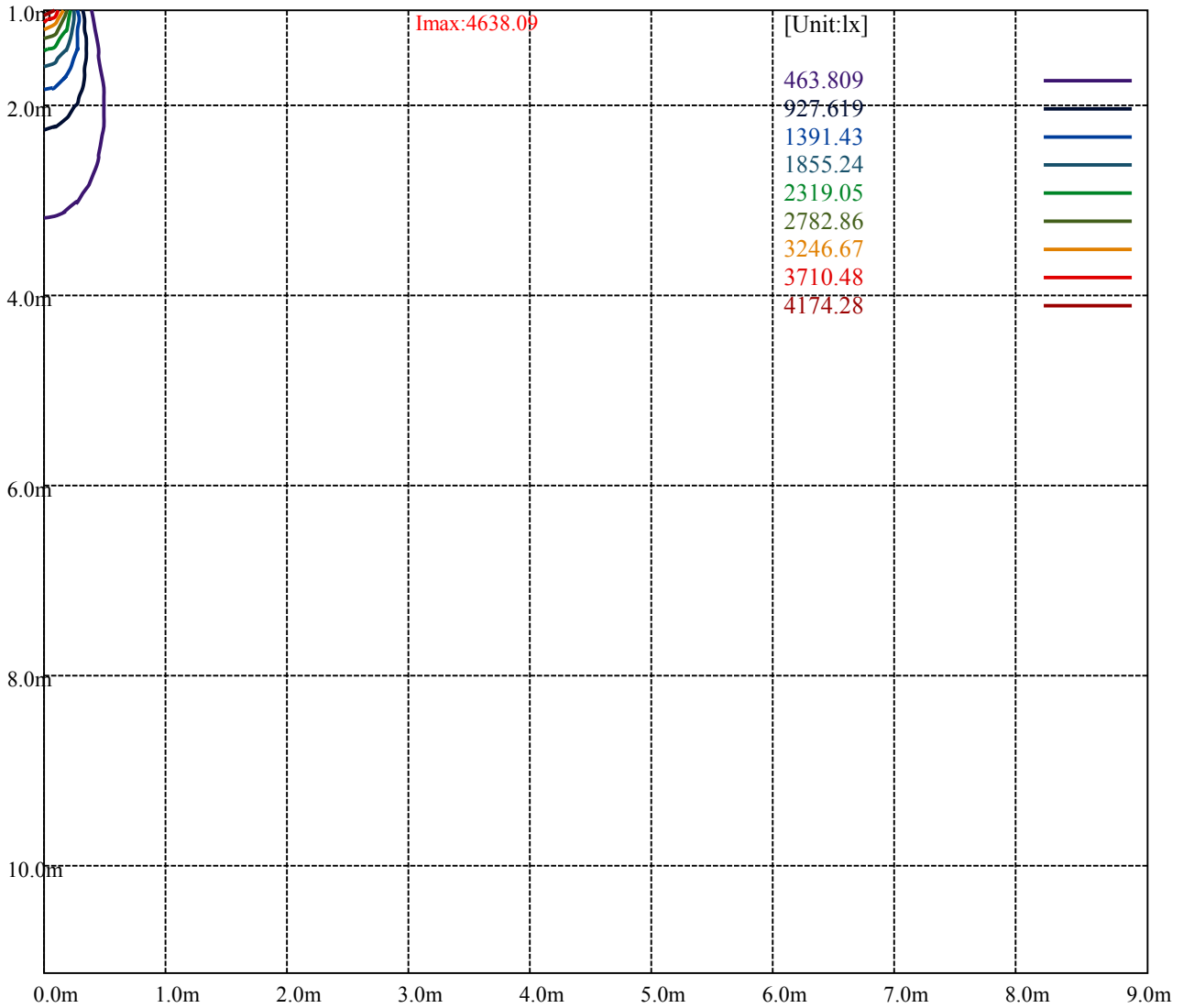
Road

**Imax:4638.09**

(10%Imax) 463.809	—
(20%Imax) 927.619	—
(30%Imax) 1391.43	—
(40%Imax) 1855.24	—
(50%Imax) 2319.05	—
(60%Imax) 2782.86	—
(70%Imax) 3246.67	—
(80%Imax) 3710.48	—
(90%Imax) 4174.28	—



- (10%Emax) 115.9522 —
- (20%Emax) 231.9045 —
- (30%Emax) 347.8575 —
- (40%Emax) 463.81 —
- (50%Emax) 579.7625 —
- (60%Emax) 695.715 —
- (70%Emax) 811.665 —
- (80%Emax) 927.6175 —
- (90%Emax) 1043.57 —



Luminance Table

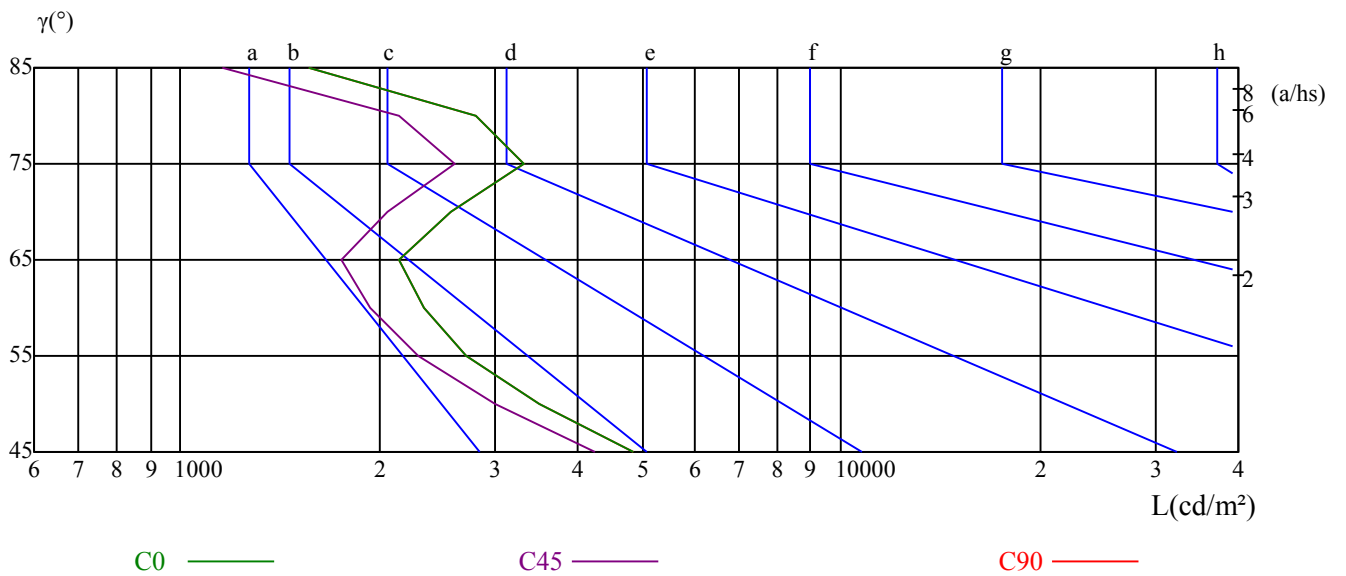
$\gamma$	45	50	55	60	65	70	75	80	85
C0	4852	3483	2710	2332	2137	2564	3314	2804	1567
C45	4234	2995	2294	1942	1747	2054	2594	2136	1155
C90	4852	3483	2710	2332	2137	2564	3314	2804	1567

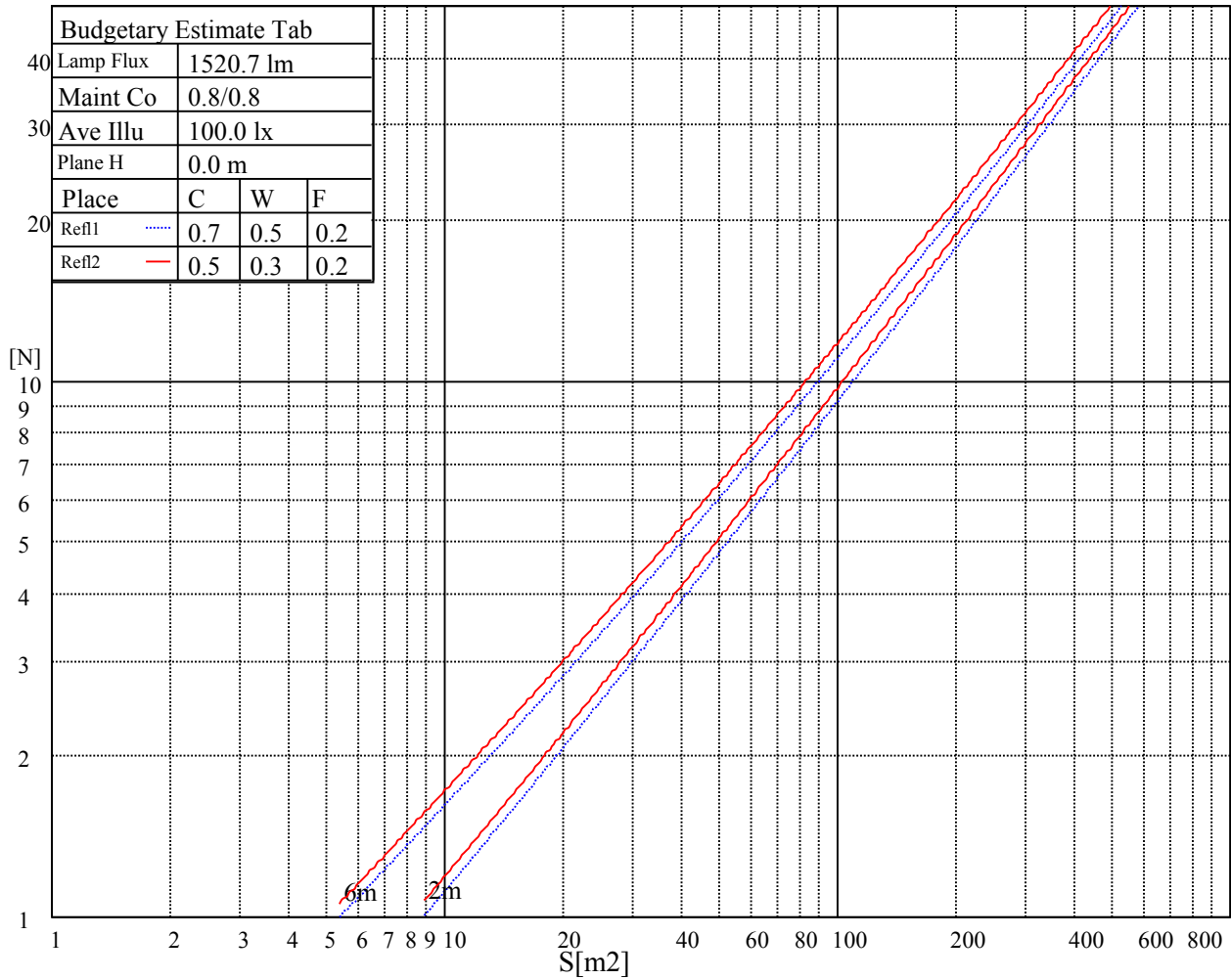
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4627	4627	4627	10037	10037	10037	11304	11304	11304

Glare Table

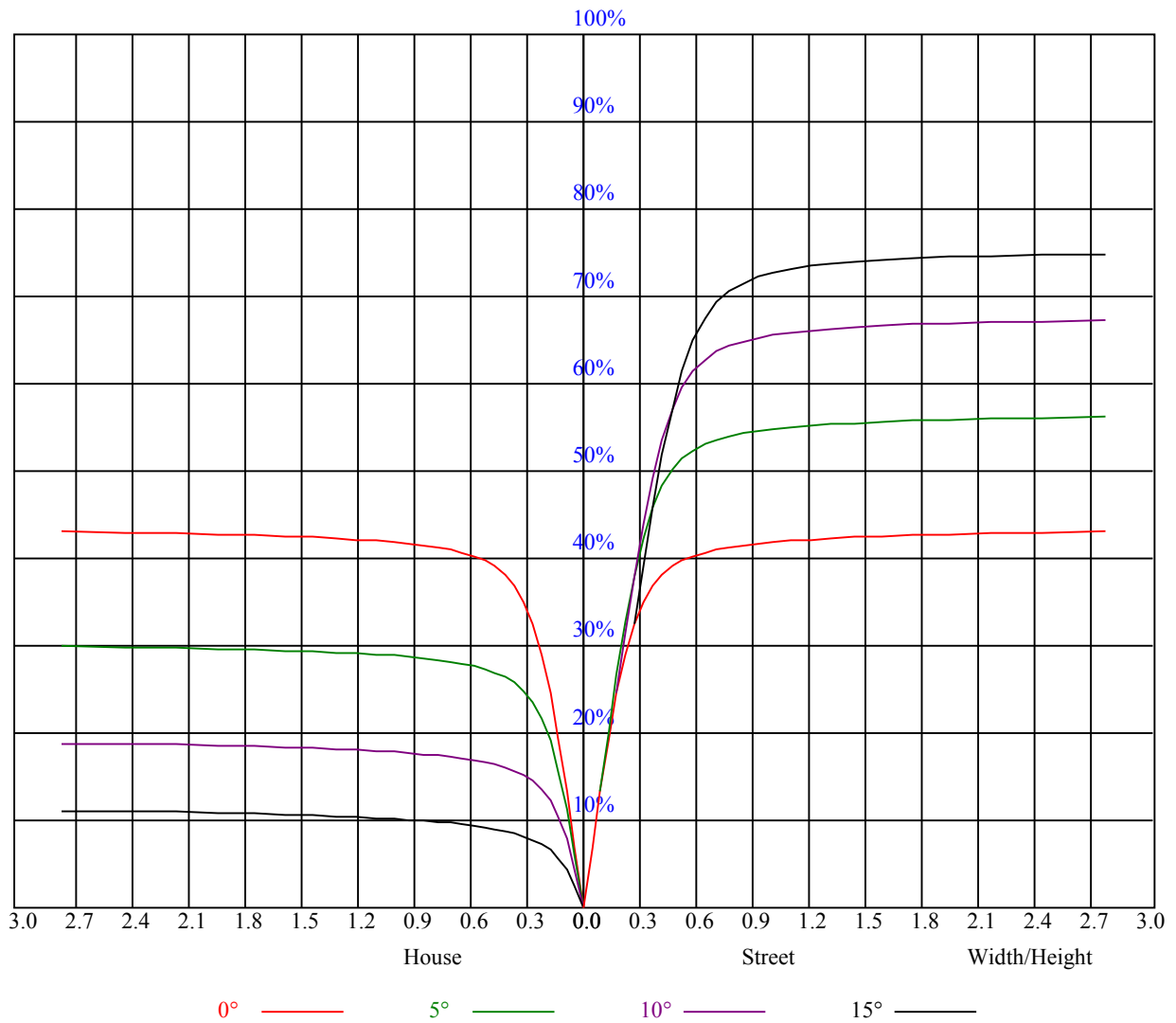
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.04	1.04	1.04	1.02	1.02	1.02	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.87
1	0.97	0.95	0.93	0.95	0.94	0.92	0.92	0.90	0.89	0.89	0.87	0.86	0.86	0.85	0.84	0.82
2	0.92	0.89	0.86	0.90	0.87	0.85	0.87	0.85	0.83	0.85	0.83	0.81	0.82	0.81	0.80	0.78
3	0.87	0.83	0.80	0.86	0.82	0.80	0.84	0.81	0.78	0.82	0.79	0.77	0.80	0.78	0.76	0.75
4	0.83	0.79	0.76	0.82	0.78	0.75	0.80	0.77	0.74	0.78	0.76	0.74	0.77	0.75	0.73	0.72
5	0.79	0.75	0.72	0.79	0.75	0.72	0.77	0.74	0.71	0.76	0.73	0.71	0.74	0.72	0.70	0.69
6	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
7	0.73	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.64
8	0.71	0.67	0.64	0.70	0.66	0.64	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62
9	0.68	0.64	0.62	0.68	0.64	0.61	0.67	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.61	0.60
10	0.66	0.62	0.60	0.66	0.62	0.59	0.65	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.58



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	4643.44	4625.44	4574.25	4504.50	4413.94	4286.25	4137.19	3983.63	3791.81
45.0	4642.88	4619.81	4569.19	4492.13	4402.69	4275.56	4123.69	3972.38	3827.81
90.0	4633.31	4616.44	4564.69	4497.75	4408.88	4286.81	4140.56	3990.38	3799.69
135.0	4632.75	4640.63	4620.38	4579.31	4511.81	4392.56	4269.38	4127.06	3949.88
180.0	4643.44	4638.38	4604.06	4539.38	4453.88	4332.38	4179.94	4025.25	3828.38
225.0	4642.88	4642.88	4616.44	4558.50	4470.75	4369.50	4247.44	4069.69	3909.94
270.0	4633.31	4628.81	4593.94	4539.38	4462.31	4361.06	4205.25	4063.50	3907.13
315.0	4632.75	4603.50	4543.31	4455.00	4353.75	4214.25	4068.56	3889.69	3690.00
360.0	4643.44	4625.44	4574.25	4504.50	4413.94	4286.25	4137.19	3983.63	3791.81
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3585.38	3385.13	3138.75	2901.38	2620.69	2332.13	2074.50	1822.50	1526.06
45.0	3578.06	3380.63	3192.75	2902.50	2624.06	2403.56	2091.94	1819.69	1621.69
90.0	3618.56	3396.38	3155.63	2926.13	2653.31	2370.94	2120.06	1873.69	1584.56
135.0	3748.50	3551.63	3315.94	3088.13	2813.63	2528.44	2273.06	1985.63	1711.69
180.0	3635.44	3405.38	3156.19	2917.69	2635.31	2347.88	2091.38	1840.50	1542.38
225.0	3733.88	3494.81	3283.88	3052.69	2804.06	2485.69	2230.88	1979.44	1708.31
270.0	3690.56	3501.56	3292.88	3035.81	2760.19	2505.38	2217.94	1965.38	1695.38
315.0	3497.06	3259.69	2997.00	2746.69	2487.38	2166.19	1915.88	1674.56	1419.19
360.0	3585.38	3385.13	3138.75	2901.38	2620.69	2332.13	2074.50	1822.50	1526.06
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1312.31	1121.06	911.81	768.38	646.88	534.94	442.13	375.75	315.00
45.0	1353.38	1164.38	990.56	798.19	672.19	569.81	461.81	390.94	332.44
90.0	1368.56	1103.34	976.73	808.88	682.20	562.28	462.60	390.77	324.90
135.0	1481.06	1272.94	1033.31	871.31	730.69	591.19	498.94	419.63	354.38
180.0	1322.44	1101.77	932.68	770.85	651.15	539.83	448.03	381.71	321.08
225.0	1460.81	1097.10	1054.63	880.20	747.34	620.94	527.51	441.73	372.94
270.0	1446.75	1245.94	1044.56	870.19	738.00	640.13	511.88	436.50	381.38
315.0	1120.39	1011.38	819.11	690.47	582.75	471.99	408.88	342.39	284.51
360.0	1312.31	1121.06	911.81	768.38	646.88	534.94	442.13	375.75	315.00
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	285.75	227.14	198.79	173.19	152.61	137.31	122.79	111.77	100.74
45.0	284.63	233.04	200.98	173.25	151.65	135.51	120.54	108.28	99.00
90.0	277.26	233.49	198.96	174.94	155.03	134.89	121.61	110.64	98.83
135.0	291.38	285.75	212.34	182.36	159.92	141.53	125.78	112.95	103.05
180.0	277.14	236.14	203.23	179.33	159.69	141.19	125.94	114.47	102.15
225.0	321.86	278.27	234.28	205.93	182.08	156.94	140.06	125.38	111.49
270.0	315.56	287.44	230.91	200.08	174.71	155.59	137.36	123.75	110.59
315.0	251.04	218.81	184.05	166.28	148.73	128.98	118.35	107.66	97.09
360.0	285.75	227.14	198.79	173.19	152.61	137.31	122.79	111.77	100.74
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	91.52	84.32	78.58	70.43	65.36	61.31	55.80	52.09	49.05
45.0	89.78	82.58	75.49	69.19	64.01	59.34	54.23	50.51	47.03
90.0	90.62	83.36	75.43	69.75	64.52	58.73	55.24	51.02	46.74
135.0	93.38	86.06	78.69	72.23	66.99	62.21	56.93	53.16	49.67
180.0	93.83	86.34	79.76	72.39	67.16	62.44	57.60	53.38	49.89
225.0	99.56	90.56	81.84	74.08	68.06	62.21	57.49	52.82	48.54
270.0	99.11	90.28	82.52	73.97	68.12	63.00	57.43	53.44	49.73
315.0	88.03	81.17	74.25	68.01	63.17	58.22	54.28	50.23	46.52
360.0	91.52	84.32	78.58	70.43	65.36	61.31	55.80	52.09	49.05



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	45.06	41.85	39.43	36.34	34.03	31.84	29.48	27.79	26.38
45.0	43.03	40.16	37.46	34.76	32.18	30.15	28.13	26.49	24.92
90.0	43.93	40.61	37.18	34.93	32.68	29.76	28.13	26.38	24.69
135.0	45.68	42.81	40.05	37.24	34.59	32.51	30.21	28.41	26.61
180.0	46.29	43.03	40.33	37.52	35.21	32.79	30.54	28.80	27.23
225.0	45.06	41.91	38.19	35.55	33.19	30.54	28.58	27.00	25.31
270.0	46.01	42.53	39.71	36.84	34.43	31.89	29.76	28.07	26.38
315.0	43.48	40.67	37.29	34.88	32.68	30.26	28.46	27.00	25.48
360.0	45.06	41.85	39.43	36.34	34.03	31.84	29.48	27.79	26.38
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	24.81	23.68	22.78	21.71	20.98	20.25	19.46	18.73	18.11
45.0	23.68	22.61	21.66	20.81	20.14	19.46	18.79	18.23	17.72
90.0	23.40	22.28	21.32	20.42	19.69	19.01	18.45	17.89	17.33
135.0	25.09	23.91	22.78	21.71	20.93	20.19	19.35	18.73	18.11
180.0	25.54	24.47	23.46	22.33	21.49	20.76	19.97	19.24	18.56
225.0	24.02	22.89	21.88	21.04	20.25	19.46	18.90	18.17	17.55
270.0	25.03	23.91	22.95	21.83	21.09	20.36	19.41	18.84	18.28
315.0	24.19	23.18	22.22	21.32	20.42	19.63	18.96	18.23	17.61
360.0	24.81	23.68	22.78	21.71	20.98	20.25	19.46	18.73	18.11
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	17.49	16.93	16.48	15.98	15.53	15.02	14.63	14.23	13.73
45.0	17.21	16.76	16.71	17.16	18.17	19.52	21.32	23.01	24.75
90.0	16.93	16.48	16.37	16.71	17.49	19.01	20.53	22.22	23.96
135.0	17.49	16.93	16.43	15.92	15.47	15.02	14.57	14.18	13.78
180.0	17.83	17.33	16.76	16.20	15.75	15.30	14.79	14.40	14.01
225.0	17.04	16.65	16.54	16.88	17.61	19.13	20.70	22.39	24.53
270.0	17.66	17.16	17.21	17.66	18.62	20.19	22.16	24.02	25.99
315.0	16.99	16.48	15.92	15.41	14.96	14.57	13.95	13.61	13.16
360.0	17.49	16.93	16.48	15.98	15.53	15.02	14.63	14.23	13.73
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	13.33	12.88	12.49	12.09	11.70	11.31	10.91	10.52	10.18
45.0	26.78	28.52	30.09	31.33	31.39	30.21	27.56	24.81	21.94
90.0	25.76	27.73	29.36	31.11	31.61	30.94	28.91	26.16	23.51
135.0	13.33	12.94	12.60	12.15	11.81	11.42	10.97	10.58	10.24
180.0	13.50	13.11	12.77	12.26	11.87	11.48	11.03	10.69	10.29
225.0	26.21	28.18	30.38	31.50	31.78	31.33	29.87	27.39	23.40
270.0	28.24	30.32	32.18	33.81	34.26	33.30	31.22	28.24	25.26
315.0	12.71	12.32	12.04	11.64	11.19	10.91	10.58	10.18	9.79
360.0	13.33	12.88	12.49	12.09	11.70	11.31	10.91	10.52	10.18
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.73	9.34	9.00	8.49	8.10	7.59	7.14	6.69	6.41
45.0	18.11	14.51	10.97	9.62	8.10	7.20	6.69	6.30	6.08
90.0	20.25	16.99	12.38	9.79	8.21	7.20	6.69	6.30	6.02
135.0	9.79	9.39	9.00	8.55	8.16	7.54	7.09	6.64	6.36
180.0	9.84	9.51	9.00	8.55	8.16	7.59	7.09	6.64	6.36
225.0	20.81	17.38	12.88	9.96	9.11	7.82	7.09	6.53	6.24
270.0	21.77	17.83	13.44	10.07	9.23	7.43	6.81	6.41	6.19
315.0	9.39	9.00	8.49	8.16	7.65	7.09	6.64	6.30	6.19
360.0	9.73	9.34	9.00	8.49	8.10	7.59	7.14	6.69	6.41

Intensity data(cd)

C/ $\gamma$ (°)	90.0
0.0	6.24
45.0	5.96
90.0	5.96
135.0	6.08
180.0	6.36
225.0	6.08
270.0	6.02
315.0	6.02
360.0	6.24