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NATA

LumCAT: CR01D02935AC

Luminaire:

Report No: NATA0100

Voltage(V): 35.8000

Test No: GC2018112613

Current(A): 0.3000

LampCAT: CREE CXA1512

Power (W): 10.7400

Lamp flux(lm): 1425.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 29

Width(mm): 29

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1285.15

Efficiency(%): 90.19%

Lumens(lm)/Power(W): 119.71

Central intensity(cd): 2507.203

Maximum intensity(cd): 2507.203

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=35.1

[C90/270]Total=35.1

Field angle(10%Imax): [C0/180]Total=69.6

[C90/270]Total=69.6

Maximum s/h(1/2): C0_180=0.58 C90_270=0.58

Maximum s/h(1/4): C0_180=0.60 C90_270=0.60

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 90.22%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 93.739%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2507.203	0.600	0.6	.042%	.047%
1.0	2503.617	4.792	5.391	.336%	.420%
2.0	2488.992	9.526	14.917	.668%	1.161%
3.0	2465.719	14.151	29.068	.993%	2.262%
4.0	2434.289	18.621	47.69	1.307%	3.711%
5.0	2387.742	22.821	70.511	1.601%	5.487%
6.0	2333.320	26.746	97.257	1.877%	7.568%
7.0	2267.578	30.305	127.561	2.127%	9.926%
8.0	2190.867	33.437	160.998	2.346%	12.528%
9.0	2108.109	36.164	197.162	2.538%	15.342%
10.0	2017.195	38.412	235.574	2.696%	18.331%
11.0	1919.531	40.165	275.739	2.819%	21.456%
12.0	1824.328	41.594	317.333	2.919%	24.692%
13.0	1725.047	42.554	359.887	2.986%	28.004%
14.0	1618.031	42.925	402.813	3.012%	31.344%
15.0	1521.422	43.181	445.994	3.030%	34.704%
16.0	1423.125	43.016	489.01	3.019%	38.051%
17.0	1317.586	42.244	531.255	2.964%	41.338%
18.0	1204.080	40.803	572.057	2.863%	44.513%
19.0	1130.210	40.351	612.408	2.832%	47.653%
20.0	1037.461	38.911	651.319	2.731%	50.680%
21.0	950.555	37.356	688.675	2.621%	53.587%
22.0	876.241	35.996	724.671	2.526%	56.388%
23.0	799.263	34.247	758.918	2.403%	59.053%
24.0	726.567	32.407	791.325	2.274%	61.575%
25.0	662.105	30.685	822.01	2.153%	63.962%
26.0	599.920	28.839	850.849	2.024%	66.206%
27.0	542.805	27.024	877.873	1.896%	68.309%
28.0	493.741	25.419	903.292	1.784%	70.287%
29.0	445.409	23.680	926.972	1.662%	72.130%
30.0	403.313	22.114	949.086	1.552%	73.850%
31.0	365.323	20.633	969.719	1.448%	75.456%
32.0	328.718	19.102	988.821	1.341%	76.942%
33.0	297.766	17.784	1006.606	1.248%	78.326%
34.0	274.416	16.828	1023.433	1.181%	79.635%
35.0	245.355	15.433	1038.866	1.083%	80.836%
36.0	218.658	14.094	1052.96	.989%	81.933%
37.0	198.647	13.110	1066.07	.920%	82.953%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	178.151	12.028	1078.097	.844%	83.889%
39.0	159.968	11.040	1089.137	.775%	84.748%
40.0	144.766	10.204	1099.341	.716%	85.542%
41.0	130.648	9.399	1108.741	.660%	86.273%
42.0	117.014	8.586	1117.327	.603%	86.941%
43.0	105.792	7.912	1125.239	.555%	87.557%
44.0	95.963	7.310	1132.549	.513%	88.126%
45.0	86.569	6.713	1139.262	.471%	88.648%
46.0	79.038	6.235	1145.497	.438%	89.133%
47.0	72.274	5.796	1151.293	.407%	89.584%
48.0	66.607	5.428	1156.721	.381%	90.007%
49.0	61.938	5.126	1161.847	.360%	90.406%
50.0	57.452	4.826	1166.674	.339%	90.781%
51.0	53.627	4.570	1171.244	.321%	91.137%
52.0	50.513	4.365	1175.609	.306%	91.476%
53.0	47.566	4.166	1179.775	.292%	91.801%
54.0	44.958	3.989	1183.763	.280%	92.111%
55.0	42.820	3.847	1187.61	.270%	92.410%
56.0	40.795	3.709	1191.319	.260%	92.699%
57.0	39.045	3.591	1194.909	.252%	92.978%
58.0	37.666	3.503	1198.412	.246%	93.251%
59.0	36.471	3.428	1201.841	.241%	93.518%
60.0	35.374	3.359	1205.2	.236%	93.779%
61.0	34.538	3.313	1208.513	.232%	94.037%
62.0	33.877	3.280	1211.793	.230%	94.292%
63.0	33.356	3.259	1215.052	.229%	94.546%
64.0	32.948	3.247	1218.299	.228%	94.798%
65.0	32.632	3.243	1221.542	.228%	95.051%
66.0	32.245	3.230	1224.773	.227%	95.302%
67.0	31.859	3.216	1227.989	.226%	95.552%
68.0	31.430	3.196	1231.184	.224%	95.801%
69.0	31.050	3.179	1234.363	.223%	96.048%
70.0	30.635	3.157	1237.52	.222%	96.294%
71.0	30.122	3.123	1240.643	.219%	96.537%
72.0	29.531	3.080	1243.723	.216%	96.777%
73.0	28.877	3.028	1246.752	.213%	97.012%
74.0	28.125	2.965	1249.716	.208%	97.243%
75.0	27.232	2.885	1252.601	.202%	97.467%

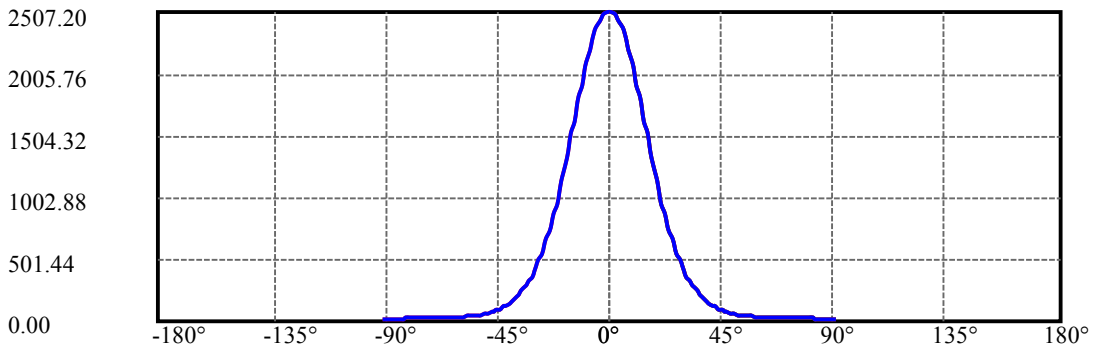
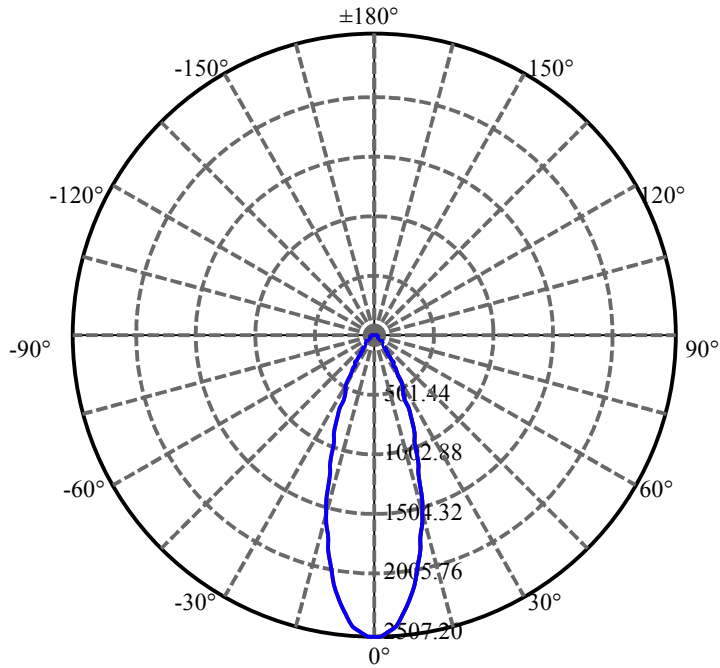
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	26.430	2.812	1255.413	.197%	97.686%
77.0	25.713	2.747	1258.161	.193%	97.900%
78.0	25.052	2.687	1260.848	.189%	98.109%
79.0	24.722	2.661	1263.509	.187%	98.316%
80.0	24.230	2.617	1266.126	.184%	98.520%
81.0	23.695	2.566	1268.692	.180%	98.719%
82.0	23.027	2.501	1271.193	.175%	98.914%
83.0	22.317	2.429	1273.622	.170%	99.103%
84.0	21.628	2.359	1275.981	.166%	99.287%
85.0	20.602	2.251	1278.231	.158%	99.462%
86.0	19.202	2.101	1280.332	.147%	99.625%
87.0	16.629	1.821	1282.153	.128%	99.767%
88.0	13.113	1.437	1283.59	.101%	99.879%
89.0	10.315	1.131	1284.721	.079%	99.967%
90.0	7.805	0.428	1285.149	.030%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	949.09	66.60%	73.85%
0-40	1099.34	77.15%	85.54%
0-60	1205.20	84.58%	93.78%
0-90	1284.72	90.16%	99.97%
0-120	1284.72	90.16%	99.97%
0-180	1285.15	90.19%	100.00%
60-90	82.88	5.82%	6.45%
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%
0-34.30	1028.12	72.15%	80.00%

ZONAL LUMEN SUMMARY

0-10	235.57
10-20	415.75
20-30	297.77
30-40	150.26
40-50	67.33
50-60	38.53
60-70	32.32
70-80	28.61
80-90	18.60
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: —————

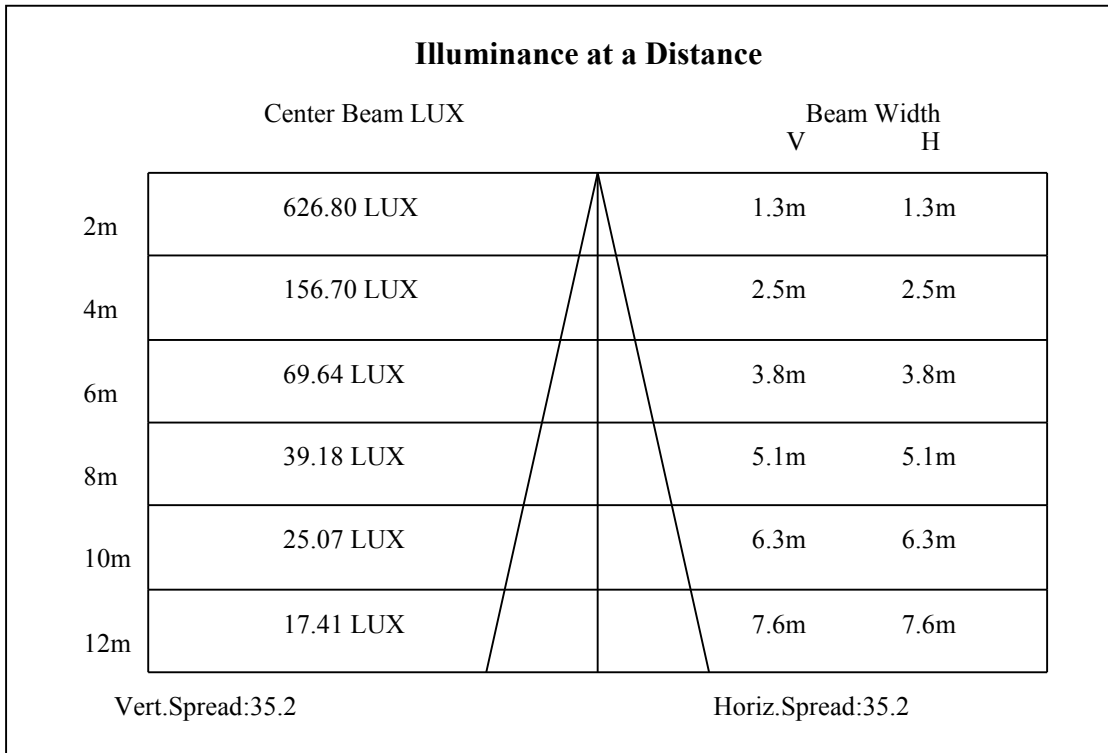
C90/C270: —————

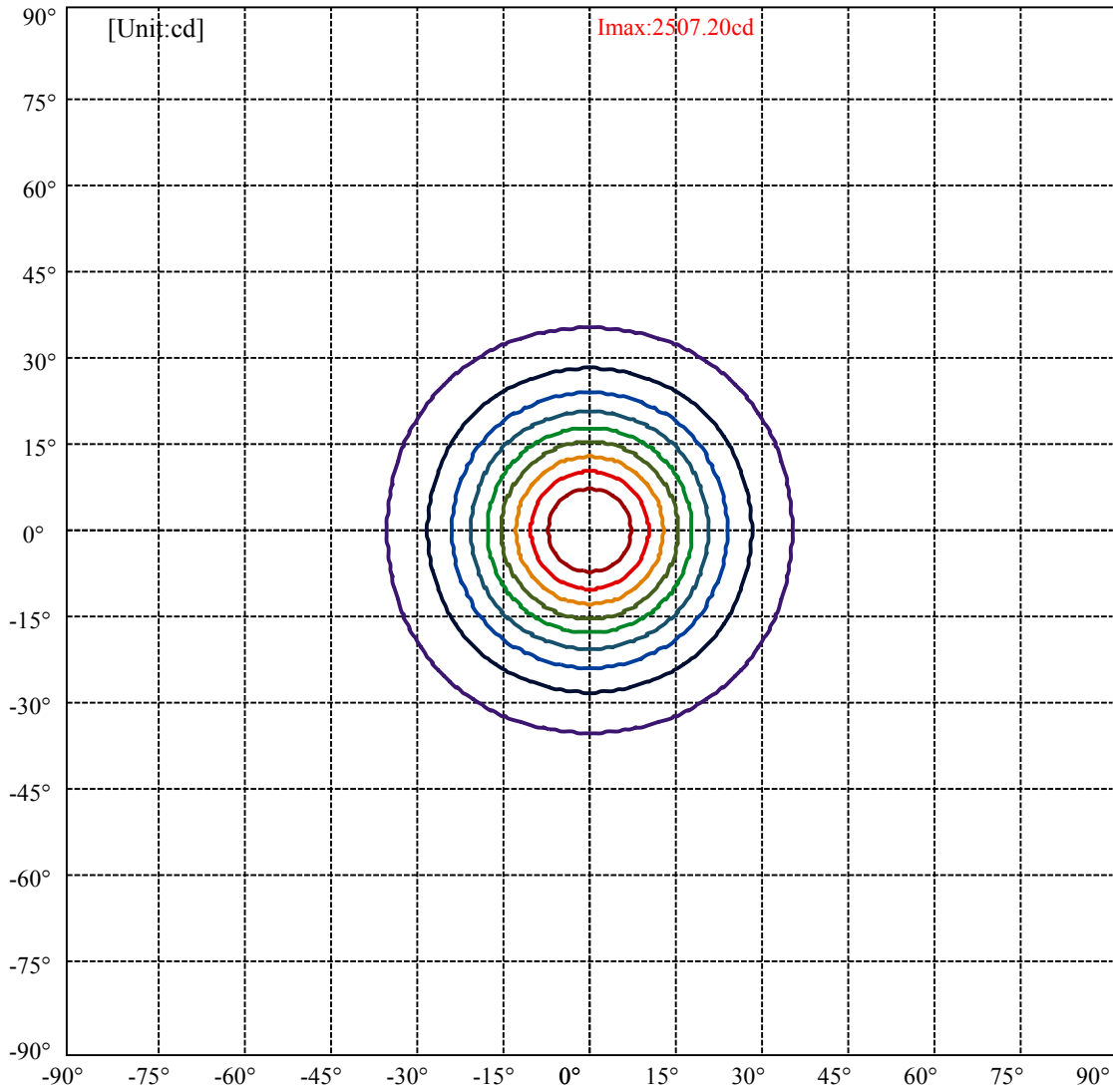
Field angle(10%Imax):C0/180Left:34.8 Right:34.8

:C90/270Left:34.8 Right:34.8

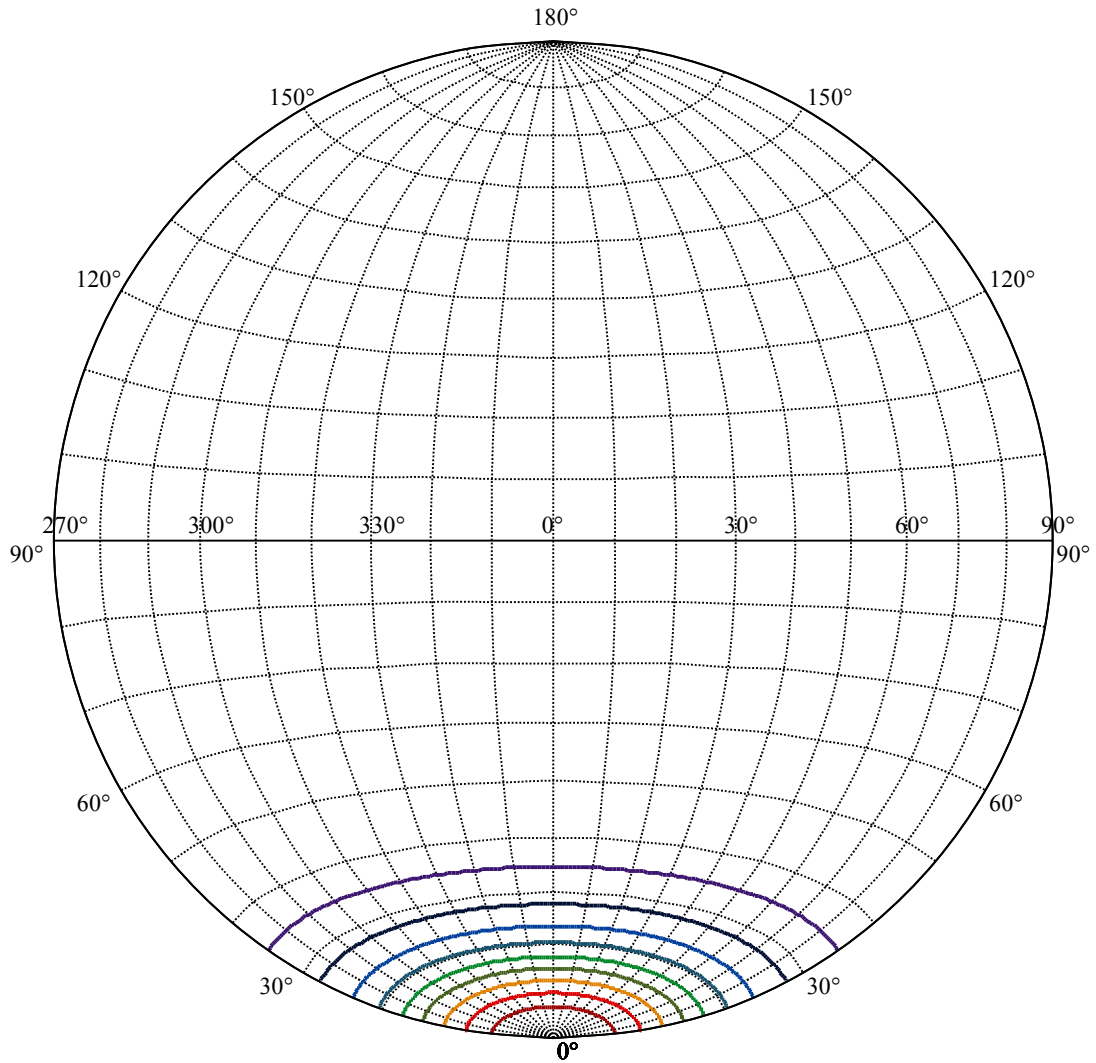
Beam Angle(50%Imax):C0/180Left:17.6 Right:17.6

:C90/270Left:17.6 Right:17.6





(10%Imax) 250.72	—
(20%Imax) 501.441	—
(30%Imax) 752.161	—
(40%Imax) 1002.88	—
(50%Imax) 1253.6	—
(60%Imax) 1504.32	—
(70%Imax) 1755.04	—
(80%Imax) 2005.76	—
(90%Imax) 2256.48	—



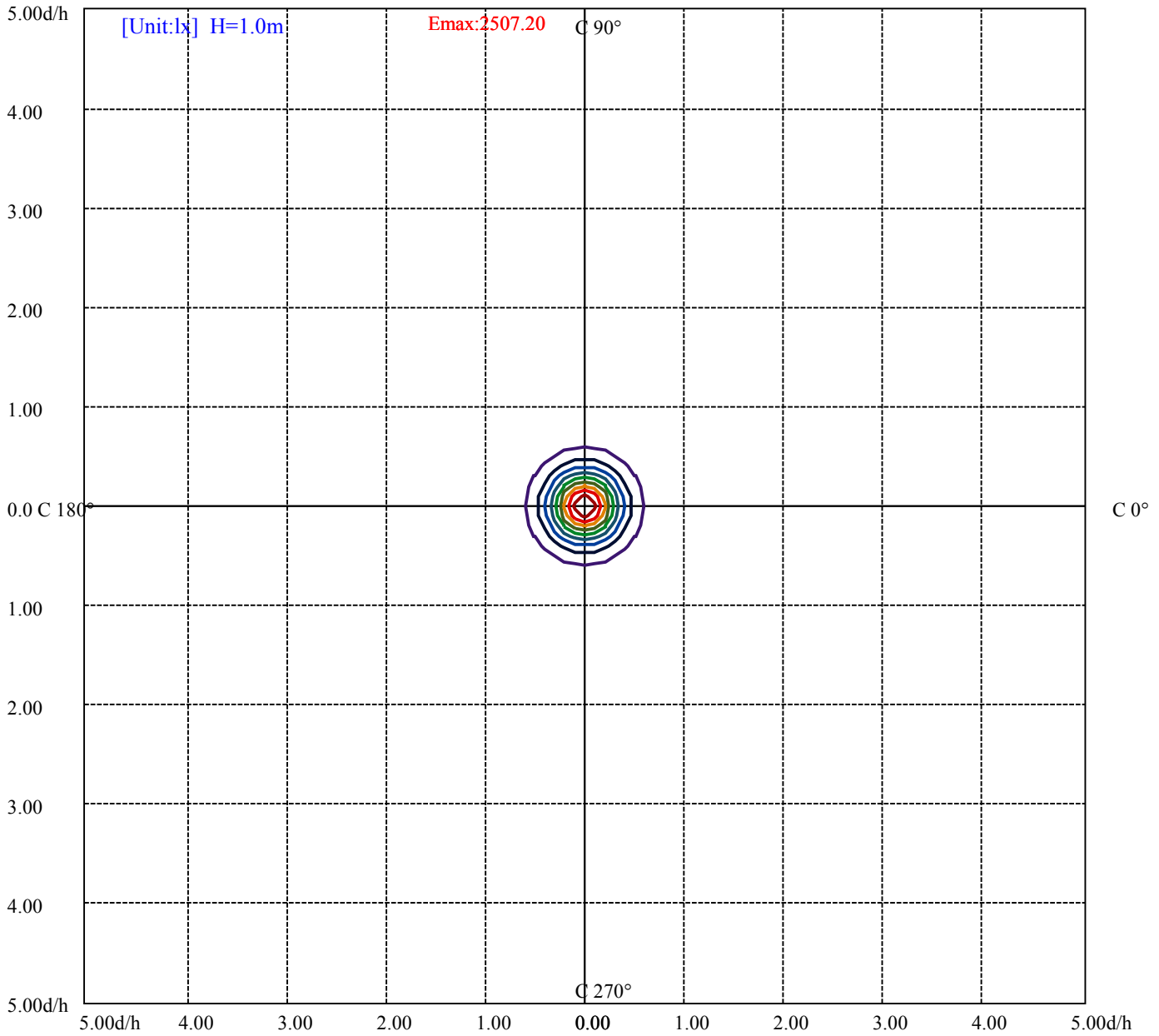
House

[Unit:cd]

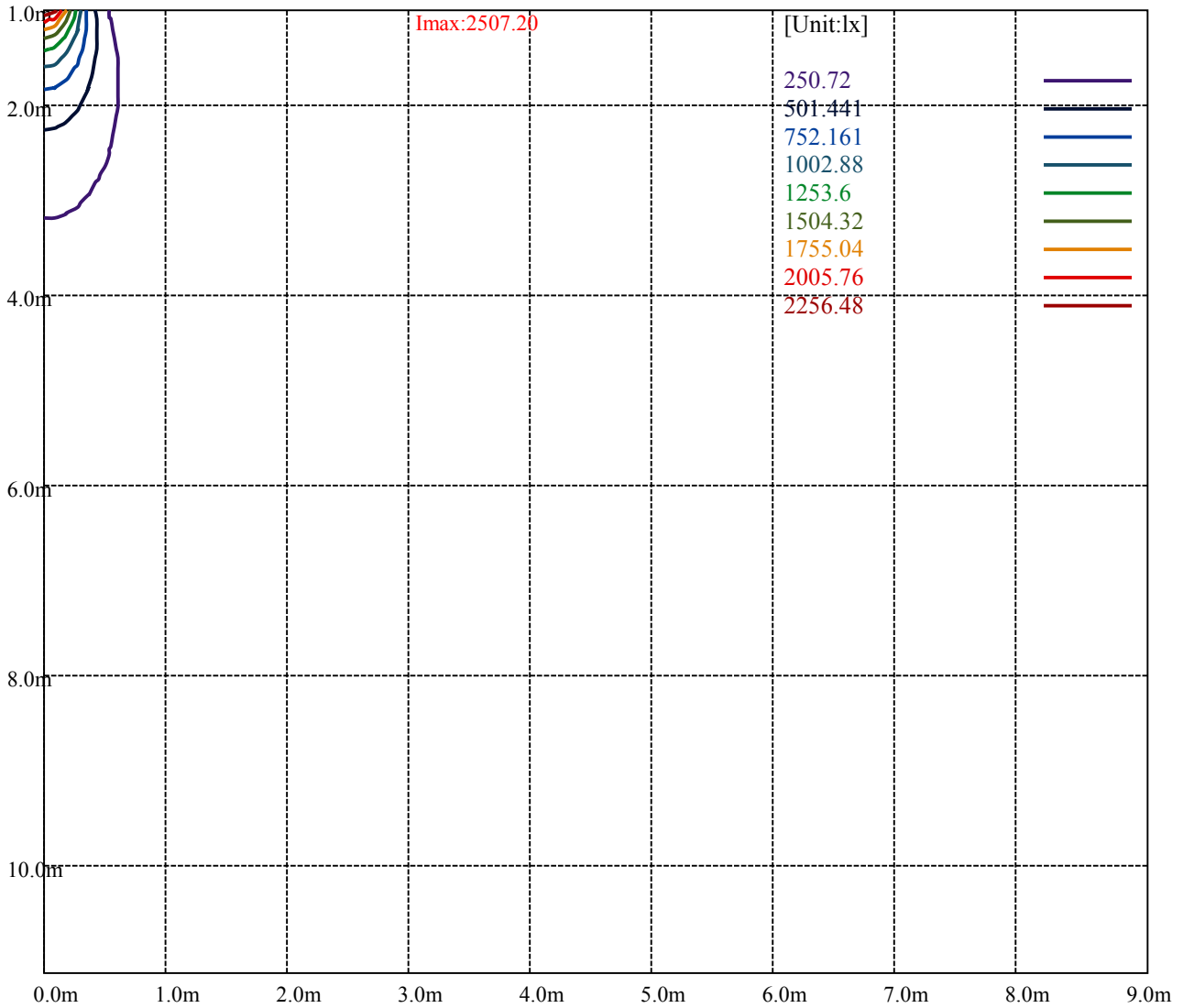
Road

Imax:2507.20

(10%Imax) 250.72	—
(20%Imax) 501.441	—
(30%Imax) 752.161	—
(40%Imax) 1002.88	—
(50%Imax) 1253.6	—
(60%Imax) 1504.32	—
(70%Imax) 1755.04	—
(80%Imax) 2005.76	—
(90%Imax) 2256.48	—



(10%Emax) 250.72	—
(20%Emax) 501.44	—
(30%Emax) 752.161	—
(40%Emax) 1002.88	—
(50%Emax) 1253.6	—
(60%Emax) 1504.32	—
(70%Emax) 1755.04	—
(80%Emax) 2005.76	—
(90%Emax) 2256.48	—



Luminance Table

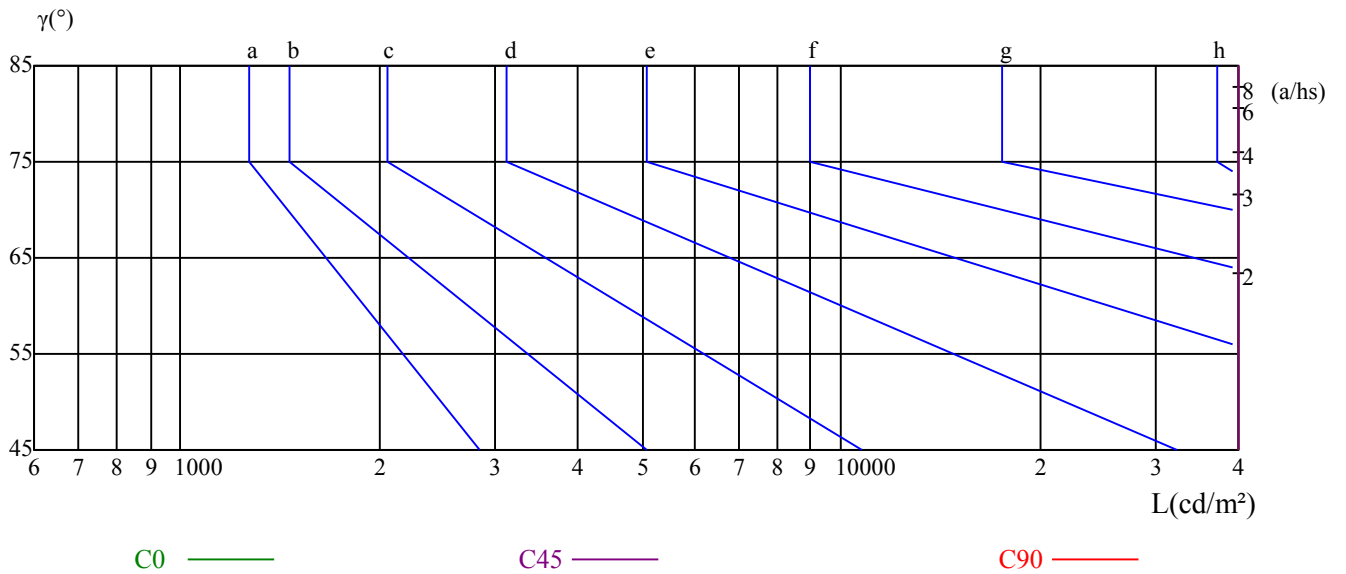
γ	45	50	55	60	65	70	75	80	85
C0	145573	106278	88769	84124	91812	106506	125109	165913	281066
C45	145573	106278	88769	84124	91812	106506	125109	165913	281066
C90	145573	106278	88769	84124	91812	106506	125109	165913	281066

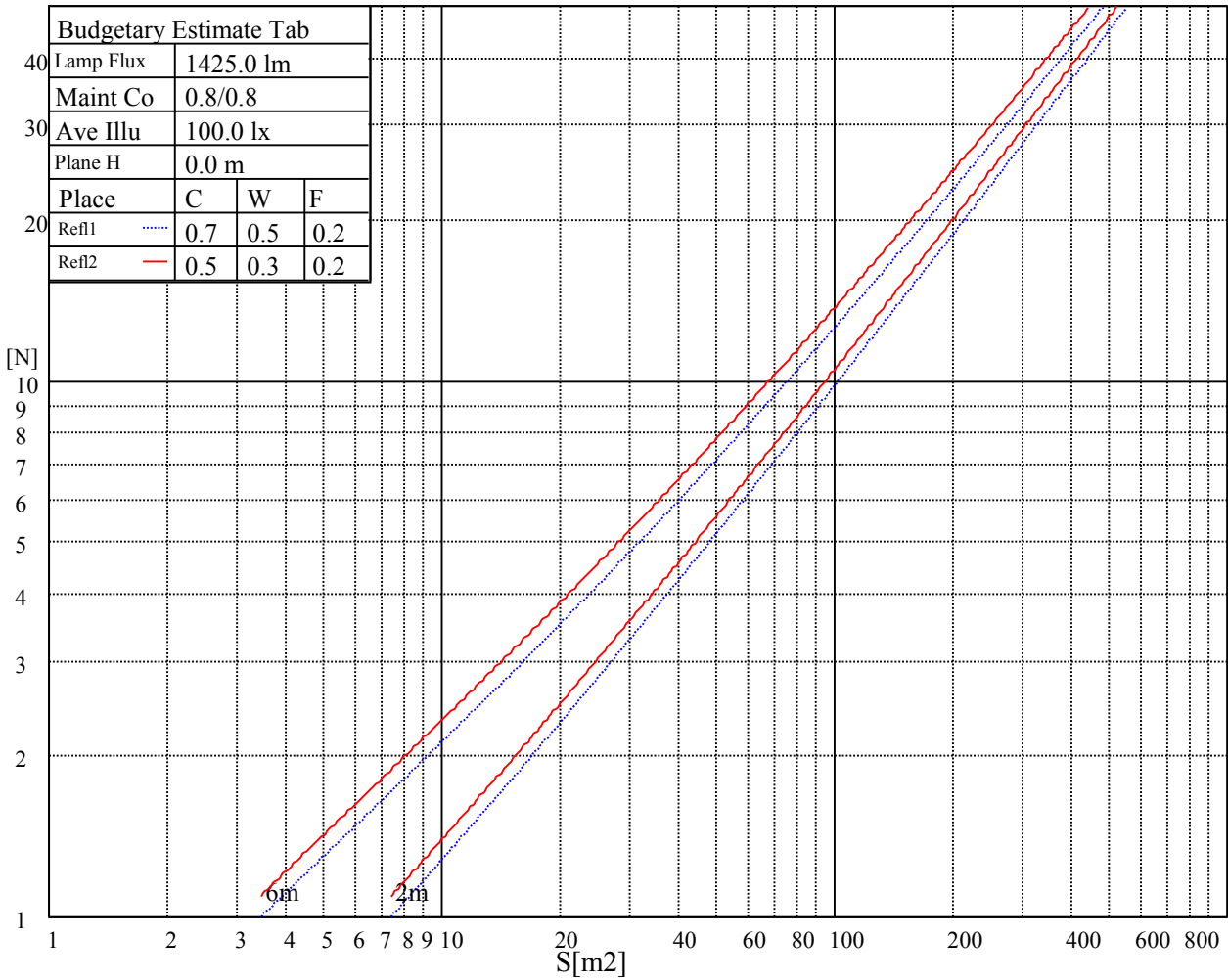
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
91812	91812	91812	125109	125109	125109	281066	281066	281066

Glare Table

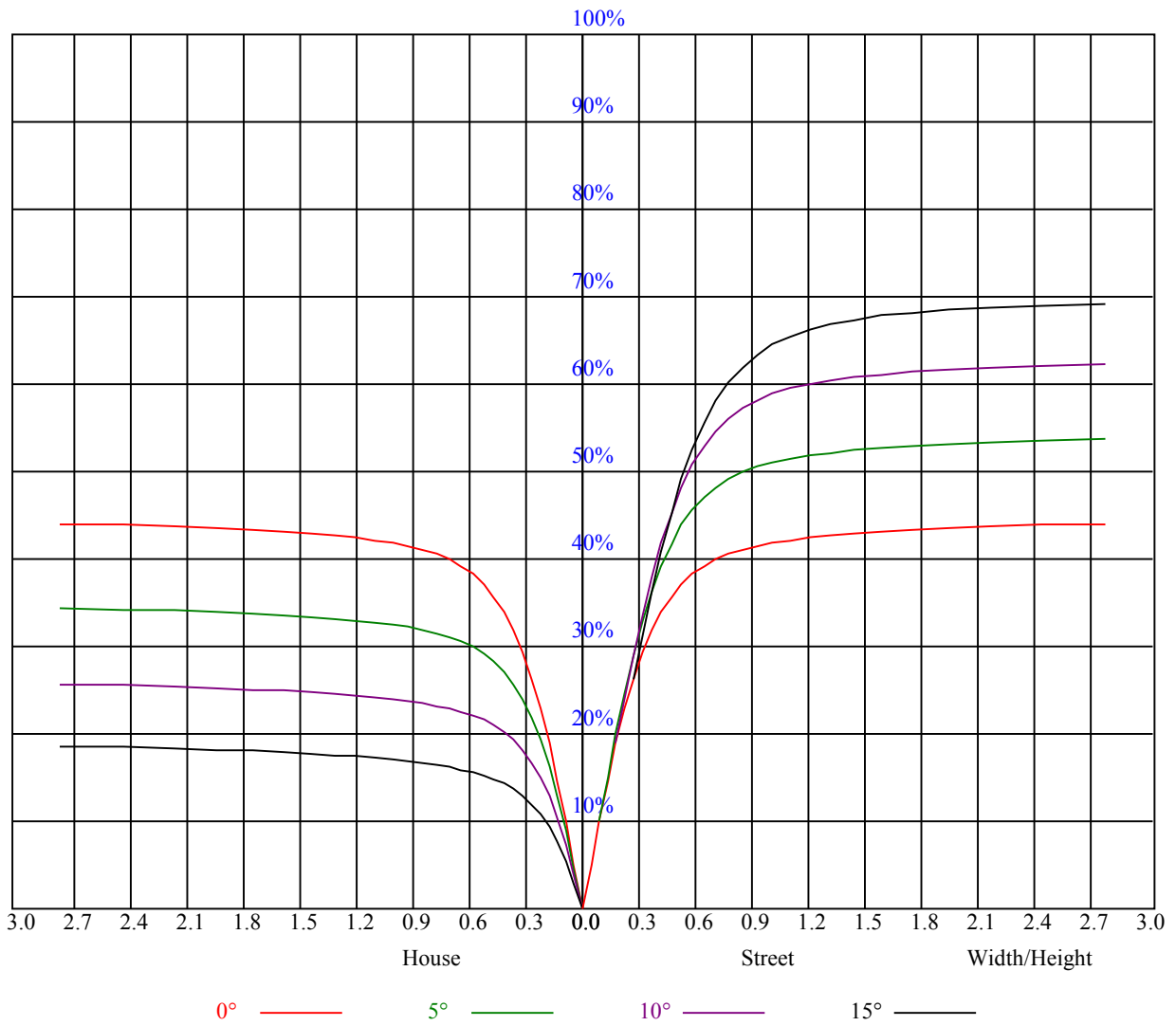
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.07	1.07	1.07	1.05	1.05	1.05	1.00	1.00	1.00	0.96	0.96	0.96	0.92	0.92	0.92	0.90
1	0.99	0.96	0.94	0.97	0.95	0.92	0.93	0.91	0.90	0.90	0.88	0.87	0.87	0.85	0.84	0.83
2	0.92	0.88	0.84	0.90	0.87	0.84	0.87	0.84	0.82	0.84	0.82	0.80	0.82	0.80	0.78	0.77
3	0.86	0.81	0.77	0.84	0.80	0.77	0.82	0.78	0.75	0.80	0.77	0.74	0.78	0.75	0.73	0.72
4	0.80	0.75	0.71	0.79	0.75	0.71	0.77	0.73	0.70	0.76	0.72	0.69	0.74	0.71	0.69	0.67
5	0.76	0.71	0.67	0.75	0.70	0.66	0.73	0.69	0.66	0.72	0.68	0.65	0.70	0.67	0.65	0.63
6	0.72	0.66	0.63	0.71	0.66	0.62	0.70	0.65	0.62	0.68	0.65	0.62	0.67	0.64	0.61	0.60
7	0.68	0.63	0.59	0.68	0.63	0.59	0.66	0.62	0.59	0.65	0.61	0.58	0.64	0.61	0.58	0.57
8	0.65	0.60	0.56	0.64	0.59	0.56	0.63	0.59	0.56	0.62	0.58	0.55	0.62	0.58	0.55	0.54
9	0.62	0.57	0.53	0.61	0.57	0.53	0.61	0.56	0.53	0.60	0.56	0.53	0.59	0.55	0.53	0.52
10	0.59	0.54	0.51	0.59	0.54	0.51	0.58	0.54	0.51	0.57	0.53	0.51	0.57	0.53	0.50	0.49



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	2508.75	2509.88	2498.63	2480.06	2456.44	2413.69	2365.31	2307.38	2230.88
45.0	2505.94	2501.44	2486.25	2466.00	2436.75	2393.44	2332.13	2267.44	2205.56
90.0	2504.25	2498.06	2482.88	2458.69	2427.19	2379.38	2314.69	2246.63	2165.06
135.0	2509.88	2506.50	2493.00	2472.75	2442.38	2394.00	2343.38	2285.44	2209.50
180.0	2508.75	2500.88	2480.06	2454.19	2416.50	2357.44	2306.81	2232.00	2139.19
225.0	2505.94	2502.00	2488.50	2461.50	2424.94	2384.44	2332.69	2255.06	2184.75
270.0	2504.25	2505.38	2494.13	2472.75	2442.38	2399.06	2344.50	2287.69	2211.19
315.0	2509.88	2504.81	2488.50	2459.81	2427.75	2380.50	2327.06	2259.00	2180.81
360.0	2508.75	2509.88	2498.63	2480.06	2456.44	2413.69	2365.31	2307.38	2230.88
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2147.63	2065.50	1966.50	1875.94	1771.88	1668.94	1573.88	1468.13	1364.63
45.0	2100.94	2016.56	1938.38	1810.69	1720.13	1639.13	1526.63	1425.38	1335.94
90.0	2086.31	1990.69	1891.13	1800.00	1693.69	1587.38	1492.31	1398.94	1281.94
135.0	2124.00	2039.06	1937.81	1843.88	1737.56	1631.81	1539.00	1432.69	1326.94
180.0	2067.19	1968.75	1856.25	1774.13	1677.94	1556.44	1459.69	1364.06	1258.88
225.0	2107.69	2004.75	1915.88	1824.19	1731.94	1615.50	1522.13	1425.38	1319.06
270.0	2127.94	2045.81	1947.94	1856.81	1751.06	1645.88	1551.94	1458.00	1342.13
315.0	2103.19	2006.44	1902.38	1809.00	1716.19	1599.19	1505.81	1412.44	1311.19
360.0	2147.63	2065.50	1966.50	1875.94	1771.88	1668.94	1573.88	1468.13	1364.63
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1276.88	1192.50	1092.94	1014.75	940.50	850.50	783.56	718.88	650.25
45.0	1234.13	1142.44	1054.69	962.44	887.06	817.88	737.44	677.81	619.31
90.0	1113.02	1102.61	1012.05	925.82	854.78	779.91	709.65	650.31	588.09
135.0	1232.44	1140.19	1041.75	960.75	885.38	806.63	734.06	668.81	601.31
180.0	1119.38	1065.71	982.35	881.94	808.88	740.87	669.09	602.16	545.68
225.0	1191.94	1120.67	1023.24	932.51	856.69	774.84	707.40	639.17	576.90
270.0	1251.56	1163.25	1058.06	977.63	900.56	827.44	740.81	676.69	617.06
315.0	1213.31	1114.31	1034.61	948.60	876.09	796.05	730.52	663.02	600.75
360.0	1276.88	1192.50	1092.94	1014.75	940.50	850.50	783.56	718.88	650.25
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	586.13	534.94	484.31	442.69	401.06	362.81	331.31	299.25	285.75
45.0	555.19	511.31	468.00	419.06	377.44	344.81	309.94	284.63	251.27
90.0	538.93	487.13	439.26	400.89	365.34	325.01	295.43	269.21	239.18
135.0	542.81	493.88	447.19	406.13	366.75	331.31	299.81	285.75	245.14
180.0	488.76	443.70	397.80	355.44	322.20	288.45	259.26	236.48	216.00
225.0	526.73	480.04	427.22	388.58	353.08	313.31	284.74	258.47	231.64
270.0	554.63	498.38	453.38	407.81	366.75	333.56	299.81	286.31	243.56
315.0	549.28	500.57	446.12	405.90	369.96	330.47	301.84	275.23	250.31
360.0	586.13	534.94	484.31	442.69	401.06	362.81	331.31	299.25	285.75
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	243.56	221.29	195.81	176.91	160.03	142.99	128.08	116.27	105.24
45.0	225.79	205.03	184.67	165.15	149.23	134.83	119.36	108.51	98.83
90.0	217.41	197.21	174.60	158.29	142.71	125.83	115.31	103.61	92.25
135.0	220.05	200.03	179.38	161.66	146.76	134.89	118.18	106.93	97.48
180.0	192.60	175.73	160.31	142.31	129.21	117.28	105.81	95.63	87.81
225.0	207.96	188.89	169.48	151.99	137.87	123.81	112.95	101.98	92.03
270.0	219.32	198.39	179.61	159.24	144.79	131.46	116.38	105.64	96.30
315.0	222.58	202.61	181.35	164.19	147.54	134.10	120.04	107.78	97.76
360.0	243.56	221.29	195.81	176.91	160.03	142.99	128.08	116.27	105.24

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	95.46	87.69	78.92	72.62	66.49	61.54	58.05	54.28	50.18
45.0	87.69	79.99	74.03	68.18	63.23	58.73	54.17	50.68	47.70
90.0	85.16	77.12	69.36	65.08	60.53	55.13	51.98	48.88	45.84
135.0	85.73	78.98	74.08	67.05	62.10	58.39	54.28	51.58	48.49
180.0	79.76	73.18	67.28	62.16	58.50	55.07	51.47	48.54	46.24
225.0	83.59	76.16	68.79	64.46	60.47	55.91	52.14	49.28	46.69
270.0	87.19	78.92	72.39	66.38	61.76	57.21	53.16	49.89	46.69
315.0	87.98	80.27	73.35	66.94	62.44	57.66	53.78	50.96	48.71
360.0	95.46	87.69	78.92	72.62	66.49	61.54	58.05	54.28	50.18
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	47.76	45.39	43.03	41.12	39.66	38.48	37.13	36.28	35.55
45.0	45.11	42.92	40.50	38.76	37.52	36.39	35.21	34.43	33.81
90.0	42.75	40.50	38.42	36.68	35.44	34.14	33.36	32.51	31.78
135.0	45.79	43.48	41.63	39.60	38.19	37.01	35.89	35.16	34.43
180.0	43.71	42.19	40.56	39.15	37.86	36.79	35.72	34.88	34.20
225.0	44.61	42.58	40.56	39.15	37.63	36.28	35.21	34.20	33.58
270.0	44.33	42.24	40.39	38.36	36.96	35.72	34.48	33.69	32.96
315.0	45.62	43.26	41.29	39.54	38.08	36.96	36.00	35.16	34.71
360.0	47.76	45.39	43.03	41.12	39.66	38.48	37.13	36.28	35.55
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	34.82	34.14	33.69	33.13	32.74	32.34	32.12	31.67	31.22
45.0	33.41	33.08	32.91	32.79	32.57	32.18	31.89	31.61	30.99
90.0	31.50	31.16	30.71	30.43	30.04	29.64	29.36	29.03	28.41
135.0	33.81	33.36	33.19	32.85	32.40	32.06	31.61	31.16	30.66
180.0	33.64	33.13	32.51	32.01	31.78	31.33	30.88	30.32	29.93
225.0	33.13	32.74	32.46	32.06	31.78	31.33	30.99	30.60	30.04
270.0	32.34	32.01	31.78	31.28	30.60	29.93	29.31	28.86	28.35
315.0	34.20	33.98	33.81	33.41	32.96	32.63	32.23	31.84	31.39
360.0	34.82	34.14	33.69	33.13	32.74	32.34	32.12	31.67	31.22
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	30.66	29.93	29.31	28.41	27.73	26.83	25.93	25.93	25.71
45.0	30.38	29.81	29.08	28.01	27.28	26.38	25.65	25.37	24.92
90.0	27.62	27.00	26.21	25.20	24.53	24.02	23.63	23.29	22.89
135.0	30.26	29.70	28.91	27.90	27.11	26.55	25.82	25.26	24.58
180.0	29.19	28.41	27.56	26.66	25.93	25.48	24.98	24.36	23.96
225.0	29.70	29.14	28.24	27.62	26.66	25.65	25.14	24.75	24.13
270.0	27.73	27.11	26.49	25.71	24.92	24.30	23.68	23.46	23.01
315.0	30.71	29.93	29.19	28.35	27.28	26.49	25.59	25.37	24.64
360.0	30.66	29.93	29.31	28.41	27.73	26.83	25.93	25.93	25.71
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	25.09	24.30	23.51	22.44	21.60	20.81	18.51	13.95	12.26
45.0	24.75	24.02	23.29	22.44	21.04	18.84	14.96	12.21	8.78
90.0	22.22	21.54	20.81	20.19	18.90	16.71	13.33	10.74	8.27
135.0	23.74	23.34	22.73	22.28	20.87	19.86	16.93	12.60	9.96
180.0	23.46	22.61	21.88	21.15	20.19	19.29	16.09	12.38	9.06
225.0	23.85	23.29	22.61	22.22	21.71	20.25	18.84	15.19	11.93
270.0	22.33	21.54	20.64	19.91	19.41	17.78	16.82	14.23	11.59
315.0	24.13	23.57	23.06	22.39	21.09	20.08	17.55	13.61	10.69
360.0	25.09	24.30	23.51	22.44	21.60	20.81	18.51	13.95	12.26

Intensity data(cd)

C/ γ (°)	90.0
0.0	8.89
45.0	5.79
90.0	5.96
135.0	7.76
180.0	7.54
225.0	8.83
270.0	8.94
315.0	8.72
360.0	8.89