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NATA

LumCAT: 2-1609-A
Luminaire: 92.70.046.00+92.70.147.00
Report No: NATA0100 Voltage(V): 36.4000
Test No: GC2018121302 Current(A): 0.4100
LampCAT: CREE CXA1512 Power (W): 14.9240
Lamp flux(lm): 2030.0 PF: 0.0000
Number of Lamps: 1 Ballast type: DC
Length(mm): 75 Width(mm): 75
Phm Type: C Height(mm): 0

Photometric Results

Lumens(lm): 1668.95
Efficiency(%): 82.21%
Lumens(lm)/Power(W): 112.04
Central intensity(cd): 13692.660
Maximum intensity(cd): 13692.660
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=14.5
 [C90/270]Total=14.5
Field angle(10%Imax): [C0/180]Total=29.3
 [C90/270]Total=29.3
Maximum s/h(1/2): C0_180=0.25 C90_270=0.25
Maximum s/h(1/4): C0_180=0.25 C90_270=0.25
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 82.37%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.788%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	13692.656	3.276	3.276	.161%	.196%
1.0	13560.469	25.953	29.229	1.278%	1.751%
2.0	13044.375	49.922	79.151	2.459%	4.743%
3.0	12264.328	70.388	149.538	3.467%	8.960%
4.0	11313.703	86.545	236.083	4.263%	14.146%
5.0	9941.977	95.021	331.104	4.681%	19.839%
6.0	8585.648	98.415	429.519	4.848%	25.736%
7.0	7235.508	96.697	526.216	4.763%	31.530%
8.0	5812.734	88.713	614.929	4.370%	36.845%
9.0	4618.406	79.228	694.157	3.903%	41.593%
10.0	3726.000	70.952	765.109	3.495%	45.844%
11.0	2743.383	57.403	822.512	2.828%	49.283%
12.0	2294.016	52.303	874.815	2.577%	52.417%
13.0	1782.984	43.983	918.799	2.167%	55.053%
14.0	1486.477	39.435	958.234	1.943%	57.416%
15.0	1308.030	37.125	995.359	1.829%	59.640%
16.0	1204.798	36.417	1031.776	1.794%	61.822%
17.0	1101.804	35.326	1067.102	1.740%	63.939%
18.0	1005.124	34.061	1101.162	1.678%	65.980%
19.0	935.367	33.395	1134.557	1.645%	67.980%
20.0	852.096	31.959	1166.516	1.574%	69.895%
21.0	773.466	30.396	1196.912	1.497%	71.717%
22.0	704.981	28.960	1225.873	1.427%	73.452%
23.0	639.485	27.401	1253.273	1.350%	75.094%
24.0	577.659	25.765	1279.039	1.269%	76.638%
25.0	528.405	24.489	1303.527	1.206%	78.105%
26.0	485.655	23.347	1326.874	1.150%	79.504%
27.0	445.978	22.203	1349.077	1.094%	80.834%
28.0	412.601	21.242	1370.319	1.046%	82.107%
29.0	381.016	20.257	1390.575	.998%	83.321%
30.0	352.020	19.301	1409.877	.951%	84.477%
31.0	325.779	18.400	1428.277	.906%	85.580%
32.0	303.729	17.650	1445.927	.869%	86.637%
33.0	275.843	16.475	1462.402	.812%	87.624%
34.0	258.652	15.861	1478.262	.781%	88.575%
35.0	235.259	14.798	1493.06	.729%	89.461%
36.0	216.429	13.950	1507.01	.687%	90.297%
37.0	201.663	13.309	1520.319	.656%	91.095%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	187.559	12.663	1532.982	.624%	91.853%
39.0	171.387	11.828	1544.81	.583%	92.562%
40.0	158.463	11.170	1555.98	.550%	93.231%
41.0	145.863	10.494	1566.474	.517%	93.860%
42.0	131.984	9.685	1576.158	.477%	94.440%
43.0	118.343	8.851	1585.009	.436%	94.971%
44.0	105.188	8.013	1593.022	.395%	95.451%
45.0	91.779	7.117	1600.138	.351%	95.877%
46.0	78.961	6.229	1606.367	.307%	96.250%
47.0	65.862	5.282	1611.649	.260%	96.567%
48.0	54.239	4.420	1616.069	.218%	96.832%
49.0	44.079	3.648	1619.718	.180%	97.050%
50.0	34.418	2.891	1622.609	.142%	97.224%
51.0	26.810	2.285	1624.894	.113%	97.361%
52.0	21.368	1.846	1626.74	.091%	97.471%
53.0	16.868	1.477	1628.217	.073%	97.560%
54.0	13.662	1.212	1629.429	.060%	97.632%
55.0	11.925	1.071	1630.501	.053%	97.696%
56.0	10.688	0.972	1631.472	.048%	97.755%
57.0	10.181	0.936	1632.409	.046%	97.811%
58.0	9.963	0.927	1633.335	.046%	97.866%
59.0	9.795	0.921	1634.256	.045%	97.921%
60.0	9.661	0.917	1635.173	.045%	97.976%
61.0	9.577	0.919	1636.092	.045%	98.031%
62.0	9.520	0.922	1637.014	.045%	98.087%
63.0	9.485	0.927	1637.94	.046%	98.142%
64.0	9.492	0.936	1638.876	.046%	98.198%
65.0	9.492	0.943	1639.819	.046%	98.255%
66.0	9.506	0.952	1640.772	.047%	98.312%
67.0	9.555	0.965	1641.736	.048%	98.370%
68.0	9.626	0.979	1642.715	.048%	98.428%
69.0	9.745	0.998	1643.713	.049%	98.488%
70.0	9.900	1.020	1644.733	.050%	98.549%
71.0	10.083	1.045	1645.778	.052%	98.612%
72.0	10.371	1.082	1646.86	.053%	98.677%
73.0	10.603	1.112	1647.972	.055%	98.743%
74.0	10.779	1.136	1649.108	.056%	98.811%
75.0	11.081	1.174	1650.282	.058%	98.882%

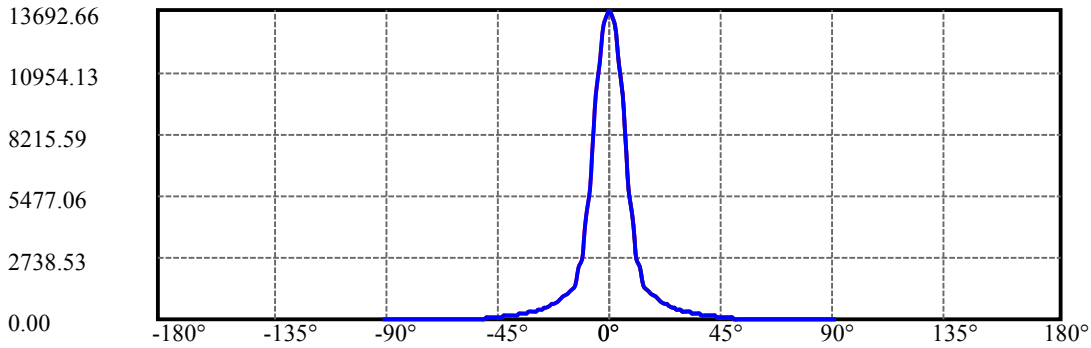
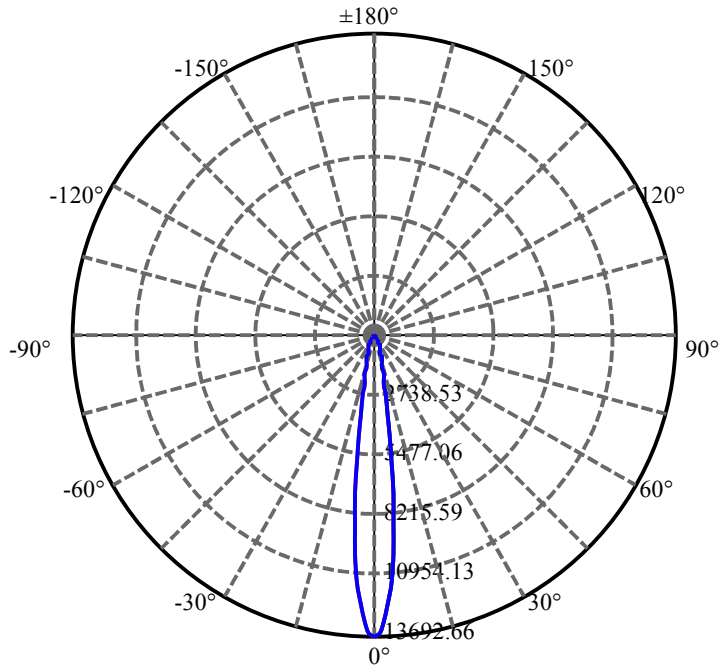
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	11.419	1.215	1651.497	.060%	98.955%
77.0	11.707	1.251	1652.748	.062%	99.029%
78.0	12.115	1.299	1654.047	.064%	99.107%
79.0	12.480	1.343	1655.391	.066%	99.188%
80.0	12.853	1.388	1656.779	.068%	99.271%
81.0	13.324	1.443	1658.222	.071%	99.357%
82.0	13.852	1.504	1659.726	.074%	99.448%
83.0	14.520	1.580	1661.307	.078%	99.542%
84.0	15.188	1.656	1662.963	.082%	99.642%
85.0	14.920	1.630	1664.593	.080%	99.739%
86.0	13.711	1.500	1666.093	.074%	99.829%
87.0	8.592	0.941	1667.034	.046%	99.885%
88.0	7.038	0.771	1667.805	.038%	99.932%
89.0	6.954	0.762	1668.568	.038%	99.977%
90.0	6.891	0.378	1668.945	.019%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1409.88	69.45%	84.48%
0-40	1555.98	76.65%	93.23%
0-60	1635.17	80.55%	97.98%
0-90	1668.57	82.20%	99.98%
0-120	1668.57	82.20%	99.98%
0-180	1668.95	82.21%	100.00%
60-90	34.31	1.69%	2.06%
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%
0-26.37	1335.16	65.77%	80.00%

ZONAL LUMEN SUMMARY

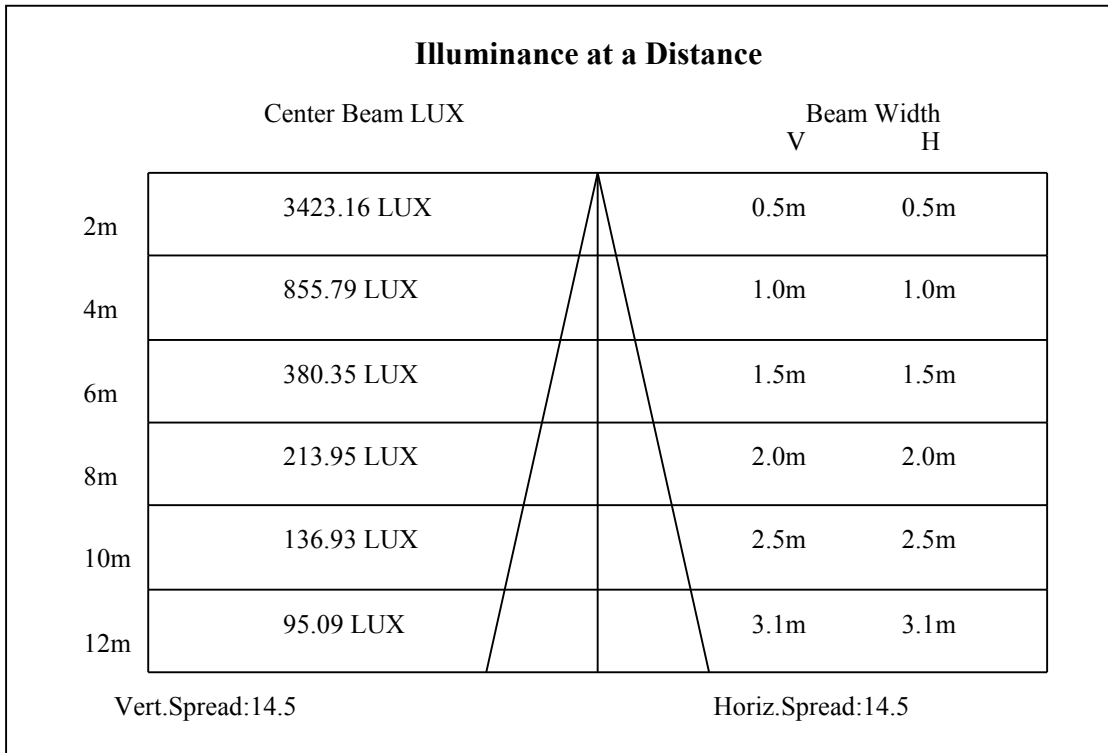
0-10	765.11
10-20	401.41
20-30	243.36
30-40	146.10
40-50	66.63
50-60	12.56
60-70	9.56
70-80	12.05
80-90	11.79
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

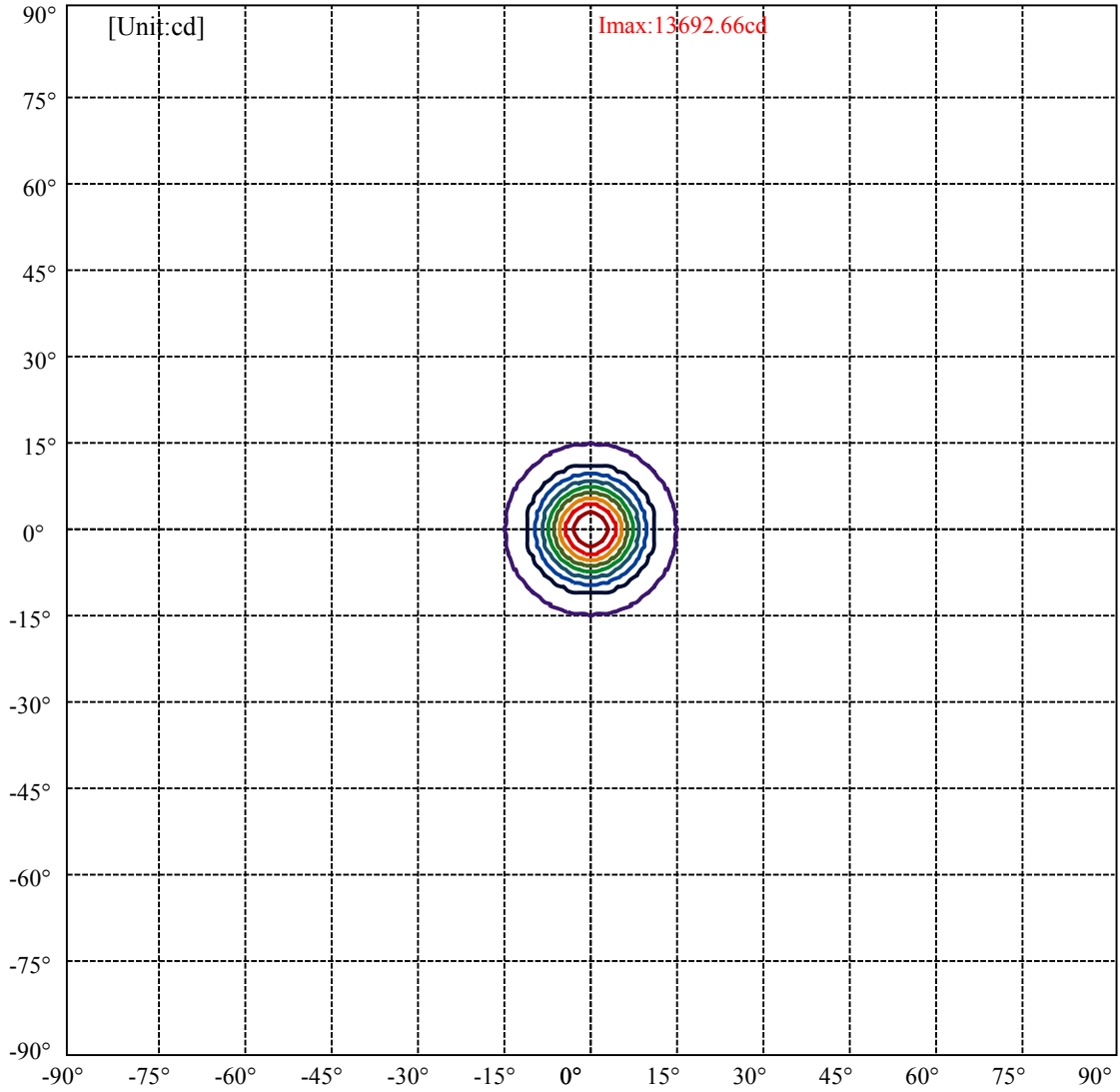


C0(Max): —————
C0/C180: —————
C90/C270: —————

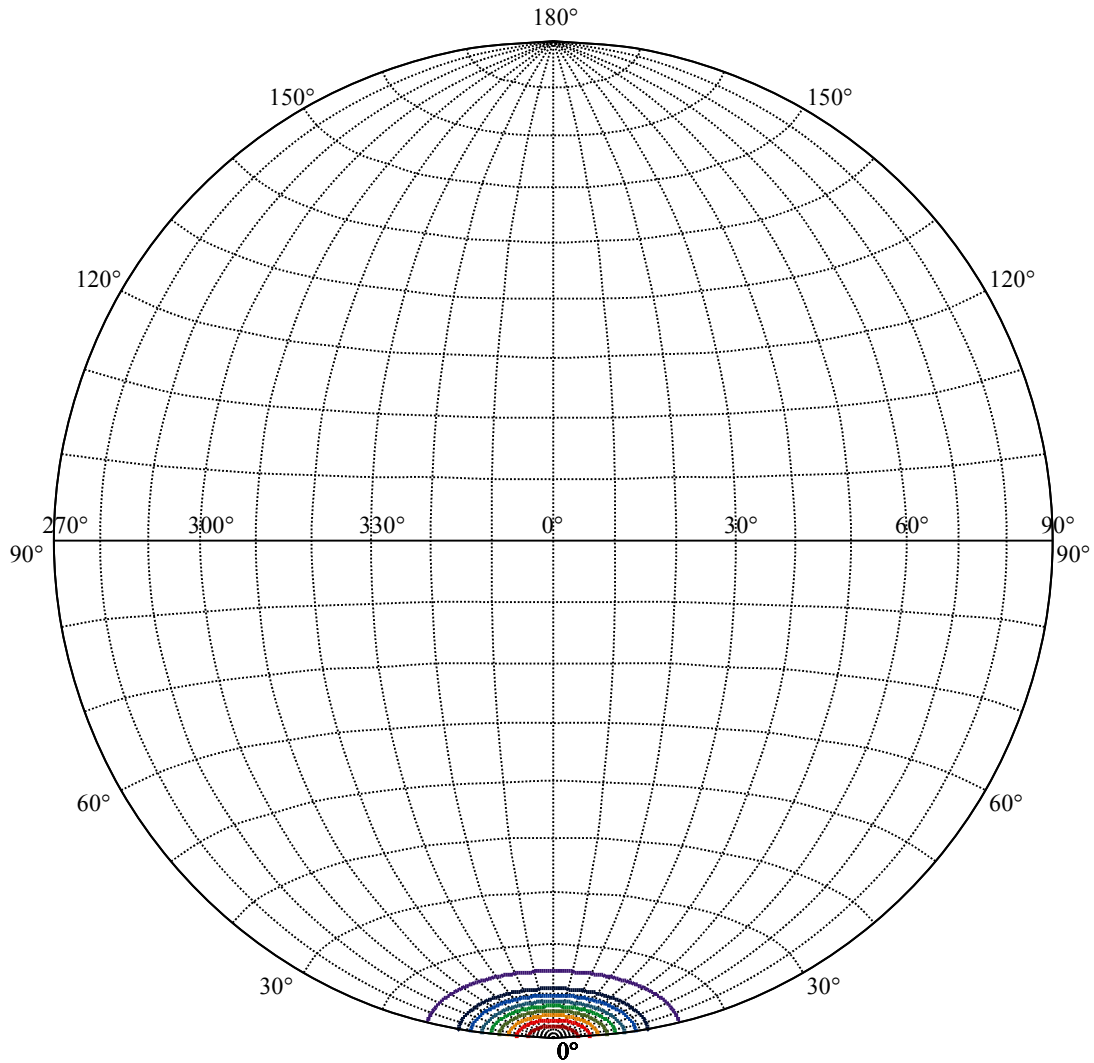
Field angle(10%Imax):C0/180Left:14.7 Right:14.7
:C90/270Left:14.7 Right:14.7

Beam Angle(50%Imax):C0/180Left:7.3 Right:7.3
:C90/270Left:7.3 Right:7.3





(10%Imax) 1369.27	—
(20%Imax) 2738.53	—
(30%Imax) 4107.8	—
(40%Imax) 5477.06	—
(50%Imax) 6846.33	—
(60%Imax) 8215.59	—
(70%Imax) 9584.86	—
(80%Imax) 10954.1	—
(90%Imax) 12323.4	—



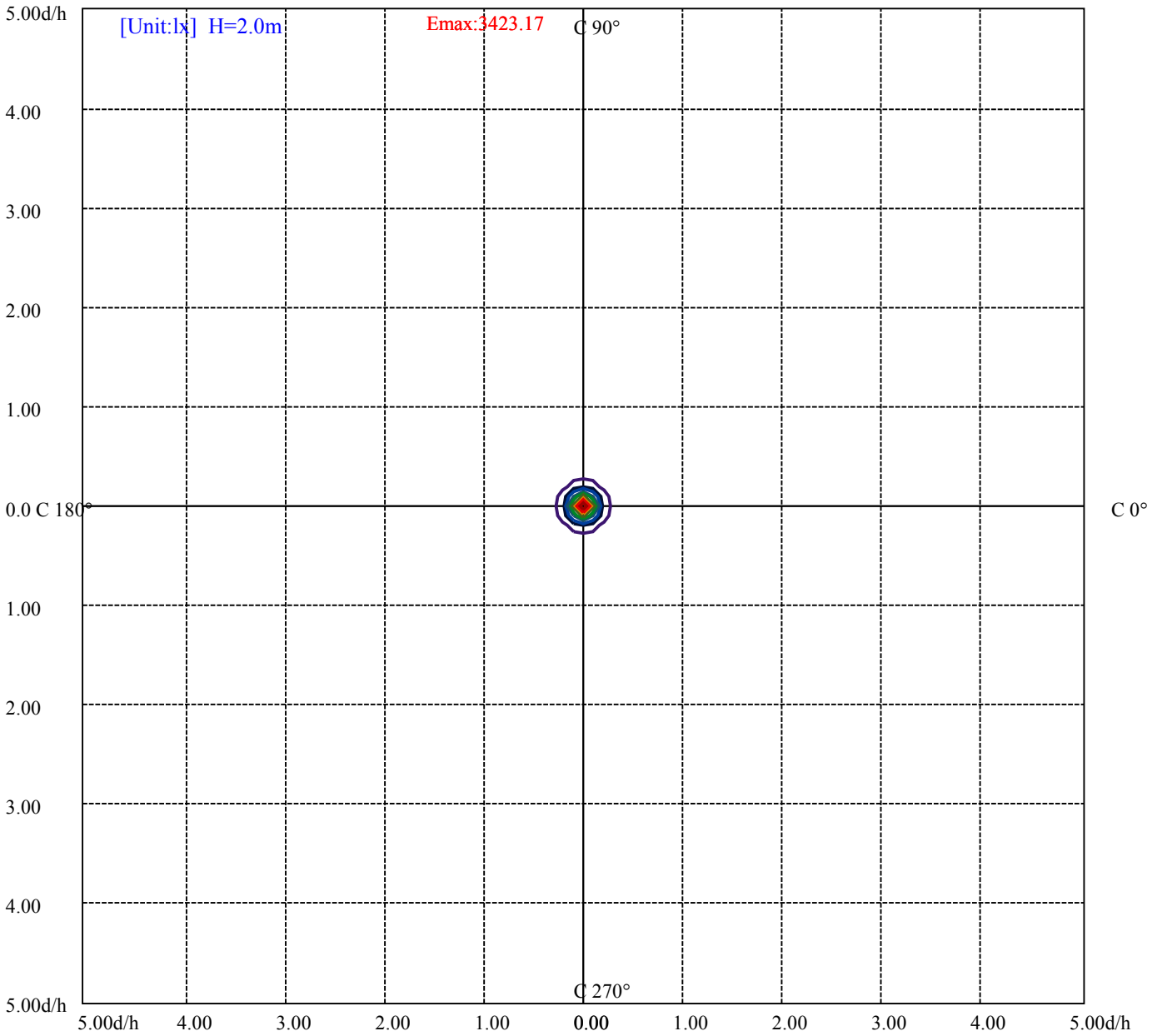
House

[Unit:cd]

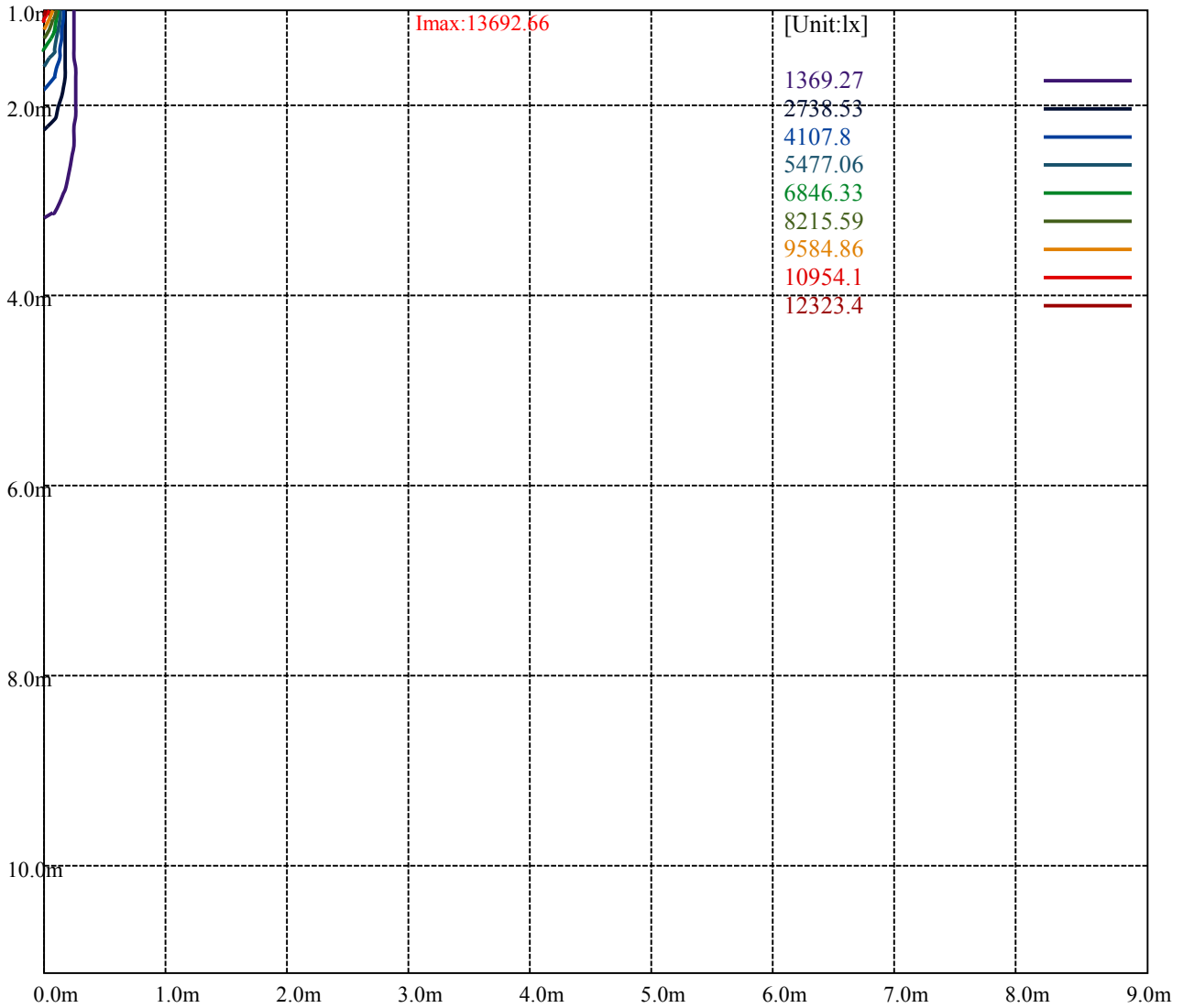
Road

Imax:13692.66

(10%Imax) 1369.27	—
(20%Imax) 2738.53	—
(30%Imax) 4107.8	—
(40%Imax) 5477.06	—
(50%Imax) 6846.33	—
(60%Imax) 8215.59	—
(70%Imax) 9584.86	—
(80%Imax) 10954.1	—
(90%Imax) 12323.4	—



- (10%Emax) 342.315
- (20%Emax) 684.6325
- (30%Emax) 1026.948
- (40%Emax) 1369.262
- (50%Emax) 1711.58
- (60%Emax) 2053.895
- (70%Emax) 2396.212
- (80%Emax) 2738.525
- (90%Emax) 3080.85



Luminance Table

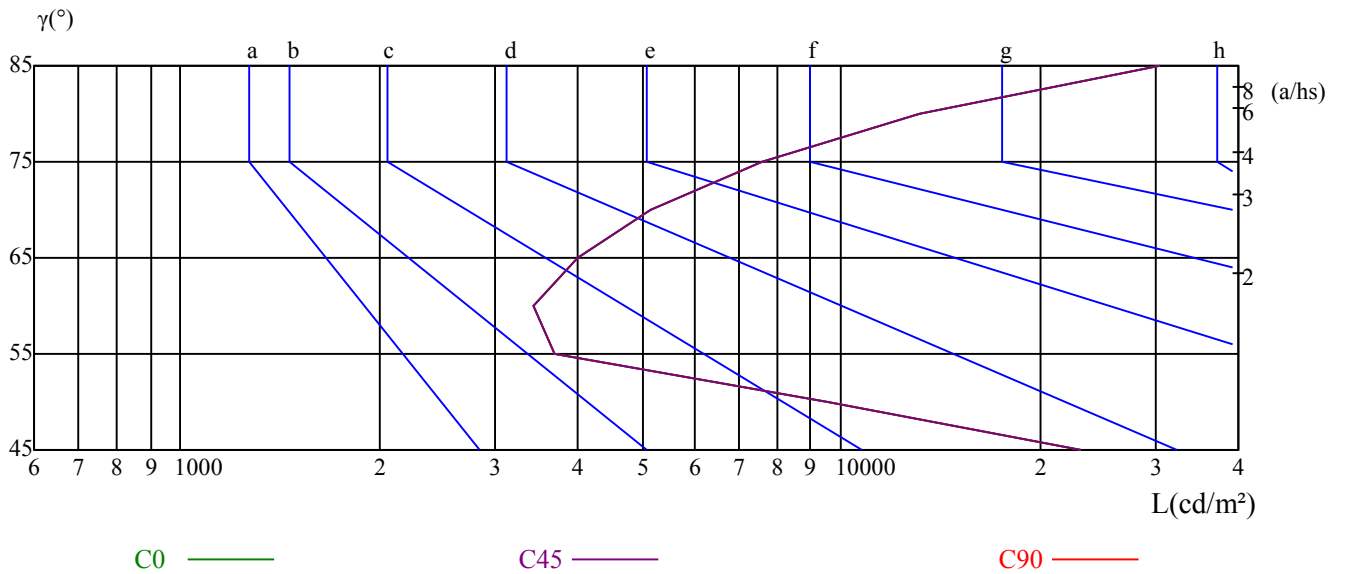
γ	45	50	55	60	65	70	75	80	85
C0	23075	9519	3696	3435	3993	5146	7611	13159	30434
C45	23075	9519	3696	3435	3993	5146	7611	13159	30434
C90	23075	9519	3696	3435	3993	5146	7611	13159	30434

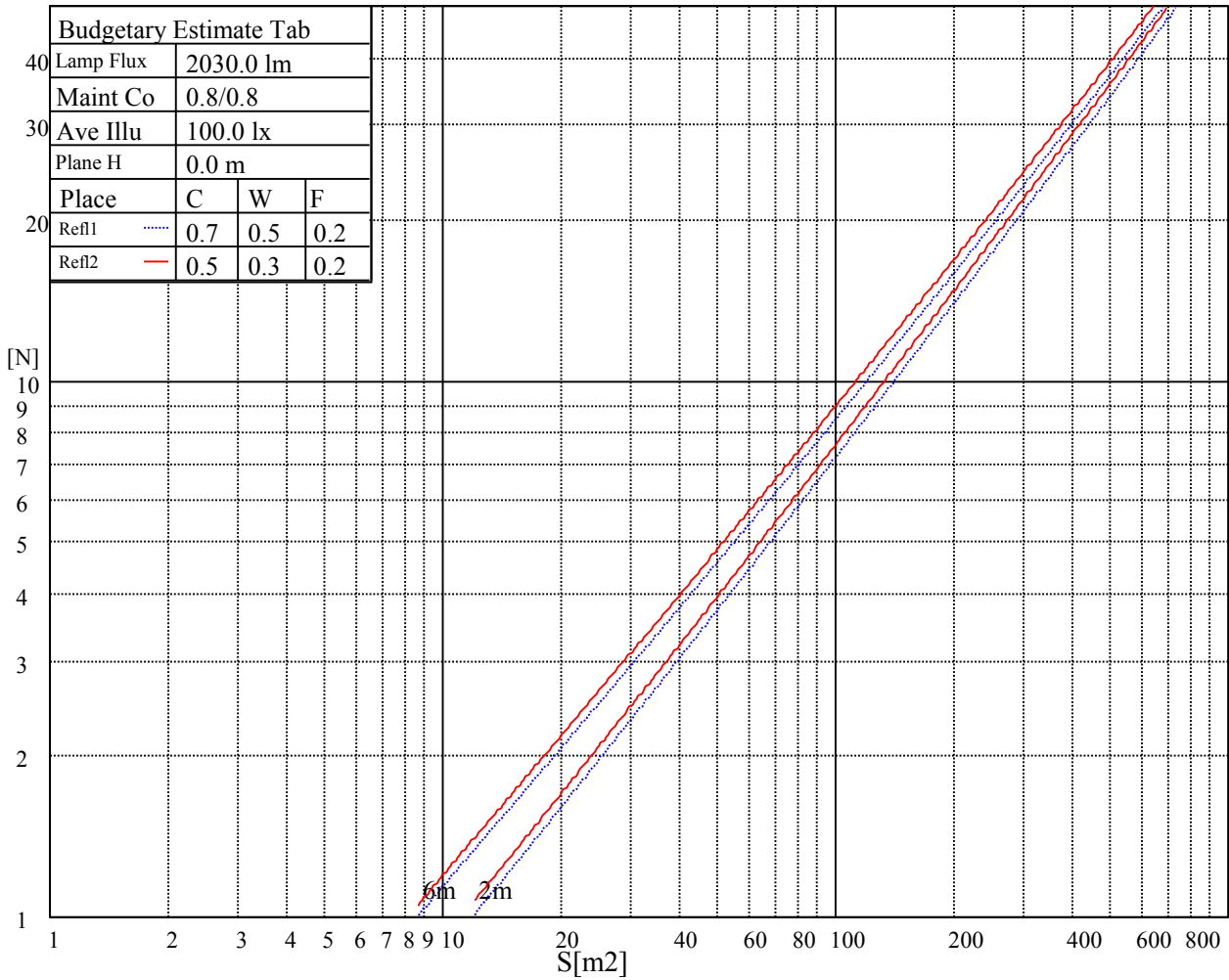
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3993	3993	3993	7611	7611	7611	30434	30434	30434

Glare Table

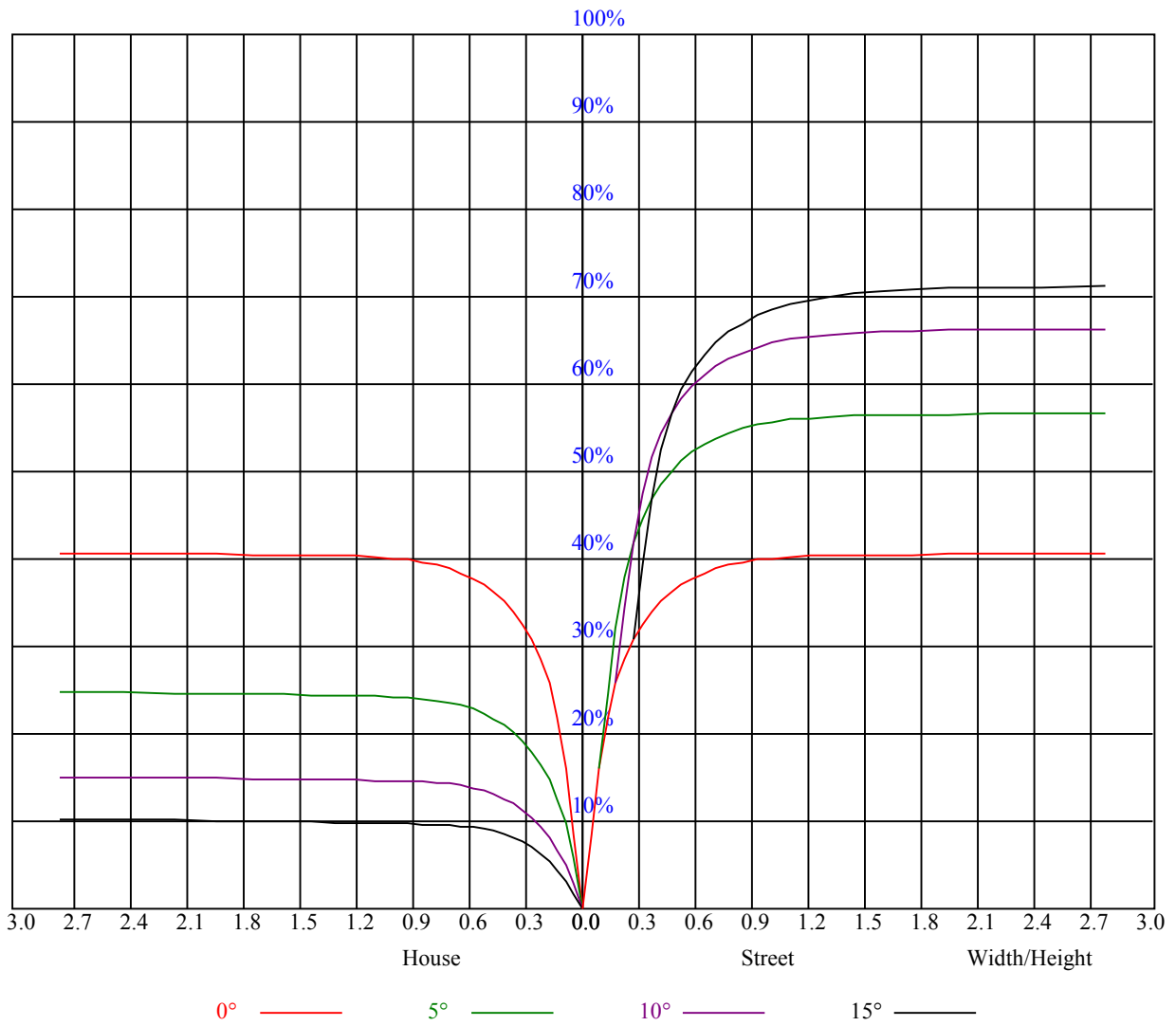
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.98	0.98	0.98	0.96	0.96	0.96	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84	0.82
1	0.92	0.90	0.89	0.90	0.89	0.87	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.80	0.80	0.78
2	0.87	0.85	0.82	0.86	0.84	0.81	0.83	0.81	0.80	0.81	0.79	0.78	0.79	0.78	0.76	0.75
3	0.83	0.80	0.77	0.82	0.79	0.77	0.80	0.78	0.76	0.78	0.76	0.75	0.77	0.75	0.73	0.72
4	0.80	0.76	0.74	0.79	0.76	0.73	0.77	0.75	0.72	0.76	0.73	0.72	0.74	0.72	0.71	0.70
5	0.77	0.73	0.70	0.76	0.73	0.70	0.75	0.72	0.70	0.73	0.71	0.69	0.72	0.70	0.68	0.67
6	0.74	0.70	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.71	0.69	0.67	0.70	0.68	0.66	0.65
7	0.72	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.65	0.69	0.67	0.65	0.69	0.66	0.64	0.63
8	0.69	0.66	0.63	0.69	0.66	0.63	0.68	0.65	0.63	0.68	0.65	0.63	0.67	0.64	0.63	0.62
9	0.68	0.64	0.62	0.67	0.64	0.62	0.66	0.63	0.61	0.66	0.63	0.61	0.65	0.63	0.61	0.60
10	0.66	0.62	0.60	0.65	0.62	0.60	0.65	0.62	0.60	0.64	0.62	0.60	0.64	0.61	0.60	0.59



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	13798.13	13185.00	12065.63	10923.75	9601.88	8010.00	6446.25	5186.25	3960.00
45.0	13764.38	13117.50	11975.63	10828.13	9517.50	7785.00	6395.63	5113.13	3886.88
90.0	13601.25	13173.75	12369.38	11121.19	10059.19	8543.25	6966.00	5619.38	4278.38
135.0	13606.88	13792.50	13618.13	13145.63	12403.13	11115.00	9832.50	8415.00	6997.50
180.0	13798.13	14169.38	14208.75	13905.00	13246.88	12031.88	11179.13	9640.69	8013.38
225.0	13764.38	14135.63	14248.13	13961.25	13426.88	12487.50	11076.75	9925.31	8178.75
270.0	13601.25	13758.75	13561.88	13061.25	12296.25	11131.88	9736.88	8381.25	6873.75
315.0	13606.88	13151.25	12307.50	11168.44	9957.94	8431.31	7052.06	5603.06	4313.25
360.0	13798.13	13185.00	12065.63	10923.75	9601.88	8010.00	6446.25	5186.25	3960.00
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2992.50	2902.50	1905.75	1580.06	1379.81	1245.38	1154.81	1077.75	995.63
45.0	2936.25	2840.63	1811.81	1542.94	1355.63	1228.50	1143.00	1063.69	982.13
90.0	3295.69	2468.81	1918.13	1608.19	1395.00	1260.56	1118.03	1088.94	992.76
135.0	5343.75	4156.88	3189.38	2885.63	1850.63	1555.88	1359.00	1236.38	1161.56
180.0	6580.69	5091.19	3844.69	2980.13	2332.13	1793.81	1532.25	1366.88	1233.00
225.0	6969.38	5479.31	4034.25	3223.13	2509.31	1859.63	1604.25	1408.50	1261.69
270.0	5467.50	4325.63	3268.13	2885.63	2003.63	1671.19	1433.25	1296.56	1184.06
315.0	3361.50	2543.06	1974.94	1646.44	1437.75	1276.88	1119.66	1099.69	1003.61
360.0	2992.50	2902.50	1905.75	1580.06	1379.81	1245.38	1154.81	1077.75	995.63
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	912.94	839.81	761.63	686.25	624.94	570.94	515.25	477.00	443.25
45.0	902.81	833.06	744.75	676.69	609.75	545.06	503.44	466.88	433.69
90.0	914.01	839.64	758.93	678.15	615.54	562.28	505.29	464.74	428.91
135.0	1060.31	989.44	905.06	826.88	756.56	686.25	614.81	564.75	522.00
180.0	1115.72	1047.38	964.46	882.56	811.01	734.06	670.56	607.33	553.56
225.0	1116.39	1068.36	993.88	900.79	824.29	750.66	672.92	605.53	554.29
270.0	1089.00	1009.69	921.94	836.44	761.06	698.63	612.00	559.69	512.44
315.0	929.81	855.56	766.13	699.98	636.69	568.01	527.01	481.33	437.12
360.0	912.94	839.81	761.63	686.25	624.94	570.94	515.25	477.00	443.25
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	408.38	375.75	349.88	321.75	294.75	285.75	243.96	225.73	208.97
45.0	396.56	369.56	343.13	316.69	291.38	285.19	243.06	223.76	211.33
90.0	393.69	362.36	336.60	309.04	286.82	262.80	241.43	224.66	208.35
135.0	475.31	441.56	411.19	379.69	350.44	326.81	302.06	285.19	256.05
180.0	513.17	477.34	436.50	406.29	377.94	344.70	319.39	295.48	264.99
225.0	504.90	467.33	428.51	395.21	368.44	340.82	314.83	293.12	272.42
270.0	466.31	426.38	394.31	363.38	334.69	311.06	286.88	284.63	243.17
315.0	409.50	380.53	348.02	324.11	301.78	272.70	255.15	236.64	216.79
360.0	408.38	375.75	349.88	321.75	294.75	285.75	243.96	225.73	208.97
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	192.88	180.23	169.03	149.79	135.68	122.79	108.84	96.75	84.21
45.0	194.63	183.21	172.52	151.48	137.70	125.16	110.87	98.61	86.34
90.0	192.38	179.16	167.79	153.51	141.13	126.73	115.99	103.67	90.73
135.0	237.21	220.89	202.44	186.69	174.60	161.33	146.53	131.63	119.25
180.0	243.90	226.07	207.06	192.32	179.38	166.73	151.43	134.49	118.29
225.0	246.32	227.81	212.06	194.12	181.69	170.94	155.98	140.29	127.35
270.0	224.55	209.81	196.14	180.39	169.99	159.92	144.73	133.09	121.95
315.0	199.58	186.13	173.42	162.79	147.54	133.31	121.50	108.23	93.38
360.0	192.88	180.23	169.03	149.79	135.68	122.79	108.84	96.75	84.21

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	70.37	57.71	47.25	36.68	28.74	21.88	16.65	13.28	10.63
45.0	71.49	60.36	49.73	39.15	30.66	24.64	19.24	15.81	13.22
90.0	76.33	63.62	53.21	41.91	33.30	26.33	20.36	16.54	13.67
135.0	104.23	89.89	76.78	64.52	51.19	40.44	30.43	23.74	18.11
180.0	108.90	97.43	79.88	69.81	58.61	44.44	36.00	28.18	21.38
225.0	113.79	100.91	86.18	73.01	61.82	49.89	39.15	31.22	24.64
270.0	109.24	94.73	81.90	67.50	55.69	43.59	33.58	26.94	21.21
315.0	79.88	67.05	51.98	41.34	32.63	24.13	19.07	15.24	12.09
360.0	70.37	57.71	47.25	36.68	28.74	21.88	16.65	13.28	10.63
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	9.73	9.68	9.68	9.62	9.56	9.51	9.45	9.39	9.34
45.0	12.26	11.59	10.91	10.35	10.01	9.73	9.62	9.51	9.51
90.0	11.53	11.14	10.80	10.52	10.46	10.41	10.35	10.29	10.29
135.0	14.18	11.31	9.90	9.73	9.62	9.56	9.51	9.51	9.51
180.0	16.20	13.05	10.46	9.79	9.68	9.56	9.45	9.34	9.28
225.0	18.28	14.63	11.93	10.52	10.18	9.90	9.68	9.51	9.34
270.0	16.93	14.06	12.04	11.25	10.69	10.29	9.96	9.79	9.68
315.0	10.18	9.96	9.79	9.68	9.51	9.39	9.28	9.28	9.23
360.0	9.73	9.68	9.68	9.62	9.56	9.51	9.45	9.39	9.34
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.34	9.28	9.17	9.06	9.06	9.06	9.11	9.17	9.23
45.0	9.45	9.45	9.51	9.56	9.68	9.79	9.96	10.24	10.80
90.0	10.24	10.29	10.29	10.24	10.29	10.35	10.46	10.58	10.69
135.0	9.51	9.56	9.56	9.62	9.62	9.68	9.79	9.90	10.01
180.0	9.23	9.23	9.17	9.17	9.17	9.17	9.23	9.34	9.34
225.0	9.28	9.34	9.39	9.39	9.51	9.68	10.01	10.29	10.58
270.0	9.62	9.62	9.62	9.68	9.79	9.90	9.96	10.13	10.29
315.0	9.23	9.17	9.23	9.34	9.34	9.39	9.45	9.56	9.73
360.0	9.34	9.28	9.17	9.06	9.06	9.06	9.11	9.17	9.23
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.34	9.51	9.68	9.90	10.01	10.24	10.41	10.58	10.74
45.0	11.98	12.49	12.32	12.26	12.38	12.60	13.44	14.18	14.57
90.0	10.86	11.03	11.19	11.53	11.87	12.15	12.71	13.28	13.95
135.0	10.24	10.46	10.69	11.14	11.76	12.38	12.83	13.11	13.73
180.0	9.45	9.56	9.73	9.73	9.84	9.96	10.13	10.35	10.58
225.0	10.58	10.74	10.91	11.19	11.25	11.31	11.25	11.31	11.36
270.0	10.52	10.69	10.91	11.19	11.42	11.70	12.09	12.43	12.88
315.0	10.01	10.35	10.80	11.70	12.83	13.33	14.06	14.63	15.02
360.0	9.34	9.51	9.68	9.90	10.01	10.24	10.41	10.58	10.74
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	11.76	12.26	12.83	14.18	14.68	13.28	7.09	6.92	6.81
45.0	14.96	15.36	16.14	17.21	14.23	13.28	7.43	6.92	6.86
90.0	14.68	15.36	16.03	16.71	17.04	16.26	9.90	7.09	7.03
135.0	14.63	15.41	16.37	17.27	18.06	17.55	14.68	7.14	7.03
180.0	10.69	10.91	11.31	11.93	12.71	13.05	8.10	7.03	6.98
225.0	11.48	11.81	11.98	12.21	12.15	12.60	7.14	7.03	6.98
270.0	13.33	13.95	14.57	15.02	15.19	12.38	7.26	7.09	7.03
315.0	15.08	15.75	16.93	16.99	15.30	11.31	7.14	7.09	6.92
360.0	11.76	12.26	12.83	14.18	14.68	13.28	7.09	6.92	6.81

Intensity data(cd)

C/γ(°)	90.0
0.0	6.75
45.0	6.86
90.0	6.92
135.0	6.98
180.0	6.92
225.0	6.92
270.0	6.92
315.0	6.86
360.0	6.75