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NATA

LumCAT: CR01D07524AR
Luminaire: 92.70.074.00
Report No: NATA0100
Test No: GC2018112805
LampCAT: CREE CXA1820
Lamp flux(lm): 2349.0
Number of Lamps: 1
Length(mm): 75
Phm Type: C

Voltage(V): 36.1000
Current(A): 0.5000
Power (W): 18.0500
PF: 0.0000
Ballast type: DC
Width(mm): 75
Height(mm): 0

Photometric Results

Lumens(lm): 2147.31
Efficiency(%): 91.41%
Lumens(lm)/Power(W): 119.11
Central intensity(cd): 11253.240
Maximum intensity(cd): 11253.240
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=23.4
 [C90/270]Total=23.4
Field angle(10%Imax): [C0/180]Total=39.6
 [C90/270]Total=39.6
Maximum s/h(1/2): C0_180=0.40 C90_270=0.40
Maximum s/h(1/4): C0_180=0.39 C90_270=0.39
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 91.52%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 95.403%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	11253.234	2.692	2.692	.115%	.125%
1.0	11239.383	21.510	24.203	.916%	1.127%
2.0	11125.266	42.578	66.78	1.813%	3.110%
3.0	10904.344	62.582	129.363	2.664%	6.024%
4.0	10577.531	80.913	210.276	3.445%	9.793%
5.0	10175.484	97.253	307.529	4.140%	14.322%
6.0	9689.273	111.065	418.594	4.728%	19.494%
7.0	9100.828	121.626	540.22	5.178%	25.158%
8.0	8490.445	129.580	669.8	5.516%	31.193%
9.0	7757.156	133.072	802.872	5.665%	37.390%
10.0	6931.125	131.985	934.857	5.619%	43.536%
11.0	6176.109	129.231	1064.088	5.502%	49.554%
12.0	5406.539	123.268	1187.356	5.248%	55.295%
13.0	4589.438	113.214	1300.57	4.820%	60.567%
14.0	3907.828	103.672	1404.242	4.413%	65.395%
15.0	3336.117	94.687	1498.929	4.031%	69.805%
16.0	2725.383	82.379	1581.308	3.507%	73.641%
17.0	2224.828	71.332	1652.64	3.037%	76.963%
18.0	1731.038	58.660	1711.3	2.497%	79.695%
19.0	1345.212	48.027	1759.326	2.045%	81.932%
20.0	1061.719	39.821	1799.147	1.695%	83.786%
21.0	825.609	32.446	1831.593	1.381%	85.297%
22.0	630.823	25.914	1857.507	1.103%	86.504%
23.0	490.929	21.035	1878.542	.895%	87.483%
24.0	388.287	17.319	1895.861	.737%	88.290%
25.0	291.424	13.506	1909.367	.575%	88.919%
26.0	226.238	10.876	1920.243	.463%	89.425%
27.0	171.851	8.556	1928.798	.364%	89.824%
28.0	133.840	6.890	1935.689	.293%	90.145%
29.0	109.230	5.807	1941.496	.247%	90.415%
30.0	92.644	5.080	1946.576	.216%	90.652%
31.0	79.748	4.504	1951.08	.192%	90.862%
32.0	71.705	4.167	1955.247	.177%	91.056%
33.0	65.609	3.919	1959.165	.167%	91.238%
34.0	60.075	3.684	1962.849	.157%	91.410%
35.0	56.180	3.534	1966.383	.150%	91.574%
36.0	53.234	3.431	1969.814	.146%	91.734%
37.0	50.759	3.350	1973.164	.143%	91.890%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	49.303	3.329	1976.493	.142%	92.045%
39.0	48.368	3.338	1979.831	.142%	92.200%
40.0	47.735	3.365	1983.195	.143%	92.357%
41.0	47.370	3.408	1986.603	.145%	92.516%
42.0	47.053	3.453	1990.056	.147%	92.677%
43.0	46.695	3.492	1993.548	.149%	92.839%
44.0	46.230	3.522	1997.07	.150%	93.003%
45.0	45.745	3.547	2000.617	.151%	93.168%
46.0	45.007	3.550	2004.167	.151%	93.334%
47.0	44.177	3.543	2007.71	.151%	93.499%
48.0	43.390	3.536	2011.246	.151%	93.663%
49.0	42.532	3.520	2014.766	.150%	93.827%
50.0	41.604	3.495	2018.261	.149%	93.990%
51.0	40.486	3.450	2021.712	.147%	94.151%
52.0	39.488	3.412	2025.124	.145%	94.310%
53.0	38.566	3.378	2028.502	.144%	94.467%
54.0	37.877	3.360	2031.862	.143%	94.624%
55.0	36.984	3.322	2035.184	.141%	94.778%
56.0	36.127	3.284	2038.469	.140%	94.931%
57.0	35.213	3.238	2041.707	.138%	95.082%
58.0	34.221	3.182	2044.89	.135%	95.230%
59.0	33.223	3.123	2048.012	.133%	95.376%
60.0	32.323	3.070	2051.082	.131%	95.519%
61.0	31.402	3.012	2054.094	.128%	95.659%
62.0	30.544	2.957	2057.051	.126%	95.797%
63.0	29.791	2.911	2059.962	.124%	95.932%
64.0	28.983	2.857	2062.819	.122%	96.065%
65.0	28.470	2.829	2065.648	.120%	96.197%
66.0	28.076	2.813	2068.461	.120%	96.328%
67.0	28.048	2.831	2071.292	.121%	96.460%
68.0	28.111	2.858	2074.15	.122%	96.593%
69.0	28.160	2.883	2077.033	.123%	96.727%
70.0	28.097	2.895	2079.929	.123%	96.862%
71.0	28.069	2.910	2082.839	.124%	96.998%
72.0	28.209	2.942	2085.781	.125%	97.135%
73.0	28.441	2.983	2088.764	.127%	97.273%
74.0	28.638	3.019	2091.782	.129%	97.414%
75.0	28.744	3.045	2094.827	.130%	97.556%

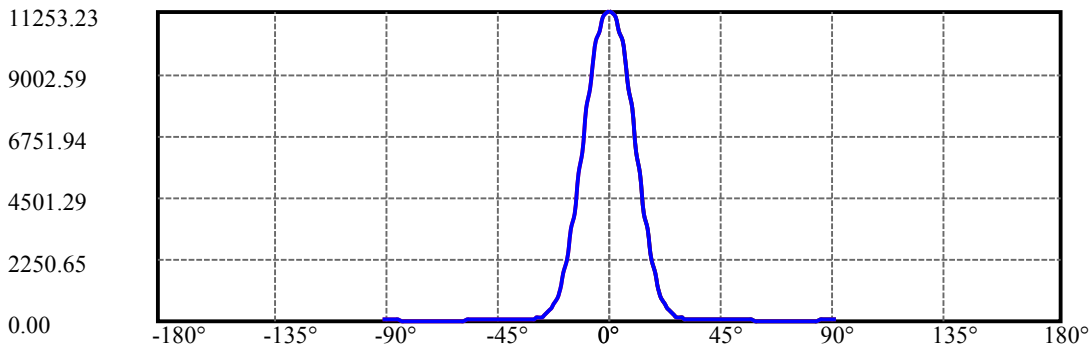
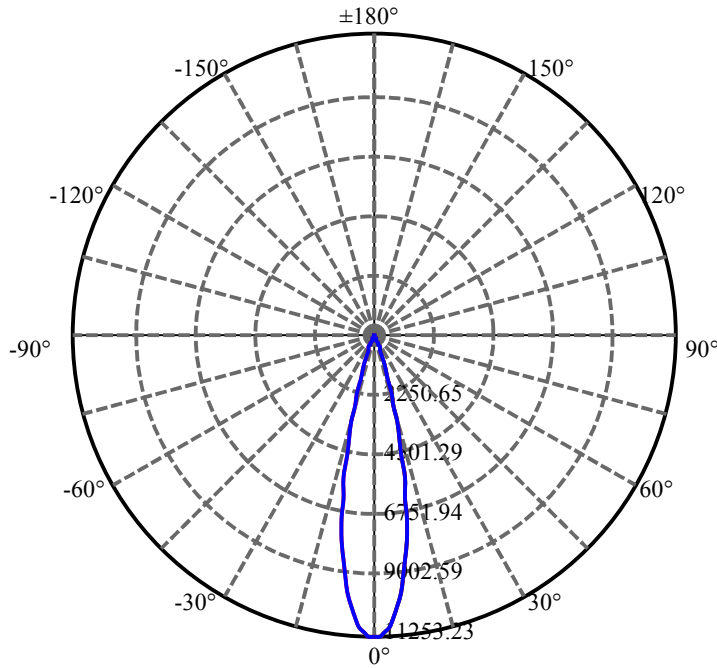
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	28.512	3.034	2097.861	.129%	97.697%
77.0	28.491	3.044	2100.905	.130%	97.839%
78.0	28.716	3.080	2103.985	.131%	97.982%
79.0	29.327	3.157	2107.142	.134%	98.129%
80.0	29.658	3.203	2110.345	.136%	98.278%
81.0	30.094	3.259	2113.605	.139%	98.430%
82.0	31.127	3.380	2116.985	.144%	98.588%
83.0	32.998	3.592	2120.576	.153%	98.755%
84.0	34.966	3.813	2124.39	.162%	98.933%
85.0	36.183	3.953	2128.343	.168%	99.117%
86.0	36.984	4.046	2132.388	.172%	99.305%
87.0	37.463	4.103	2136.491	.175%	99.496%
88.0	37.962	4.160	2140.651	.177%	99.690%
89.0	40.022	4.388	2145.039	.187%	99.894%
90.0	41.435	2.272	2147.311	.097%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1946.58	82.87%	90.65%
0-40	1983.20	84.43%	92.36%
0-60	2051.08	87.32%	95.52%
0-90	2145.04	91.32%	99.89%
0-120	2145.04	91.32%	99.89%
0-180	2147.31	91.41%	100.00%
60-90	97.03	4.13%	4.52%
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%
0-18.14	1717.85	73.13%	80.00%

ZONAL LUMEN SUMMARY

0-10	934.86
10-20	864.29
20-30	147.43
30-40	36.62
40-50	35.07
50-60	32.82
60-70	28.85
70-80	30.42
80-90	34.69
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: —————

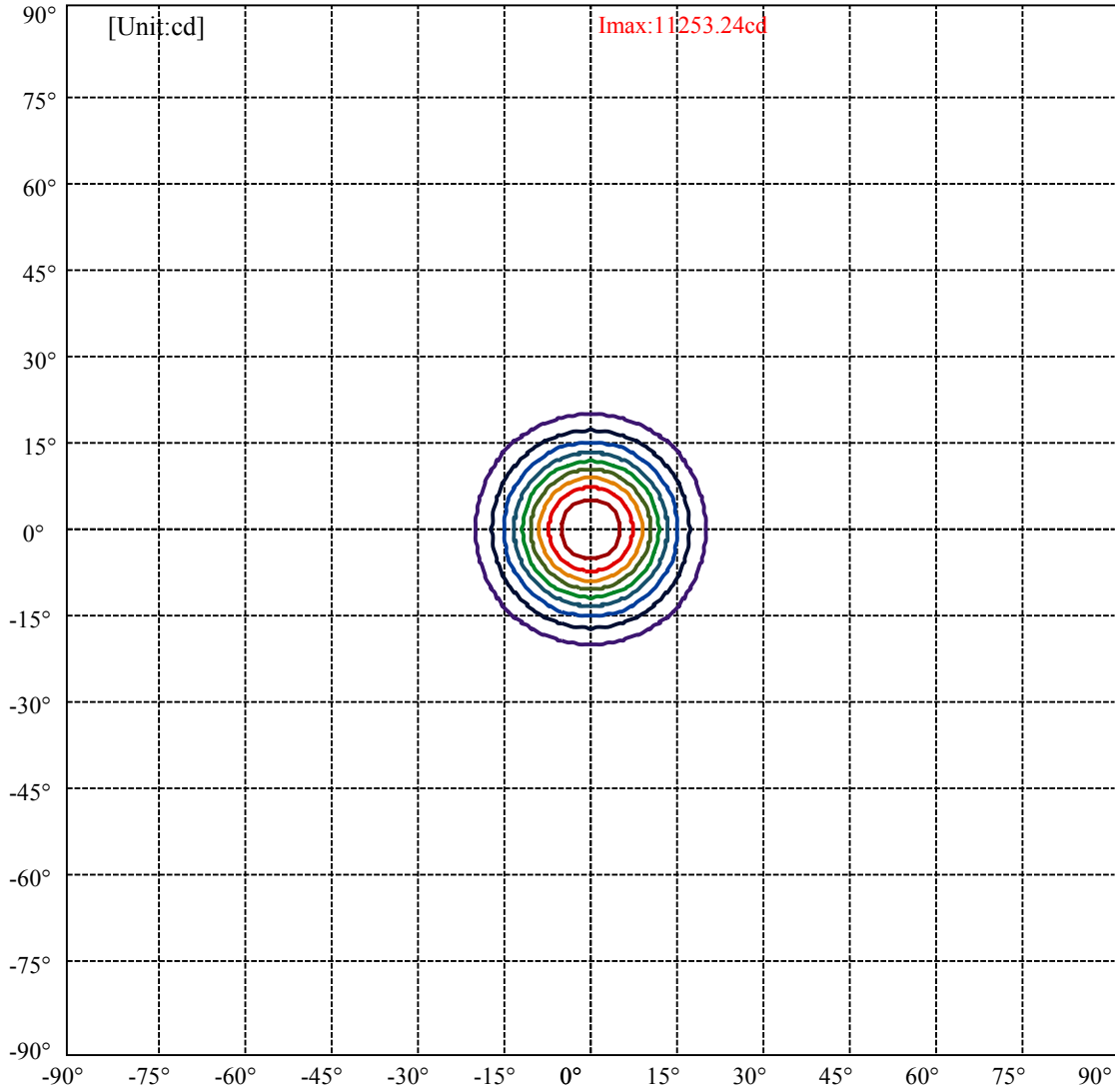
C90/C270: —————

Field angle(10%Imax):C0/180Left:19.8 Right:19.8

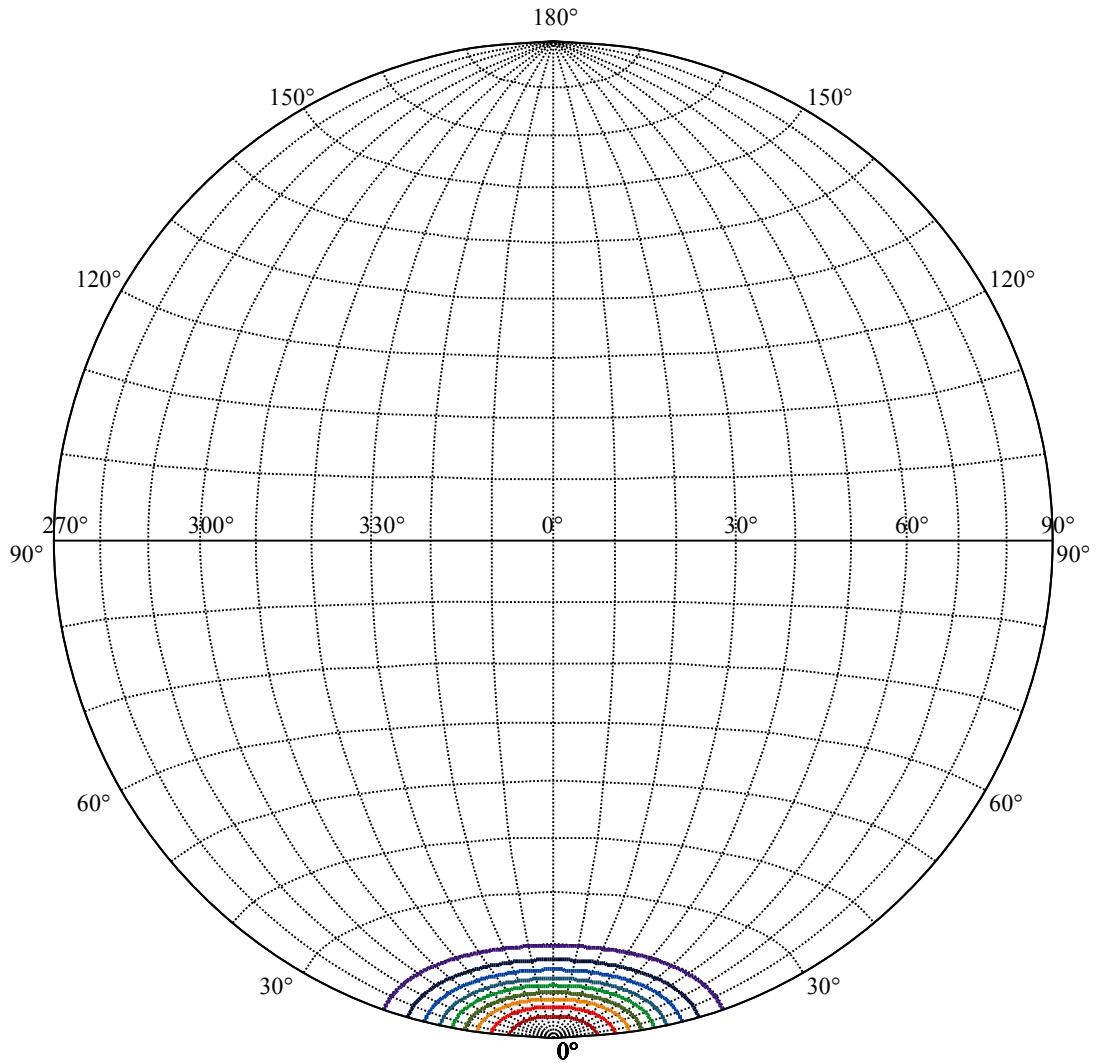
:C90/270Left:19.8 Right:19.8

Beam Angle(50%Imax):C0/180Left:11.7 Right:11.7

:C90/270Left:11.7 Right:11.7



(10%Imax) 1125.32	—
(20%Imax) 2250.65	—
(30%Imax) 3375.97	—
(40%Imax) 4501.29	—
(50%Imax) 5626.62	—
(60%Imax) 6751.94	—
(70%Imax) 7877.26	—
(80%Imax) 9002.59	—
(90%Imax) 10127.9	—



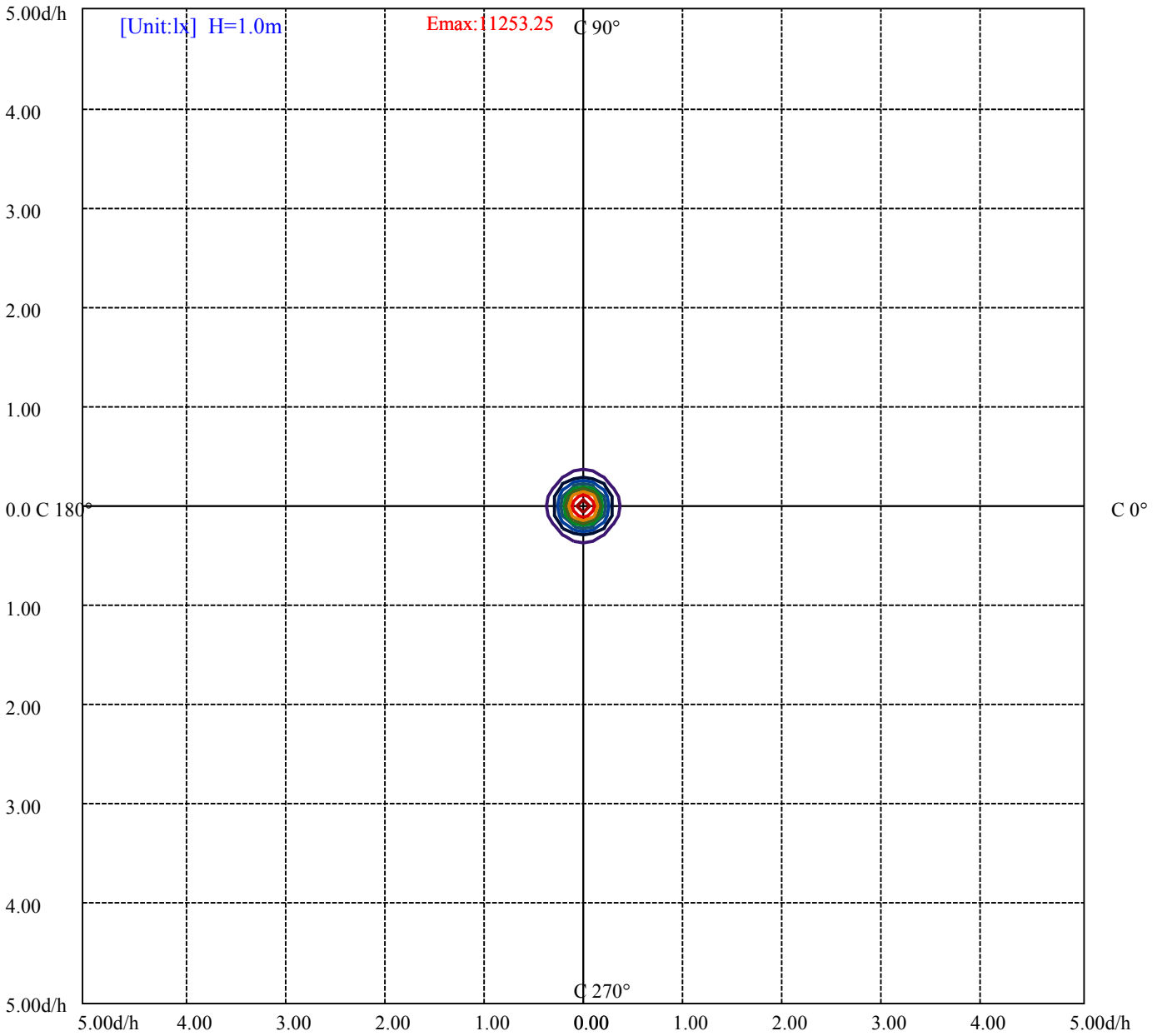
House

[Unit:cd]

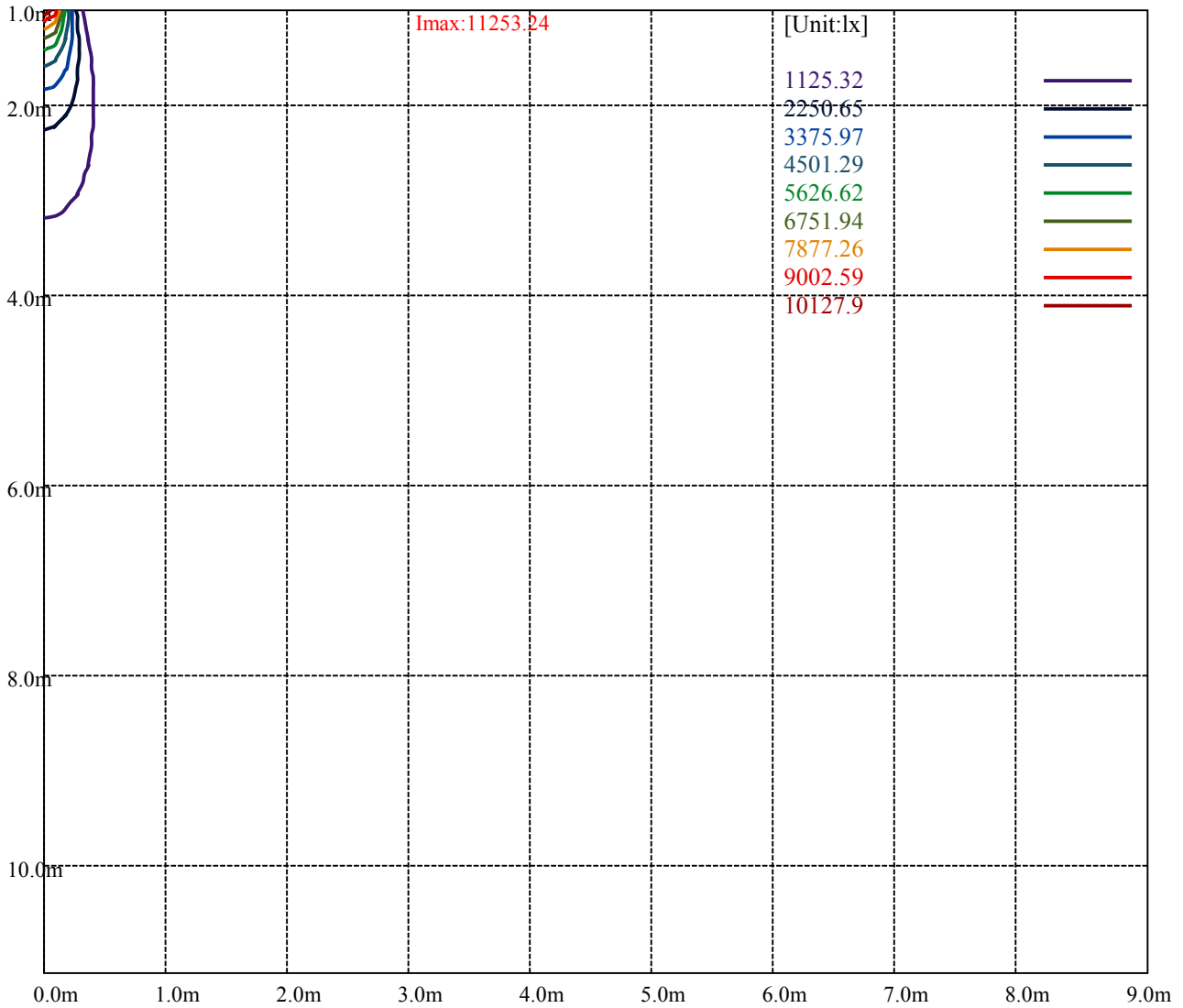
Road

Imax:11253.24

(10%Imax)	1125.32	—
(20%Imax)	2250.65	—
(30%Imax)	3375.97	—
(40%Imax)	4501.29	—
(50%Imax)	5626.62	—
(60%Imax)	6751.94	—
(70%Imax)	7877.26	—
(80%Imax)	9002.59	—
(90%Imax)	10127.9	—



- (10%E_{max}) 1125.32
- (20%E_{max}) 2250.65
- (30%E_{max}) 3375.97
- (40%E_{max}) 4501.29
- (50%E_{max}) 5626.62
- (60%E_{max}) 6751.94
- (70%E_{max}) 7877.26
- (80%E_{max}) 9002.59
- (90%E_{max}) 10127.9



Luminance Table

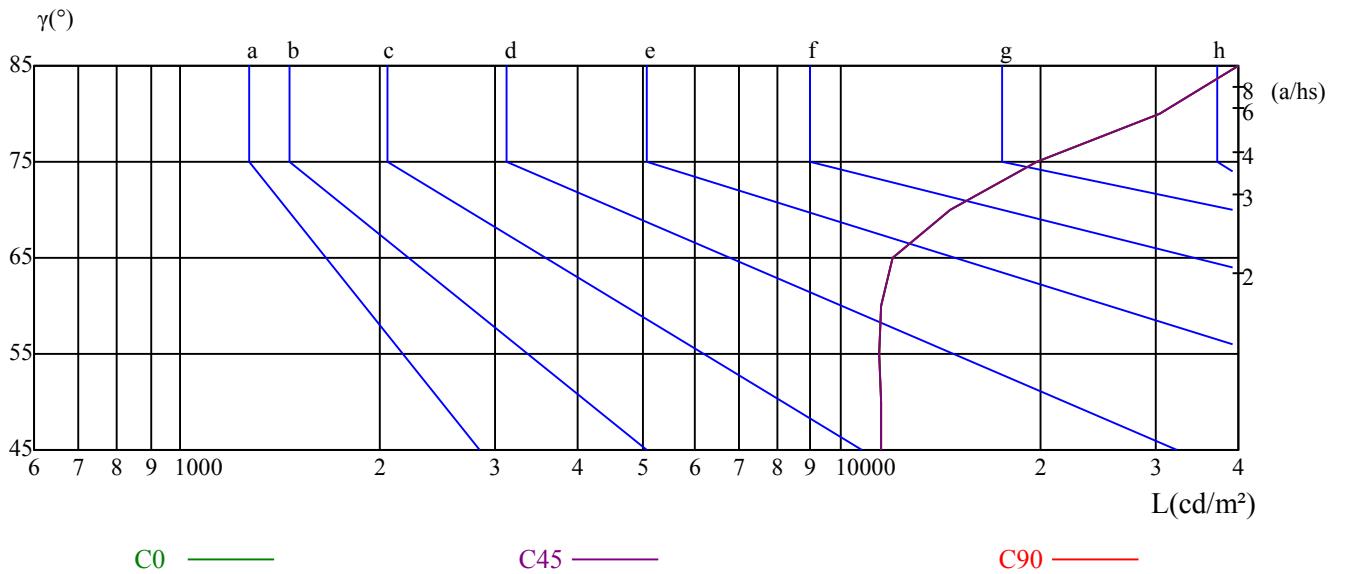
γ	45	50	55	60	65	70	75	80	85
C0	11501	11507	11463	11493	11976	14604	19744	30363	73805
C45	11501	11507	11463	11493	11976	14604	19744	30363	73805
C90	11501	11507	11463	11493	11976	14604	19744	30363	73805

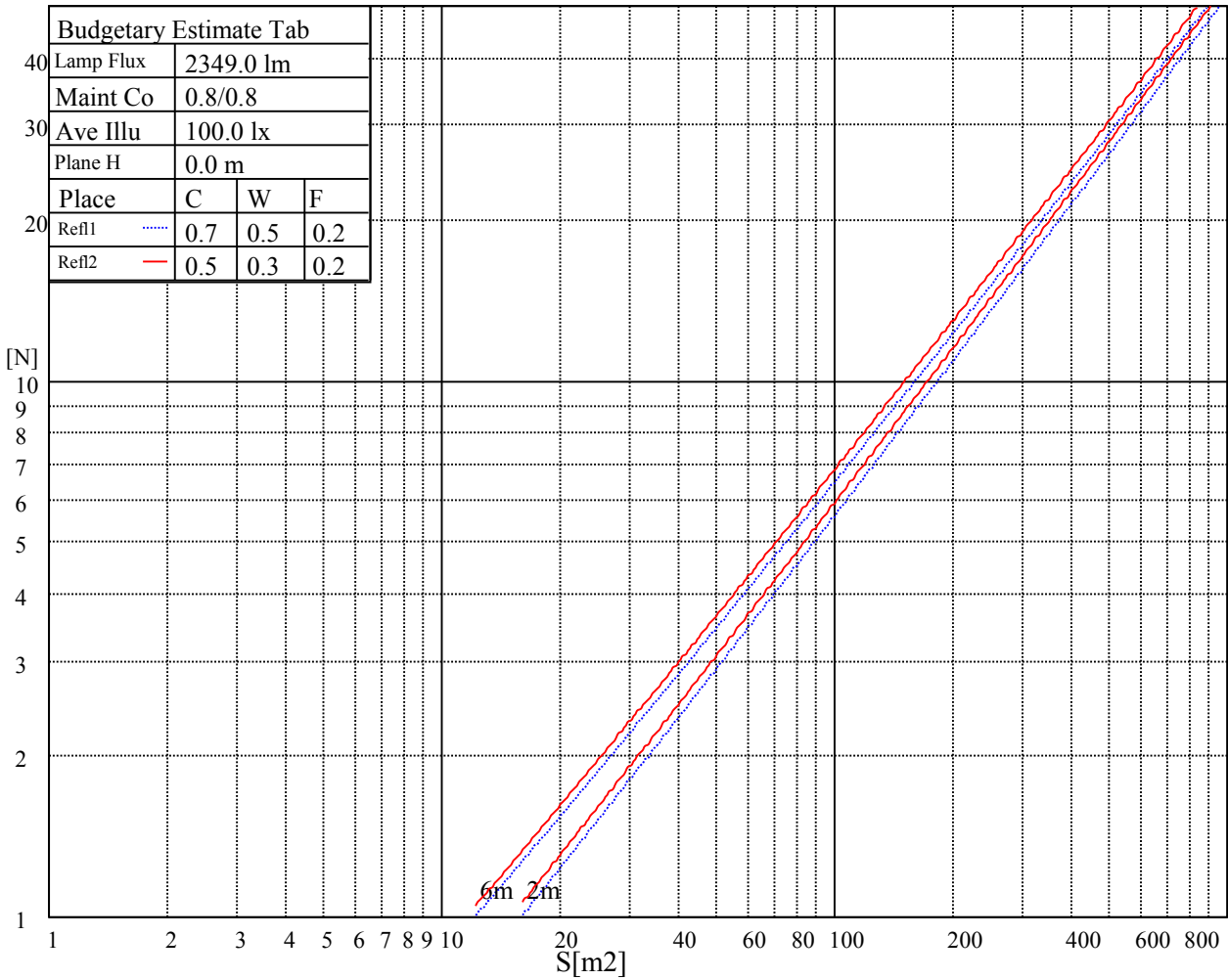
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
11976	11976	11976	19744	19744	19744	73805	73805	73805

Glare Table

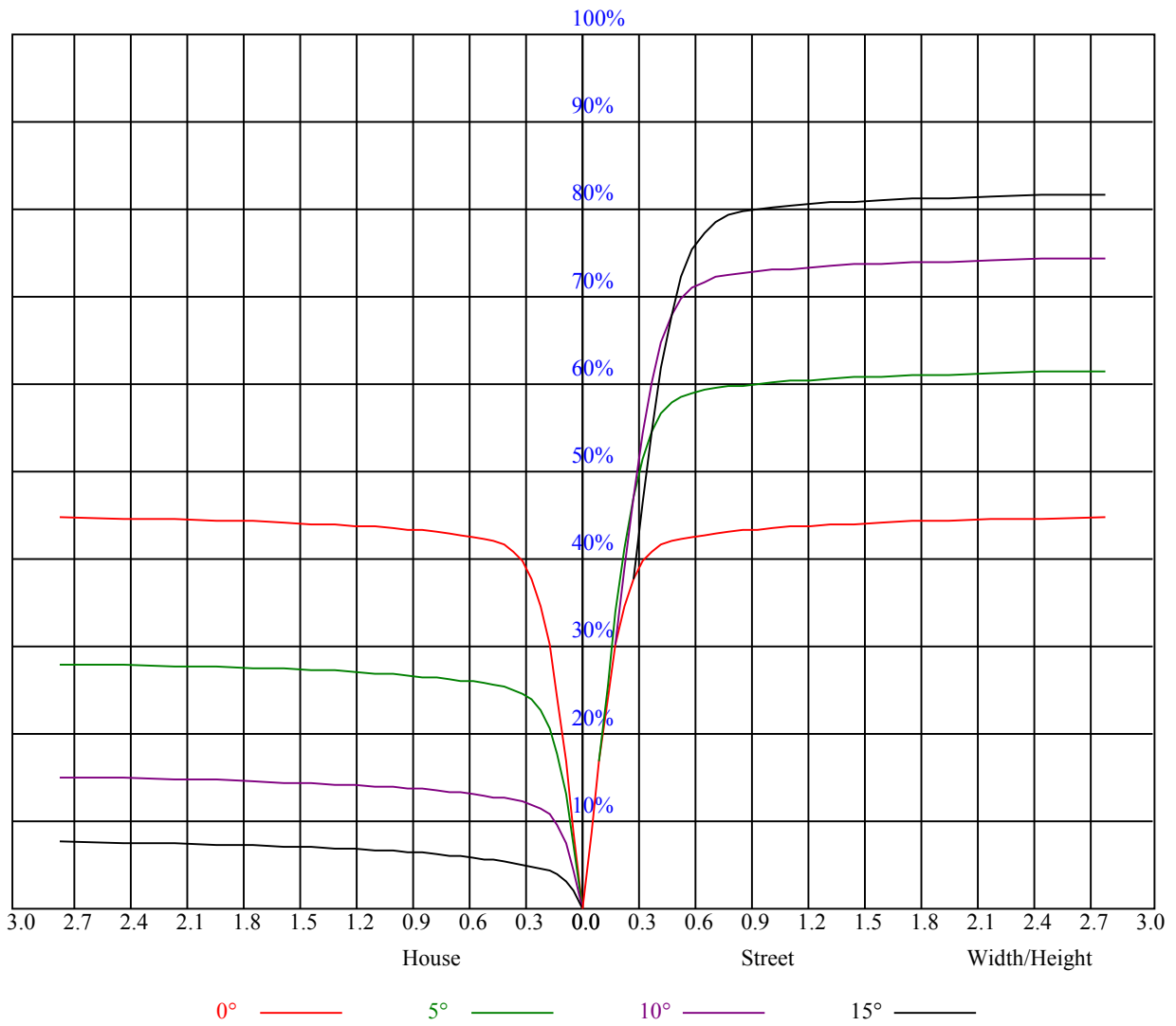
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.09	1.09	1.09	1.06	1.06	1.06	1.02	1.02	1.02	0.97	0.97	0.97	0.93	0.93	0.93	0.92
1	1.02	1.00	0.98	1.00	0.98	0.96	0.96	0.95	0.93	0.93	0.92	0.91	0.90	0.89	0.88	0.86
2	0.97	0.94	0.91	0.95	0.93	0.90	0.92	0.90	0.88	0.90	0.88	0.86	0.87	0.86	0.85	0.83
3	0.93	0.89	0.86	0.92	0.88	0.86	0.89	0.87	0.84	0.87	0.85	0.83	0.85	0.83	0.82	0.80
4	0.89	0.85	0.82	0.88	0.85	0.82	0.86	0.83	0.81	0.85	0.82	0.80	0.83	0.81	0.79	0.78
5	0.86	0.82	0.79	0.85	0.82	0.79	0.84	0.81	0.78	0.83	0.80	0.78	0.81	0.79	0.77	0.76
6	0.84	0.80	0.77	0.83	0.79	0.77	0.82	0.79	0.76	0.81	0.78	0.76	0.80	0.77	0.75	0.74
7	0.81	0.77	0.75	0.81	0.77	0.74	0.80	0.76	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.73
8	0.79	0.75	0.73	0.79	0.75	0.73	0.78	0.75	0.72	0.77	0.74	0.72	0.76	0.74	0.72	0.71
9	0.77	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.71	0.75	0.73	0.71	0.75	0.72	0.70	0.69
10	0.75	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.68



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	11266.88	11238.75	11137.50	10884.38	10400.63	9973.13	9483.75	8769.38	8139.38
45.0	11255.63	11109.38	10783.13	10355.63	9933.75	9388.13	8746.88	8105.63	7413.75
90.0	11217.94	11159.44	10918.13	10552.50	10125.56	9679.50	9167.06	8400.94	7701.19
135.0	11272.50	11283.75	11233.13	11030.63	10755.00	10406.25	9905.63	9444.38	8898.75
180.0	11266.88	11328.75	11213.44	11162.25	10854.00	10469.25	10081.13	9556.88	8918.44
225.0	11255.63	11295.00	11323.13	11212.88	11158.31	10881.00	10533.38	10056.94	9591.75
270.0	11217.94	11283.75	11272.50	11188.13	10968.75	10591.88	10141.88	9675.00	9129.38
315.0	11272.50	11216.25	11121.19	10848.38	10424.25	10014.75	9454.50	8797.50	8130.94
360.0	11266.88	11238.75	11137.50	10884.38	10400.63	9973.13	9483.75	8769.38	8139.38

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	7453.13	6660.00	5844.38	5158.13	4410.00	3785.63	3161.25	2896.88	2121.75
45.0	6480.00	5731.88	5017.50	4241.25	3549.38	2986.88	2863.13	1933.31	1528.31
90.0	6948.00	6005.25	5263.88	4547.25	3793.50	3123.56	2606.06	2084.63	1675.13
135.0	8071.88	7323.75	6553.13	5675.63	4803.75	4089.38	3375.00	2885.63	2255.06
180.0	8245.69	7421.06	6657.75	5787.56	4926.38	4208.63	3493.13	2855.81	2343.38
225.0	9024.19	8194.50	7453.69	6681.38	5827.50	4984.88	4284.00	3566.81	2998.69
270.0	8426.25	7644.38	6890.63	6142.50	5225.63	4516.88	3870.00	3150.00	2891.25
315.0	7408.13	6468.19	5727.94	5018.63	4179.38	3566.81	3036.38	2430.00	1985.06
360.0	7453.13	6660.00	5844.38	5158.13	4410.00	3785.63	3161.25	2896.88	2121.75

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1640.25	1241.44	959.63	738.56	530.44	409.50	315.56	296.44	177.92
45.0	1220.63	918.56	684.00	550.13	403.88	301.50	291.38	173.36	140.12
90.0	1096.99	977.63	795.21	610.76	452.19	365.63	286.20	204.08	167.96
135.0	1807.88	1445.63	1119.94	893.81	696.38	551.25	417.94	318.94	284.06
180.0	1893.38	1443.38	1119.38	920.98	695.81	551.19	432.23	316.80	246.04
225.0	2418.75	1904.06	1527.19	1119.77	917.55	731.98	580.39	425.64	327.38
270.0	2180.25	1721.25	1344.38	1065.94	808.88	613.13	481.50	362.25	288.56
315.0	1590.19	1109.76	944.04	704.93	541.46	403.26	301.11	233.89	177.86
360.0	1640.25	1241.44	959.63	738.56	530.44	409.50	315.56	296.44	177.92

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	142.65	115.65	96.81	85.05	74.76	67.50	61.20	56.31	52.71
45.0	113.68	95.91	86.63	77.57	67.84	62.44	57.88	53.10	50.23
90.0	136.91	111.83	94.61	83.87	74.14	66.99	61.59	56.81	53.44
135.0	192.77	144.73	117.96	99.96	85.89	79.20	73.35	67.16	63.17
180.0	189.79	140.68	116.38	94.73	80.33	72.90	66.77	61.03	58.22
225.0	250.31	188.89	137.53	109.63	92.31	80.78	73.07	66.94	61.65
270.0	205.93	158.01	128.03	107.66	89.61	79.76	72.39	64.97	59.85
315.0	142.76	115.03	95.91	82.69	73.13	64.07	58.61	54.28	50.18
360.0	142.65	115.65	96.81	85.05	74.76	67.50	61.20	56.31	52.71

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	49.95	47.81	47.03	46.52	46.07	45.90	45.51	45.06	44.55
45.0	48.49	47.25	46.46	45.90	45.23	44.61	43.99	43.26	42.58
90.0	50.74	48.71	47.64	46.63	45.68	44.89	44.44	43.71	42.64
135.0	60.58	59.06	58.56	58.56	58.44	58.56	58.67	58.78	58.56
180.0	55.24	51.81	50.34	49.16	48.26	47.87	47.48	47.14	46.80
225.0	57.15	53.44	50.06	47.98	47.14	46.52	46.13	45.84	45.62
270.0	55.91	51.75	49.11	47.42	46.46	46.07	45.62	45.34	45.06
315.0	47.81	46.24	45.23	44.78	44.61	44.55	44.61	44.44	44.04
360.0	49.95	47.81	47.03	46.52	46.07	45.90	45.51	45.06	44.55

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	43.88	43.03	42.19	41.29	40.50	40.73	39.54	38.64	37.97
45.0	41.68	40.67	40.05	40.33	38.87	37.52	36.56	35.66	35.10
90.0	42.13	41.68	40.28	39.15	39.26	37.86	36.73	35.66	34.93
135.0	58.33	57.60	56.98	56.08	53.89	51.30	48.77	46.52	44.89
180.0	46.18	45.34	44.44	43.59	43.48	42.92	42.36	40.78	40.39
225.0	45.34	44.72	43.88	42.92	42.02	41.01	40.50	40.39	39.21
270.0	44.61	43.99	43.59	42.58	41.63	40.73	40.05	39.32	38.36
315.0	43.82	43.03	42.02	41.18	40.61	40.78	39.38	38.93	37.69
360.0	43.88	43.03	42.19	41.29	40.50	40.73	39.54	38.64	37.97
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	37.29	36.56	35.94	35.27	34.20	33.30	32.51	31.89	31.05
45.0	34.48	33.58	32.74	31.78	30.88	30.04	29.31	28.58	27.79
90.0	34.20	33.47	32.68	31.67	30.54	29.76	28.97	28.13	27.34
135.0	43.71	41.96	40.73	39.26	37.63	36.28	34.88	33.64	32.63
180.0	39.77	39.15	38.48	37.63	36.90	35.83	34.88	33.81	32.85
225.0	38.64	38.25	37.58	36.96	36.23	35.10	34.09	33.19	32.23
270.0	38.31	37.24	36.17	35.38	34.48	33.64	32.74	31.67	30.88
315.0	36.62	35.66	34.71	33.75	32.91	31.84	31.22	30.32	29.59
360.0	37.29	36.56	35.94	35.27	34.20	33.30	32.51	31.89	31.05
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	30.32	29.64	29.08	28.52	29.25	29.87	29.36	29.59	29.81
45.0	27.23	27.00	27.68	27.96	27.62	27.56	27.84	27.79	28.01
90.0	26.78	26.04	25.76	25.76	25.88	25.88	25.99	25.93	25.99
135.0	31.78	30.77	29.87	29.14	28.46	27.96	27.68	27.06	26.94
180.0	31.84	30.99	30.26	29.70	29.87	30.49	31.16	30.88	30.77
225.0	31.44	30.60	29.53	28.97	28.97	28.80	28.18	27.90	27.68
270.0	30.04	28.91	28.18	27.39	26.66	26.61	26.72	27.23	27.28
315.0	28.91	27.90	27.39	27.17	27.68	27.73	28.35	28.41	28.07
360.0	30.32	29.64	29.08	28.52	29.25	29.87	29.36	29.59	29.81
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	30.09	30.49	30.60	30.99	30.77	30.26	30.04	30.38	30.04
45.0	28.41	28.63	28.24	28.46	28.63	28.97	29.36	29.59	30.54
90.0	25.99	26.38	26.72	27.23	28.13	28.80	29.76	30.60	31.73
135.0	26.72	26.72	26.72	26.78	26.61	26.49	26.33	27.11	27.28
180.0	31.39	32.51	33.75	33.13	30.43	29.70	29.64	30.38	30.54
225.0	27.73	27.23	27.39	27.79	28.07	27.45	27.96	28.07	28.18
270.0	27.00	26.78	26.72	26.89	27.62	28.07	28.46	29.31	29.76
315.0	28.35	28.80	28.97	28.69	27.84	28.18	28.18	29.19	29.19
360.0	30.09	30.49	30.60	30.99	30.77	30.26	30.04	30.38	30.04
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	29.59	30.15	31.44	33.02	34.20	35.78	36.79	38.31	41.12
45.0	31.84	32.91	35.55	36.45	39.38	41.91	42.75	40.67	40.50
90.0	32.40	34.20	36.56	38.14	37.63	36.06	36.68	38.70	37.46
135.0	28.18	29.98	32.91	35.33	34.37	34.14	33.75	35.94	38.64
180.0	30.26	30.54	30.88	33.19	34.14	37.29	38.03	35.49	39.15
225.0	28.74	29.03	30.15	32.40	34.14	35.10	38.14	39.94	43.03
270.0	30.21	31.50	33.13	35.94	39.60	39.83	37.91	36.23	38.87
315.0	29.53	30.71	33.36	35.27	36.00	35.78	35.66	38.42	41.40
360.0	29.59	30.15	31.44	33.02	34.20	35.78	36.79	38.31	41.12

Intensity data(cd)

C/ γ (°)	90.0
0.0	47.14
45.0	40.95
90.0	36.17
135.0	40.73
180.0	41.01
225.0	38.70
270.0	41.79
315.0	45.00
360.0	47.14