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NATA

LumCAT: 3-2033-M	
Luminaire: 92.70.131.00	
Report No: NATA0100	Voltage(V): 36.1000
Test No: GC2018111214	Current(A): 0.5500
LampCAT: OSRAM SOLERIQ S15	Power (W): 19.8550
Lamp flux(lm): 2582.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 79	Width(mm): 79
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 2302.30
Efficiency(%): 89.17%
Lumens(lm)/Power(W): 116.19
Central intensity(cd): 19389.370
Maximum intensity(cd): 19389.370
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=14.1
 [C90/270]Total=14.1
Field angle(10%Imax): [C0/180]Total=28.5
 [C90/270]Total=28.5
Maximum s/h(1/2): C0_180=0.24 C90_270=0.24
Maximum s/h(1/4): C0_180=0.24 C90_270=0.24
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 89.34%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.525%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	19389.375	4.639	4.639	.180%	.201%
1.0	19103.906	36.562	41.201	1.416%	1.790%
2.0	18359.297	70.263	111.464	2.721%	4.841%
3.0	17117.578	98.241	209.705	3.805%	9.108%
4.0	15516.563	118.695	328.4	4.597%	14.264%
5.0	13587.398	129.863	458.263	5.030%	19.905%
6.0	11645.367	133.487	591.75	5.170%	25.703%
7.0	9748.688	130.284	722.034	5.046%	31.361%
8.0	8009.508	122.240	844.274	4.734%	36.671%
9.0	6275.320	107.651	951.925	4.169%	41.347%
10.0	4810.570	91.605	1043.53	3.548%	45.325%
11.0	3758.344	78.641	1122.171	3.046%	48.741%
12.0	3007.406	68.568	1190.739	2.656%	51.719%
13.0	2349.070	57.948	1248.687	2.244%	54.236%
14.0	2015.859	53.479	1302.166	2.071%	56.559%
15.0	1698.469	48.206	1350.373	1.867%	58.653%
16.0	1478.531	44.691	1395.064	1.731%	60.594%
17.0	1334.440	42.784	1437.848	1.657%	62.453%
18.0	1225.723	41.536	1479.384	1.609%	64.257%
19.0	1124.241	40.138	1519.522	1.555%	66.000%
20.0	1069.678	40.120	1559.642	1.554%	67.743%
21.0	1016.592	39.951	1599.593	1.547%	69.478%
22.0	970.165	39.854	1639.447	1.544%	71.209%
23.0	936.851	40.142	1679.589	1.555%	72.953%
24.0	909.028	40.545	1720.134	1.570%	74.714%
25.0	883.406	40.941	1761.076	1.586%	76.492%
26.0	862.763	41.475	1802.55	1.606%	78.293%
27.0	844.327	42.035	1844.585	1.628%	80.119%
28.0	827.388	42.596	1887.181	1.650%	81.969%
29.0	813.452	43.247	1930.428	1.675%	83.848%
30.0	799.840	43.856	1974.284	1.699%	85.753%
31.0	780.272	44.069	2018.353	1.707%	87.667%
32.0	745.031	43.295	2061.648	1.677%	89.547%
33.0	691.608	41.307	2102.955	1.600%	91.341%
34.0	606.087	37.166	2140.121	1.439%	92.956%
35.0	512.796	32.254	2172.375	1.249%	94.357%
36.0	413.009	26.621	2198.997	1.031%	95.513%
37.0	317.820	20.975	2219.971	.812%	96.424%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	212.738	14.363	2234.334	.556%	97.048%
39.0	151.095	10.427	2244.761	.404%	97.501%
40.0	68.766	4.847	2249.608	.188%	97.711%
41.0	36.380	2.617	2252.226	.101%	97.825%
42.0	23.491	1.724	2253.95	.067%	97.900%
43.0	19.427	1.453	2255.402	.056%	97.963%
44.0	16.692	1.272	2256.674	.049%	98.018%
45.0	14.745	1.143	2257.817	.044%	98.068%
46.0	13.830	1.091	2258.908	.042%	98.115%
47.0	13.029	1.045	2259.953	.040%	98.161%
48.0	12.684	1.034	2260.987	.040%	98.205%
49.0	12.340	1.021	2262.008	.040%	98.250%
50.0	12.045	1.012	2263.02	.039%	98.294%
51.0	11.784	1.004	2264.024	.039%	98.337%
52.0	11.552	0.998	2265.023	.039%	98.381%
53.0	11.313	0.991	2266.013	.038%	98.424%
54.0	11.095	0.984	2266.998	.038%	98.467%
55.0	10.905	0.980	2267.977	.038%	98.509%
56.0	10.709	0.974	2268.951	.038%	98.551%
57.0	10.575	0.973	2269.924	.038%	98.594%
58.0	10.441	0.971	2270.895	.038%	98.636%
59.0	10.315	0.970	2271.864	.038%	98.678%
60.0	10.216	0.970	2272.834	.038%	98.720%
61.0	10.125	0.971	2273.805	.038%	98.762%
62.0	10.055	0.974	2274.779	.038%	98.804%
63.0	9.984	0.976	2275.755	.038%	98.847%
64.0	9.893	0.975	2276.73	.038%	98.889%
65.0	9.837	0.978	2277.707	.038%	98.932%
66.0	9.780	0.980	2278.687	.038%	98.974%
67.0	9.731	0.982	2279.669	.038%	99.017%
68.0	9.682	0.984	2280.654	.038%	99.060%
69.0	9.654	0.988	2281.642	.038%	99.103%
70.0	9.591	0.988	2282.63	.038%	99.146%
71.0	9.563	0.992	2283.622	.038%	99.189%
72.0	9.534	0.994	2284.616	.039%	99.232%
73.0	9.513	0.998	2285.614	.039%	99.275%
74.0	9.478	0.999	2286.613	.039%	99.319%
75.0	9.450	1.001	2287.614	.039%	99.362%

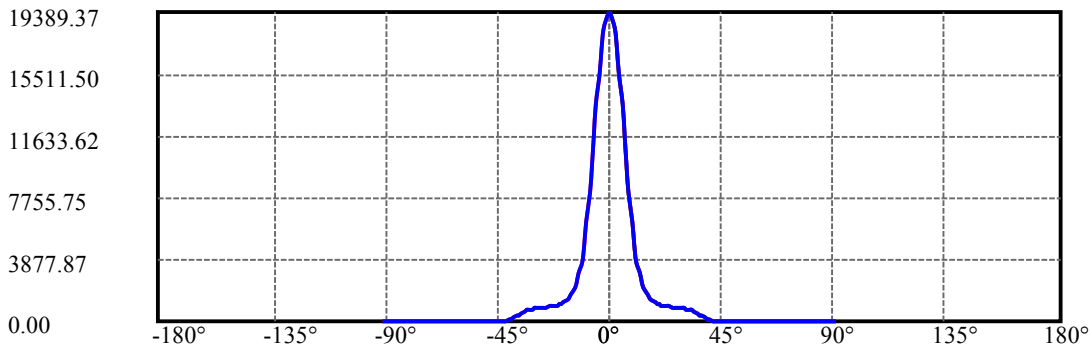
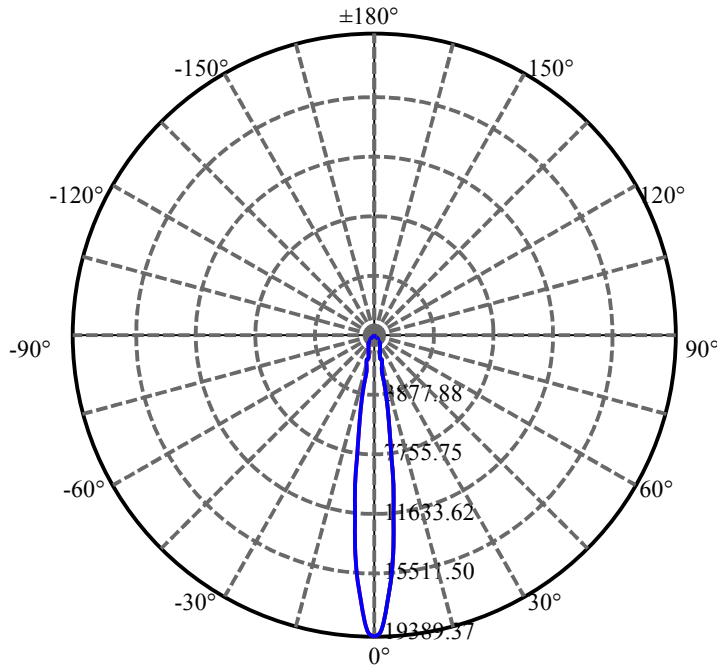
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.422	1.003	2288.617	.039%	99.406%
77.0	9.415	1.006	2289.623	.039%	99.449%
78.0	9.408	1.009	2290.632	.039%	99.493%
79.0	9.387	1.010	2291.642	.039%	99.537%
80.0	9.373	1.012	2292.654	.039%	99.581%
81.0	9.359	1.014	2293.668	.039%	99.625%
82.0	9.366	1.017	2294.685	.039%	99.669%
83.0	9.352	1.018	2295.703	.039%	99.713%
84.0	9.345	1.019	2296.722	.039%	99.758%
85.0	9.330	1.019	2297.741	.039%	99.802%
86.0	9.281	1.015	2298.757	.039%	99.846%
87.0	9.260	1.014	2299.771	.039%	99.890%
88.0	9.246	1.013	2300.784	.039%	99.934%
89.0	9.239	1.013	2301.797	.039%	99.978%
90.0	9.232	0.506	2302.303	.020%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1974.28	76.46%	85.75%
0-40	2249.61	87.13%	97.71%
0-60	2272.83	88.03%	98.72%
0-90	2301.80	89.15%	99.98%
0-120	2301.80	89.15%	99.98%
0-180	2302.30	89.17%	100.00%
60-90	29.93	1.16%	1.30%
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%
0-26.93	1841.84	71.33%	80.00%

ZONAL LUMEN SUMMARY

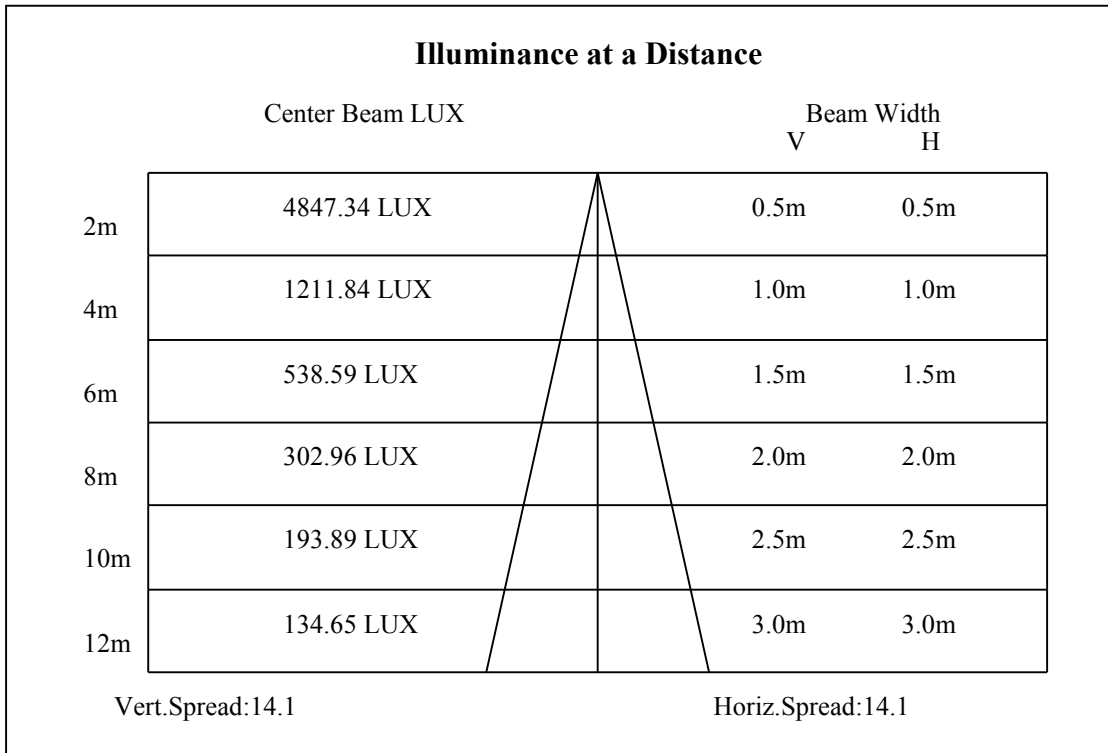
0-10	1043.53
10-20	516.11
20-30	414.64
30-40	275.32
40-50	13.41
50-60	9.81
60-70	9.80
70-80	10.02
80-90	9.14
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

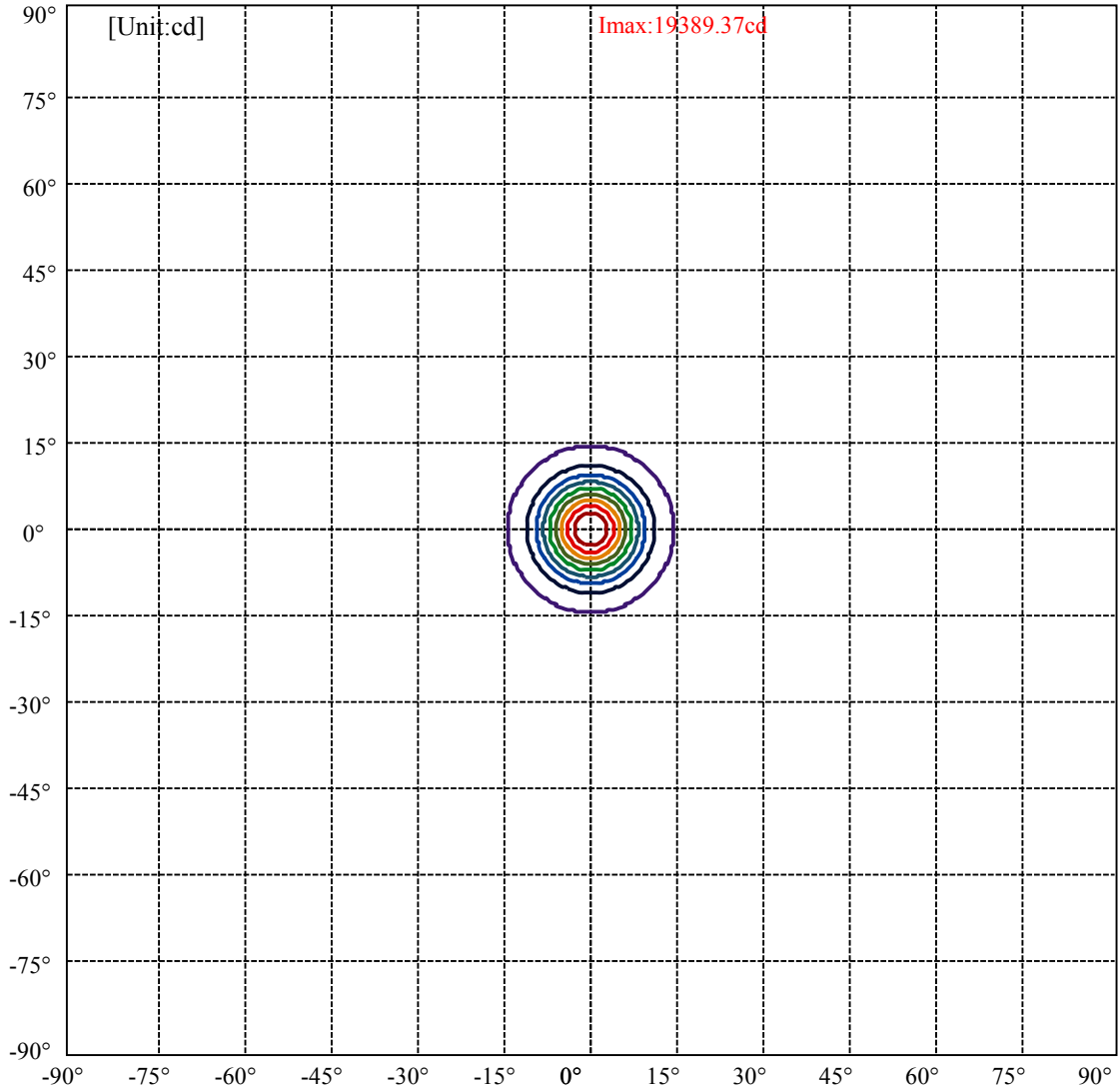


C0(Max): —————
C0/C180: —————
C90/C270: —————

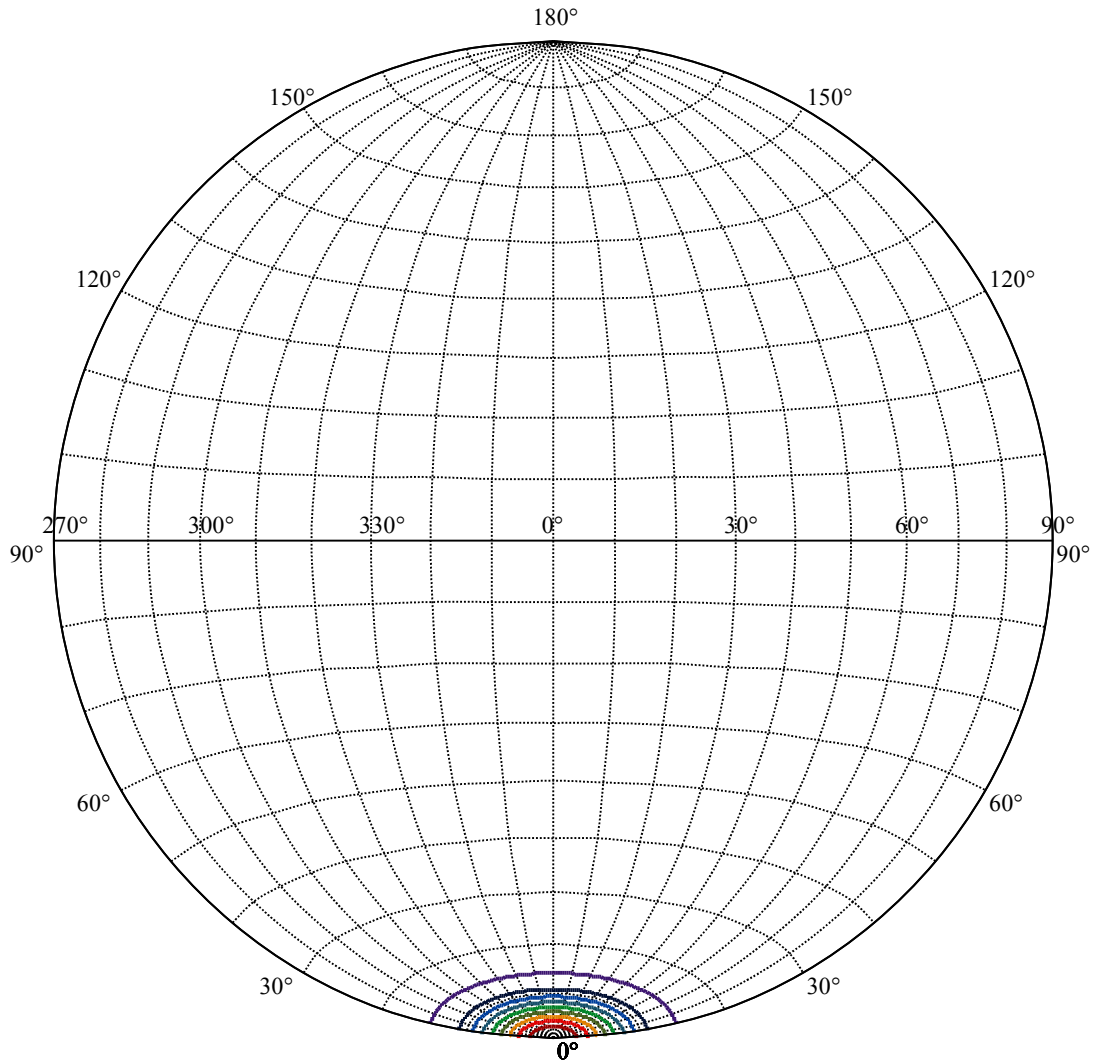
Field angle(10%Imax):C0/180Left:14.2 Right:14.2
:C90/270Left:14.2 Right:14.2

Beam Angle(50%Imax):C0/180Left:7.0 Right:7.0
:C90/270Left:7.0 Right:7.0





(10%I _{max}) 1938.94	—
(20%I _{max}) 3877.87	—
(30%I _{max}) 5816.81	—
(40%I _{max}) 7755.75	—
(50%I _{max}) 9694.69	—
(60%I _{max}) 11633.6	—
(70%I _{max}) 13572.6	—
(80%I _{max}) 15511.5	—
(90%I _{max}) 17450.4	—



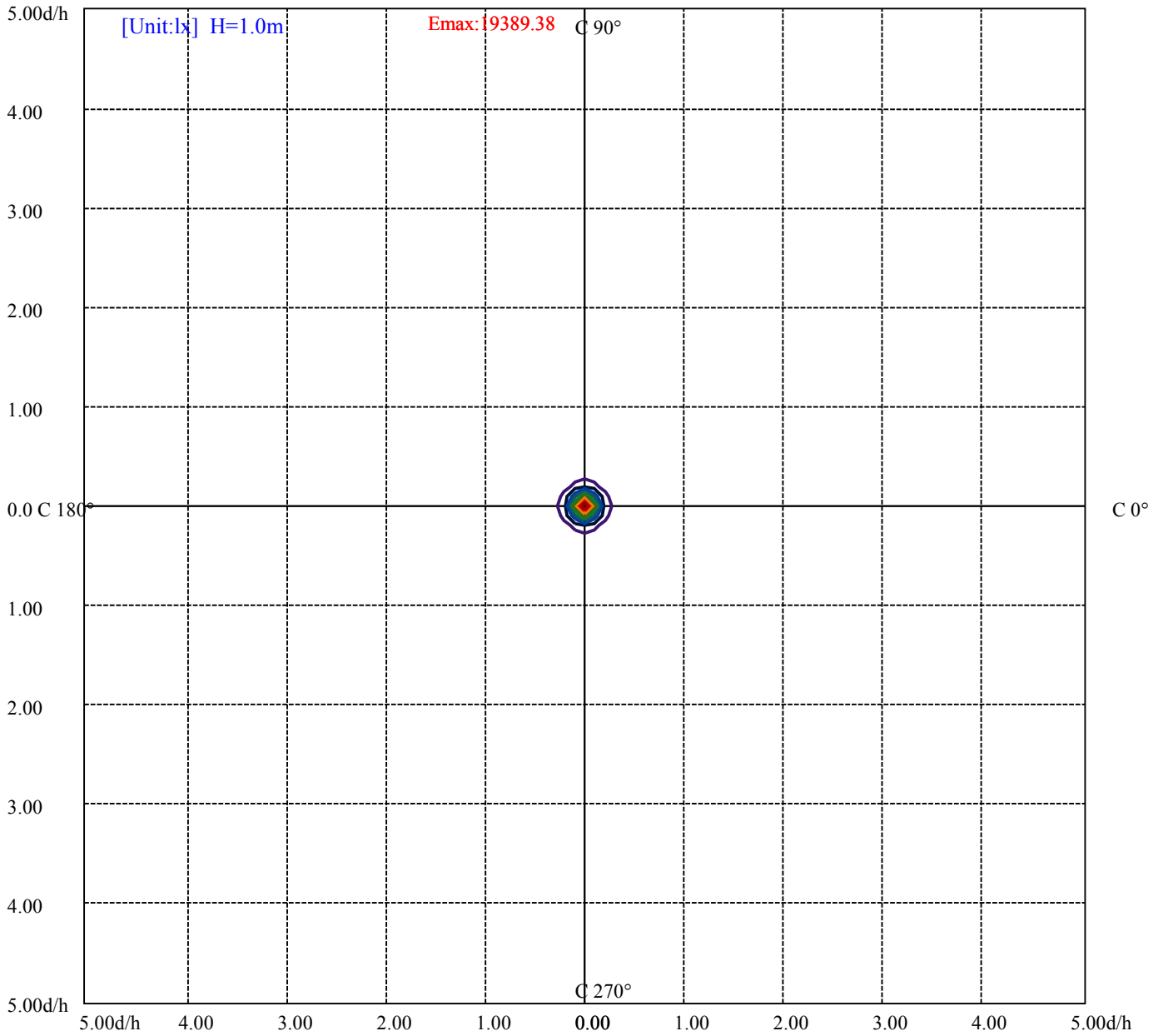
House

[Unit:cd]

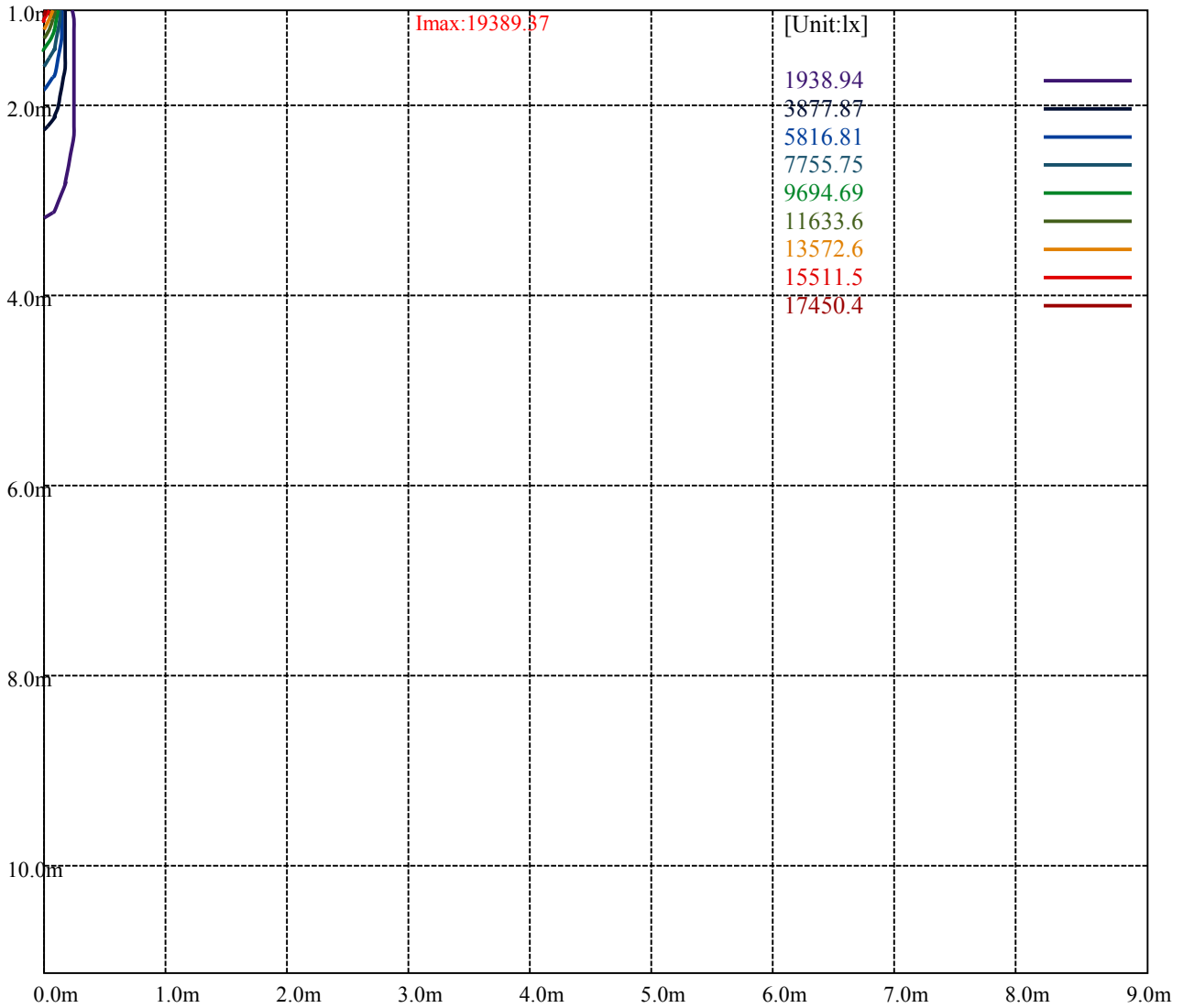
Road

Imax:19389.37

(10%Imax) 1938.94	—
(20%Imax) 3877.87	—
(30%Imax) 5816.81	—
(40%Imax) 7755.75	—
(50%Imax) 9694.69	—
(60%Imax) 11633.6	—
(70%Imax) 13572.6	—
(80%Imax) 15511.5	—
(90%Imax) 17450.4	—



(10%Emax) 1938.93	—
(20%Emax) 3877.87	—
(30%Emax) 5816.8	—
(40%Emax) 7755.73	—
(50%Emax) 9694.67	—
(60%Emax) 11633.6	—
(70%Emax) 13572.5	—
(80%Emax) 15511.5	—
(90%Emax) 17450.4	—



Luminance Table

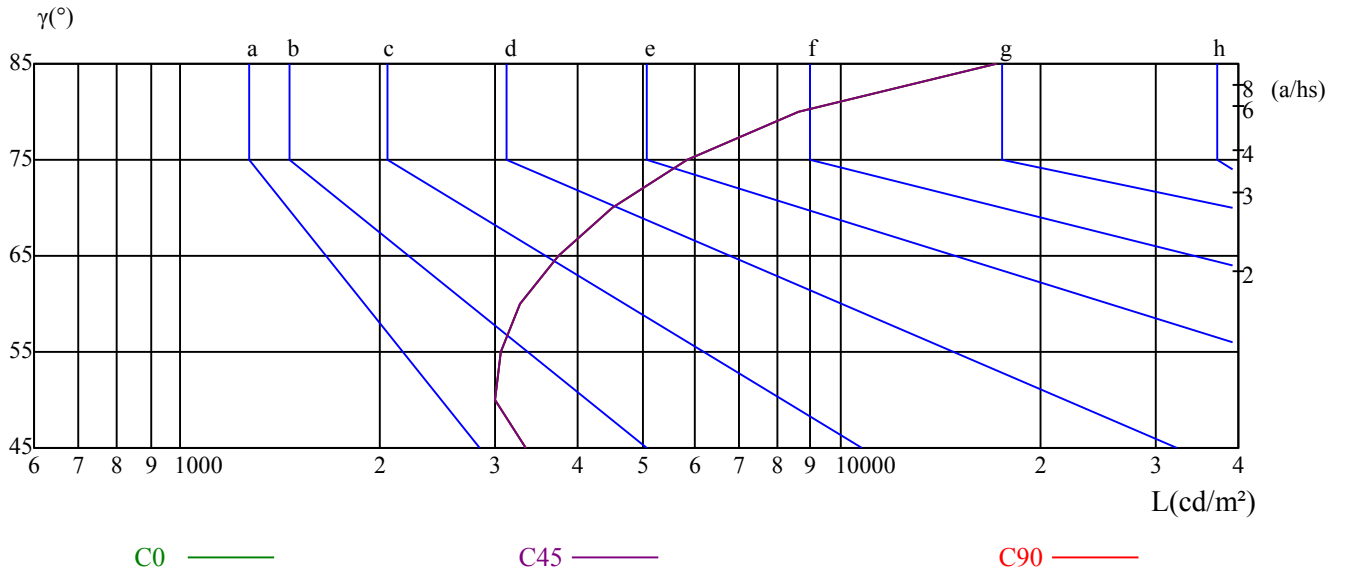
γ	45	50	55	60	65	70	75	80	85
C0	3341	3002	3046	3274	3729	4493	5850	8648	17154
C45	3341	3002	3046	3274	3729	4493	5850	8648	17154
C90	3341	3002	3046	3274	3729	4493	5850	8648	17154

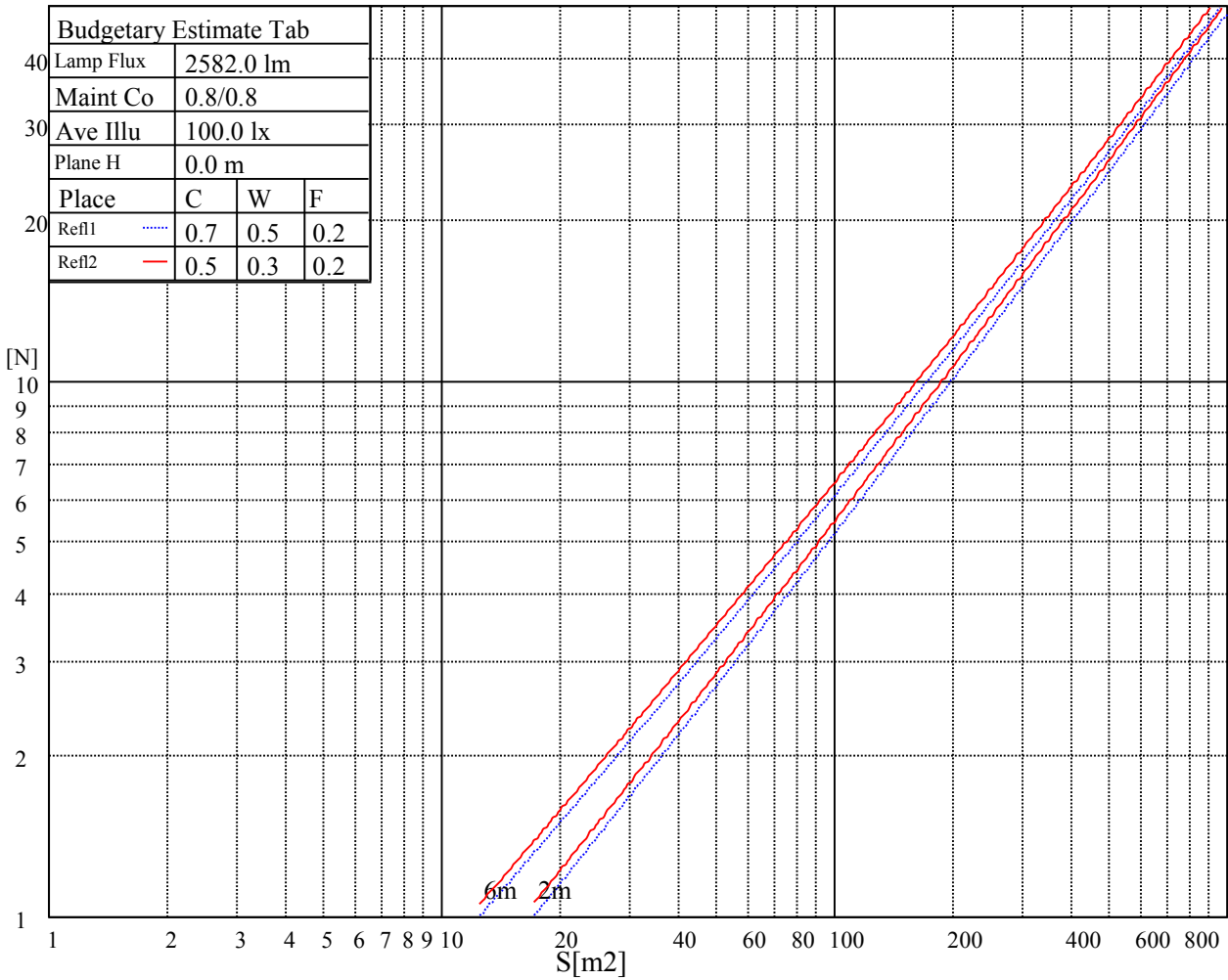
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3729	3729	3729	5850	5850	5850	17154	17154	17154

Glare Table

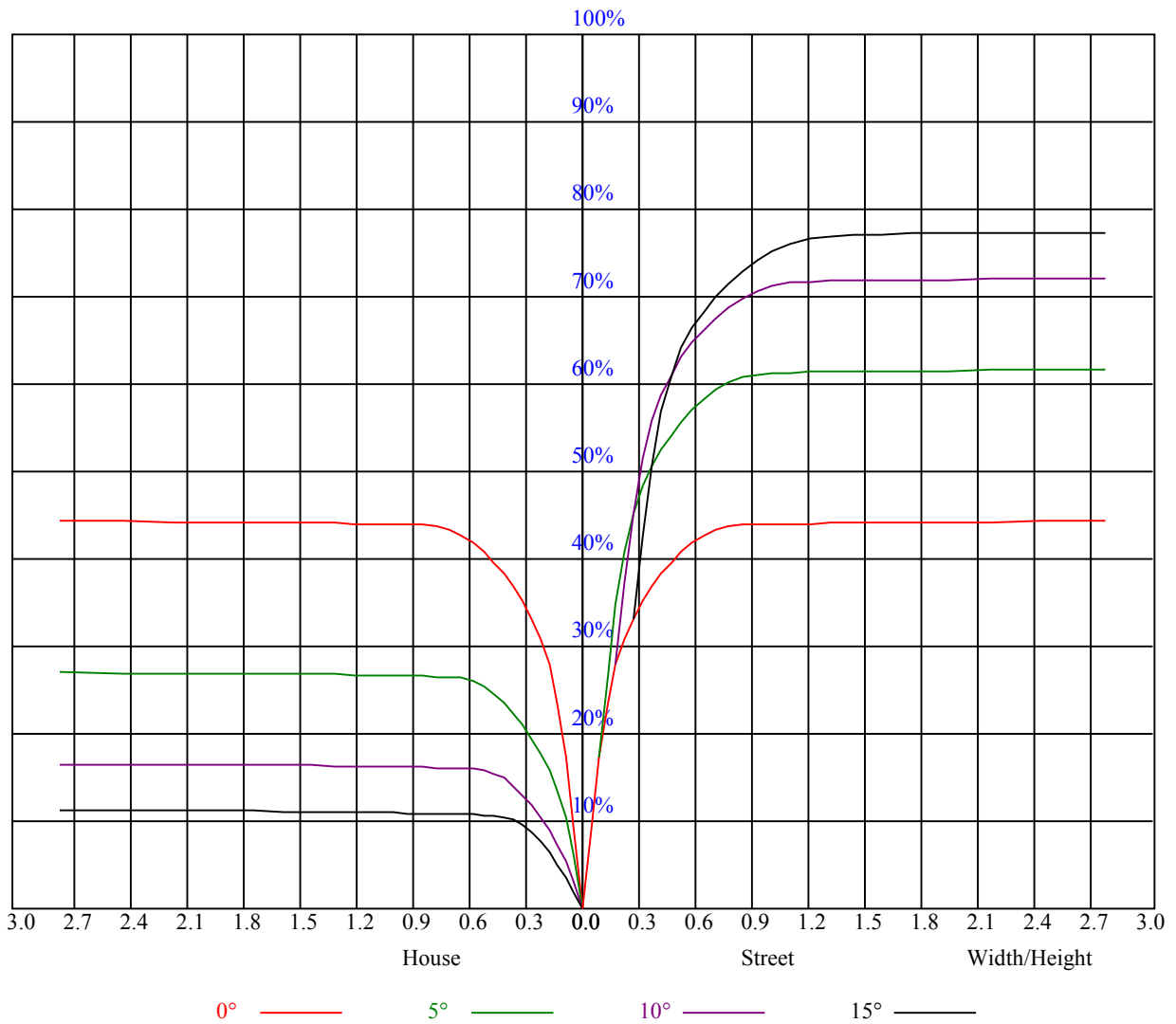
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.06	1.06	1.06	1.04	1.04	1.04	0.99	0.99	0.99	0.95	0.95	0.95	0.91	0.91	0.91	0.89
1	1.00	0.98	0.97	0.98	0.97	0.95	0.95	0.93	0.92	0.91	0.90	0.89	0.88	0.88	0.87	0.85
2	0.95	0.92	0.90	0.94	0.91	0.89	0.91	0.89	0.87	0.88	0.87	0.85	0.86	0.85	0.83	0.82
3	0.91	0.87	0.85	0.90	0.87	0.84	0.87	0.85	0.83	0.85	0.83	0.81	0.84	0.82	0.80	0.79
4	0.87	0.83	0.81	0.86	0.83	0.80	0.84	0.81	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.76
5	0.84	0.80	0.77	0.83	0.79	0.77	0.82	0.78	0.76	0.80	0.78	0.75	0.79	0.77	0.75	0.74
6	0.81	0.77	0.74	0.80	0.77	0.74	0.79	0.76	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.71
7	0.78	0.74	0.72	0.78	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.69
8	0.76	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.69	0.74	0.71	0.69	0.73	0.70	0.68	0.67
9	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.67	0.66
10	0.72	0.68	0.65	0.71	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.69	0.67	0.65	0.64



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	19136.25	19563.75	19473.75	18798.75	17718.75	16121.25	14225.63	12363.75	10530.00
45.0	19569.38	19074.38	18157.50	16908.75	14973.75	13162.50	11255.63	9202.50	7318.13
90.0	19378.13	18601.88	17476.88	15890.63	13989.38	11125.13	10185.19	7770.38	6381.00
135.0	19473.75	18916.88	17791.88	16295.63	14681.25	12605.63	10490.63	8701.88	7065.00
180.0	19136.25	18129.38	16903.13	15204.38	13196.25	11033.44	9365.63	7167.94	5610.94
225.0	19569.38	19445.63	18804.38	17595.00	16042.50	14422.50	11180.25	10503.56	8512.31
270.0	19378.13	19580.63	19220.63	18253.13	17010.00	15294.38	13308.75	11469.38	9658.13
315.0	19473.75	19518.75	19046.25	17994.38	16520.63	14934.38	13151.25	10810.13	9000.56
360.0	19136.25	19563.75	19473.75	18798.75	17718.75	16121.25	14225.63	12363.75	10530.00
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	8336.25	6738.75	5304.38	3976.88	3037.50	2874.38	2126.81	1734.19	1530.00
45.0	5782.50	4325.63	3358.13	2902.50	2140.31	1839.38	1601.44	1425.38	1303.31
90.0	4987.69	3532.50	2899.69	2386.13	1988.44	1706.06	1522.69	1366.88	1257.19
135.0	5231.25	4033.13	3155.63	2902.50	2040.19	1758.94	1549.69	1364.06	1252.69
180.0	4299.75	3117.38	2505.94	2096.44	1775.25	1551.94	1400.63	1270.13	1114.14
225.0	6689.81	5250.38	3920.06	2981.25	2421.00	2033.44	1697.06	1507.50	1366.31
270.0	7554.38	6041.25	4725.00	3555.00	2902.50	2275.31	1886.63	1612.13	1435.50
315.0	7320.94	5445.56	4197.94	3258.56	2487.38	2087.44	1802.81	1548.00	1416.38
360.0	8336.25	6738.75	5304.38	3976.88	3037.50	2874.38	2126.81	1734.19	1530.00
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1400.06	1255.50	1158.75	1100.25	1033.88	991.13	955.69	919.13	896.63
45.0	1204.31	1109.81	1050.19	1002.38	956.25	925.31	902.25	882.56	858.38
90.0	1118.64	1085.91	1021.28	970.99	935.61	904.16	883.24	865.07	845.16
135.0	1161.00	1085.06	1027.69	979.88	945.00	915.75	889.31	866.81	848.25
180.0	1097.33	1024.99	986.34	945.56	907.37	886.22	866.25	840.88	824.96
225.0	1245.94	1117.58	1087.99	1036.52	983.81	948.94	919.63	893.76	872.21
270.0	1291.50	1196.44	1114.88	1052.44	1006.88	969.75	935.44	907.31	886.50
315.0	1287.00	1118.64	1110.32	1044.73	992.53	953.55	920.42	891.73	870.02
360.0	1400.06	1255.50	1158.75	1100.25	1033.88	991.13	955.69	919.13	896.63
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	873.56	851.06	837.00	824.06	807.19	793.69	770.06	700.88	624.94
45.0	842.63	826.88	813.94	798.19	781.88	753.19	676.13	579.94	487.13
90.0	831.09	818.61	801.06	787.39	770.06	712.35	639.00	550.86	444.26
135.0	831.94	816.75	803.25	792.00	766.13	712.13	647.44	522.56	427.50
180.0	811.80	796.22	783.17	768.32	732.09	648.45	563.46	469.46	360.11
225.0	851.68	834.36	820.74	806.57	789.69	775.74	730.13	646.20	555.24
270.0	861.75	844.31	830.25	816.19	802.13	789.19	763.88	704.25	627.19
315.0	850.16	830.93	818.21	806.01	793.01	775.52	742.78	674.55	576.00
360.0	873.56	851.06	837.00	824.06	807.19	793.69	770.06	700.88	624.94
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	534.38	422.44	308.25	295.88	115.82	57.66	28.07	22.73	19.35
45.0	392.63	287.44	184.22	106.59	49.61	26.44	23.29	19.58	16.20
90.0	335.36	242.61	150.47	75.83	36.73	25.37	22.11	18.11	15.53
135.0	342.00	286.88	131.57	66.77	32.34	24.75	21.26	17.66	15.81
180.0	253.86	168.13	90.28	42.86	25.59	21.99	18.34	15.53	13.95
225.0	449.44	331.76	250.37	160.65	76.05	35.16	24.58	20.98	17.21
270.0	526.50	429.75	318.38	293.63	124.14	62.83	28.41	21.77	19.01
315.0	469.91	373.56	268.37	166.56	89.83	36.84	21.88	19.07	16.48
360.0	534.38	422.44	308.25	295.88	115.82	57.66	28.07	22.73	19.35

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	16.48	15.19	13.28	12.88	12.49	12.15	11.87	11.64	11.42
45.0	14.01	13.33	12.94	12.60	12.32	12.04	11.76	11.53	11.31
90.0	13.89	13.50	13.05	12.71	12.43	12.15	11.87	11.64	11.36
135.0	14.12	13.61	13.22	12.94	12.54	12.32	12.04	11.81	11.53
180.0	13.39	13.05	12.60	12.32	12.04	11.70	11.48	11.25	11.03
225.0	15.08	13.61	13.11	12.71	12.38	12.04	11.81	11.59	11.36
270.0	16.03	14.74	13.22	12.83	12.38	12.09	11.87	11.59	11.36
315.0	14.96	13.61	12.83	12.49	12.15	11.87	11.59	11.36	11.14
360.0	16.48	15.19	13.28	12.88	12.49	12.15	11.87	11.64	11.42
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	11.19	11.03	10.80	10.63	10.52	10.41	10.24	10.18	10.13
45.0	11.08	10.91	10.69	10.58	10.52	10.35	10.24	10.18	10.13
90.0	11.19	10.97	10.80	10.63	10.46	10.35	10.24	10.13	10.01
135.0	11.31	11.03	10.80	10.69	10.46	10.35	10.24	10.13	10.07
180.0	10.74	10.63	10.46	10.35	10.24	10.13	10.07	9.96	9.90
225.0	11.14	10.91	10.69	10.58	10.46	10.29	10.24	10.13	10.07
270.0	11.14	10.97	10.80	10.69	10.52	10.41	10.29	10.24	10.13
315.0	10.97	10.80	10.63	10.46	10.35	10.24	10.18	10.07	10.01
360.0	11.19	11.03	10.80	10.63	10.52	10.41	10.24	10.18	10.13
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.01	9.96	9.90	9.84	9.73	9.73	9.68	9.62	9.56
45.0	10.01	9.90	9.84	9.79	9.73	9.68	9.62	9.62	9.56
90.0	9.96	9.90	9.84	9.79	9.73	9.68	9.68	9.62	9.56
135.0	10.01	9.90	9.84	9.79	9.73	9.68	9.68	9.56	9.56
180.0	9.84	9.73	9.73	9.68	9.62	9.56	9.56	9.51	9.45
225.0	10.01	9.90	9.84	9.79	9.73	9.68	9.62	9.56	9.56
270.0	10.07	9.96	9.90	9.84	9.84	9.79	9.79	9.68	9.68
315.0	9.96	9.90	9.79	9.73	9.73	9.68	9.62	9.56	9.56
360.0	10.01	9.96	9.90	9.84	9.73	9.73	9.68	9.62	9.56
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.56	9.51	9.51	9.45	9.39	9.39	9.39	9.34	9.39
45.0	9.56	9.51	9.51	9.45	9.45	9.45	9.39	9.39	9.34
90.0	9.56	9.56	9.45	9.45	9.45	9.45	9.45	9.45	9.45
135.0	9.51	9.45	9.45	9.39	9.39	9.39	9.39	9.34	9.34
180.0	9.45	9.45	9.39	9.39	9.39	9.34	9.34	9.34	9.28
225.0	9.51	9.51	9.51	9.51	9.39	9.39	9.39	9.39	9.34
270.0	9.62	9.62	9.56	9.56	9.51	9.51	9.51	9.51	9.51
315.0	9.51	9.51	9.45	9.39	9.39	9.39	9.39	9.34	9.34
360.0	9.56	9.51	9.51	9.45	9.39	9.39	9.39	9.34	9.39
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.34	9.34	9.28	9.28	9.28	9.28	9.28	9.28	9.23
45.0	9.34	9.34	9.34	9.34	9.34	9.28	9.28	9.28	9.28
90.0	9.45	9.45	9.51	9.34	9.28	9.23	9.23	9.23	9.23
135.0	9.34	9.34	9.28	9.34	9.28	9.23	9.23	9.23	9.23
180.0	9.28	9.28	9.28	9.28	9.23	9.23	9.23	9.23	9.23
225.0	9.34	9.34	9.34	9.34	9.34	9.34	9.28	9.28	9.28
270.0	9.45	9.51	9.51	9.56	9.62	9.39	9.28	9.23	9.23
315.0	9.34	9.34	9.28	9.28	9.28	9.28	9.28	9.23	9.23
360.0	9.34	9.34	9.28	9.28	9.28	9.28	9.28	9.28	9.23

Intensity data(cd)

C/ γ ($^{\circ}$)	90.0
0.0	9.23
45.0	9.28
90.0	9.23
135.0	9.23
180.0	9.23
225.0	9.23
270.0	9.23
315.0	9.23
360.0	9.23