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NATA

Client:

LumCAT: 3-1742-N

Luminaire: 92.70.065.00+92.70.061.00

Report No: nata-0100

Voltage(V): 36.1000

Test No: GC2018112002

Current(A): 0.5000

LampCAT: OSRAM SOLERIQ S13

Power (W): 18.0500

Lamp flux(lm): 1776.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 86

Width(mm): 86

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1395.64, Efficiency(%): 78.58% , Luminous Efficacy(lm/W): 77.32

Central intensity(cd): 5703.750, Maximum intensity(cd): 5703.750

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=23.2

[C90/270]Total=23.2

Field angle(10%Imax): [C0/180]Total=45.6

[C90/270]Total=45.6

Maximum s/h(1/2): C0_180=0.39 C90_270=0.39

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(%): 78.66%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 97.540%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5703.750	1.365	1.365	.077%	.098%
1.0	5673.586	10.858	12.223	.611%	.876%
2.0	5569.875	21.317	33.539	1.200%	2.403%
3.0	5408.086	31.038	64.578	1.748%	4.627%
4.0	5216.977	39.908	104.485	2.247%	7.487%
5.0	4988.180	47.675	152.16	2.684%	10.903%
6.0	4690.969	53.771	205.931	3.028%	14.755%
7.0	4409.016	58.923	264.855	3.318%	18.977%
8.0	4091.906	62.450	327.305	3.516%	23.452%
9.0	3743.156	64.213	391.517	3.616%	28.053%
10.0	3390.750	64.568	456.086	3.636%	32.679%
11.0	3041.930	63.650	519.736	3.584%	37.240%
12.0	2700.563	61.572	581.308	3.467%	41.652%
13.0	2342.250	57.779	639.087	3.253%	45.792%
14.0	2031.188	53.886	692.973	3.034%	49.653%
15.0	1751.836	49.721	742.695	2.800%	53.215%
16.0	1480.078	44.738	787.432	2.519%	56.421%
17.0	1251.668	40.131	827.563	2.260%	59.296%
18.0	1042.383	35.323	862.886	1.989%	61.827%
19.0	915.933	32.701	895.587	1.841%	64.170%
20.0	784.540	29.425	925.012	1.657%	66.279%
21.0	686.236	26.968	951.981	1.518%	68.211%
22.0	620.726	25.499	977.48	1.436%	70.038%
23.0	561.431	24.056	1001.536	1.355%	71.762%
24.0	504.619	22.508	1024.044	1.267%	73.374%
25.0	463.816	21.495	1045.539	1.210%	74.915%
26.0	423.668	20.367	1065.906	1.147%	76.374%
27.0	388.976	19.365	1085.271	1.090%	77.761%
28.0	355.521	18.303	1103.574	1.031%	79.073%
29.0	326.981	17.384	1120.958	.979%	80.319%
30.0	301.605	16.537	1137.495	.931%	81.503%
31.0	280.413	15.838	1153.333	.892%	82.638%
32.0	256.479	14.904	1168.237	.839%	83.706%
33.0	236.728	14.139	1182.376	.796%	84.719%
34.0	219.537	13.462	1195.838	.758%	85.684%
35.0	201.909	12.700	1208.538	.715%	86.594%
36.0	187.664	12.096	1220.634	.681%	87.461%
37.0	175.388	11.575	1232.209	.652%	88.290%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	163.097	11.011	1243.22	.620%	89.079%
39.0	150.996	10.421	1253.641	.587%	89.825%
40.0	141.237	9.956	1263.596	.561%	90.539%
41.0	131.217	9.440	1273.037	.532%	91.215%
42.0	120.930	8.874	1281.91	.500%	91.851%
43.0	111.375	8.330	1290.24	.469%	92.448%
44.0	101.566	7.737	1297.977	.436%	93.002%
45.0	92.566	7.178	1305.155	.404%	93.517%
46.0	83.637	6.598	1311.752	.371%	93.989%
47.0	75.797	6.079	1317.831	.342%	94.425%
48.0	68.365	5.571	1323.402	.314%	94.824%
49.0	62.023	5.133	1328.536	.289%	95.192%
50.0	55.470	4.660	1333.195	.262%	95.526%
51.0	49.950	4.257	1337.452	.240%	95.831%
52.0	45.373	3.921	1341.373	.221%	96.112%
53.0	40.598	3.556	1344.929	.200%	96.366%
54.0	36.345	3.224	1348.153	.182%	96.597%
55.0	33.054	2.969	1351.122	.167%	96.810%
56.0	29.855	2.714	1353.836	.153%	97.005%
57.0	26.684	2.454	1356.29	.138%	97.181%
58.0	24.413	2.270	1358.561	.128%	97.343%
59.0	22.261	2.092	1360.653	.118%	97.493%
60.0	20.285	1.926	1362.58	.108%	97.631%
61.0	18.724	1.796	1364.375	.101%	97.760%
62.0	17.480	1.692	1366.068	.095%	97.881%
63.0	16.488	1.611	1367.679	.091%	97.997%
64.0	15.736	1.551	1369.23	.087%	98.108%
65.0	15.068	1.498	1370.728	.084%	98.215%
66.0	14.541	1.457	1372.184	.082%	98.319%
67.0	14.055	1.419	1373.603	.080%	98.421%
68.0	13.514	1.374	1374.977	.077%	98.519%
69.0	13.085	1.340	1376.317	.075%	98.615%
70.0	12.656	1.304	1377.621	.073%	98.709%
71.0	12.213	1.266	1378.887	.071%	98.800%
72.0	11.777	1.228	1380.116	.069%	98.888%
73.0	11.398	1.195	1381.311	.067%	98.973%
74.0	11.011	1.161	1382.471	.065%	99.056%
75.0	10.561	1.119	1383.59	.063%	99.137%

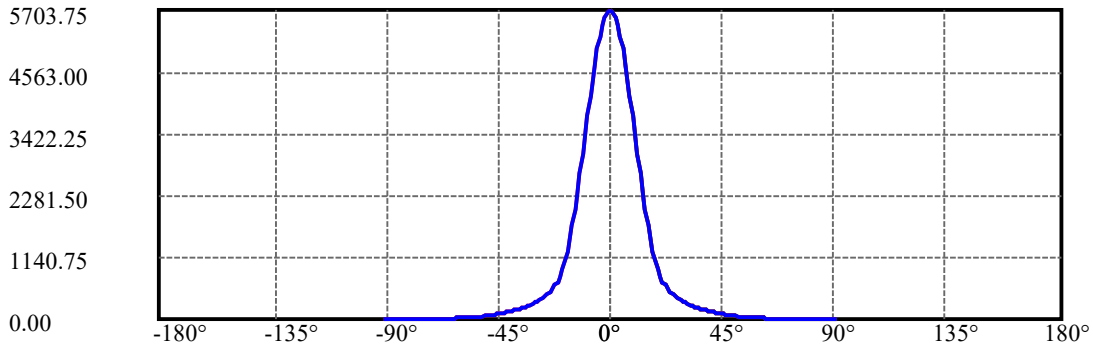
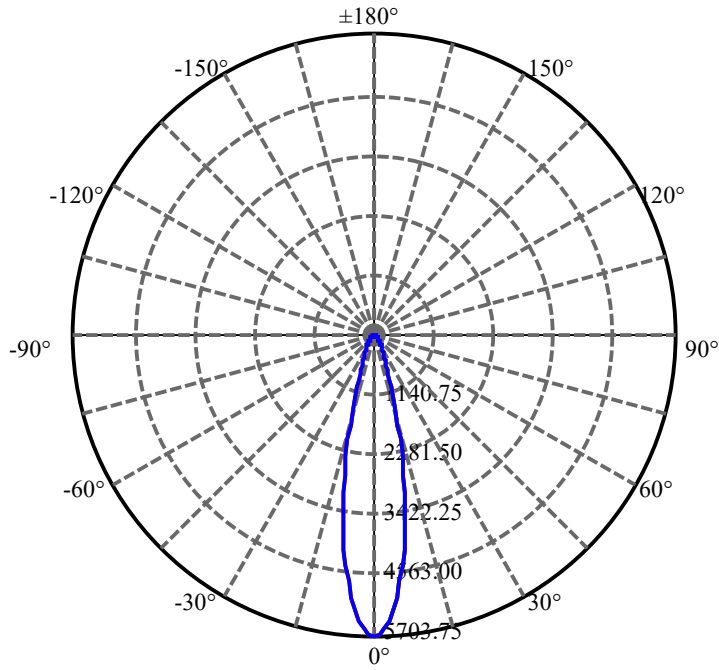
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.195	1.085	1384.675	.061%	99.214%
77.0	9.844	1.052	1385.727	.059%	99.290%
78.0	9.443	1.013	1386.74	.057%	99.362%
79.0	9.014	0.970	1387.71	.055%	99.432%
80.0	8.627	0.932	1388.642	.052%	99.499%
81.0	8.248	0.893	1389.535	.050%	99.563%
82.0	7.847	0.852	1390.387	.048%	99.624%
83.0	7.460	0.812	1391.199	.046%	99.682%
84.0	7.052	0.769	1391.968	.043%	99.737%
85.0	6.715	0.734	1392.702	.041%	99.789%
86.0	6.377	0.698	1393.399	.039%	99.839%
87.0	6.096	0.668	1394.067	.038%	99.887%
88.0	5.836	0.640	1394.707	.036%	99.933%
89.0	5.716	0.627	1395.333	.035%	99.978%
90.0	5.597	0.307	1395.64	.017%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1137.49	64.05%	81.50%
0-40	1263.60	71.15%	90.54%
0-60	1362.58	76.72%	97.63%
0-90	1395.33	78.57%	99.98%
0-120	1395.33	78.57%	99.98%
0-180	1395.64	78.58%	100.00%
60-90	34.68	1.95%	2.48%
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%
0-28.74	1116.51	62.87%	80.00%

ZONAL LUMEN SUMMARY

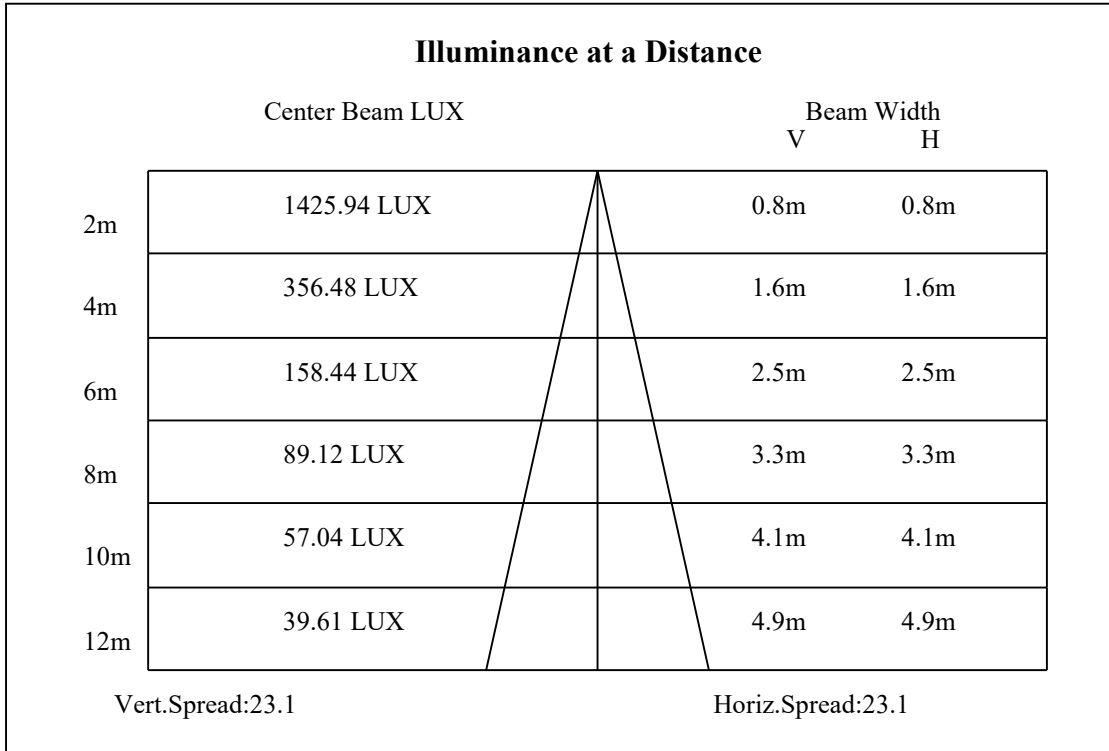
0-10	456.09
10-20	468.93
20-30	212.48
30-40	126.10
40-50	69.60
50-60	29.38
60-70	15.04
70-80	11.02
80-90	6.69
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

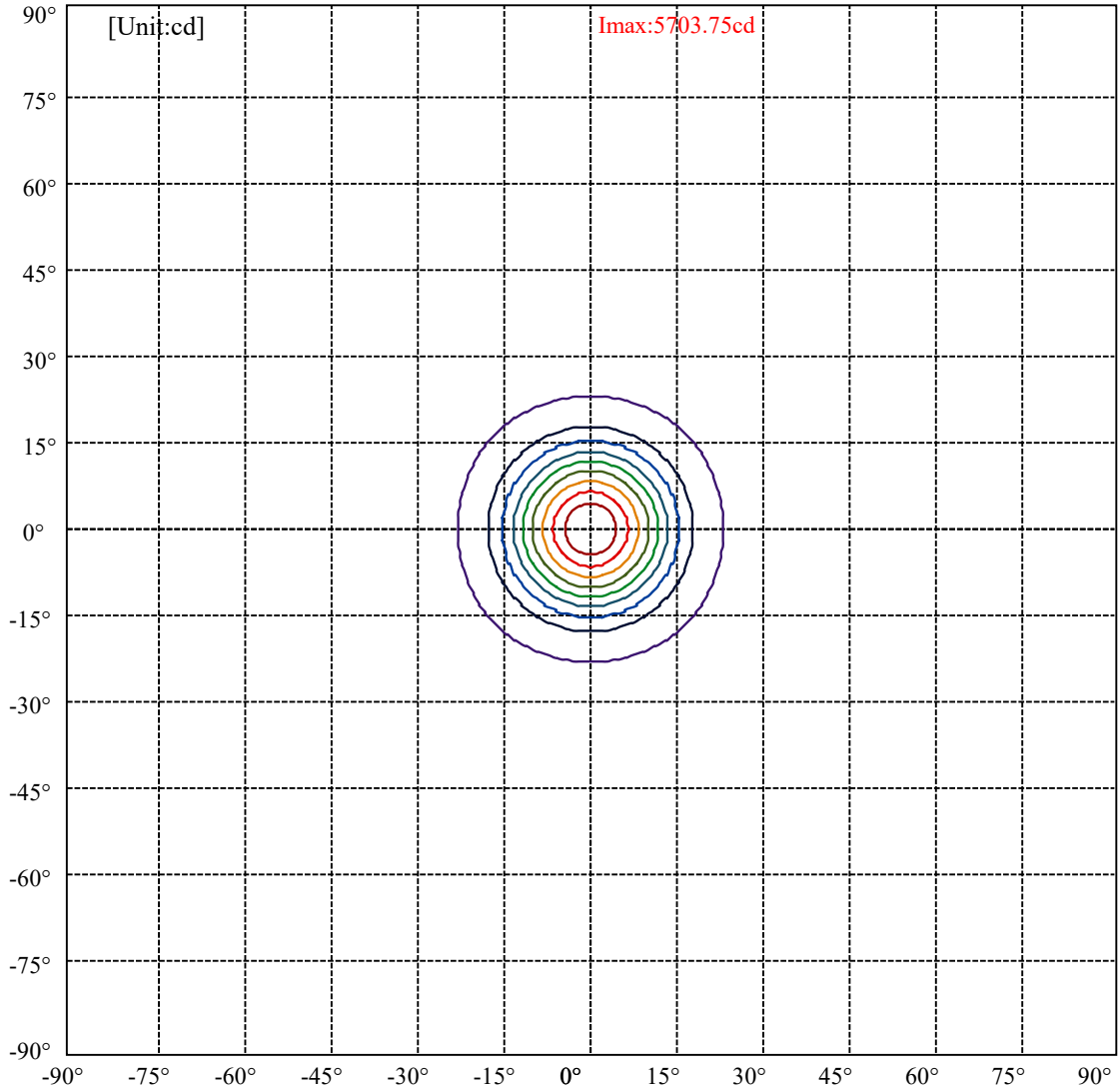


C0(Max): —————
C0/C180: —————
C90/C270: —————

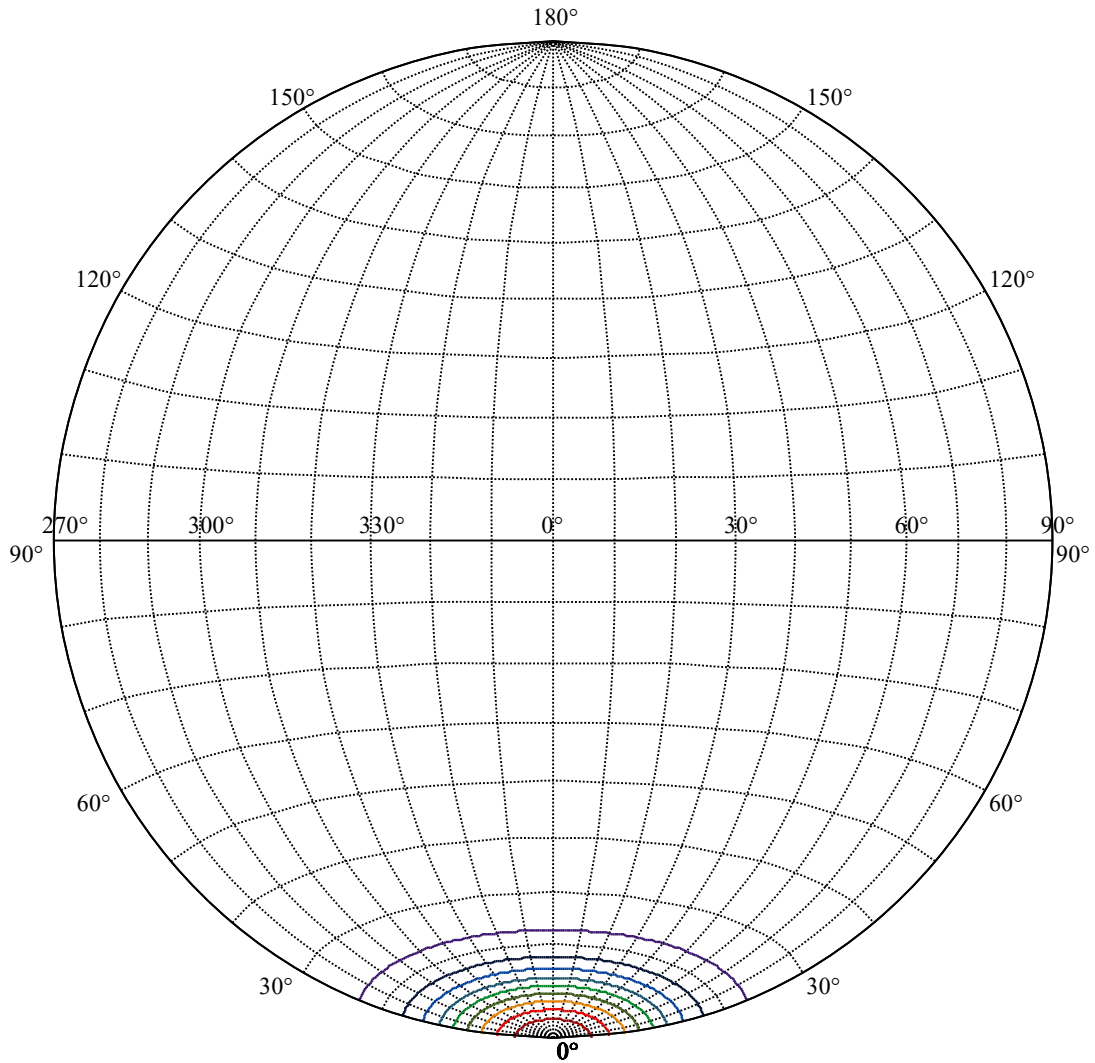
Field angle(10%Imax):C0/180Left:22.8 Right:22.8
:C90/270Left:22.8 Right:22.8

Beam Angle(50%Imax):C0/180Left:11.6 Right:11.6
:C90/270Left:11.6 Right:11.6





(10%Imax) 570.375	—
(20%Imax) 1140.75	—
(30%Imax) 1711.13	—
(40%Imax) 2281.5	—
(50%Imax) 2851.88	—
(60%Imax) 3422.25	—
(70%Imax) 3992.63	—
(80%Imax) 4563	—
(90%Imax) 5133.38	—



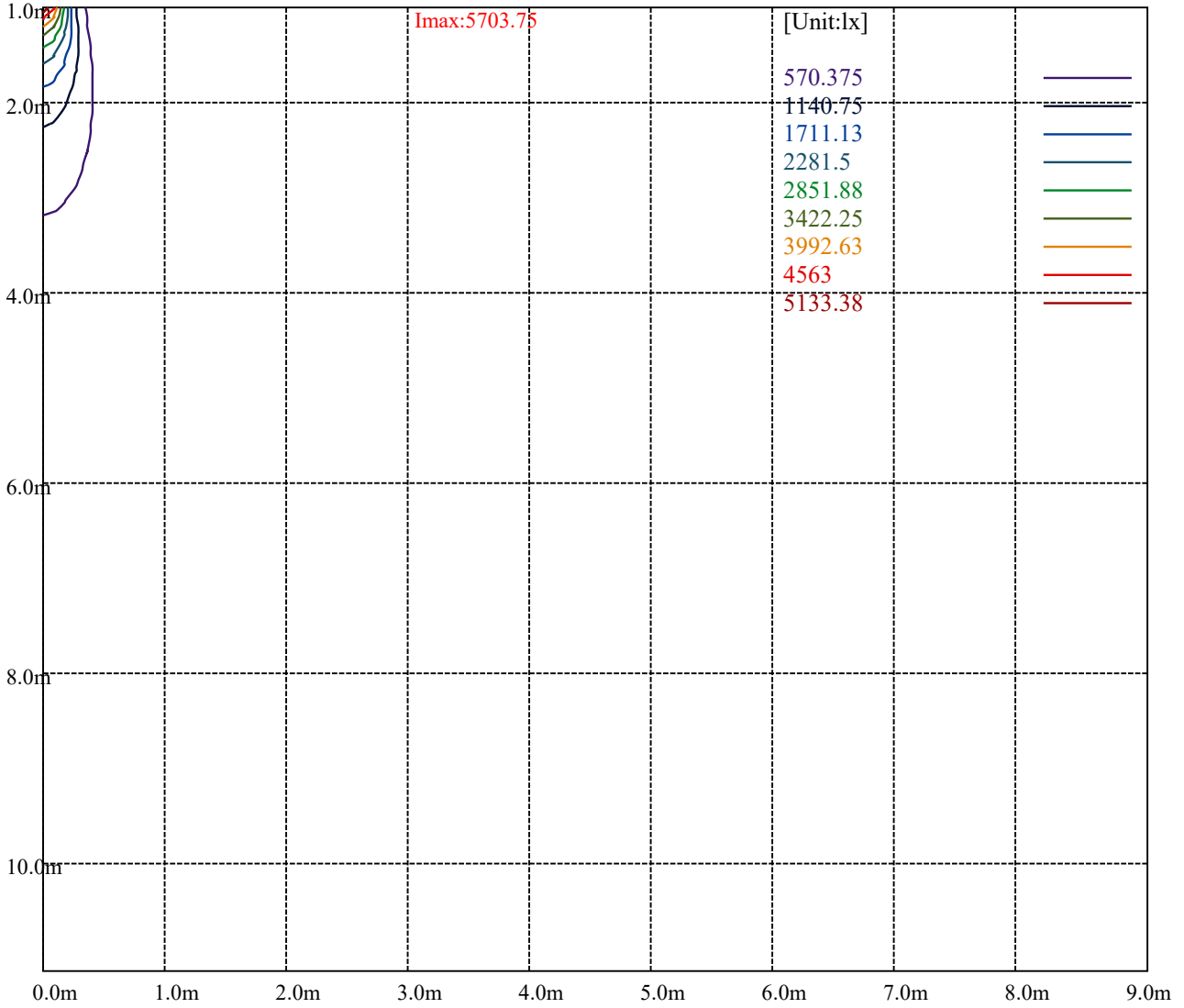
House

[Unit:cd]

Road

Imax:5703.75

(10%Imax) 570.375	—
(20%Imax) 1140.75	—
(30%Imax) 1711.13	—
(40%Imax) 2281.5	—
(50%Imax) 2851.88	—
(60%Imax) 3422.25	—
(70%Imax) 3992.63	—
(80%Imax) 4563	—
(90%Imax) 5133.38	—



Luminance Table

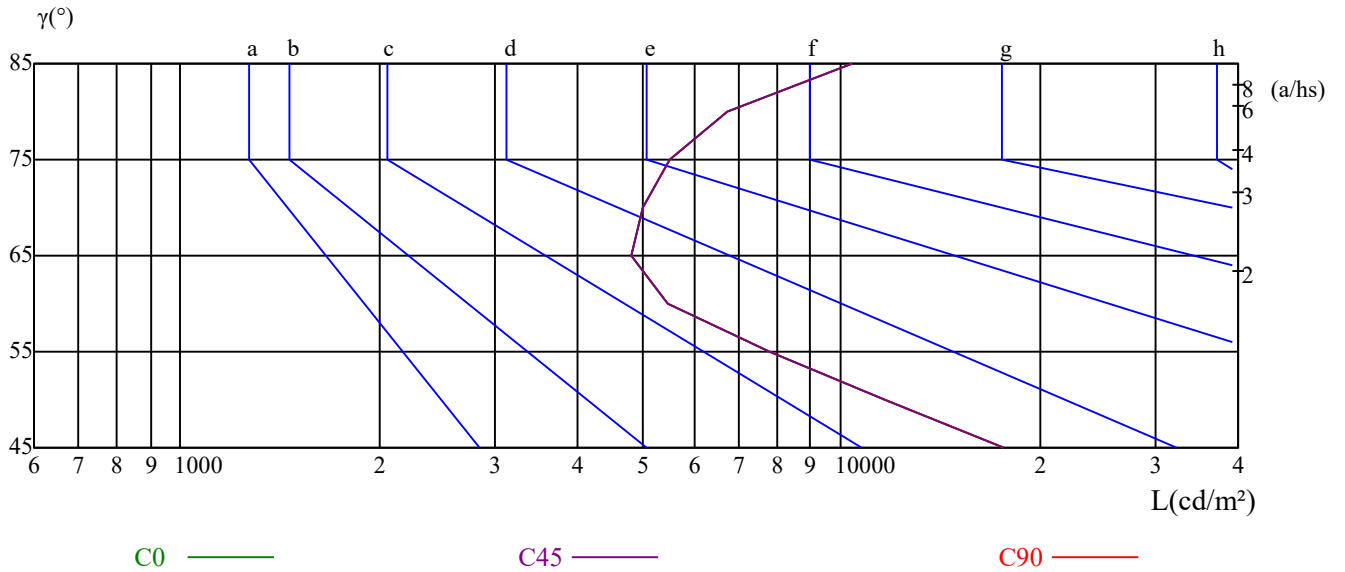
γ	45	50	55	60	65	70	75	80	85
C0	17700	11668	7792	5485	4821	5003	5517	6718	10417
C45	17700	11668	7792	5485	4821	5003	5517	6718	10417
C90	17700	11668	7792	5485	4821	5003	5517	6718	10417

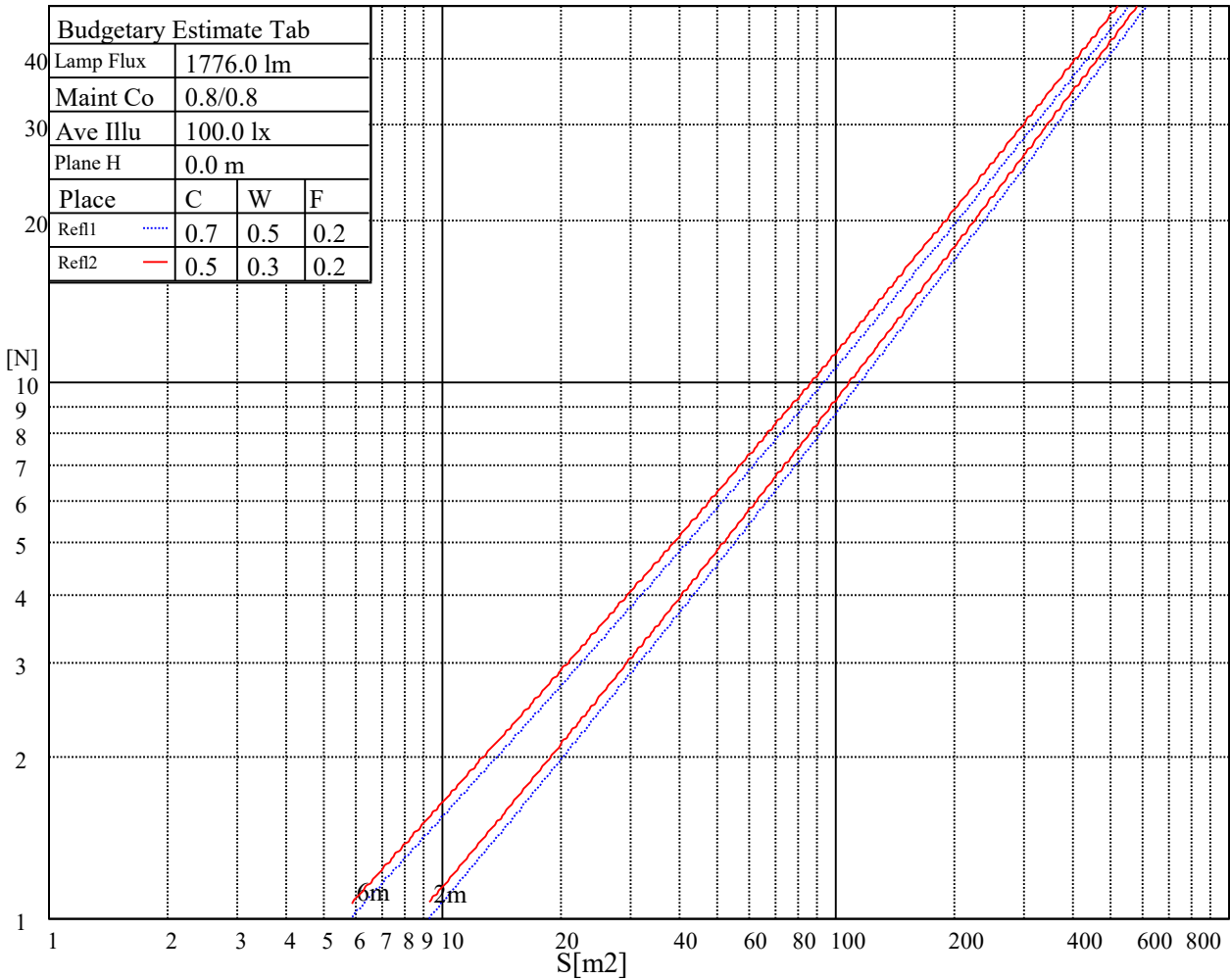
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4821	4821	4821	5517	5517	5517	10417	10417	10417

Glare Table

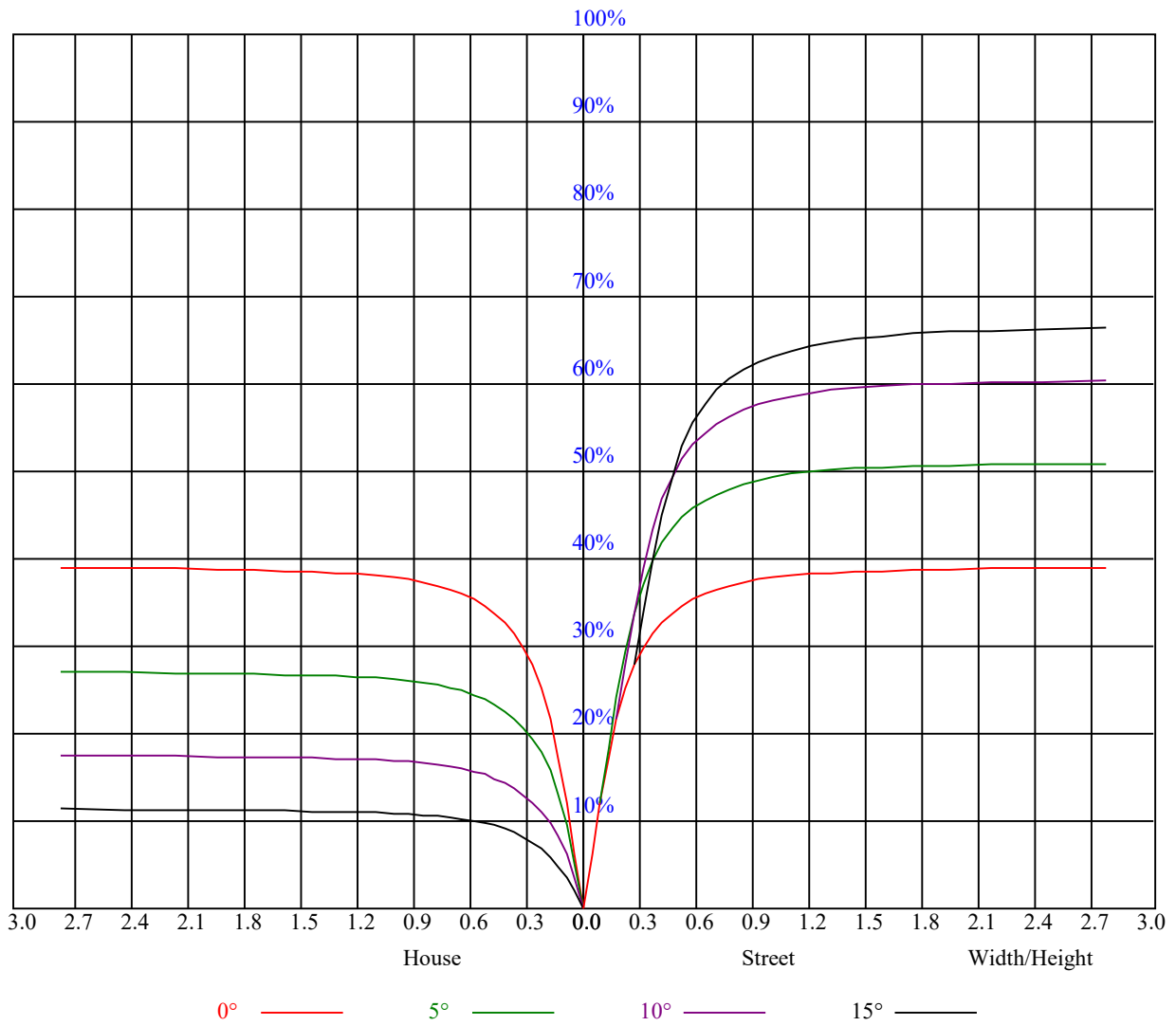
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

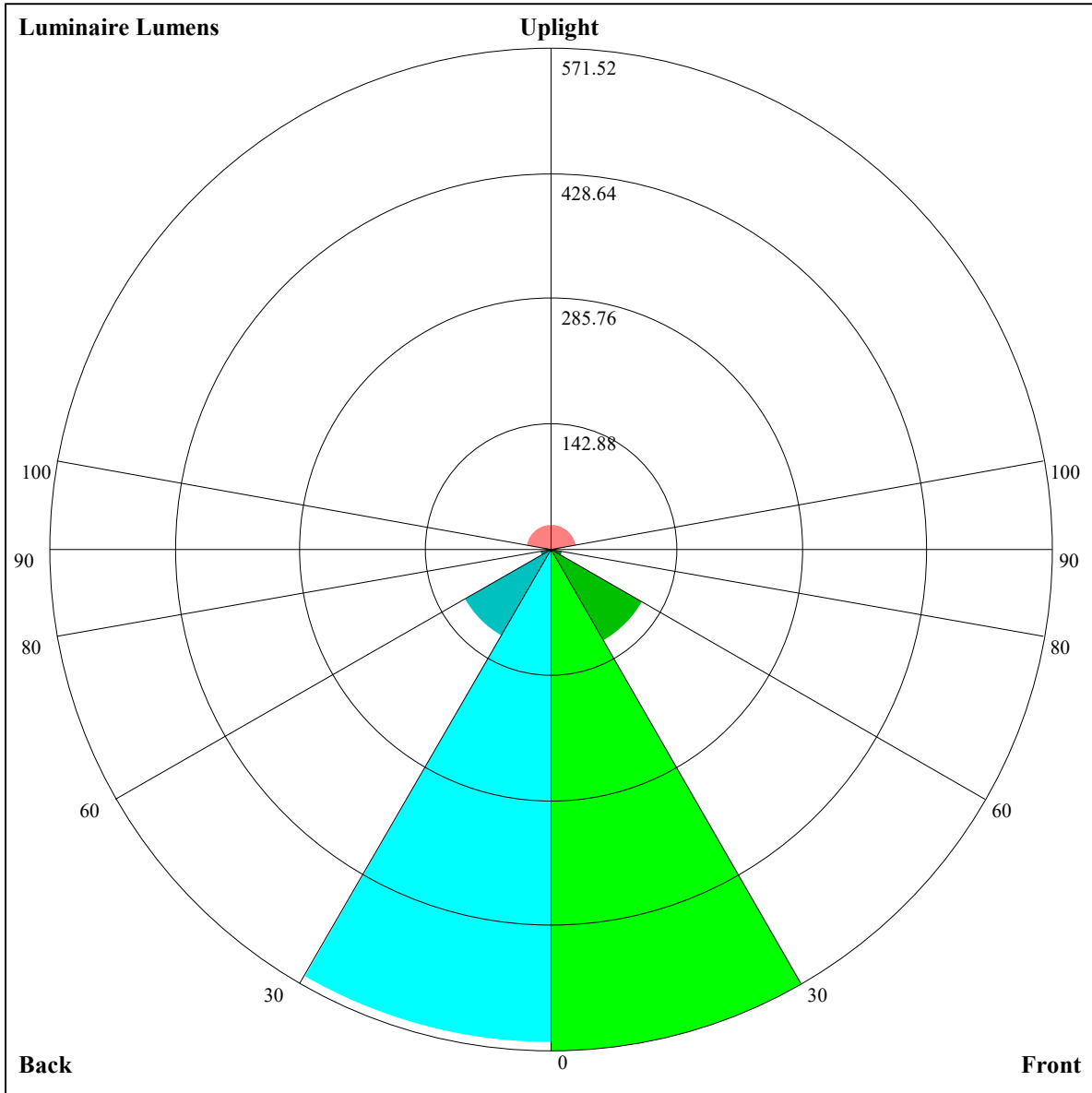
Luminance Limiting Curve





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	0.94	0.94	0.94	0.91	0.91	0.91	0.87	0.87	0.87	0.84	0.84	0.84	0.80	0.80	0.80	0.79
1	0.88	0.86	0.84	0.86	0.84	0.83	0.83	0.81	0.80	0.80	0.79	0.78	0.77	0.76	0.76	0.74
2	0.83	0.80	0.77	0.81	0.79	0.77	0.79	0.77	0.75	0.76	0.75	0.73	0.74	0.73	0.72	0.71
3	0.78	0.75	0.72	0.77	0.74	0.72	0.75	0.73	0.70	0.73	0.71	0.69	0.72	0.70	0.68	0.67
4	0.74	0.71	0.68	0.74	0.70	0.67	0.72	0.69	0.67	0.70	0.68	0.66	0.69	0.67	0.65	0.64
5	0.71	0.67	0.64	0.70	0.67	0.64	0.69	0.66	0.63	0.68	0.65	0.63	0.67	0.64	0.62	0.61
6	0.68	0.64	0.61	0.67	0.64	0.61	0.66	0.63	0.61	0.65	0.62	0.60	0.64	0.62	0.60	0.59
7	0.65	0.61	0.59	0.65	0.61	0.59	0.64	0.61	0.58	0.63	0.60	0.58	0.62	0.60	0.58	0.57
8	0.63	0.59	0.56	0.63	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.56	0.60	0.58	0.56	0.55
9	0.61	0.57	0.54	0.60	0.57	0.54	0.60	0.56	0.54	0.59	0.56	0.54	0.59	0.56	0.54	0.53
10	0.59	0.55	0.53	0.58	0.55	0.53	0.58	0.55	0.52	0.57	0.54	0.52	0.57	0.54	0.52	0.51





Luminaire Lumens:

FL=571.52,FM=119.34,FH=13.38,FVH=3.75

BL=561.71,BM=113.46,BH=13.18,BVH=3.73

UL=6.11,UH=29.06

BUG Rating:B2-U2-G0

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	5737.50	5739.19	5667.75	5544.00	5346.00	5141.25	4879.69	4594.50	4320.00
45.0	5685.19	5586.19	5353.31	5145.75	4921.88	4642.31	4330.13	4028.06	3672.00
90.0	5664.38	5541.19	5366.81	5118.19	4891.50	4640.63	4289.06	3976.31	3649.50
135.0	5727.94	5666.06	5537.25	5377.50	5157.56	4930.88	4632.75	4352.63	4002.75
180.0	5737.50	5668.31	5537.81	5312.81	5095.13	4849.31	4505.06	4208.63	3882.94
225.0	5685.19	5739.19	5721.75	5623.88	5479.88	5257.13	4989.94	4722.75	4410.00
270.0	5664.38	5730.19	5724.56	5645.81	5514.19	5316.75	5066.44	4812.19	4506.19
315.0	5727.94	5718.38	5649.75	5496.75	5329.69	5127.19	4834.69	4577.06	4291.88
360.0	5737.50	5739.19	5667.75	5544.00	5346.00	5141.25	4879.69	4594.50	4320.00
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3991.50	3643.88	3325.50	3000.38	2601.56	2298.38	2012.06	1717.31	1451.25
45.0	3307.50	2978.44	2616.19	2310.19	1991.25	1706.63	1481.63	1276.88	1047.38
90.0	3268.13	2891.81	2577.38	2235.94	1922.06	1668.38	1415.81	1119.32	1013.96
135.0	3624.75	3274.88	2886.19	2547.00	2154.38	1869.19	1611.56	1383.75	1131.19
180.0	3503.81	3112.31	2770.31	2397.94	2081.81	1767.94	1489.50	1119.43	1053.51
225.0	4111.88	3747.94	3372.75	3029.06	2645.44	2279.25	1977.19	1704.94	1408.50
270.0	4179.38	3875.63	3511.69	3185.44	2806.88	2438.44	2125.13	1873.69	1526.63
315.0	3958.31	3601.13	3275.44	2898.56	2534.63	2221.31	1901.81	1645.31	1380.94
360.0	3991.50	3643.88	3325.50	3000.38	2601.56	2298.38	2012.06	1717.31	1451.25
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1239.19	1037.81	872.44	763.88	676.13	614.25	556.88	511.31	465.19
45.0	896.63	788.63	686.25	621.00	567.56	514.13	464.63	429.75	392.06
90.0	854.10	752.01	675.96	599.46	548.21	503.27	452.64	417.71	387.06
135.0	961.31	833.63	714.94	642.94	586.13	529.88	479.25	442.13	403.88
180.0	866.59	768.77	684.23	597.26	551.70	505.46	448.76	417.04	385.09
225.0	1112.29	1028.53	881.04	747.39	669.43	606.49	544.28	490.89	449.04
270.0	1305.00	1136.81	915.19	795.94	717.75	630.00	565.88	521.44	466.31
315.0	1103.96	981.28	846.28	722.03	648.90	587.98	524.64	480.26	440.72
360.0	1239.19	1037.81	872.44	763.88	676.13	614.25	556.88	511.31	465.19
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	428.06	388.13	359.44	334.69	306.00	284.63	270.11	243.84	224.10
45.0	365.06	335.25	308.25	286.31	261.51	241.99	226.18	211.84	195.02
90.0	355.95	327.21	303.58	279.62	259.99	238.89	220.28	204.86	189.62
135.0	374.63	343.13	314.44	289.69	284.06	240.53	223.82	208.52	191.08
180.0	352.58	323.38	299.31	274.39	253.24	231.92	213.69	199.13	183.94
225.0	406.80	369.68	340.54	312.30	289.29	266.06	244.74	227.48	209.31
270.0	427.50	391.50	352.13	325.13	301.50	284.63	253.35	235.46	214.03
315.0	401.23	365.91	338.18	310.73	287.72	263.19	241.65	225.17	208.18
360.0	428.06	388.13	359.44	334.69	306.00	284.63	270.11	243.84	224.10
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	209.87	196.76	181.29	170.16	159.58	149.34	139.28	128.53	117.34
45.0	182.87	172.01	160.43	150.64	140.74	129.38	118.46	109.74	98.44
90.0	176.01	165.09	155.19	143.49	133.88	123.75	112.89	102.38	93.49
135.0	178.59	167.06	155.25	144.73	135.00	124.48	113.79	105.53	95.12
180.0	169.93	158.51	147.94	135.90	127.01	117.51	107.16	97.59	89.44
225.0	192.83	179.27	166.95	152.89	142.65	133.59	124.26	113.74	104.74
270.0	198.28	183.88	168.98	155.98	145.46	135.00	125.55	117.17	106.71
315.0	192.94	180.51	168.75	154.18	145.58	136.69	126.06	116.33	107.27
360.0	209.87	196.76	181.29	170.16	159.58	149.34	139.28	128.53	117.34

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	107.78	97.37	87.53	79.59	71.16	63.56	57.38	51.92	45.96
45.0	89.94	81.00	72.90	65.81	58.78	52.59	47.53	42.86	37.52
90.0	84.26	75.83	68.96	61.82	56.19	50.23	44.89	40.50	36.51
135.0	86.85	78.53	71.10	64.46	58.67	52.26	47.53	43.37	38.08
180.0	81.84	73.18	66.83	60.13	54.79	49.28	44.21	40.11	36.28
225.0	95.29	86.18	78.58	70.76	64.46	57.99	52.14	47.48	43.26
270.0	98.38	89.38	80.89	73.74	67.22	59.63	54.28	49.33	43.93
315.0	96.19	87.64	79.59	70.59	64.91	58.22	51.64	47.42	43.26
360.0	107.78	97.37	87.53	79.59	71.16	63.56	57.38	51.92	45.96
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	41.63	37.69	33.69	30.21	27.56	24.86	22.50	20.64	18.79
45.0	33.81	30.60	27.45	24.69	22.50	20.42	18.62	17.44	16.59
90.0	32.23	29.14	26.55	23.63	21.60	19.74	17.89	16.88	16.14
135.0	34.48	31.50	28.07	25.31	23.12	21.04	19.24	17.78	16.71
180.0	32.12	29.19	26.72	23.96	22.05	20.42	18.96	17.44	16.54
225.0	38.48	34.99	31.73	28.18	25.71	23.57	21.43	19.63	18.23
270.0	40.05	36.45	32.85	29.53	26.94	24.41	22.16	20.42	18.73
315.0	37.97	34.88	31.78	27.96	25.82	23.63	21.49	19.58	18.11
360.0	41.63	37.69	33.69	30.21	27.56	24.86	22.50	20.64	18.79
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	17.49	16.71	15.98	15.41	14.91	14.23	13.84	13.33	12.83
45.0	15.92	15.24	14.63	14.12	13.67	13.16	12.77	12.26	11.87
90.0	15.41	14.96	14.34	13.78	13.39	12.88	12.43	12.09	11.64
135.0	16.09	15.41	14.74	14.29	13.78	13.28	12.83	12.49	11.98
180.0	15.92	15.30	14.68	14.23	13.73	13.22	12.88	12.43	12.04
225.0	16.88	15.98	15.30	14.68	14.23	13.73	13.22	12.83	12.43
270.0	17.44	16.20	15.47	14.91	14.40	13.84	13.39	12.94	12.43
315.0	16.76	16.09	15.41	14.91	14.34	13.78	13.33	12.88	12.49
360.0	17.49	16.71	15.98	15.41	14.91	14.23	13.84	13.33	12.83
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	12.43	11.98	11.59	11.08	10.74	10.35	9.90	9.56	9.00
45.0	11.42	11.03	10.69	10.24	9.79	9.51	9.00	8.55	8.21
90.0	11.14	10.86	10.52	9.96	9.62	9.34	8.89	8.49	8.10
135.0	11.64	11.25	10.86	10.46	10.07	9.68	9.28	8.83	8.44
180.0	11.59	11.19	10.80	10.41	9.96	9.62	9.23	8.72	8.33
225.0	11.98	11.64	11.25	10.80	10.46	10.13	9.79	9.34	9.06
270.0	12.04	11.64	11.19	10.80	10.52	10.07	9.79	9.39	9.00
315.0	11.98	11.59	11.19	10.74	10.41	10.07	9.68	9.23	8.89
360.0	12.43	11.98	11.59	11.08	10.74	10.35	9.90	9.56	9.00
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.66	8.27	7.82	7.43	7.03	6.69	6.30	6.08	5.85
45.0	7.82	7.43	7.09	6.69	6.36	5.96	5.79	5.51	5.51
90.0	7.76	7.37	6.98	6.53	6.24	5.91	5.74	5.57	5.57
135.0	8.04	7.65	7.26	6.86	6.47	6.19	5.91	5.63	5.57
180.0	7.99	7.54	7.20	6.75	6.41	6.19	5.85	5.63	5.57
225.0	8.61	8.21	7.88	7.43	7.09	6.75	6.47	6.08	5.91
270.0	8.66	8.27	7.82	7.48	7.14	6.75	6.47	6.19	5.96
315.0	8.44	8.04	7.65	7.26	6.98	6.58	6.24	6.02	5.79
360.0	8.66	8.27	7.82	7.43	7.03	6.69	6.30	6.08	5.85

Intensity data(cd)

C/γ(°)	90.0
0.0	5.57
45.0	5.51
90.0	5.57
135.0	5.51
180.0	5.57
225.0	5.68
270.0	5.74
315.0	5.63
360.0	5.57