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NATA

Client:

LumCAT: 3-1701-N

Luminaire: 92.70.065.00+92.70.061.00

Report No: nata-0100

Voltage(V): 36.2000

Test No: GC2018112001

Current(A): 0.5000

LampCAT: OSRAM SOLERIQ S13

Power (W): 18.1000

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): 1409.77, Efficiency(%): 79.38% , Luminous Efficacy(lm/W): 77.89

Central intensity(cd): 10413.560, Maximum intensity(cd): 10413.560

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=16.2

[C90/270]Total=16.2

Field angle(10%Imax): [C0/180]Total=29.4

[C90/270]Total=29.4

Maximum s/h(1/2): C0_180=0.28 C90_270=0.28

Maximum s/h(1/4): C0_180=0.27 C90_270=0.27

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 79.52%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 97.586%

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/11/20
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10413.563	2.491	2.491	.140%	.177%
1.0	10305.422	19.723	22.214	1.111%	1.576%
2.0	9913.641	37.941	60.155	2.136%	4.267%
3.0	9342.703	53.620	113.775	3.019%	8.070%
4.0	8697.516	66.532	180.307	3.746%	12.790%
5.0	7879.148	75.306	255.612	4.240%	18.131%
6.0	7034.133	80.630	336.242	4.540%	23.851%
7.0	6234.469	83.319	419.562	4.691%	29.761%
8.0	5324.484	81.261	500.823	4.576%	35.525%
9.0	4386.234	75.245	576.068	4.237%	40.862%
10.0	3451.641	65.728	641.795	3.701%	45.525%
11.0	2566.055	53.693	695.488	3.023%	49.333%
12.0	1886.091	43.002	738.491	2.421%	52.384%
13.0	1412.916	34.854	773.345	1.963%	54.856%
14.0	1129.662	29.969	803.314	1.687%	56.982%
15.0	1003.683	28.487	831.801	1.604%	59.002%
16.0	909.246	27.483	859.285	1.547%	60.952%
17.0	824.435	26.433	885.717	1.488%	62.827%
18.0	760.704	25.778	911.495	1.451%	64.655%
19.0	710.142	25.354	936.849	1.428%	66.454%
20.0	656.979	24.641	961.49	1.387%	68.202%
21.0	606.987	23.854	985.344	1.343%	69.894%
22.0	563.604	23.153	1008.496	1.304%	71.536%
23.0	518.597	22.221	1030.717	1.251%	73.112%
24.0	470.665	20.993	1051.71	1.182%	74.601%
25.0	435.115	20.165	1071.876	1.135%	76.032%
26.0	400.184	19.238	1091.113	1.083%	77.396%
27.0	368.051	18.323	1109.437	1.032%	78.696%
28.0	339.103	17.458	1126.895	.983%	79.934%
29.0	312.630	16.621	1143.515	.936%	81.113%
30.0	291.101	15.961	1159.477	.899%	82.246%
31.0	266.505	15.052	1174.529	.848%	83.313%
32.0	247.655	14.392	1188.92	.810%	84.334%
33.0	227.440	13.584	1202.504	.765%	85.298%
34.0	212.527	13.032	1215.537	.734%	86.222%
35.0	196.924	12.386	1227.923	.697%	87.101%
36.0	183.607	11.835	1239.758	.666%	87.940%
37.0	172.730	11.399	1251.157	.642%	88.749%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	161.895	10.930	1262.087	.615%	89.524%
39.0	151.186	10.434	1272.521	.587%	90.264%
40.0	141.912	10.003	1282.524	.563%	90.974%
41.0	132.047	9.500	1292.024	.535%	91.648%
42.0	120.881	8.870	1300.894	.499%	92.277%
43.0	110.412	8.258	1309.152	.465%	92.862%
44.0	99.795	7.602	1316.754	.428%	93.402%
45.0	89.325	6.926	1323.68	.390%	93.893%
46.0	80.051	6.315	1329.995	.356%	94.341%
47.0	71.888	5.765	1335.76	.325%	94.750%
48.0	64.920	5.291	1341.051	.298%	95.125%
49.0	59.041	4.886	1345.937	.275%	95.472%
50.0	53.100	4.461	1350.398	.251%	95.788%
51.0	47.855	4.078	1354.476	.230%	96.078%
52.0	43.460	3.756	1358.232	.211%	96.344%
53.0	38.651	3.385	1361.617	.191%	96.584%
54.0	34.130	3.028	1364.645	.170%	96.799%
55.0	30.839	2.770	1367.415	.156%	96.995%
56.0	27.809	2.528	1369.943	.142%	97.175%
57.0	24.919	2.292	1372.235	.129%	97.337%
58.0	22.816	2.122	1374.357	.119%	97.488%
59.0	20.855	1.960	1376.317	.110%	97.627%
60.0	19.013	1.806	1378.123	.102%	97.755%
61.0	17.536	1.682	1379.804	.095%	97.874%
62.0	16.305	1.579	1381.383	.089%	97.986%
63.0	15.441	1.509	1382.892	.085%	98.093%
64.0	14.794	1.458	1384.35	.082%	98.197%
65.0	14.238	1.415	1385.765	.080%	98.297%
66.0	13.718	1.374	1387.139	.077%	98.394%
67.0	13.254	1.338	1388.477	.075%	98.489%
68.0	12.755	1.297	1389.774	.073%	98.581%
69.0	12.312	1.260	1391.035	.071%	98.671%
70.0	11.932	1.230	1392.264	.069%	98.758%
71.0	11.538	1.196	1393.46	.067%	98.843%
72.0	11.116	1.159	1394.62	.065%	98.925%
73.0	10.814	1.134	1395.754	.064%	99.005%
74.0	10.519	1.109	1396.863	.062%	99.084%
75.0	10.146	1.075	1397.937	.061%	99.160%

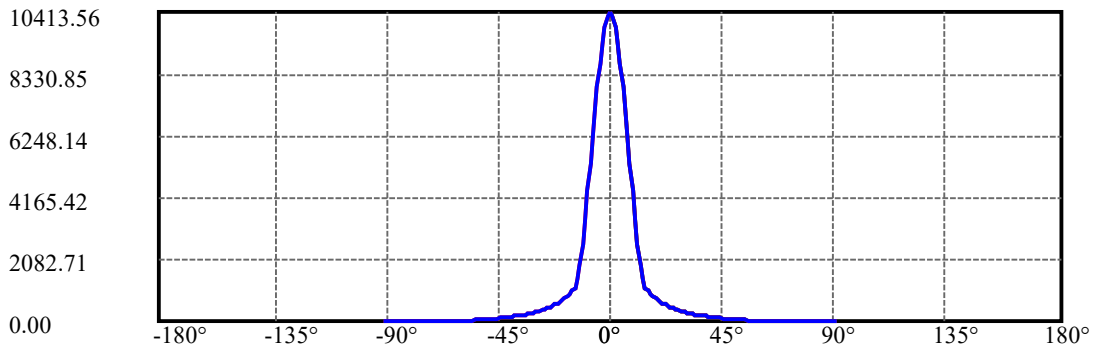
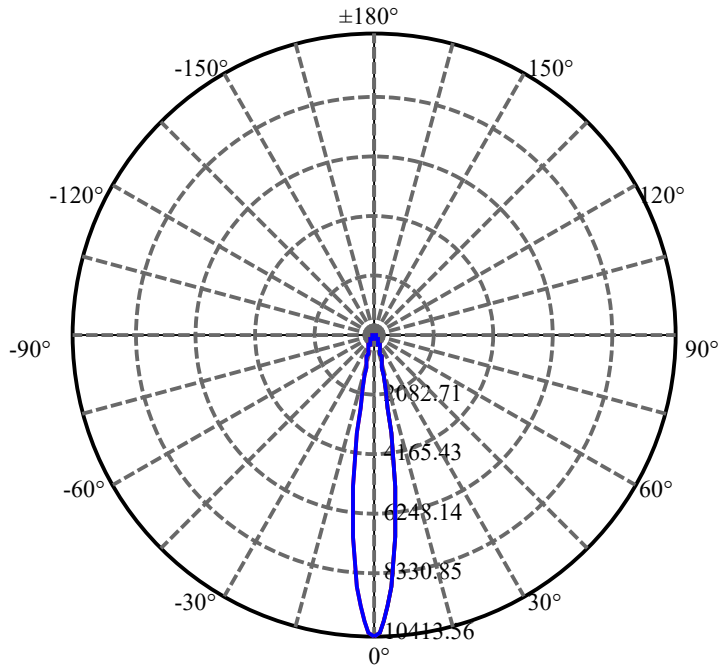
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.872	1.050	1398.988	.059%	99.235%
77.0	9.584	1.024	1400.012	.058%	99.308%
78.0	9.253	0.993	1401.004	.056%	99.378%
79.0	8.880	0.956	1401.96	.054%	99.446%
80.0	8.515	0.920	1402.88	.052%	99.511%
81.0	8.121	0.880	1403.759	.050%	99.573%
82.0	7.727	0.839	1404.599	.047%	99.633%
83.0	7.376	0.803	1405.401	.045%	99.690%
84.0	6.975	0.761	1406.162	.043%	99.744%
85.0	6.645	0.726	1406.888	.041%	99.795%
86.0	6.293	0.688	1407.576	.039%	99.844%
87.0	6.012	0.658	1408.235	.037%	99.891%
88.0	5.745	0.630	1408.864	.035%	99.935%
89.0	5.555	0.609	1409.473	.034%	99.979%
90.0	5.491	0.301	1409.774	.017%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1159.48	65.29%	82.25%
0-40	1282.52	72.21%	90.97%
0-60	1378.12	77.60%	97.75%
0-90	1409.47	79.36%	99.98%
0-120	1409.47	79.36%	99.98%
0-180	1409.77	79.38%	100.00%
60-90	33.16	1.87%	2.35%
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%
0-28.06	1127.82	63.50%	80.00%

ZONAL LUMEN SUMMARY

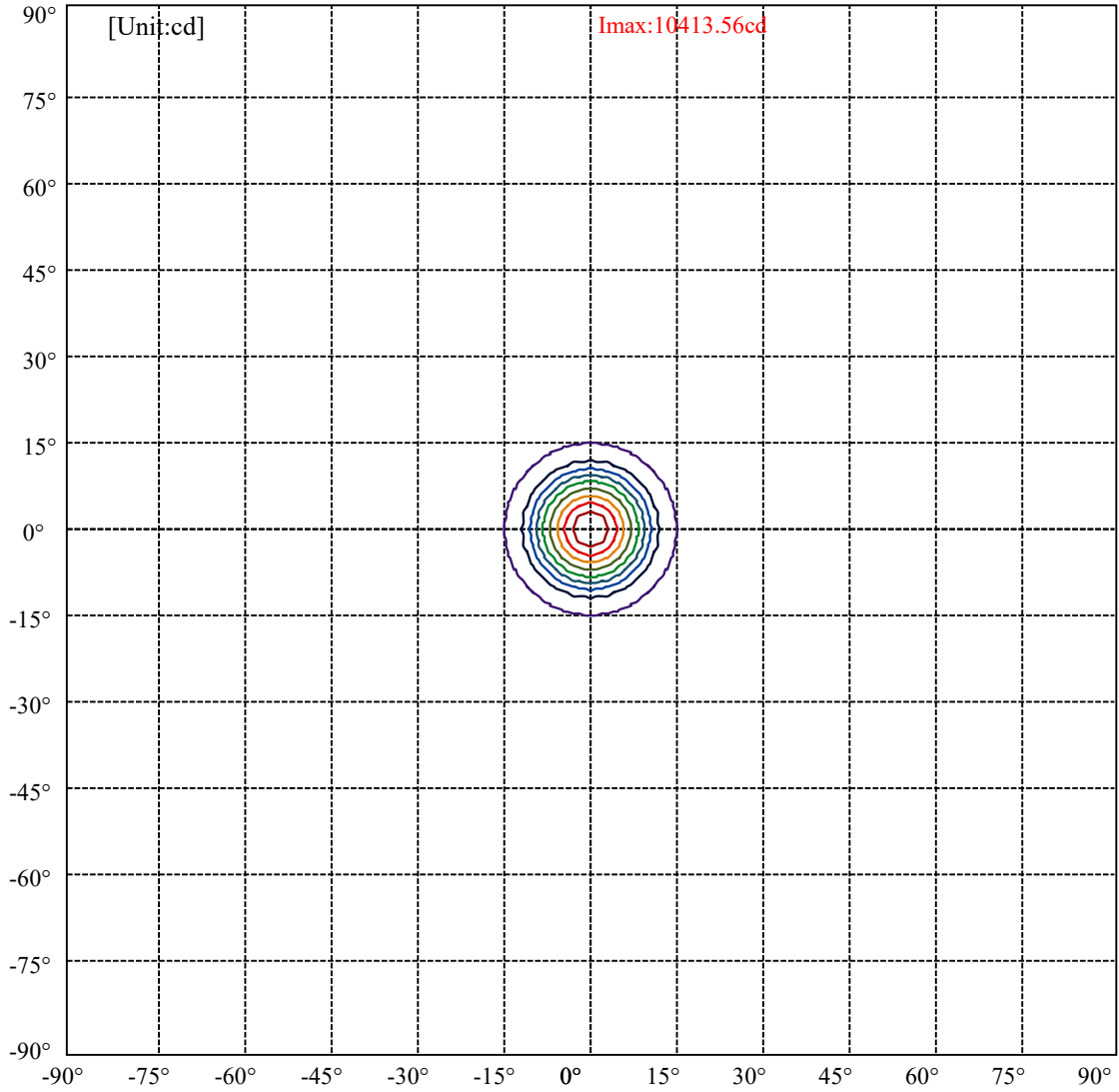
0-10	641.80
10-20	319.69
20-30	197.99
30-40	123.05
40-50	67.87
50-60	27.72
60-70	14.14
70-80	10.62
80-90	6.59
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00



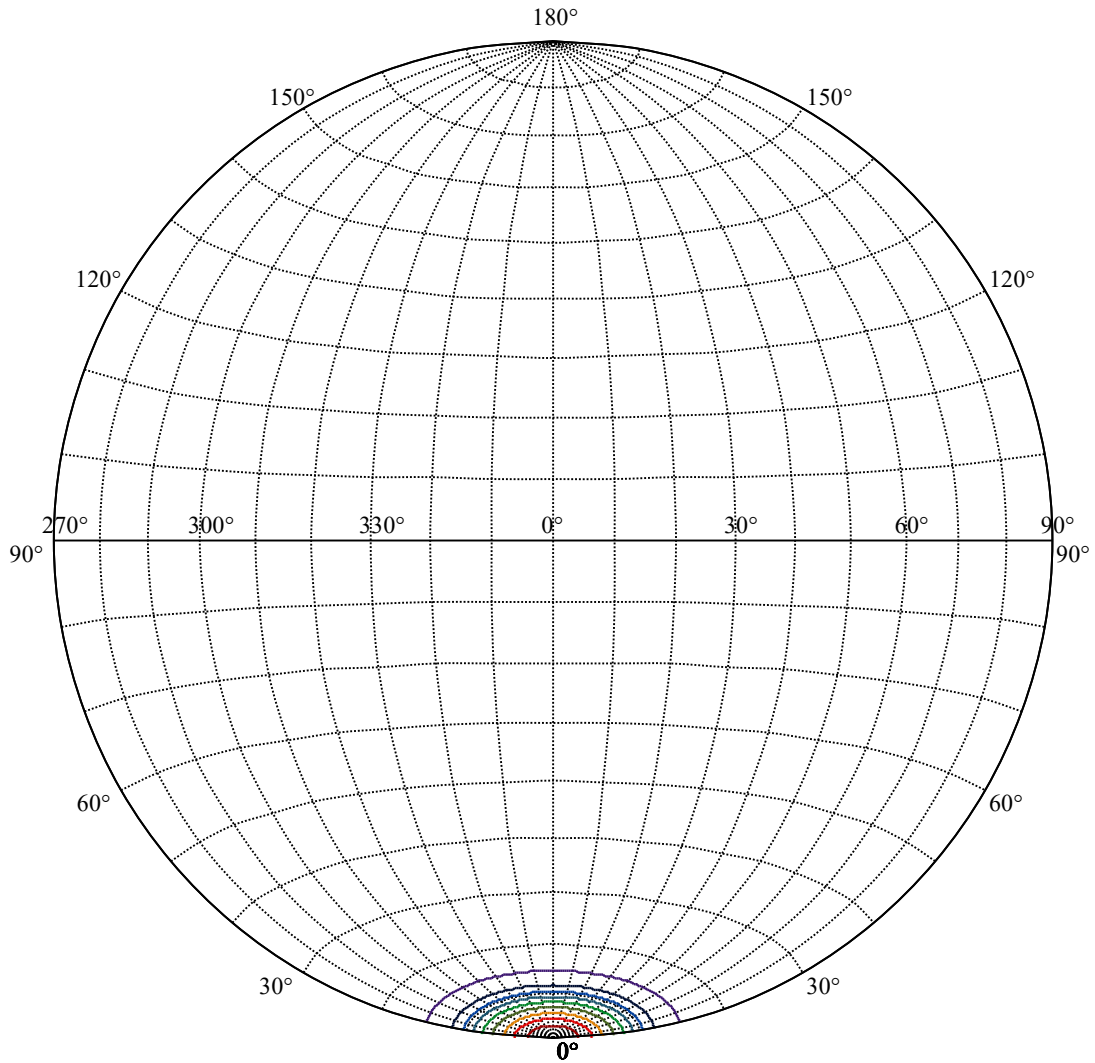
C0(Max): —————
C0/C180: —————
C90/C270: —————

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

Beam Angle(50%Imax):C0/180Left:8.1 Right:8.1
:C90/270Left:8.1 Right:8.1



(10%I _{max}) 1041.36	—
(20%I _{max}) 2082.71	—
(30%I _{max}) 3124.07	—
(40%I _{max}) 4165.42	—
(50%I _{max}) 5206.78	—
(60%I _{max}) 6248.14	—
(70%I _{max}) 7289.49	—
(80%I _{max}) 8330.85	—
(90%I _{max}) 9372.21	—



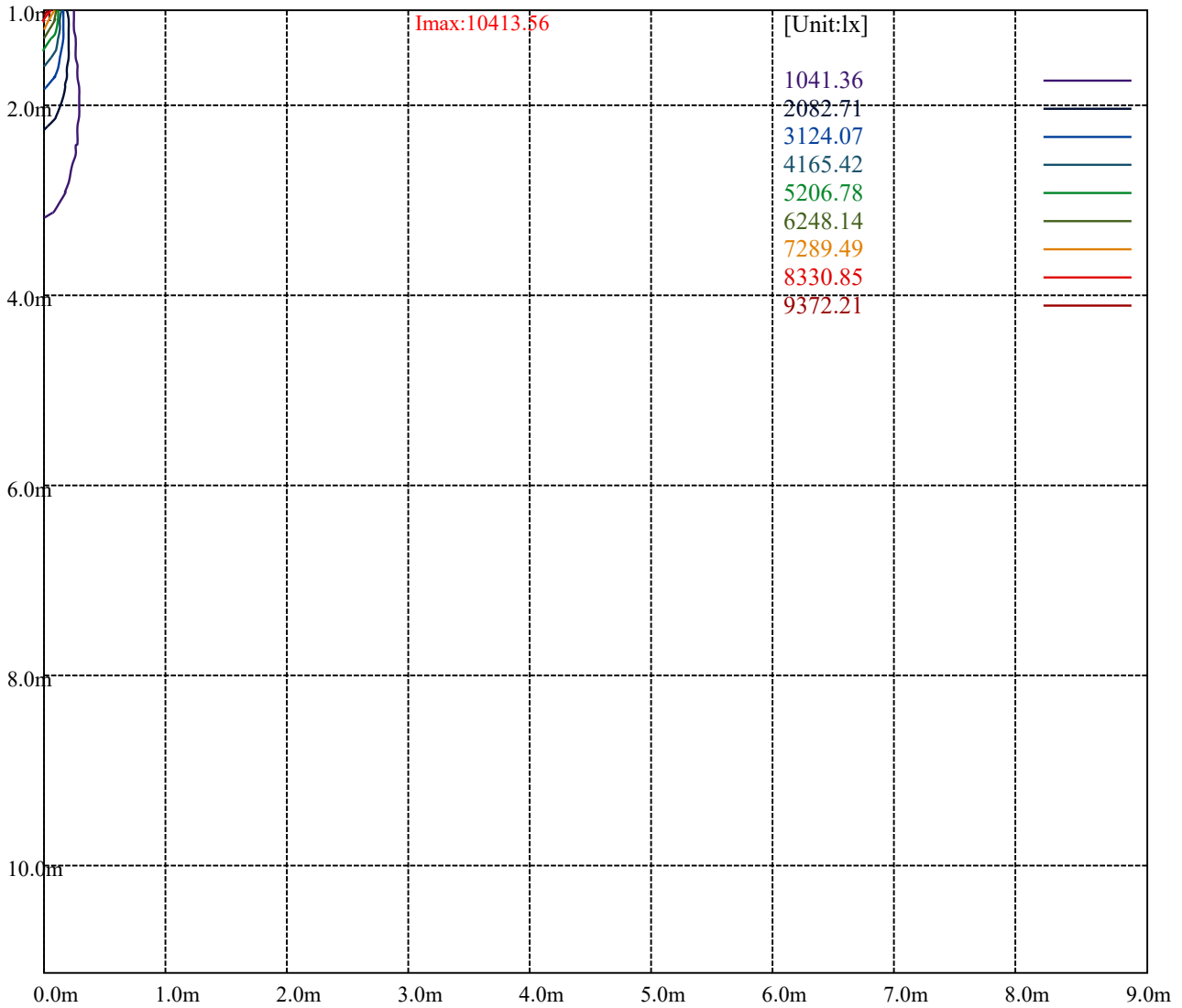
House

[Unit:cd]

Road

Imax:10413.56

(10%Imax) 1041.36	—
(20%Imax) 2082.71	—
(30%Imax) 3124.07	—
(40%Imax) 4165.42	—
(50%Imax) 5206.78	—
(60%Imax) 6248.14	—
(70%Imax) 7289.49	—
(80%Imax) 8330.85	—
(90%Imax) 9372.21	—



Luminance Table

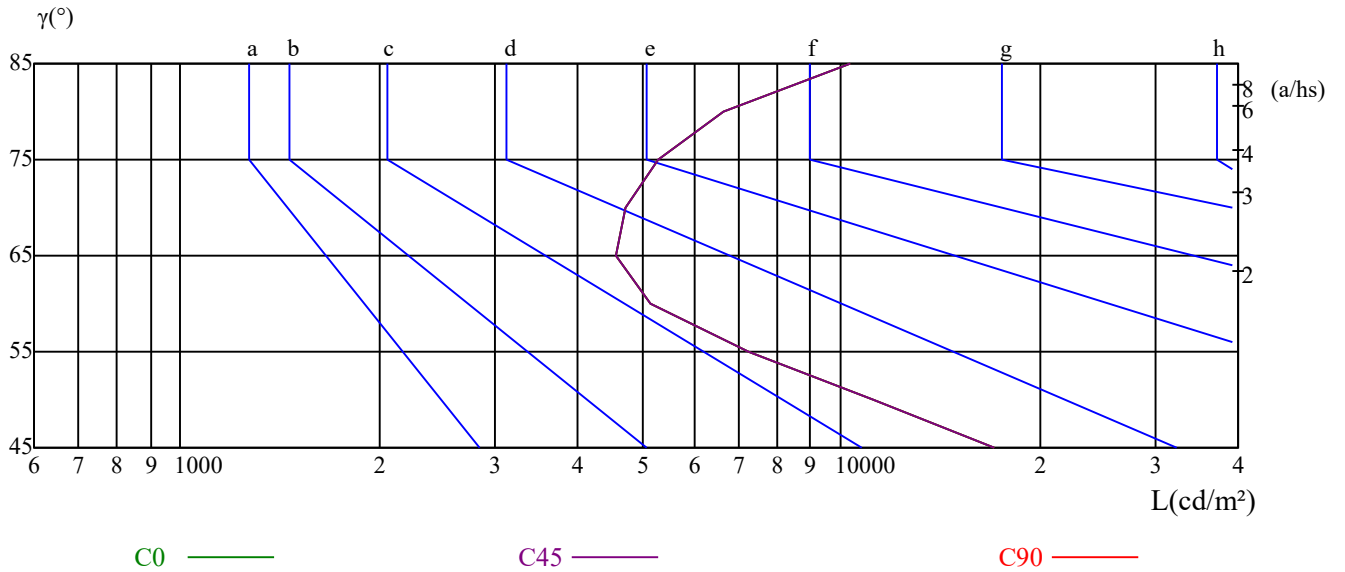
γ	45	50	55	60	65	70	75	80	85
C0	17080	11169	7270	5141	4555	4717	5300	6630	10308
C45	17080	11169	7270	5141	4555	4717	5300	6630	10308
C90	17080	11169	7270	5141	4555	4717	5300	6630	10308

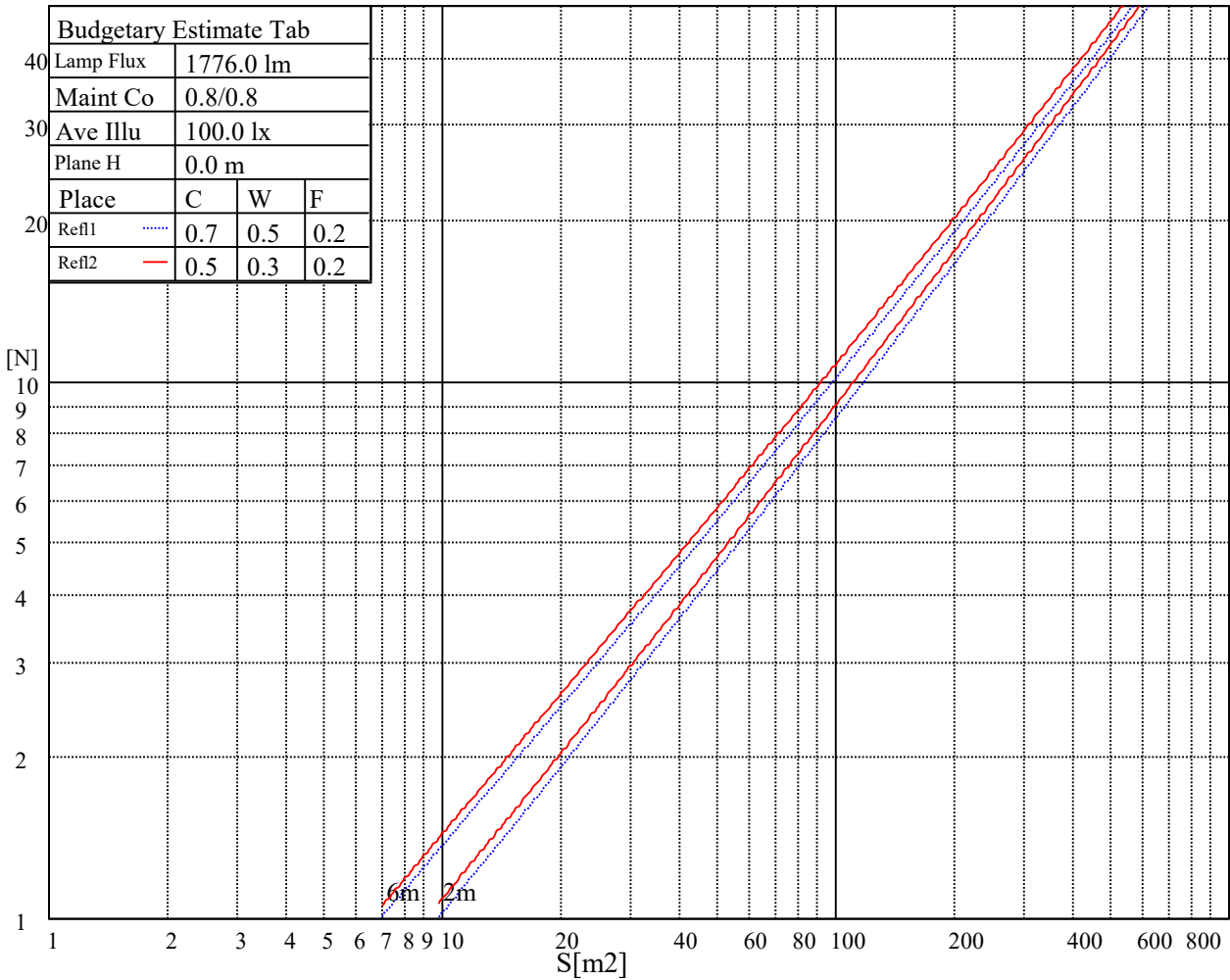
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4555	4555	4555	5300	5300	5300	10308	10308	10308

Glare Table

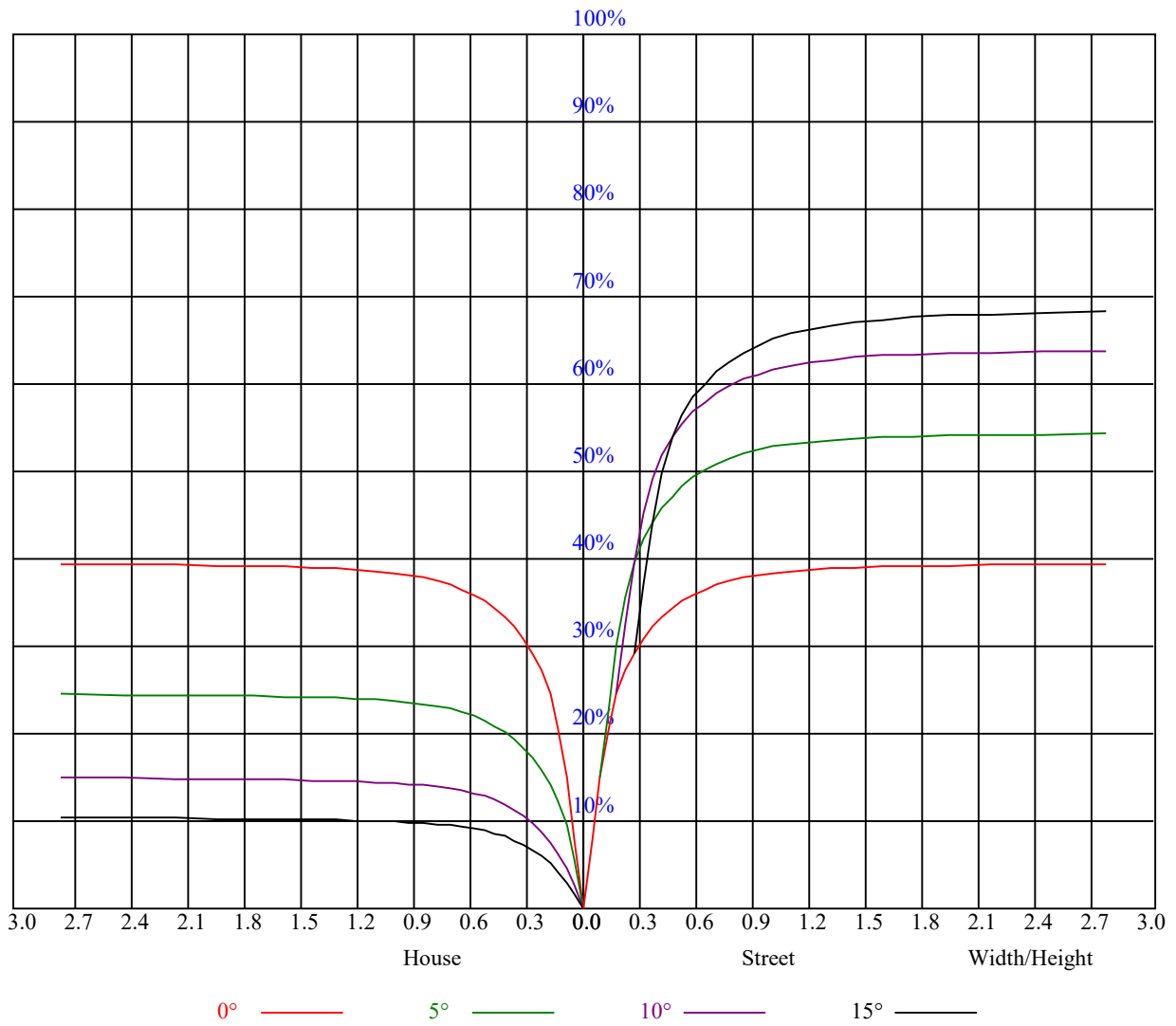
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

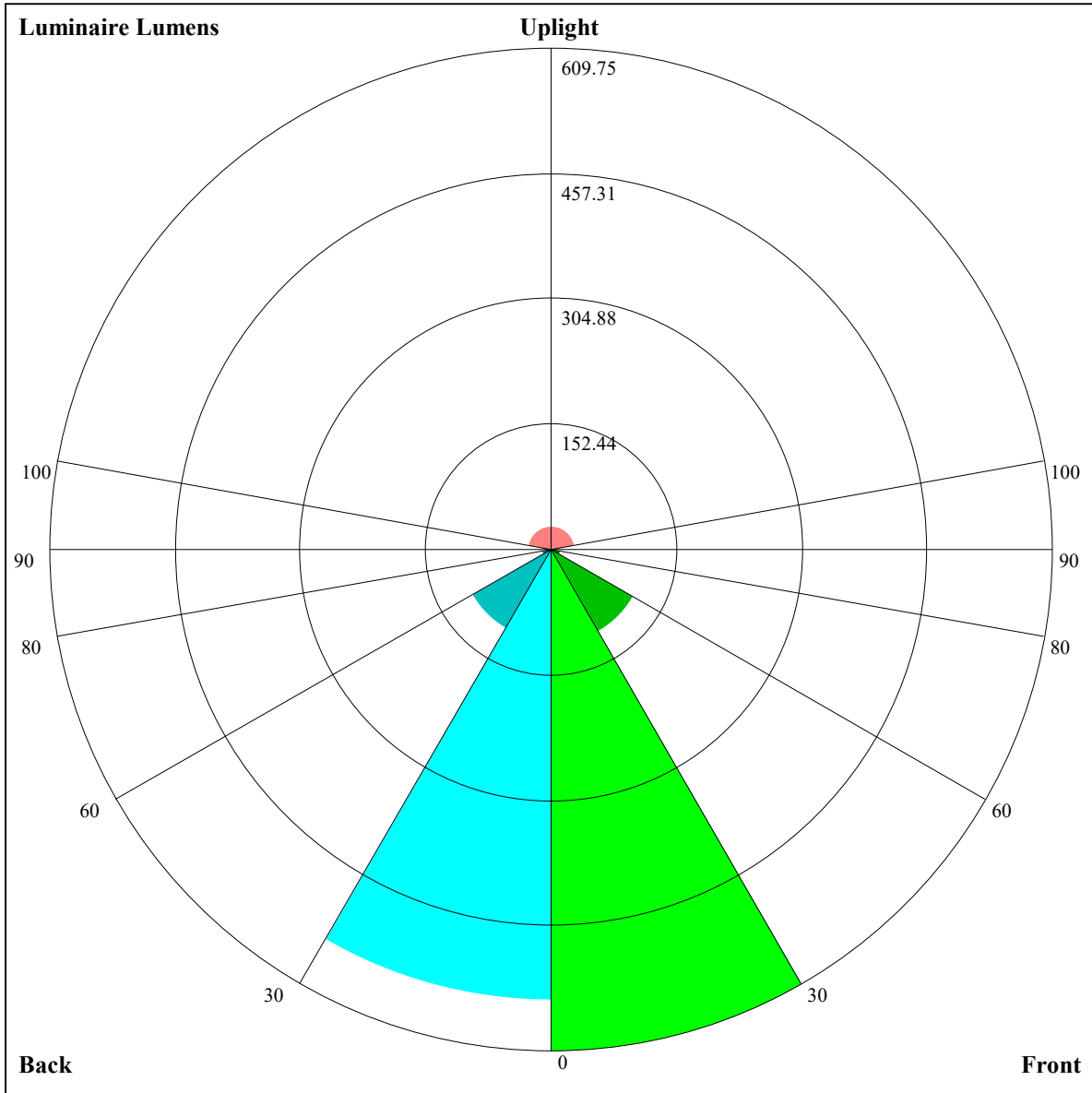
Luminance Limiting Curve





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	0.95	0.95	0.95	0.92	0.92	0.92	0.88	0.88	0.88	0.85	0.85	0.85	0.81	0.81	0.81	0.80
1	0.89	0.87	0.86	0.87	0.86	0.84	0.84	0.83	0.82	0.81	0.80	0.79	0.78	0.78	0.77	0.76
2	0.84	0.81	0.79	0.83	0.80	0.78	0.80	0.78	0.77	0.78	0.76	0.75	0.76	0.75	0.73	0.72
3	0.80	0.77	0.74	0.79	0.76	0.74	0.77	0.74	0.72	0.75	0.73	0.71	0.73	0.72	0.70	0.69
4	0.76	0.73	0.70	0.76	0.72	0.70	0.74	0.71	0.69	0.73	0.70	0.68	0.71	0.69	0.68	0.67
5	0.73	0.70	0.67	0.73	0.69	0.67	0.71	0.69	0.66	0.70	0.68	0.66	0.69	0.67	0.65	0.64
6	0.71	0.67	0.64	0.70	0.67	0.64	0.69	0.66	0.64	0.68	0.65	0.63	0.67	0.65	0.63	0.62
7	0.68	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.62	0.66	0.63	0.61	0.65	0.63	0.61	0.60
8	0.66	0.63	0.60	0.66	0.62	0.60	0.65	0.62	0.60	0.64	0.62	0.60	0.64	0.61	0.59	0.59
9	0.64	0.61	0.58	0.64	0.61	0.58	0.63	0.60	0.58	0.63	0.60	0.58	0.62	0.60	0.58	0.57
10	0.63	0.59	0.57	0.62	0.59	0.57	0.62	0.59	0.57	0.61	0.58	0.57	0.61	0.58	0.56	0.56





Luminaire Lumens:

FL=609.75,FM=115.21,FH=12.77,FVH=3.75

BL=548.48,BM=111.03,BH=12.51,BVH=3.63

UL=5.99,UH=28.51

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	10134.56	10445.63	10479.38	10264.50	9770.63	9087.75	8381.25	7517.81	6742.13
45.0	10562.63	10465.88	10017.00	9426.94	8713.13	7800.75	6823.13	5985.00	5041.13
90.0	10492.31	10213.31	9664.88	8911.69	8155.69	7238.25	6307.88	5509.69	4556.81
135.0	10464.75	10211.63	9633.94	9007.88	8332.31	7531.88	6684.19	5922.00	4991.63
180.0	10134.56	9643.50	9018.00	8152.31	7417.69	6672.38	5819.63	4887.00	3972.94
225.0	10562.63	10432.13	9969.19	9376.31	8680.50	7762.50	6969.94	6197.06	5177.81
270.0	10492.31	10540.69	10284.75	9848.25	9321.75	8460.00	7617.94	6944.63	5985.00
315.0	10464.75	10490.63	10242.00	9753.75	9188.44	8479.69	7669.13	6912.56	6128.44
360.0	10134.56	10445.63	10479.38	10264.50	9770.63	9087.75	8381.25	7517.81	6742.13
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5851.69	4870.13	3920.63	2988.56	2017.69	1487.81	1187.44	1013.06	918.56
45.0	4033.13	3121.88	2217.38	1609.31	1216.13	1038.38	949.50	877.50	797.63
90.0	3673.69	2722.50	1937.81	1457.44	1112.51	1016.83	915.92	843.24	772.88
135.0	3960.00	3050.44	2184.19	1611.00	1229.06	1040.63	938.81	869.63	777.94
180.0	2968.31	2123.44	1587.38	1114.54	1063.13	945.90	856.86	790.65	734.46
225.0	4417.88	3401.44	2466.56	1812.94	1361.81	1119.26	1019.81	931.50	842.46
270.0	5043.94	4252.50	3104.44	2304.00	1701.56	1274.06	1110.94	999.56	893.81
315.0	5141.25	4070.81	3110.06	2190.94	1601.44	1114.43	1050.19	948.83	857.76
360.0	5851.69	4870.13	3920.63	2988.56	2017.69	1487.81	1187.44	1013.06	918.56
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	842.06	780.19	716.63	671.06	623.81	582.19	533.81	492.75	449.44
45.0	741.38	694.13	636.75	591.75	546.19	498.38	451.13	416.81	383.06
90.0	712.63	665.38	620.89	567.23	524.59	484.31	437.51	403.43	373.61
135.0	722.25	681.75	622.13	580.50	543.94	492.19	447.19	418.50	380.81
180.0	673.82	629.89	586.52	532.24	491.79	454.11	411.81	381.94	355.44
225.0	781.48	729.45	679.95	620.61	573.47	527.57	474.98	437.46	404.66
270.0	826.31	767.81	706.50	659.81	614.25	563.06	514.13	473.63	432.56
315.0	785.70	732.54	686.48	632.70	590.79	546.98	494.78	456.41	421.88
360.0	842.06	780.19	716.63	671.06	623.81	582.19	533.81	492.75	449.44
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	410.63	376.31	348.75	324.56	299.25	285.75	253.46	232.93	215.55
45.0	355.50	326.25	300.38	286.31	253.69	234.00	218.53	204.58	188.61
90.0	343.35	314.72	291.32	267.81	248.96	229.44	211.73	197.55	182.19
135.0	353.25	327.94	297.56	286.31	249.75	229.95	215.16	201.83	186.98
180.0	328.16	305.44	281.70	257.29	241.37	223.82	206.72	196.20	185.18
225.0	371.59	341.61	317.14	293.01	272.93	252.62	234.34	219.71	204.53
270.0	394.88	365.06	334.69	310.50	285.75	269.55	244.46	228.15	209.42
315.0	387.06	355.50	329.51	303.02	280.35	256.11	235.13	219.26	202.95
360.0	410.63	376.31	348.75	324.56	299.25	285.75	253.46	232.93	215.55
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	201.49	188.66	174.32	163.52	153.68	143.38	133.26	123.58	112.28
45.0	176.85	166.44	155.48	145.69	135.79	125.61	113.96	104.40	92.81
90.0	169.65	159.36	150.19	139.11	130.44	121.28	109.97	99.06	89.72
135.0	175.61	165.49	155.25	145.97	137.14	126.79	115.71	106.26	95.51
180.0	171.39	163.52	154.69	144.90	135.17	123.69	111.83	99.90	90.11
225.0	190.52	179.21	169.14	157.73	148.61	140.23	128.98	117.17	106.54
270.0	195.19	182.76	170.33	159.08	149.96	139.73	129.49	119.03	107.44
315.0	188.16	176.40	165.77	153.51	144.51	135.68	123.86	113.91	103.95
360.0	201.49	188.66	174.32	163.52	153.68	143.38	133.26	123.58	112.28

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	101.08	91.52	81.73	73.86	66.21	59.74	54.84	50.06	44.38
45.0	83.93	74.76	66.94	61.26	55.58	50.29	45.79	41.51	36.56
90.0	80.04	71.49	65.08	58.84	53.94	48.77	43.20	39.43	35.33
135.0	85.50	76.44	68.18	61.93	56.36	50.29	45.73	41.34	36.11
180.0	80.33	72.84	65.64	59.23	53.94	48.15	42.53	38.03	34.09
225.0	94.89	84.43	76.05	68.12	62.16	55.97	50.18	45.34	40.73
270.0	97.03	86.23	76.84	69.41	63.23	56.53	51.58	46.80	41.18
315.0	91.80	82.69	74.64	66.71	60.92	55.07	48.99	45.17	40.84
360.0	101.08	91.52	81.73	73.86	66.21	59.74	54.84	50.06	44.38
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	39.94	35.66	31.22	28.35	25.82	23.34	21.21	19.52	17.78
45.0	32.29	29.31	26.89	24.08	22.05	20.36	18.39	17.04	15.98
90.0	30.99	28.18	25.71	23.06	21.32	19.63	18.06	16.71	15.69
135.0	32.40	29.48	26.66	23.96	21.94	20.03	18.45	17.04	15.86
180.0	29.93	27.17	24.69	22.33	20.25	18.62	17.10	15.92	15.24
225.0	35.49	31.95	29.03	25.76	23.51	21.43	19.46	17.83	16.54
270.0	36.90	33.13	29.53	26.55	24.30	22.05	20.03	18.51	16.99
315.0	35.10	31.84	28.74	25.26	23.34	21.38	19.41	17.72	16.37
360.0	39.94	35.66	31.22	28.35	25.82	23.34	21.21	19.52	17.78
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	16.43	15.47	14.91	14.40	13.84	13.33	12.88	12.43	11.98
45.0	15.19	14.57	14.06	13.56	13.11	12.54	12.09	11.76	11.36
90.0	15.02	14.51	13.95	13.44	12.99	12.49	12.09	11.70	11.36
135.0	15.30	14.63	14.06	13.61	13.16	12.60	12.21	11.81	11.36
180.0	14.68	14.12	13.56	13.11	12.66	12.26	11.76	11.42	11.14
225.0	15.64	15.02	14.46	13.84	13.39	12.88	12.43	12.04	11.64
270.0	15.98	15.30	14.68	14.12	13.67	13.16	12.71	12.32	11.81
315.0	15.30	14.74	14.23	13.67	13.22	12.77	12.32	11.98	11.64
360.0	16.43	15.47	14.91	14.40	13.84	13.33	12.88	12.43	11.98
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	11.53	11.25	10.91	10.58	10.29	10.01	9.68	9.45	9.06
45.0	10.97	10.74	10.52	10.13	9.84	9.62	9.23	8.78	8.55
90.0	10.97	10.63	10.35	9.96	9.68	9.39	9.00	8.66	8.27
135.0	11.03	10.69	10.35	10.01	9.73	9.45	9.06	8.72	8.33
180.0	10.69	10.41	10.18	9.79	9.45	9.11	8.78	8.33	7.93
225.0	11.19	10.86	10.52	10.18	9.90	9.62	9.34	8.94	8.55
270.0	11.42	11.08	10.80	10.35	10.18	9.84	9.56	9.17	8.78
315.0	11.14	10.86	10.52	10.18	9.90	9.62	9.39	9.00	8.66
360.0	11.53	11.25	10.91	10.58	10.29	10.01	9.68	9.45	9.06
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.72	8.27	7.93	7.48	7.14	6.75	6.41	6.13	5.79
45.0	8.10	7.71	7.31	6.92	6.58	6.19	5.91	5.68	5.51
90.0	7.82	7.48	7.14	6.75	6.41	6.08	5.85	5.63	5.46
135.0	7.88	7.48	7.14	6.75	6.47	6.13	5.85	5.57	5.40
180.0	7.59	7.20	6.86	6.47	6.13	5.85	5.63	5.51	5.46
225.0	8.16	7.76	7.43	7.03	6.75	6.36	6.08	5.74	5.63
270.0	8.44	8.04	7.65	7.26	6.86	6.53	6.24	5.85	5.63
315.0	8.27	7.88	7.54	7.14	6.81	6.47	6.13	5.85	5.57
360.0	8.72	8.27	7.93	7.48	7.14	6.75	6.41	6.13	5.79

Intensity data(cd)

C/γ(°)	90.0
0.0	5.51
45.0	5.46
90.0	5.46
135.0	5.46
180.0	5.51
225.0	5.51
270.0	5.51
315.0	5.51
360.0	5.51