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NATA

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Client:

LumCAT: 3-1546-A3

Luminaire: 99.02.73.172+92.76.365.00

Report No: nata-0100

Voltage(V): 36.3000

Test No: GC2018111510

Current(A): 0.5500

LampCAT: OSRAM SOLERIQ S15

Power (W): 20.3280

Lamp flux(lm): 2616.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 84

Width(mm): 84

Phm Type: C

Height(mm): 0

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Photometric Results

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Lumens(lm): 2395.47, Efficiency(%): 91.57% , Luminous Efficacy(lm/W): 117.84

Central intensity(cd): 8855.719, Maximum intensity(cd): 8855.719

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=25.0

[C90/270]Total=25.0

Field angle(10%Imax): [C0/180]Total=56.4

[C90/270]Total=56.4

Maximum s/h(1/2): C0\_180=0.42 C90\_270=0.42

Maximum s/h(1/4): C0\_180=0.42 C90\_270=0.42

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.65%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 98.613%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	8855.719	2.119	2.119	.081%	.088%
1.0	8834.766	16.908	19.027	.646%	.794%
2.0	8750.320	33.488	52.515	1.280%	2.192%
3.0	8609.836	49.414	101.929	1.889%	4.255%
4.0	8409.586	64.330	166.259	2.459%	6.941%
5.0	8088.258	77.304	243.563	2.955%	10.168%
6.0	7722.984	88.526	332.089	3.384%	13.863%
7.0	7329.867	97.959	430.048	3.745%	17.953%
8.0	6806.039	103.873	533.92	3.971%	22.289%
9.0	6330.516	108.598	642.519	4.151%	26.822%
10.0	5798.039	110.409	752.927	4.221%	31.431%
11.0	5187.445	108.544	861.471	4.149%	35.963%
12.0	4693.570	107.012	968.483	4.091%	40.430%
13.0	4159.898	102.618	1071.101	3.923%	44.714%
14.0	3573.070	94.791	1165.892	3.624%	48.671%
15.0	3143.602	89.223	1255.115	3.411%	52.395%
16.0	2734.664	82.660	1337.775	3.160%	55.846%
17.0	2285.508	73.277	1411.052	2.801%	58.905%
18.0	2011.570	68.166	1479.218	2.606%	61.751%
19.0	1763.508	62.961	1542.179	2.407%	64.379%
20.0	1519.313	56.984	1599.163	2.178%	66.758%
21.0	1335.157	52.470	1651.633	2.006%	68.948%
22.0	1220.295	50.129	1701.762	1.916%	71.041%
23.0	1101.312	47.189	1748.951	1.804%	73.011%
24.0	1038.178	46.306	1795.257	1.770%	74.944%
25.0	984.762	45.638	1840.896	1.745%	76.849%
26.0	944.866	45.422	1886.318	1.736%	78.745%
27.0	914.829	45.545	1931.862	1.741%	80.647%
28.0	889.854	45.812	1977.674	1.751%	82.559%
29.0	868.655	46.182	2023.856	1.765%	84.487%
30.0	848.018	46.497	2070.353	1.777%	86.428%
31.0	823.282	46.499	2116.852	1.777%	88.369%
32.0	772.566	44.895	2161.747	1.716%	90.243%
33.0	703.209	42.000	2203.746	1.605%	91.997%
34.0	615.002	37.713	2241.459	1.442%	93.571%
35.0	499.423	31.413	2272.872	1.201%	94.882%
36.0	382.753	24.671	2297.543	.943%	95.912%
37.0	301.556	19.901	2317.445	.761%	96.743%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	183.248	12.372	2329.817	.473%	97.259%
39.0	103.662	7.154	2336.971	.273%	97.558%
40.0	54.478	3.840	2340.811	.147%	97.718%
41.0	34.495	2.482	2343.292	.095%	97.822%
42.0	26.360	1.934	2345.227	.074%	97.903%
43.0	22.127	1.655	2346.882	.063%	97.972%
44.0	17.733	1.351	2348.232	.052%	98.028%
45.0	15.138	1.174	2349.406	.045%	98.077%
46.0	13.008	1.026	2350.432	.039%	98.120%
47.0	12.227	0.981	2351.413	.037%	98.161%
48.0	11.974	0.976	2352.389	.037%	98.202%
49.0	11.777	0.975	2353.363	.037%	98.242%
50.0	11.609	0.975	2354.339	.037%	98.283%
51.0	11.440	0.975	2355.314	.037%	98.324%
52.0	11.320	0.978	2356.292	.037%	98.365%
53.0	11.215	0.982	2357.274	.038%	98.406%
54.0	11.095	0.984	2358.258	.038%	98.447%
55.0	11.004	0.988	2359.247	.038%	98.488%
56.0	10.927	0.993	2360.24	.038%	98.529%
57.0	10.814	0.995	2361.235	.038%	98.571%
58.0	10.737	0.998	2362.233	.038%	98.613%
59.0	10.680	1.004	2363.237	.038%	98.655%
60.0	10.617	1.008	2364.246	.039%	98.697%
61.0	10.547	1.012	2365.257	.039%	98.739%
62.0	10.498	1.016	2366.274	.039%	98.781%
63.0	10.441	1.020	2367.294	.039%	98.824%
64.0	10.392	1.024	2368.318	.039%	98.867%
65.0	10.357	1.029	2369.347	.039%	98.910%
66.0	10.315	1.033	2370.381	.040%	98.953%
67.0	10.273	1.037	2371.418	.040%	98.996%
68.0	10.223	1.039	2372.457	.040%	99.039%
69.0	10.202	1.044	2373.502	.040%	99.083%
70.0	10.181	1.049	2374.551	.040%	99.127%
71.0	10.153	1.053	2375.604	.040%	99.171%
72.0	10.118	1.055	2376.659	.040%	99.215%
73.0	10.104	1.060	2377.718	.041%	99.259%
74.0	10.090	1.064	2378.782	.041%	99.304%
75.0	10.062	1.066	2379.848	.041%	99.348%

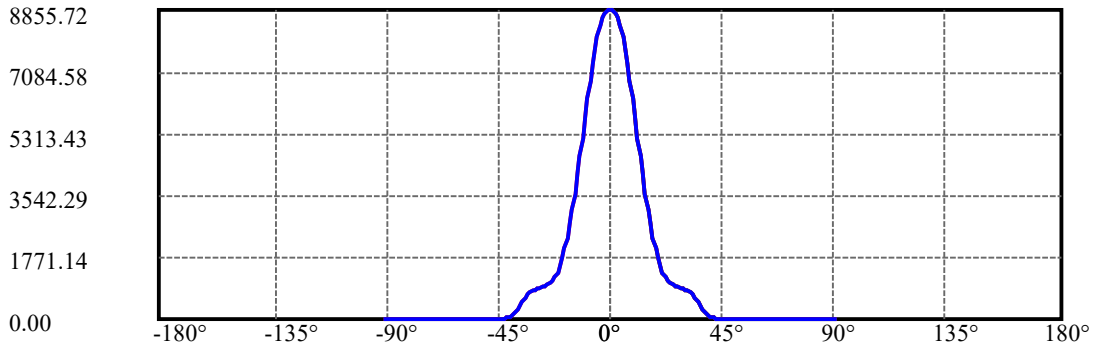
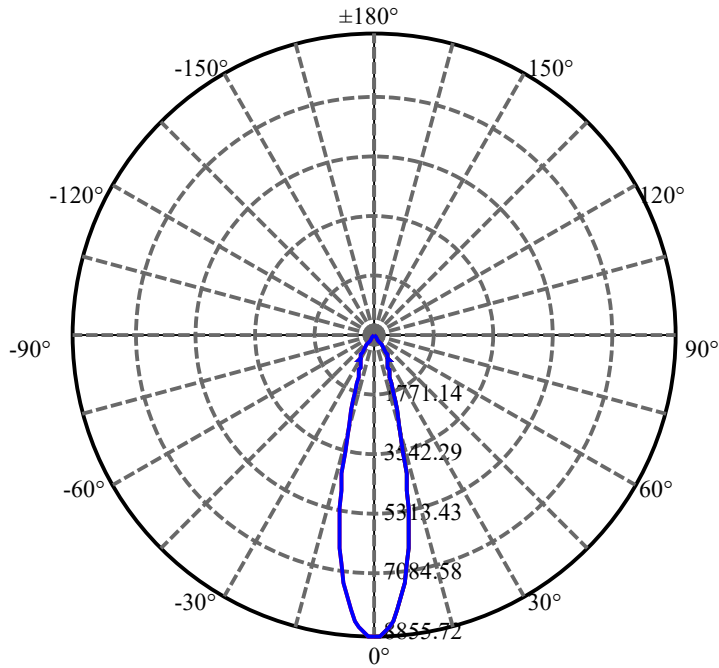
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	10.041	1.068	2380.916	.041%	99.393%
77.0	10.020	1.071	2381.987	.041%	99.437%
78.0	9.998	1.072	2383.059	.041%	99.482%
79.0	9.970	1.073	2384.132	.041%	99.527%
80.0	9.956	1.075	2385.208	.041%	99.572%
81.0	9.949	1.078	2386.285	.041%	99.617%
82.0	9.935	1.079	2387.364	.041%	99.662%
83.0	9.928	1.081	2388.445	.041%	99.707%
84.0	9.921	1.082	2389.527	.041%	99.752%
85.0	9.942	1.086	2390.613	.042%	99.797%
86.0	9.872	1.080	2391.693	.041%	99.842%
87.0	9.858	1.080	2392.772	.041%	99.888%
88.0	9.844	1.079	2393.851	.041%	99.933%
89.0	9.816	1.076	2394.927	.041%	99.978%
90.0	9.830	0.539	2395.466	.021%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2070.35	79.14%	86.43%
0-40	2340.81	89.48%	97.72%
0-60	2364.25	90.38%	98.70%
0-90	2394.93	91.55%	99.98%
0-120	2394.93	91.55%	99.98%
0-180	2395.47	91.57%	100.00%
60-90	31.69	1.21%	1.32%
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%
0-26.66	1916.37	73.26%	80.00%

ZONAL LUMEN SUMMARY

0-10	752.93
10-20	846.24
20-30	471.19
30-40	270.46
40-50	13.53
50-60	9.91
60-70	10.31
70-80	10.66
80-90	9.72
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: —————

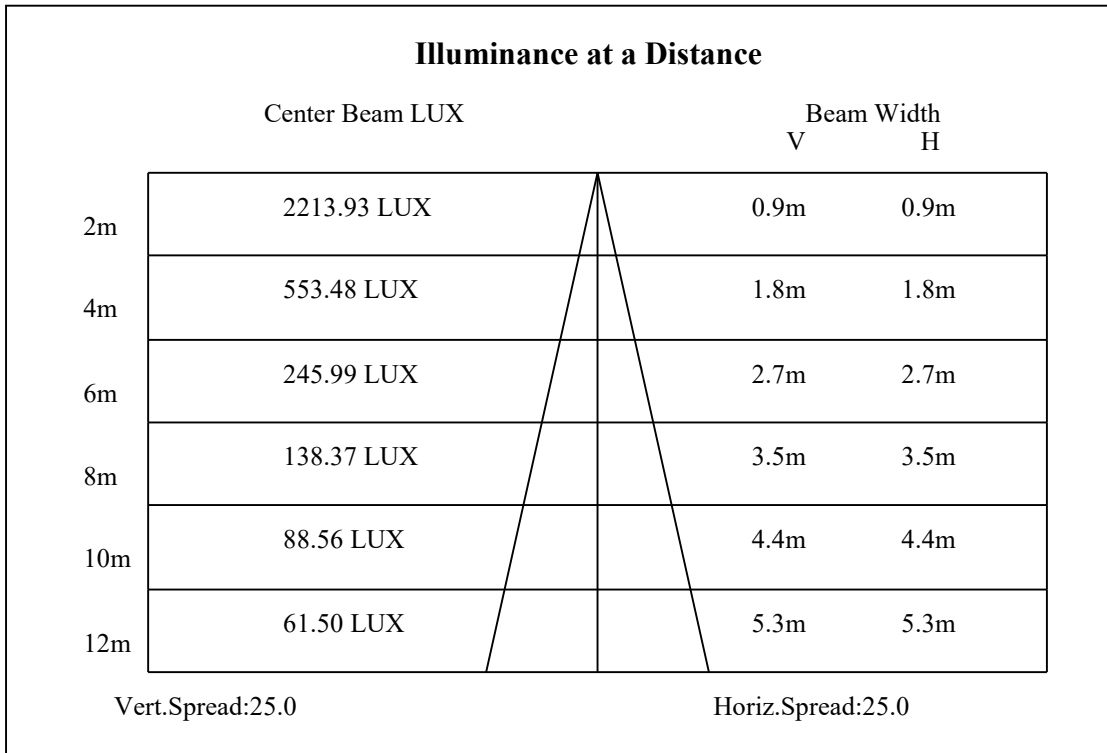
C90/C270: —————

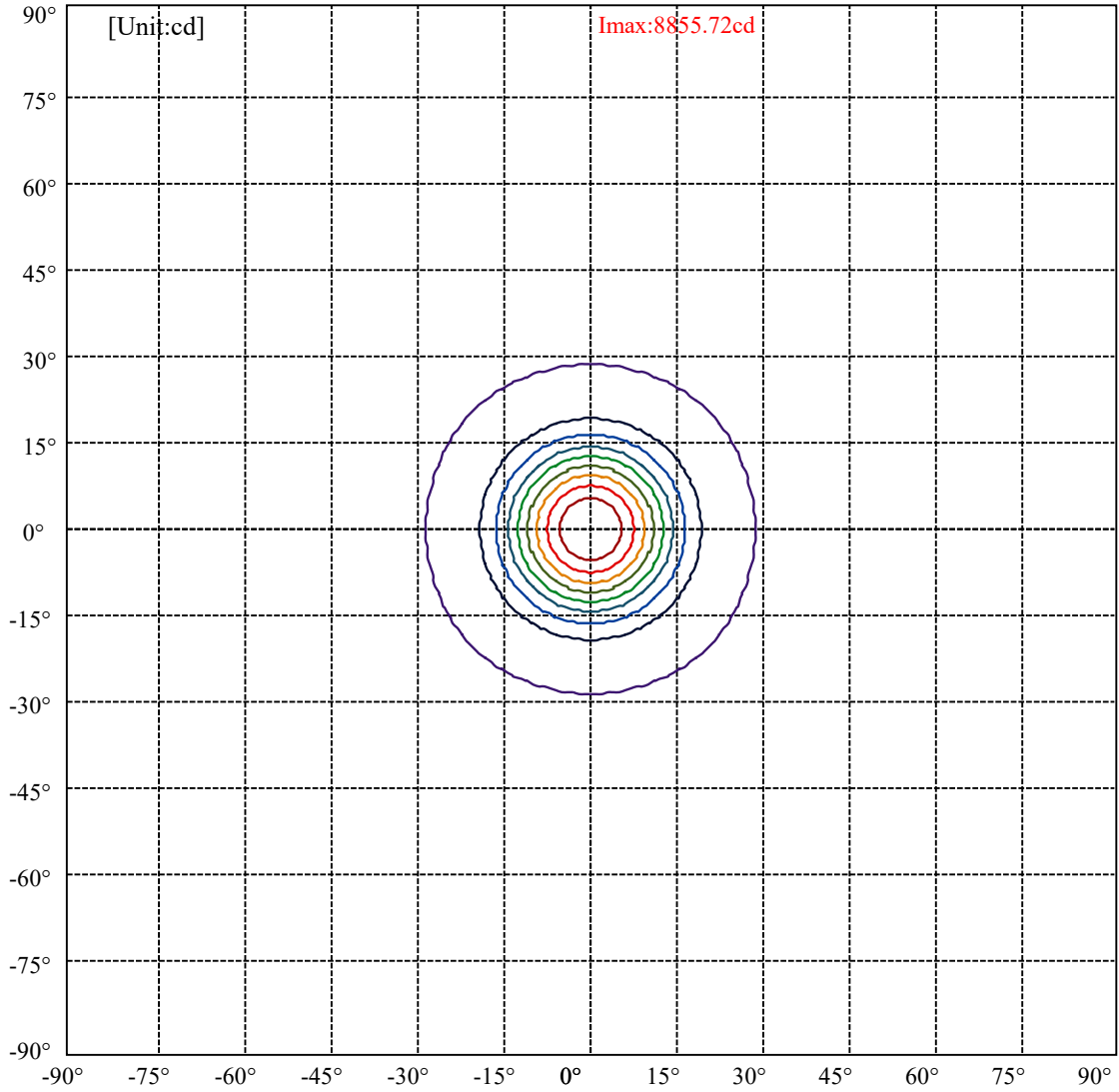
Field angle(10%Imax):C0/180Left:28.2 Right:28.2

:C90/270Left:28.2 Right:28.2

Beam Angle(50%Imax):C0/180Left:12.5 Right:12.5

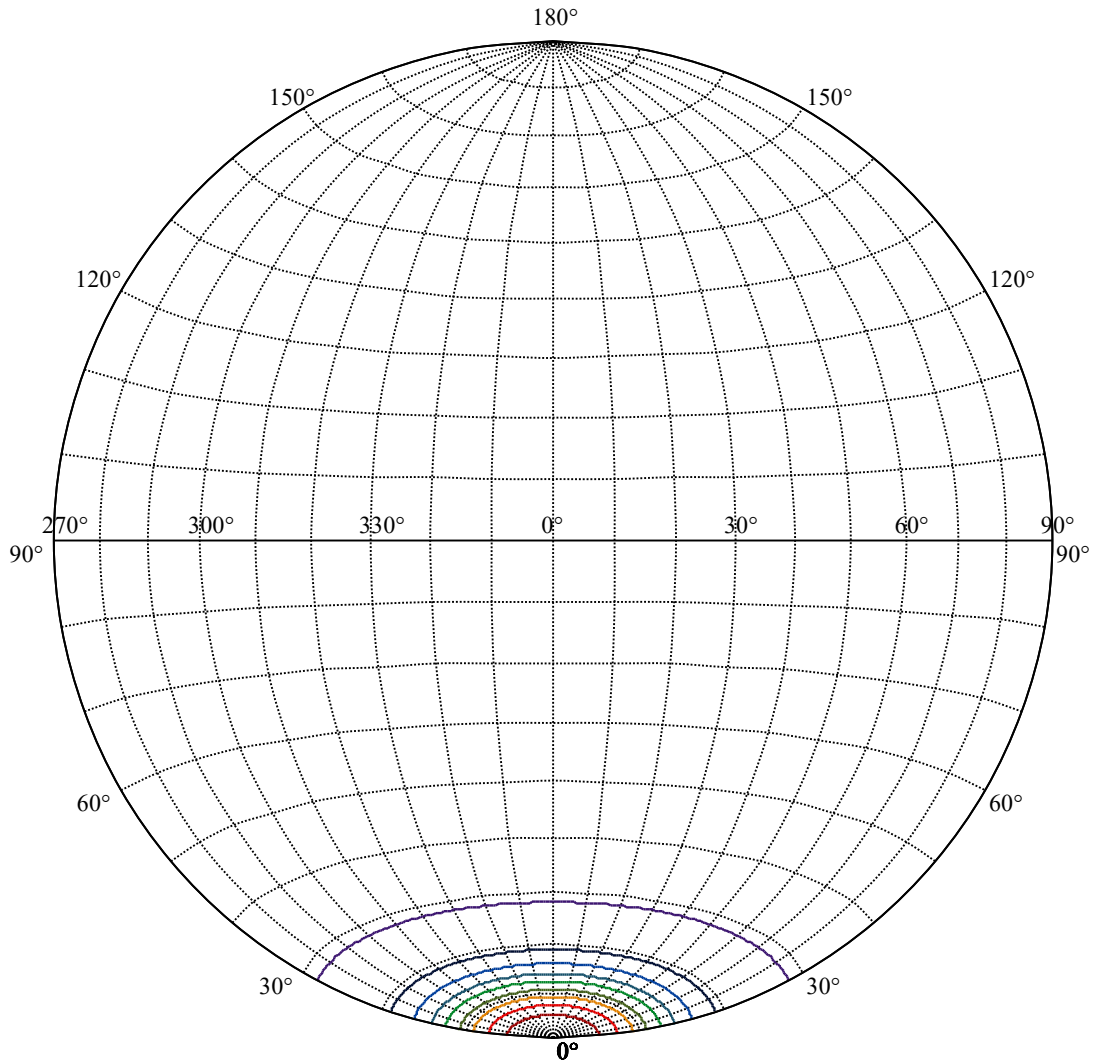
:C90/270Left:12.5 Right:12.5





(10%Imax) 885.572	—
(20%Imax) 1771.14	—
(30%Imax) 2656.72	—
(40%Imax) 3542.29	—
(50%Imax) 4427.86	—
(60%Imax) 5313.43	—
(70%Imax) 6199	—
(80%Imax) 7084.58	—
(90%Imax) 7970.15	—





House

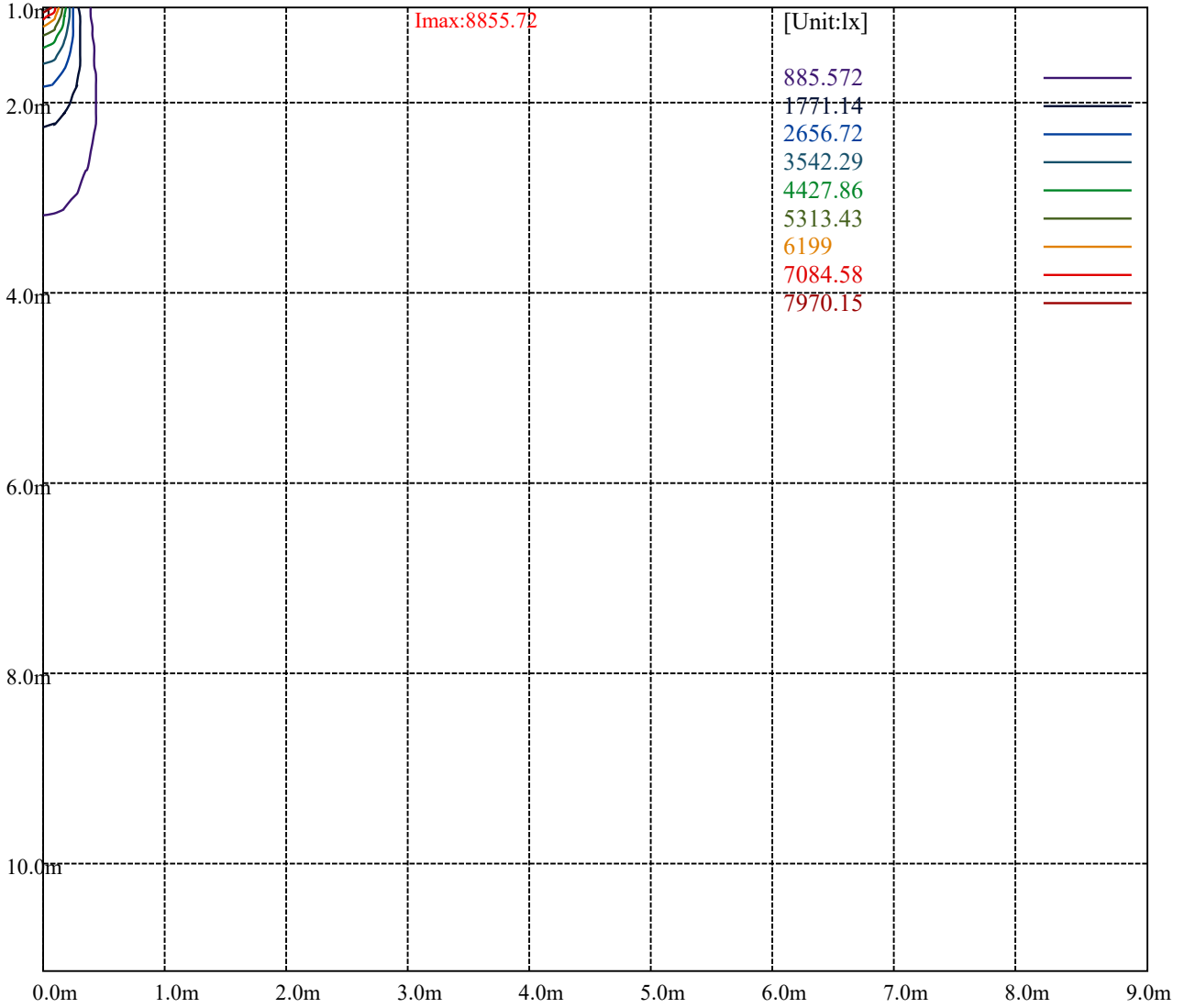
[Unit:cd]

Road

**Imax:8855.72**

(10%Imax)	885.572	—
(20%Imax)	1771.14	—
(30%Imax)	2656.72	—
(40%Imax)	3542.29	—
(50%Imax)	4427.86	—
(60%Imax)	5313.43	—
(70%Imax)	6199	—
(80%Imax)	7084.58	—
(90%Imax)	7970.15	—





Luminance Table

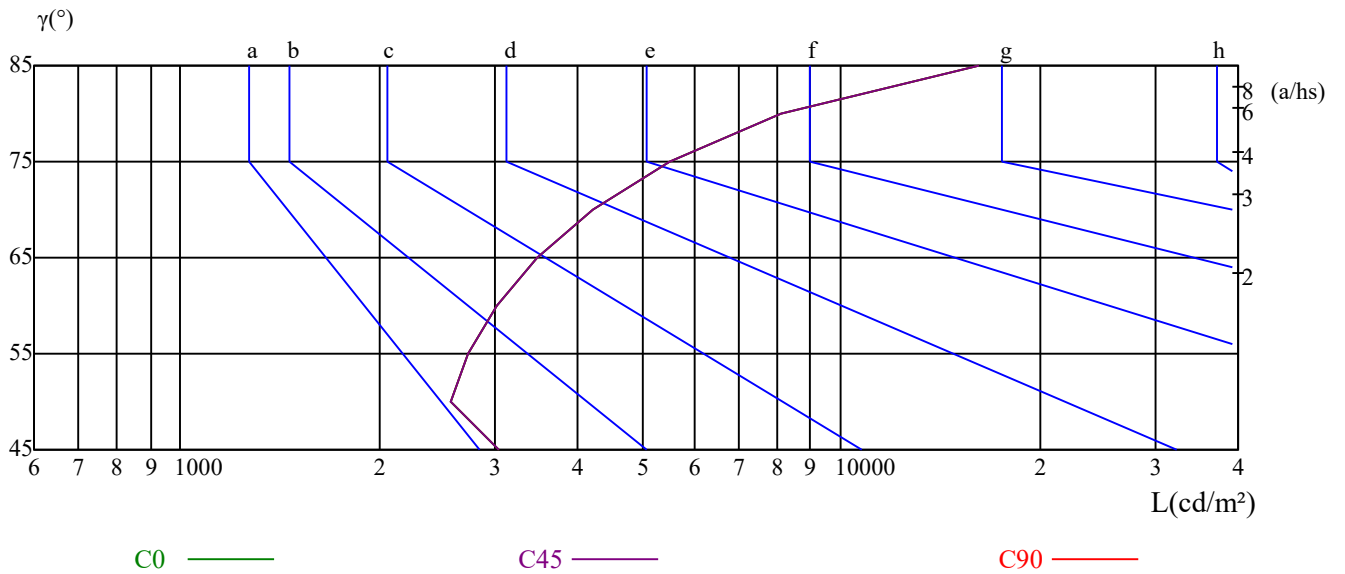
$\gamma$	45	50	55	60	65	70	75	80	85
C0	3034	2559	2719	3009	3473	4219	5510	8126	16167
C45	3034	2559	2719	3009	3473	4219	5510	8126	16167
C90	3034	2559	2719	3009	3473	4219	5510	8126	16167

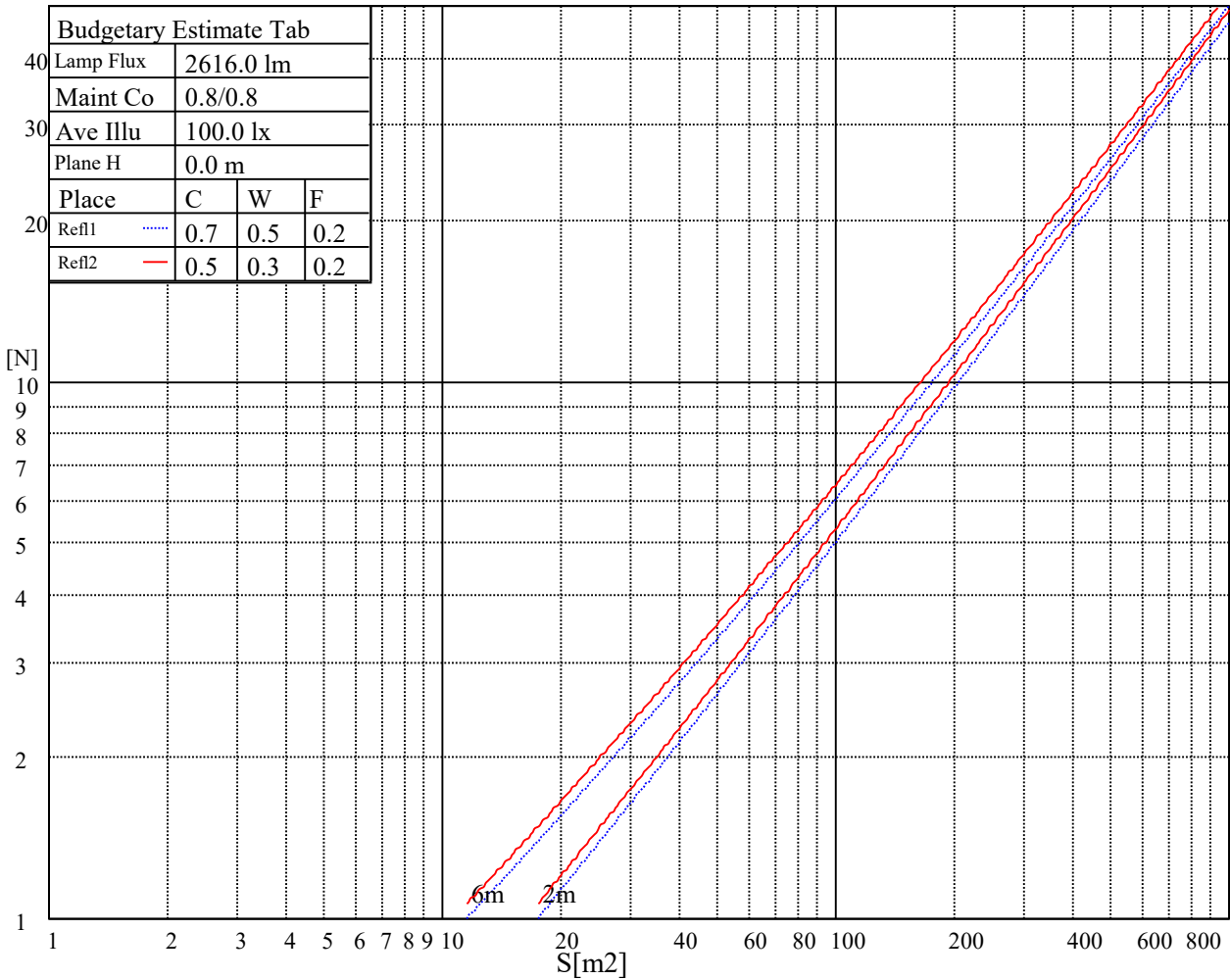
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3473	3473	3473	5510	5510	5510	16167	16167	16167

Glare Table

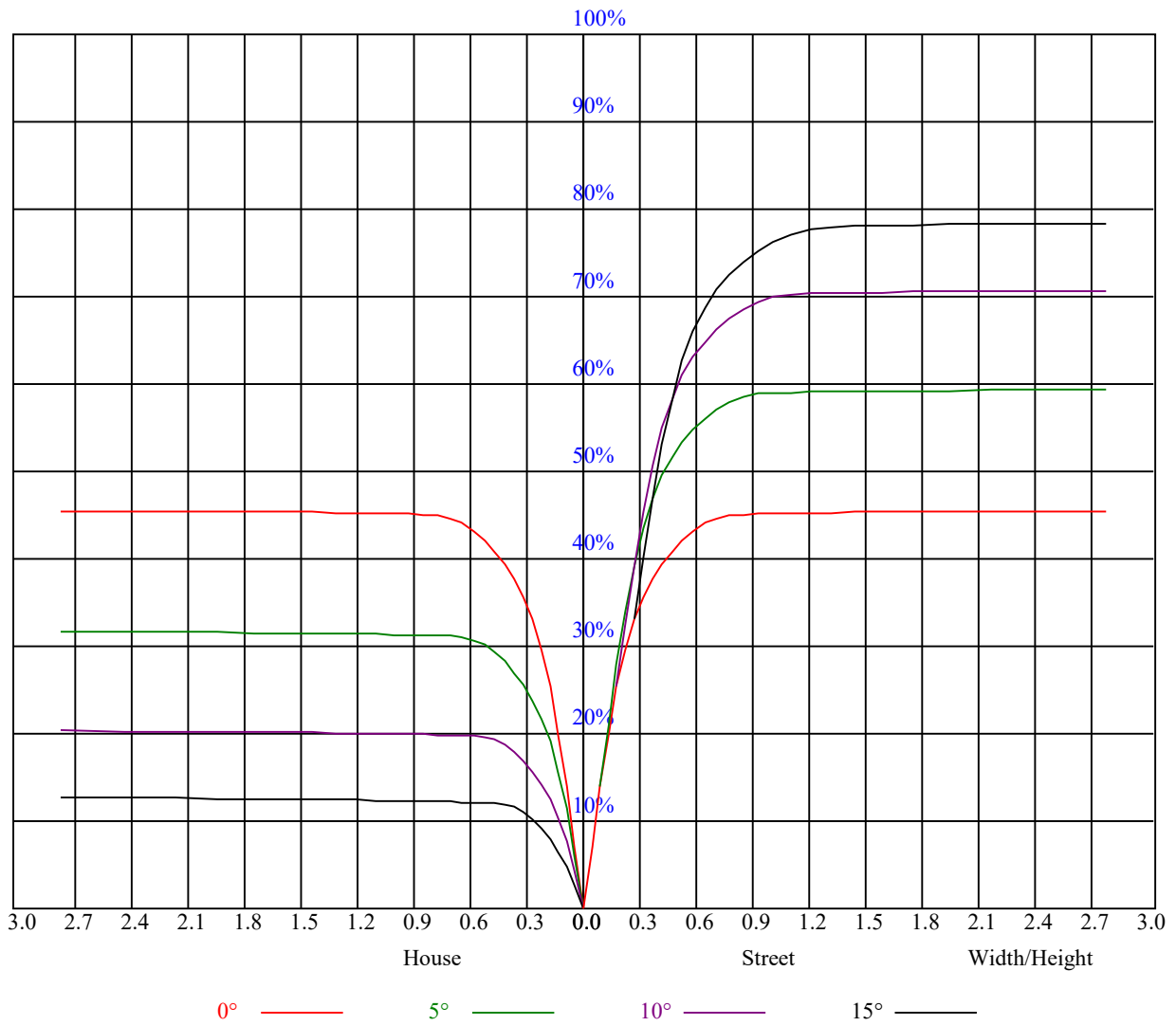
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

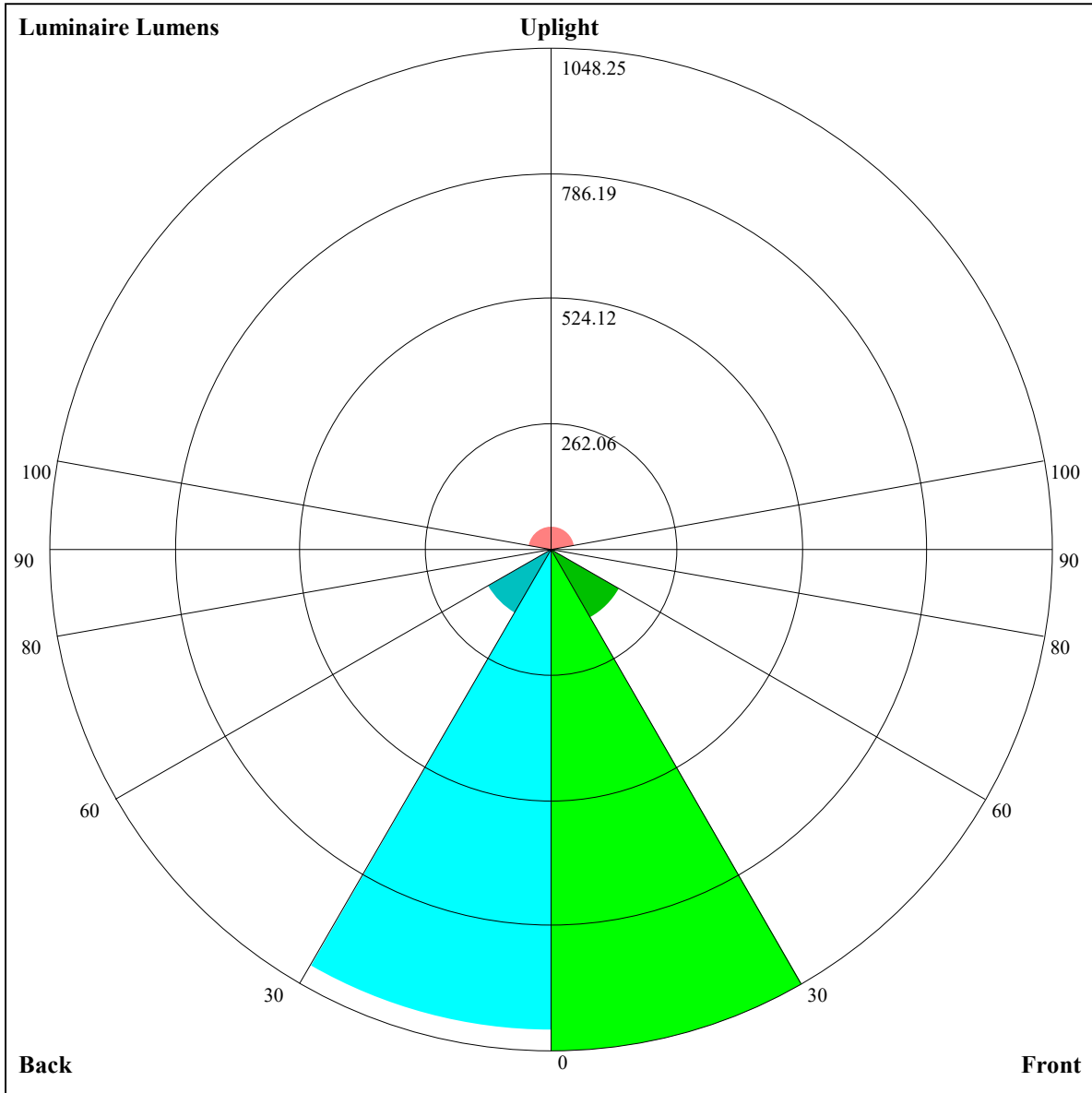
Luminance Limiting Curve





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	1.07	1.07	1.07	1.02	1.02	1.02	0.97	0.97	0.97	0.94	0.94	0.94	0.92
1	1.03	1.01	0.99	1.01	0.99	0.97	0.97	0.96	0.94	0.94	0.92	0.91	0.90	0.90	0.89	0.87
2	0.97	0.94	0.91	0.96	0.93	0.90	0.93	0.90	0.88	0.90	0.88	0.87	0.87	0.86	0.85	0.83
3	0.92	0.89	0.86	0.91	0.88	0.85	0.89	0.86	0.84	0.87	0.84	0.82	0.85	0.83	0.81	0.80
4	0.88	0.84	0.81	0.87	0.83	0.80	0.85	0.82	0.79	0.83	0.81	0.79	0.82	0.80	0.78	0.77
5	0.84	0.80	0.77	0.83	0.80	0.77	0.82	0.79	0.76	0.81	0.78	0.75	0.79	0.77	0.75	0.74
6	0.81	0.77	0.73	0.80	0.76	0.73	0.79	0.75	0.73	0.78	0.75	0.72	0.77	0.74	0.72	0.71
7	0.78	0.73	0.70	0.77	0.73	0.70	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.71	0.69	0.68
8	0.75	0.71	0.68	0.74	0.70	0.68	0.74	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.66
9	0.72	0.68	0.65	0.72	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.65	0.70	0.67	0.65	0.64
10	0.70	0.66	0.63	0.70	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.68	0.65	0.63	0.62





Luminaire Lumens:

FL=1048.25,FM=164.32,FH=10.48,FVH=5.41

BL=1004.5,BM=152.99,BH=10.47,BVH=5.4

UL=10.72,UH=51.04

BUG Rating:B3-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	8838.56	8867.25	8851.50	8785.69	8668.13	8457.19	8161.31	7834.50	7409.25
45.0	8865.56	8812.69	8682.19	8503.31	8255.81	7899.19	7470.56	7038.56	6517.69
90.0	8850.94	8787.94	8654.63	8434.69	8163.56	7732.13	7319.25	6864.19	6238.69
135.0	8867.81	8830.69	8707.50	8541.00	8309.25	7967.25	7538.06	7106.06	6586.88
180.0	8838.56	8769.94	8593.88	8379.56	8108.44	7681.50	7270.31	6808.50	6179.06
225.0	8865.56	8868.38	8831.25	8722.69	8547.19	8273.25	7941.94	7587.56	7061.63
270.0	8850.94	8871.19	8849.25	8788.50	8664.75	8431.88	8123.06	7795.69	7360.88
315.0	8867.81	8870.06	8832.38	8723.25	8559.56	8263.69	7959.38	7603.88	7094.25
360.0	8838.56	8867.25	8851.50	8785.69	8668.13	8457.19	8161.31	7834.50	7409.25
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	6929.44	6466.50	5891.63	5361.19	4763.81	4186.69	3698.44	3247.31	2741.06
45.0	5952.94	5432.06	4847.06	4333.50	3774.94	3262.50	2845.13	2465.44	2052.00
90.0	5778.56	5181.19	4534.31	4086.56	3597.19	3089.25	2636.44	2279.25	1875.38
135.0	6027.19	5504.06	4908.94	4388.06	3809.81	3278.25	2849.06	2463.19	2045.25
180.0	5722.88	5132.25	4476.38	4021.88	3523.50	2916.00	2579.06	2234.25	1838.25
225.0	6665.63	6114.94	5480.44	5029.31	4514.06	3819.94	3409.31	2982.94	2472.19
270.0	6868.13	6389.44	5816.81	5299.31	4722.19	4150.69	3659.06	3157.31	2723.63
315.0	6699.38	6163.88	5544.00	5028.75	4573.69	3881.25	3472.31	3047.63	2536.31
360.0	6929.44	6466.50	5891.63	5361.19	4763.81	4186.69	3698.44	3247.31	2741.06
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2385.56	2073.38	1744.31	1531.69	1357.31	1206.56	1099.13	1029.38	972.56
45.0	1788.19	1572.19	1344.94	1209.38	1110.94	1034.44	981.00	946.13	914.63
90.0	1669.50	1472.63	1296.56	1120.84	1083.54	1022.79	971.27	932.96	905.01
135.0	1781.44	1572.19	1353.94	1221.75	1124.44	1047.38	994.50	960.19	931.50
180.0	1635.19	1444.50	1296.00	1118.42	1082.25	1023.19	966.77	932.85	907.20
225.0	2190.38	1910.81	1648.13	1439.44	1295.44	1115.04	1086.98	1019.31	976.05
270.0	2392.31	2095.31	1772.44	1560.94	1389.94	1240.88	1127.81	1051.31	989.44
315.0	2250.00	1967.06	1698.19	1478.81	1318.50	1120.22	1077.98	1005.98	962.55
360.0	2385.56	2073.38	1744.31	1531.69	1357.31	1206.56	1099.13	1029.38	972.56
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	933.75	909.56	888.19	867.38	848.25	830.81	806.06	742.50	627.19
45.0	891.56	870.75	849.94	831.94	804.94	734.63	655.31	551.81	411.19
90.0	885.88	863.61	846.17	827.38	797.06	711.79	602.44	499.28	384.02
135.0	905.63	880.88	858.94	840.38	810.56	735.19	650.81	547.88	411.19
180.0	883.91	860.74	842.51	821.98	787.89	697.61	588.32	485.89	384.75
225.0	940.05	912.71	889.48	865.63	847.41	824.74	770.40	696.60	598.22
270.0	950.63	919.69	896.06	873.56	852.19	831.94	799.31	724.50	605.25
315.0	927.23	900.90	877.95	855.90	837.96	813.83	753.02	671.57	573.58
360.0	933.75	909.56	888.19	867.38	848.25	830.81	806.06	742.50	627.19
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	526.50	422.44	303.19	228.15	97.54	49.22	33.19	28.24	22.73
45.0	298.69	285.75	111.21	54.96	36.51	31.67	24.58	22.16	17.78
90.0	271.46	176.23	92.70	42.47	32.91	26.78	22.11	19.35	13.89
135.0	306.00	293.63	115.20	54.62	33.92	28.74	21.32	18.90	15.30
180.0	260.49	165.60	84.38	38.93	30.60	24.41	19.13	16.31	12.60
225.0	456.92	342.17	237.88	127.24	64.86	37.24	30.38	23.74	19.35
270.0	502.88	397.69	292.50	161.94	78.75	43.48	31.44	26.10	21.26
315.0	439.09	328.95	228.94	120.99	60.75	34.43	28.74	22.22	18.96
360.0	526.50	422.44	303.19	228.15	97.54	49.22	33.19	28.24	22.73

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	20.59	16.09	12.49	12.15	11.87	11.64	11.48	11.36	11.25
45.0	12.54	12.21	11.98	11.81	11.64	11.53	11.36	11.25	11.19
90.0	12.60	12.38	12.15	11.98	11.81	11.64	11.48	11.36	11.25
135.0	12.66	12.38	12.21	11.87	11.70	11.59	11.42	11.31	11.19
180.0	12.21	11.93	11.76	11.64	11.48	11.36	11.19	11.08	11.03
225.0	15.81	12.66	12.32	11.98	11.81	11.64	11.42	11.31	11.19
270.0	18.39	13.89	12.66	12.38	12.09	11.87	11.70	11.53	11.42
315.0	16.31	12.54	12.26	11.98	11.81	11.59	11.48	11.36	11.19
360.0	20.59	16.09	12.49	12.15	11.87	11.64	11.48	11.36	11.25
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	11.14	11.03	10.97	10.86	10.74	10.69	10.63	10.52	10.52
45.0	11.08	10.97	10.91	10.80	10.74	10.69	10.63	10.58	10.52
90.0	11.14	11.03	10.91	10.80	10.74	10.69	10.63	10.58	10.52
135.0	11.08	11.03	10.97	10.86	10.74	10.69	10.63	10.58	10.52
180.0	10.91	10.80	10.74	10.63	10.58	10.58	10.52	10.46	10.41
225.0	11.08	11.03	10.91	10.80	10.69	10.69	10.58	10.52	10.46
270.0	11.25	11.19	11.08	10.97	10.91	10.80	10.74	10.63	10.58
315.0	11.08	10.97	10.91	10.80	10.74	10.63	10.58	10.52	10.46
360.0	11.14	11.03	10.97	10.86	10.74	10.69	10.63	10.52	10.52
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.41	10.41	10.35	10.29	10.29	10.24	10.18	10.18	10.18
45.0	10.46	10.41	10.35	10.35	10.29	10.24	10.24	10.18	10.18
90.0	10.46	10.41	10.35	10.35	10.29	10.24	10.24	10.24	10.18
135.0	10.46	10.41	10.41	10.35	10.29	10.29	10.24	10.24	10.18
180.0	10.35	10.29	10.24	10.24	10.18	10.13	10.13	10.07	10.07
225.0	10.41	10.41	10.35	10.29	10.24	10.18	10.18	10.13	10.13
270.0	10.52	10.46	10.46	10.35	10.35	10.29	10.24	10.24	10.18
315.0	10.46	10.35	10.35	10.29	10.24	10.18	10.18	10.18	10.13
360.0	10.41	10.41	10.35	10.29	10.29	10.24	10.18	10.18	10.18
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.13	10.07	10.07	10.07	10.07	10.01	10.01	9.96	9.96
45.0	10.13	10.13	10.13	10.07	10.07	10.01	10.01	10.01	9.96
90.0	10.18	10.13	10.13	10.07	10.07	10.01	10.01	9.96	9.96
135.0	10.13	10.18	10.13	10.13	10.07	10.07	10.07	10.01	10.01
180.0	10.07	10.07	10.01	10.01	9.96	9.96	9.96	9.90	9.90
225.0	10.07	10.07	10.07	10.01	10.01	10.01	9.96	9.96	9.96
270.0	10.13	10.13	10.13	10.07	10.07	10.07	10.01	10.01	9.96
315.0	10.13	10.07	10.07	10.07	10.01	10.01	9.96	9.96	9.96
360.0	10.13	10.07	10.07	10.07	10.07	10.01	10.01	9.96	9.96
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.96	9.96	9.90	9.90	9.90	9.90	9.90	9.84	9.84
45.0	9.96	10.01	9.96	10.01	10.18	9.84	9.84	9.84	9.84
90.0	9.96	9.96	9.96	9.96	9.96	9.84	9.79	9.79	9.79
135.0	10.01	9.96	9.96	9.96	9.90	9.90	9.84	9.84	9.84
180.0	9.90	9.84	9.90	9.84	9.84	9.84	9.84	9.79	9.79
225.0	9.96	9.90	9.96	9.90	9.90	9.84	9.84	9.84	9.79
270.0	9.96	9.96	9.90	9.90	9.96	9.90	9.96	9.96	9.84
315.0	9.90	9.90	9.90	9.90	9.90	9.90	9.84	9.84	9.79
360.0	9.96	9.96	9.90	9.90	9.90	9.90	9.90	9.84	9.84

Intensity data(cd)

C/γ(°)	90.0
0.0	9.84
45.0	9.84
90.0	9.84
135.0	9.84
180.0	9.84
225.0	9.79
270.0	9.84
315.0	9.79
360.0	9.84