
NATA

Client:

LumCAT: 3-2033-M

Luminaire: 92.70.131.000

Report No: nata-0100

Test No: GC2018120708

LampCAT: OSRAM SOLERIQ S13

Lamp flux(lm): 1777.0

Number of Lamps: 1

Length(mm): 79

Phm Type: C

Voltage(V): 36.8000

Current(A): 0.5000

Power (W): 18.4000

PF: 0.0000

Ballast type: DC

Width(mm): 79

Height(mm): 0

Photometric Results

Lumens(lm): 1564.17, Efficiency(%): 88.02% , Luminous Efficacy(lm/W): 85.01

Central intensity(cd): 15281.720, Maximum intensity(cd): 15281.720

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=13.0

[C90/270]Total=13.0

Field angle(10%Imax): [C0/180]Total=25.2

[C90/270]Total=25.2

Maximum s/h(1/2): C0_180=0.22 C90_270=0.22

Maximum s/h(1/4): C0_180=0.23 C90_270=0.23

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 88.23%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 98.492%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	15281.719	3.656	3.656	.206%	.234%
1.0	15008.906	28.725	32.381	1.616%	2.070%
2.0	14256.563	54.561	86.942	3.070%	5.558%
3.0	12876.117	73.899	160.841	4.159%	10.283%
4.0	11468.109	87.726	248.567	4.937%	15.891%
5.0	10045.125	96.007	344.574	5.403%	22.029%
6.0	8416.336	96.474	441.048	5.429%	28.197%
7.0	6716.109	89.756	530.804	5.051%	33.935%
8.0	5362.031	81.834	612.638	4.605%	39.167%
9.0	4042.195	69.343	681.981	3.902%	43.600%
10.0	2974.148	56.635	738.616	3.187%	47.221%
11.0	2311.734	48.371	786.987	2.722%	50.313%
12.0	1797.750	40.988	827.976	2.307%	52.934%
13.0	1364.934	33.671	861.646	1.895%	55.086%
14.0	1168.931	31.011	892.657	1.745%	57.069%
15.0	1044.879	29.656	922.314	1.669%	58.965%
16.0	924.553	27.946	950.26	1.573%	60.752%
17.0	852.792	27.342	977.602	1.539%	62.500%
18.0	794.974	26.939	1004.541	1.516%	64.222%
19.0	744.764	26.590	1031.131	1.496%	65.922%
20.0	709.137	26.597	1057.728	1.497%	67.622%
21.0	679.894	26.719	1084.447	1.504%	69.330%
22.0	653.491	26.845	1111.292	1.511%	71.047%
23.0	633.080	27.126	1138.418	1.527%	72.781%
24.0	616.212	27.485	1165.903	1.547%	74.538%
25.0	599.400	27.779	1193.682	1.563%	76.314%
26.0	586.631	28.201	1221.883	1.587%	78.117%
27.0	574.369	28.595	1250.478	1.609%	79.945%
28.0	563.864	29.029	1279.507	1.634%	81.801%
29.0	555.089	29.511	1309.018	1.661%	83.688%
30.0	546.645	29.973	1338.991	1.687%	85.604%
31.0	536.344	30.292	1369.283	1.705%	87.541%
32.0	522.759	30.378	1399.662	1.710%	89.483%
33.0	494.754	29.549	1429.211	1.663%	91.372%
34.0	434.145	26.622	1455.833	1.498%	93.074%
35.0	367.277	23.101	1478.935	1.300%	94.551%
36.0	293.196	18.899	1497.833	1.064%	95.759%
37.0	224.641	14.825	1512.659	.834%	96.707%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	135.780	9.167	1521.826	.516%	97.293%
39.0	74.426	5.136	1526.962	.289%	97.621%
40.0	31.887	2.248	1529.21	.126%	97.765%
41.0	16.938	1.219	1530.428	.069%	97.843%
42.0	14.484	1.063	1531.491	.060%	97.911%
43.0	12.586	0.941	1532.432	.053%	97.971%
44.0	10.976	0.836	1533.268	.047%	98.024%
45.0	9.837	0.763	1534.031	.043%	98.073%
46.0	8.979	0.708	1534.739	.040%	98.118%
47.0	8.641	0.693	1535.433	.039%	98.163%
48.0	8.445	0.688	1536.121	.039%	98.207%
49.0	8.255	0.683	1536.804	.038%	98.250%
50.0	8.065	0.677	1537.481	.038%	98.294%
51.0	7.931	0.676	1538.157	.038%	98.337%
52.0	7.784	0.673	1538.83	.038%	98.380%
53.0	7.629	0.668	1539.498	.038%	98.423%
54.0	7.509	0.666	1540.164	.037%	98.465%
55.0	7.390	0.664	1540.828	.037%	98.508%
56.0	7.277	0.662	1541.49	.037%	98.550%
57.0	7.186	0.661	1542.151	.037%	98.592%
58.0	7.088	0.659	1542.81	.037%	98.634%
59.0	7.017	0.660	1543.469	.037%	98.677%
60.0	6.954	0.660	1544.13	.037%	98.719%
61.0	6.891	0.661	1544.791	.037%	98.761%
62.0	6.813	0.660	1545.45	.037%	98.803%
63.0	6.771	0.662	1546.112	.037%	98.845%
64.0	6.722	0.663	1546.774	.037%	98.888%
65.0	6.680	0.664	1547.438	.037%	98.930%
66.0	6.652	0.666	1548.105	.037%	98.973%
67.0	6.609	0.667	1548.772	.038%	99.016%
68.0	6.574	0.668	1549.44	.038%	99.058%
69.0	6.560	0.672	1550.112	.038%	99.101%
70.0	6.518	0.672	1550.784	.038%	99.144%
71.0	6.504	0.674	1551.458	.038%	99.187%
72.0	6.476	0.675	1552.133	.038%	99.230%
73.0	6.469	0.678	1552.812	.038%	99.274%
74.0	6.455	0.680	1553.492	.038%	99.317%
75.0	6.441	0.682	1554.174	.038%	99.361%

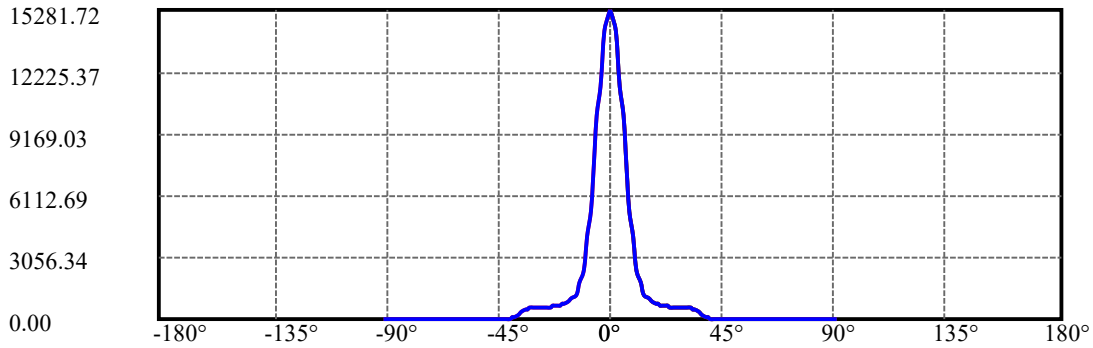
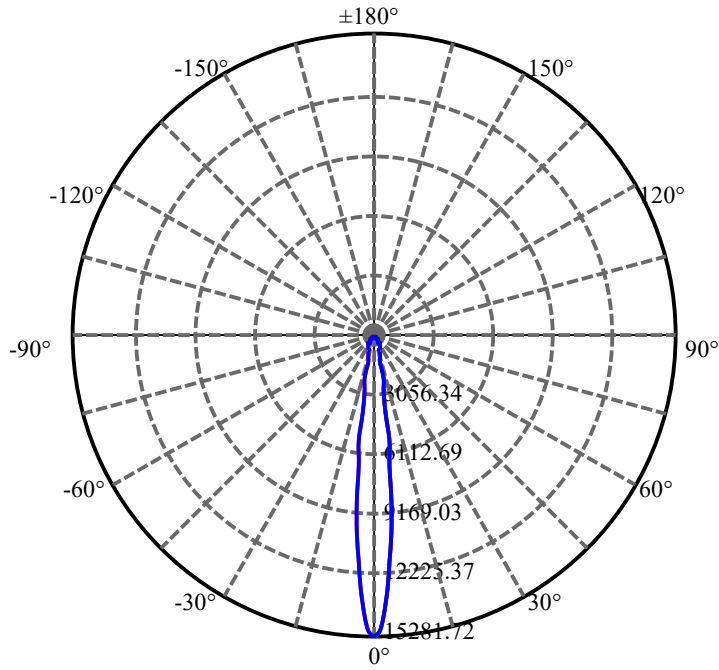
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	6.434	0.685	1554.859	.039%	99.405%
77.0	6.398	0.684	1555.542	.038%	99.448%
78.0	6.398	0.686	1556.229	.039%	99.492%
79.0	6.384	0.687	1556.916	.039%	99.536%
80.0	6.384	0.689	1557.606	.039%	99.580%
81.0	6.363	0.689	1558.295	.039%	99.624%
82.0	6.377	0.693	1558.987	.039%	99.669%
83.0	6.363	0.693	1559.68	.039%	99.713%
84.0	6.377	0.696	1560.375	.039%	99.757%
85.0	6.335	0.692	1561.067	.039%	99.802%
86.0	6.321	0.691	1561.759	.039%	99.846%
87.0	6.279	0.688	1562.447	.039%	99.890%
88.0	6.293	0.690	1563.136	.039%	99.934%
89.0	6.286	0.689	1563.825	.039%	99.978%
90.0	6.293	0.345	1564.171	.019%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1338.99	75.35%	85.60%
0-40	1529.21	86.06%	97.76%
0-60	1544.13	86.90%	98.72%
0-90	1563.83	88.00%	99.98%
0-120	1563.83	88.00%	99.98%
0-180	1564.17	88.02%	100.00%
60-90	20.36	1.15%	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%
0-27.03	1251.34	70.42%	80.00%

ZONAL LUMEN SUMMARY

0-10	738.62
10-20	319.11
20-30	281.26
30-40	190.22
40-50	8.27
50-60	6.65
60-70	6.65
70-80	6.82
80-90	6.22
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



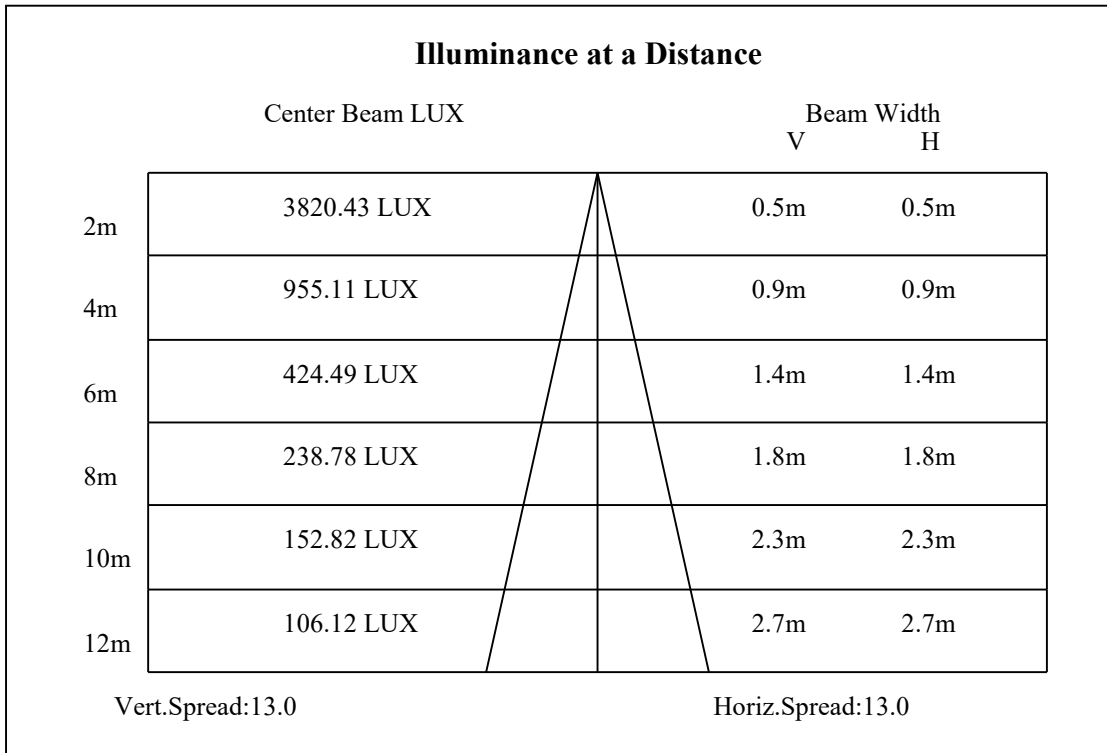
C0(Max): —————

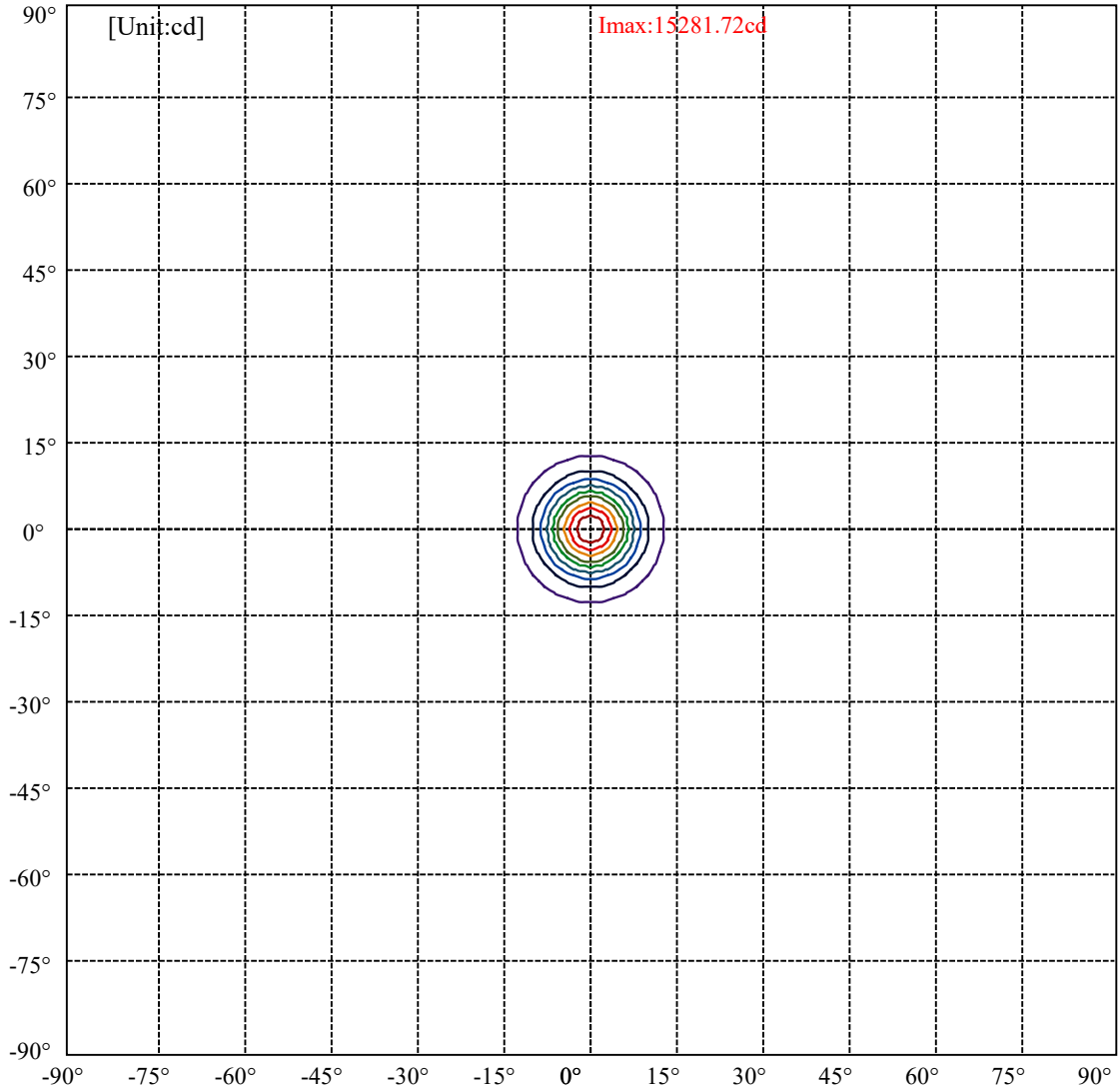
C0/C180: —————

C90/C270: —————

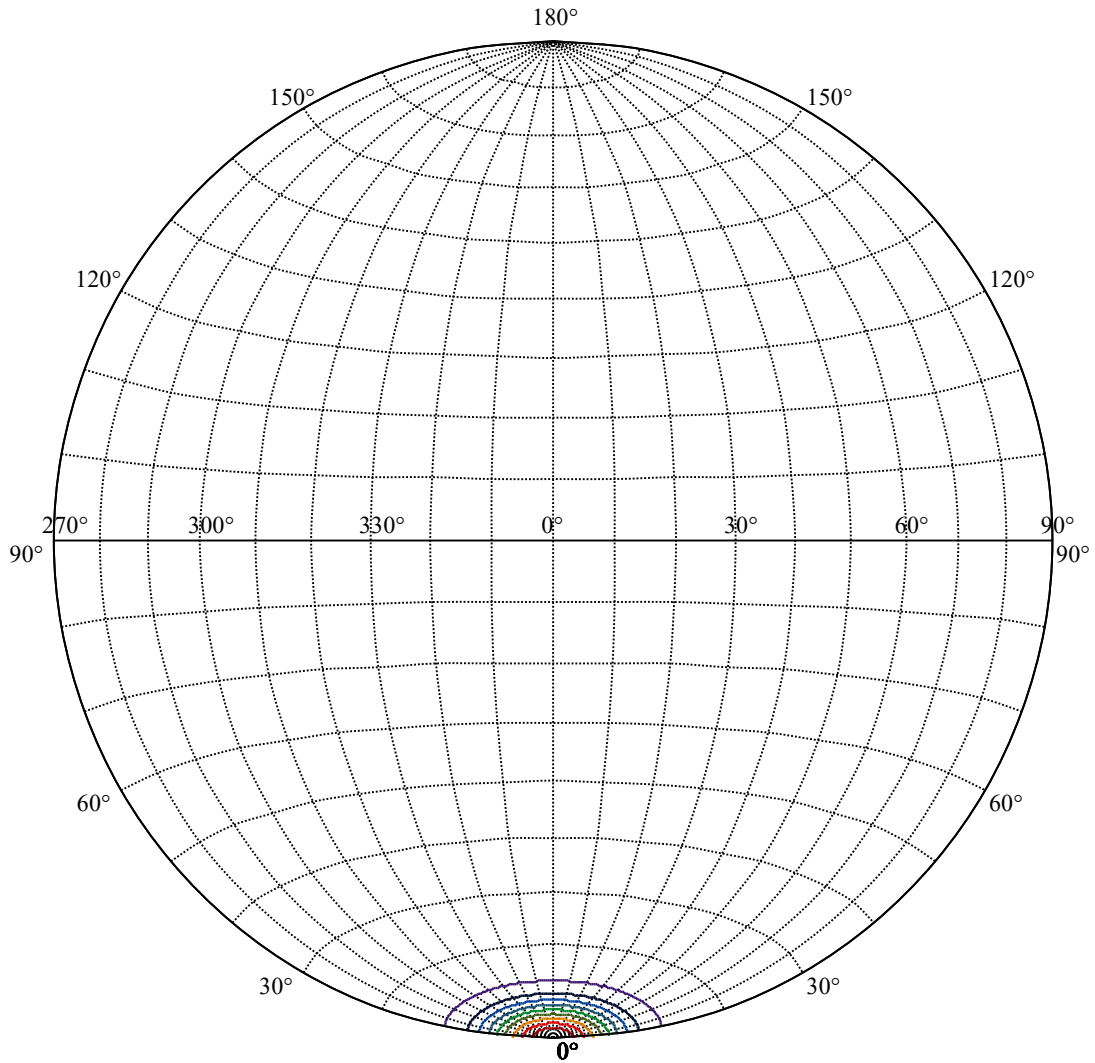
Field angle(10%Imax):C0/180Left:12.6 Right:12.6
:C90/270Left:12.6 Right:12.6

Beam Angle(50%Imax):C0/180Left:6.5 Right:6.5
:C90/270Left:6.5 Right:6.5





(10%Imax) 1528.17	—
(20%Imax) 3056.34	—
(30%Imax) 4584.52	—
(40%Imax) 6112.69	—
(50%Imax) 7640.86	—
(60%Imax) 9169.03	—
(70%Imax) 10697.2	—
(80%Imax) 12225.4	—
(90%Imax) 13753.5	—



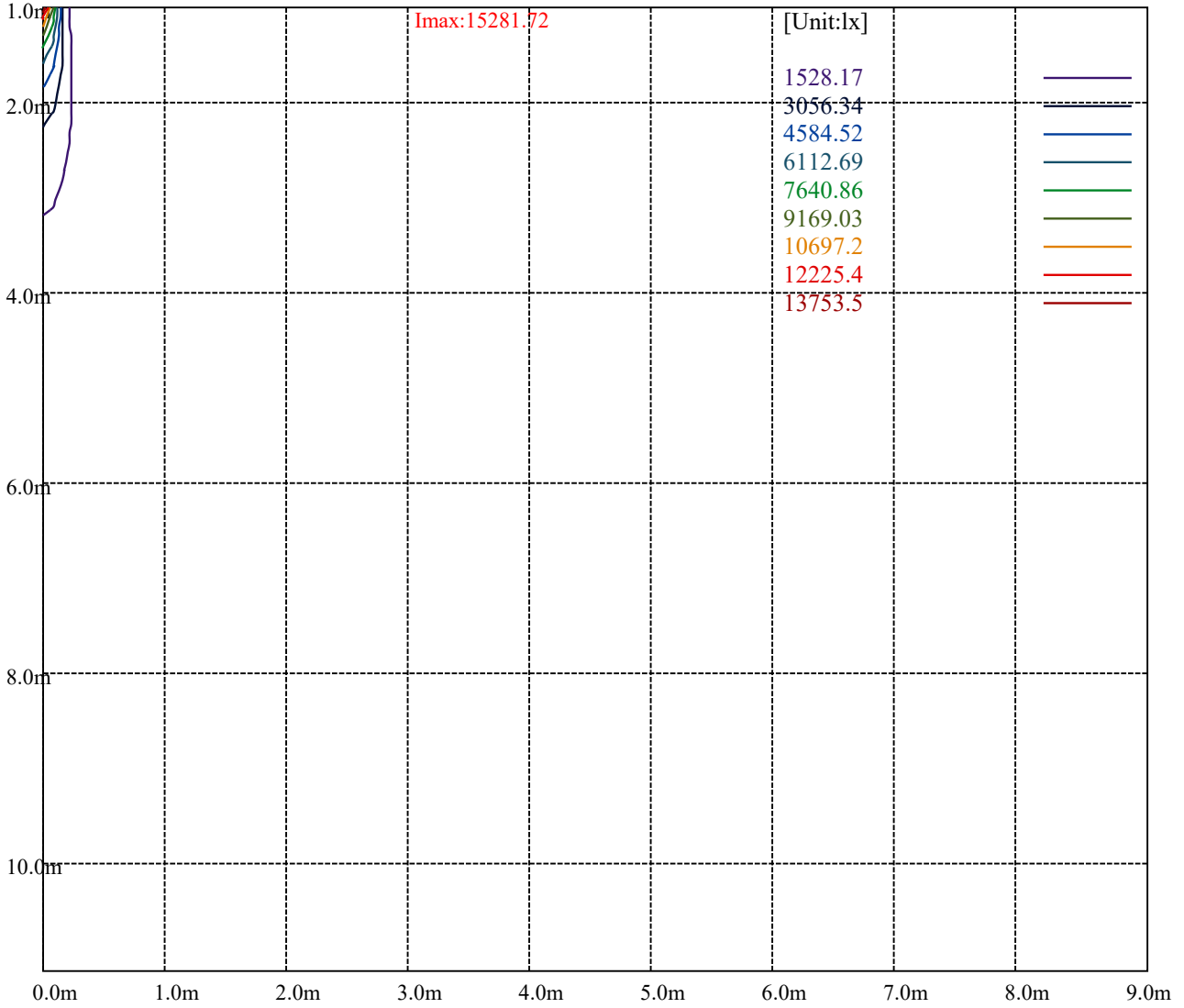
House

[Unit:cd]

Road

Imax:15281.72

(10%Imax) 1528.17	—
(20%Imax) 3056.34	—
(30%Imax) 4584.52	—
(40%Imax) 6112.69	—
(50%Imax) 7640.86	—
(60%Imax) 9169.03	—
(70%Imax) 10697.2	—
(80%Imax) 12225.4	—
(90%Imax) 13753.5	—



Luminance Table

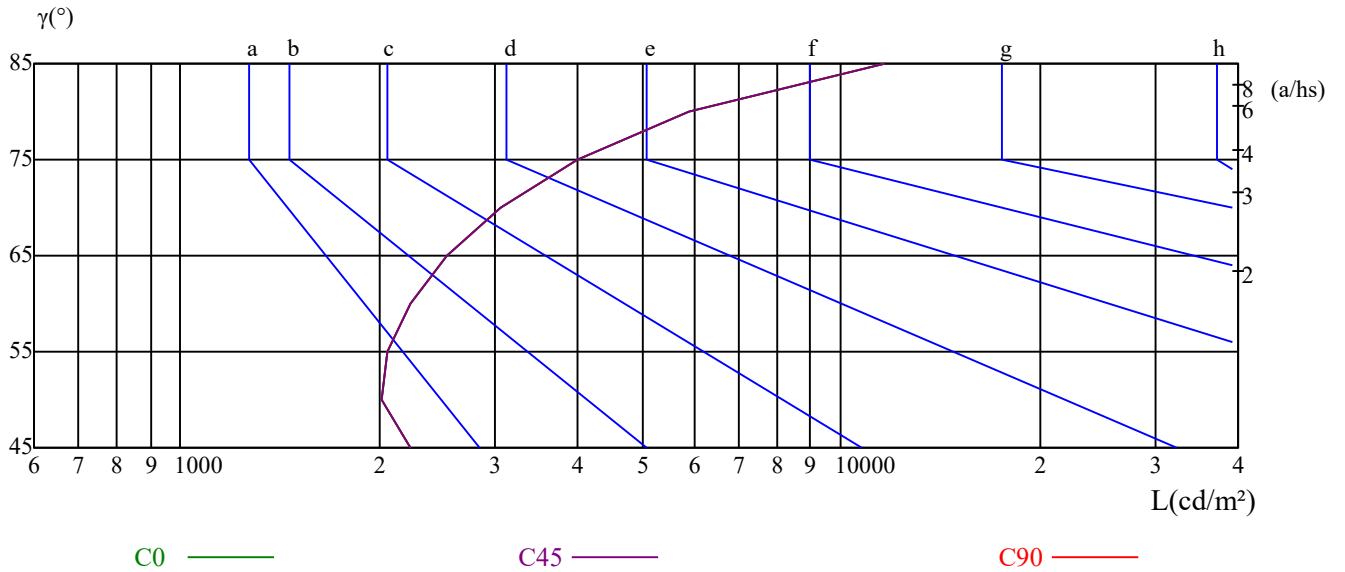
γ	45	50	55	60	65	70	75	80	85
C0	2229	2010	2064	2228	2533	3054	3987	5891	11647
C45	2229	2010	2064	2228	2533	3054	3987	5891	11647
C90	2229	2010	2064	2228	2533	3054	3987	5891	11647

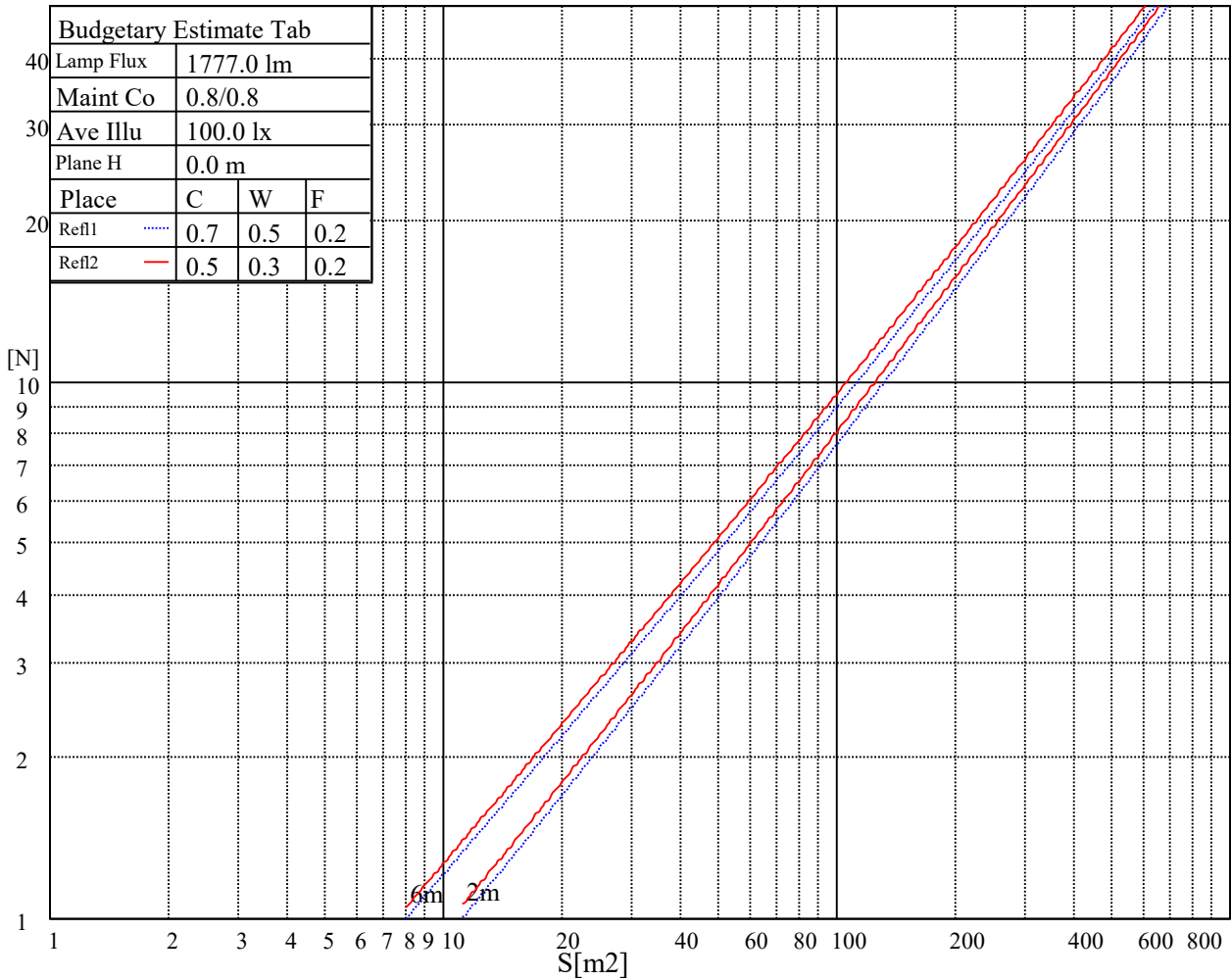
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
2533	2533	2533	3987	3987	3987	11647	11647	11647

Glare Table

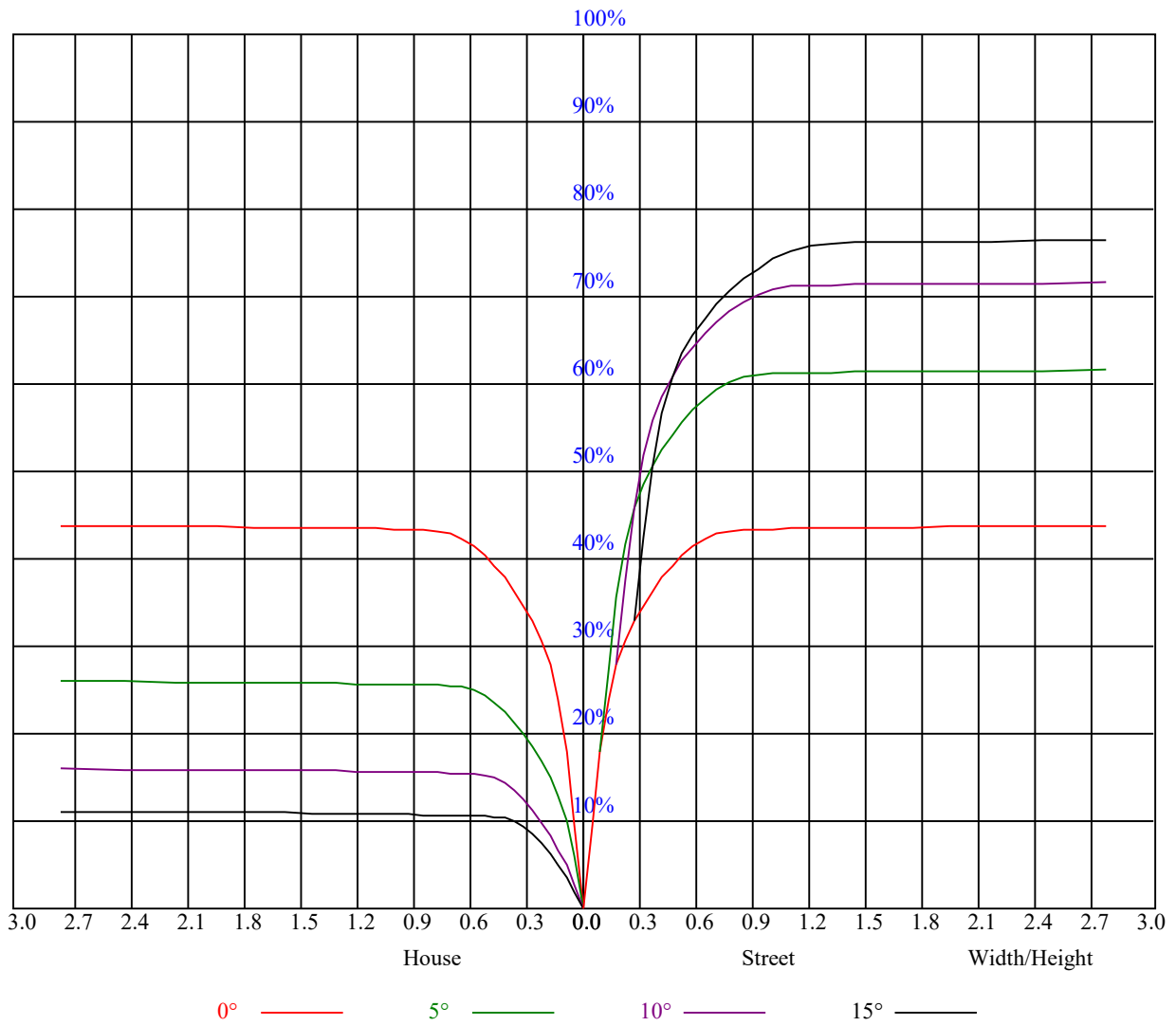
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

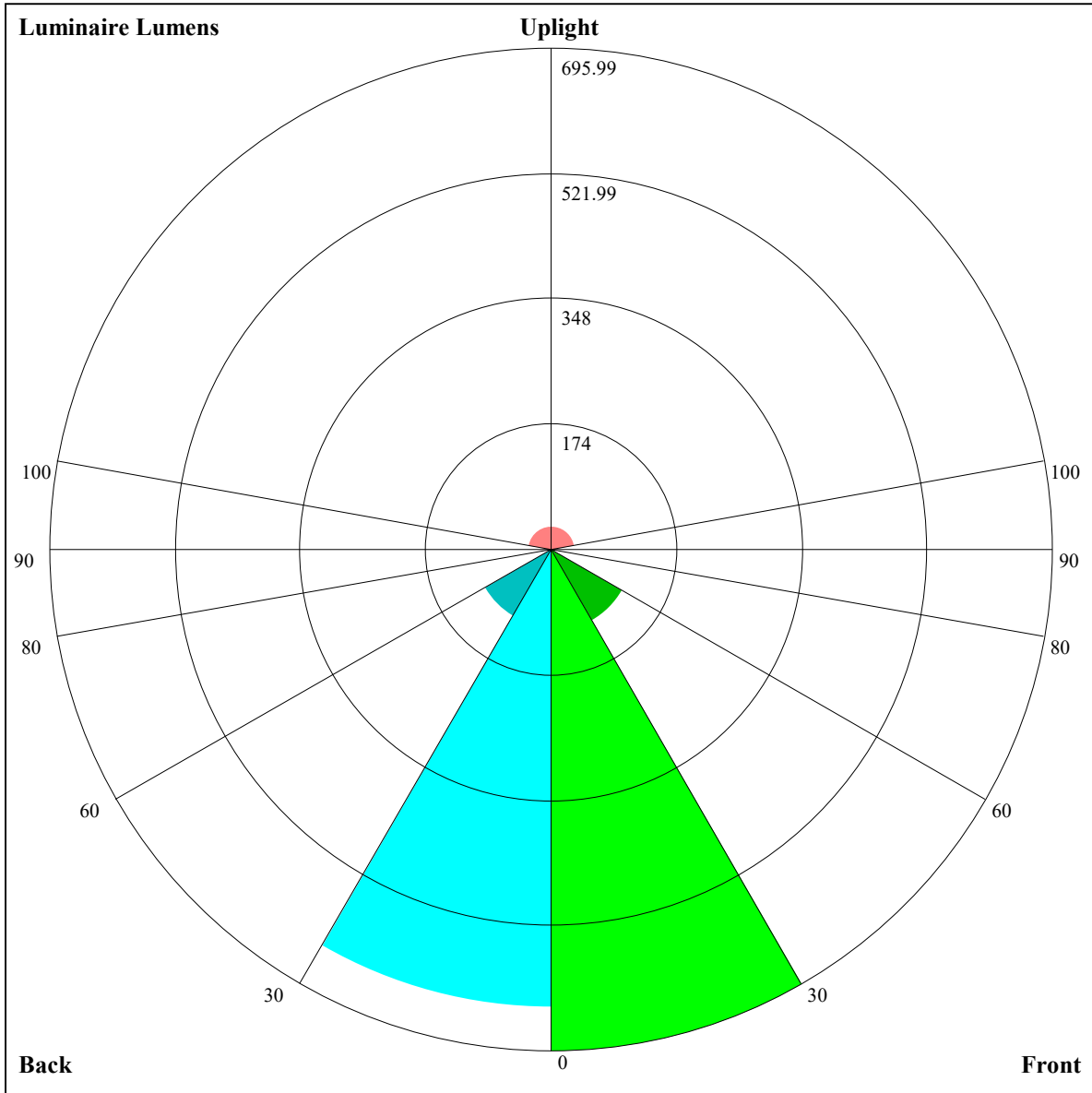
Luminance Limiting Curve





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	1.05	1.05	1.05	1.03	1.03	1.03	0.98	0.98	0.98	0.94	0.94	0.94	0.90	0.90	0.90	0.88
1	0.99	0.97	0.95	0.97	0.95	0.94	0.94	0.92	0.91	0.90	0.89	0.88	0.87	0.87	0.86	0.84
2	0.94	0.91	0.89	0.93	0.90	0.88	0.90	0.88	0.86	0.87	0.86	0.84	0.85	0.84	0.82	0.81
3	0.90	0.86	0.84	0.89	0.86	0.83	0.86	0.84	0.82	0.84	0.82	0.81	0.83	0.81	0.79	0.78
4	0.86	0.82	0.80	0.85	0.82	0.79	0.83	0.81	0.78	0.82	0.79	0.77	0.80	0.78	0.77	0.76
5	0.83	0.79	0.76	0.82	0.79	0.76	0.81	0.78	0.75	0.79	0.77	0.75	0.78	0.76	0.74	0.73
6	0.80	0.76	0.73	0.79	0.76	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.76	0.74	0.72	0.71
7	0.77	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.72	0.70	0.69
8	0.75	0.71	0.69	0.75	0.71	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.70	0.68	0.67
9	0.73	0.69	0.67	0.73	0.69	0.67	0.72	0.69	0.66	0.71	0.68	0.66	0.71	0.68	0.66	0.65
10	0.71	0.67	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.64





Luminaire Lumens:

FL=695.99,FM=115.53,FH=6.75,FVH=3.46

BL=635.59,BM=106.1,BH=6.74,BVH=3.46

UL=6.87,UH=32.67

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	15046.88	15345.00	14990.63	14220.00	12976.88	11424.38	9894.38	8133.75	6643.13
45.0	15322.50	15598.13	15249.38	14394.38	13320.00	11795.63	10040.63	8409.38	6862.50
90.0	15468.75	15395.63	14838.75	13792.50	11089.13	10893.94	9278.44	7274.81	5819.63
135.0	15288.75	15176.25	14506.88	13393.13	12121.88	10462.50	8685.00	7143.75	5743.13
180.0	15046.88	14332.50	13280.63	10880.44	10110.38	8526.94	6984.56	5231.81	4027.50
225.0	15322.50	14439.38	13314.38	11201.63	10048.50	8481.38	6966.56	5290.31	4117.50
270.0	15468.75	14973.75	13921.88	12498.75	11025.00	9264.38	7537.50	6114.38	4854.38
315.0	15288.75	14810.63	13950.00	12628.13	11053.13	9511.88	7943.63	6130.69	4828.50
360.0	15046.88	15345.00	14990.63	14220.00	12976.88	11424.38	9894.38	8133.75	6643.13
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5141.25	3808.13	2840.63	2419.31	1600.31	1334.81	1155.38	996.75	907.31
45.0	5113.13	3864.38	2947.50	2112.75	1564.88	1305.56	1132.31	982.69	897.75
90.0	4506.19	3134.25	2330.44	1806.19	1437.19	1108.97	1061.33	937.07	873.11
135.0	4218.75	3178.13	2840.63	1851.19	1436.06	1221.19	1071.00	936.56	861.19
180.0	3022.31	2130.19	1687.50	1406.81	1116.68	1040.34	942.41	858.66	800.66
225.0	3134.25	2247.19	1788.75	1475.44	1113.86	1064.98	958.84	880.14	811.07
270.0	3515.63	2857.50	2084.06	1722.38	1343.81	1158.19	1037.25	901.13	832.50
315.0	3686.06	2573.44	1974.38	1587.94	1306.69	1117.41	1000.52	903.43	838.74
360.0	5141.25	3808.13	2840.63	2419.31	1600.31	1334.81	1155.38	996.75	907.31
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	842.06	784.13	740.81	709.31	680.06	654.19	635.06	616.50	603.56
45.0	831.38	774.00	730.13	698.63	670.50	649.69	628.31	610.31	597.94
90.0	809.27	758.81	721.97	685.58	655.03	633.21	615.60	598.22	587.64
135.0	801.56	749.25	712.13	685.13	660.38	636.75	618.75	603.56	588.94
180.0	750.38	708.08	678.66	651.54	628.43	611.44	597.49	580.11	568.91
225.0	759.32	718.99	688.89	661.33	640.52	621.34	607.39	592.20	578.31
270.0	784.69	733.50	697.50	675.00	649.13	631.13	615.94	600.19	586.13
315.0	781.14	731.36	703.01	672.64	643.89	626.91	611.16	594.11	581.63
360.0	842.06	784.13	740.81	709.31	680.06	654.19	635.06	616.50	603.56
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	587.25	576.00	568.69	560.25	548.44	540.56	526.50	471.38	408.94
45.0	582.75	571.50	563.06	555.75	543.94	533.81	527.06	482.06	426.94
90.0	575.89	564.81	555.13	545.68	536.01	524.93	509.51	460.29	399.21
135.0	576.00	566.44	557.44	548.44	537.75	529.31	505.69	448.31	373.50
180.0	559.80	549.45	540.84	532.24	521.72	492.24	438.92	356.74	293.96
225.0	568.07	558.17	548.55	540.00	531.90	509.63	460.41	397.86	317.70
270.0	574.31	563.63	555.19	547.31	536.63	528.75	501.75	436.50	369.00
315.0	570.88	560.93	551.81	543.49	534.38	522.84	488.19	420.02	348.98
360.0	587.25	576.00	568.69	560.25	548.44	540.56	526.50	471.38	408.94
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	339.19	293.06	166.61	99.39	41.68	17.66	15.58	13.73	11.76
45.0	371.81	284.63	193.50	129.66	65.03	23.46	16.54	14.85	12.94
90.0	322.31	251.10	171.84	100.35	43.54	17.89	15.98	14.29	12.26
135.0	302.06	249.19	139.89	78.92	30.21	16.71	14.91	13.28	11.42
180.0	213.30	129.38	77.40	28.13	16.03	14.68	12.77	10.41	9.62
225.0	233.16	161.66	90.17	33.13	16.71	14.85	12.94	10.80	9.62
270.0	295.88	240.24	128.42	67.56	23.68	15.47	13.95	11.98	10.29
315.0	267.86	187.88	118.41	58.28	18.22	14.79	13.22	11.36	9.90
360.0	339.19	293.06	166.61	99.39	41.68	17.66	15.58	13.73	11.76

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	10.29	9.00	8.61	8.38	8.21	8.04	7.88	7.71	7.59
45.0	11.03	9.62	8.89	8.66	8.44	8.27	8.16	7.99	7.82
90.0	10.69	9.39	8.94	8.78	8.55	8.33	8.16	8.04	7.88
135.0	10.18	9.23	8.94	8.78	8.55	8.38	8.21	8.10	7.93
180.0	9.06	8.78	8.55	8.33	8.16	7.99	7.88	7.65	7.48
225.0	8.94	8.66	8.44	8.27	8.10	7.88	7.76	7.65	7.48
270.0	9.51	8.66	8.44	8.27	8.04	7.88	7.76	7.59	7.48
315.0	9.00	8.49	8.33	8.10	7.99	7.76	7.65	7.54	7.37
360.0	10.29	9.00	8.61	8.38	8.21	8.04	7.88	7.71	7.59
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	7.48	7.37	7.26	7.20	7.09	7.03	6.98	6.92	6.81
45.0	7.65	7.54	7.43	7.31	7.20	7.14	7.03	6.98	6.92
90.0	7.71	7.59	7.48	7.37	7.26	7.14	7.03	6.98	6.92
135.0	7.76	7.59	7.48	7.31	7.20	7.09	7.03	6.92	6.86
180.0	7.37	7.26	7.14	7.03	6.98	6.92	6.86	6.75	6.69
225.0	7.43	7.31	7.14	7.09	6.98	6.92	6.86	6.86	6.75
270.0	7.37	7.26	7.20	7.14	7.03	6.98	6.92	6.86	6.81
315.0	7.31	7.20	7.09	7.03	6.98	6.92	6.92	6.86	6.75
360.0	7.48	7.37	7.26	7.20	7.09	7.03	6.98	6.92	6.81
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	6.75	6.75	6.69	6.64	6.58	6.58	6.58	6.53	6.47
45.0	6.86	6.81	6.75	6.69	6.64	6.64	6.58	6.53	6.53
90.0	6.86	6.81	6.75	6.69	6.64	6.64	6.64	6.58	6.58
135.0	6.81	6.75	6.75	6.69	6.64	6.58	6.58	6.53	6.53
180.0	6.69	6.64	6.58	6.58	6.58	6.53	6.47	6.47	6.41
225.0	6.75	6.69	6.64	6.64	6.58	6.53	6.53	6.47	6.47
270.0	6.75	6.69	6.69	6.69	6.64	6.58	6.58	6.58	6.58
315.0	6.69	6.64	6.58	6.58	6.58	6.53	6.53	6.47	6.47
360.0	6.75	6.75	6.69	6.64	6.58	6.58	6.58	6.53	6.47
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	6.47	6.41	6.47	6.41	6.41	6.36	6.36	6.36	6.36
45.0	6.53	6.53	6.47	6.47	6.41	6.41	6.41	6.41	6.41
90.0	6.58	6.53	6.53	6.47	6.53	6.47	6.53	6.47	6.47
135.0	6.47	6.47	6.41	6.47	6.41	6.36	6.36	6.36	6.36
180.0	6.36	6.41	6.41	6.41	6.36	6.36	6.36	6.36	6.30
225.0	6.47	6.47	6.41	6.41	6.41	6.41	6.36	6.36	6.36
270.0	6.53	6.53	6.53	6.53	6.53	6.47	6.47	6.47	6.47
315.0	6.41	6.41	6.41	6.36	6.41	6.36	6.36	6.30	6.36
360.0	6.47	6.41	6.47	6.41	6.41	6.36	6.36	6.36	6.36
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	6.30	6.30	6.30	6.30	6.36	6.30	6.30	6.30	6.30
45.0	6.41	6.41	6.36	6.36	6.36	6.36	6.30	6.36	6.30
90.0	6.41	6.47	6.47	6.53	6.36	6.30	6.30	6.30	6.30
135.0	6.36	6.36	6.30	6.36	6.30	6.30	6.24	6.24	6.30
180.0	6.24	6.30	6.30	6.24	6.24	6.30	6.24	6.24	6.24
225.0	6.36	6.36	6.36	6.36	6.36	6.36	6.30	6.30	6.30
270.0	6.47	6.53	6.53	6.58	6.41	6.36	6.30	6.30	6.30
315.0	6.36	6.30	6.30	6.30	6.30	6.30	6.24	6.30	6.24
360.0	6.30	6.30	6.30	6.30	6.36	6.30	6.30	6.30	6.30

Intensity data(cd)

C/γ(°)	90.0
0.0	6.24
45.0	6.30
90.0	6.30
135.0	6.30
180.0	6.30
225.0	6.30
270.0	6.30
315.0	6.30
360.0	6.24