
NATA

Client:

LumCAT: 3-1699-N

Luminaire: 92.70.065.00+92.70.089.00

Report No: nata-0100

Voltage(V): 36.2000

Test No: GC2018112005

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): 79

Width(mm): 79

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1406.33, Efficiency(%): 79.19% , Luminous Efficacy(lm/W): 77.70

Central intensity(cd): 6516.281, Maximum intensity(cd): 6516.281

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=21.8

[C90/270]Total=21.8

Field angle(10%Imax): [C0/180]Total=42.2

[C90/270]Total=42.2

Maximum s/h(1/2): C0_180=0.37 C90_270=0.37

Maximum s/h(1/4): C0_180=0.37 C90_270=0.37

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 79.27%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 97.895%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6516.281	1.559	1.559	.088%	.111%
1.0	6474.797	12.392	13.951	.698%	.992%
2.0	6354.773	24.320	38.271	1.369%	2.721%
3.0	6164.227	35.378	73.649	1.992%	5.237%
4.0	5927.625	45.344	118.993	2.553%	8.461%
5.0	5604.609	53.566	172.559	3.016%	12.270%
6.0	5245.805	60.131	232.69	3.386%	16.546%
7.0	4875.820	65.162	297.852	3.669%	21.179%
8.0	4459.359	68.058	365.91	3.832%	26.019%
9.0	4043.391	69.363	435.273	3.906%	30.951%
10.0	3629.109	69.107	504.38	3.891%	35.865%
11.0	3203.789	67.037	571.417	3.775%	40.632%
12.0	2811.797	64.108	635.526	3.610%	45.190%
13.0	2416.359	59.608	695.133	3.356%	49.429%
14.0	2049.398	54.369	749.503	3.061%	53.295%
15.0	1734.117	49.218	798.721	2.771%	56.795%
16.0	1458.949	44.099	842.82	2.483%	59.931%
17.0	1204.003	38.602	881.422	2.174%	62.675%
18.0	1022.421	34.647	916.069	1.951%	65.139%
19.0	883.505	31.543	947.612	1.776%	67.382%
20.0	757.603	28.415	976.027	1.600%	69.403%
21.0	661.352	25.990	1002.017	1.463%	71.251%
22.0	595.814	24.476	1026.493	1.378%	72.991%
23.0	537.159	23.016	1049.509	1.296%	74.628%
24.0	486.654	21.706	1071.216	1.222%	76.171%
25.0	448.242	20.774	1091.989	1.170%	77.648%
26.0	412.924	19.850	1111.84	1.118%	79.060%
27.0	379.849	18.911	1130.75	1.065%	80.404%
28.0	350.255	18.032	1148.782	1.015%	81.687%
29.0	321.209	17.077	1165.859	.962%	82.901%
30.0	295.945	16.227	1182.086	.914%	84.055%
31.0	269.852	15.241	1197.327	.858%	85.139%
32.0	248.920	14.465	1211.792	.814%	86.167%
33.0	224.430	13.404	1225.197	.755%	87.120%
34.0	206.058	12.636	1237.832	.711%	88.019%
35.0	187.734	11.808	1249.641	.665%	88.858%
36.0	171.668	11.065	1260.706	.623%	89.645%
37.0	157.711	10.408	1271.114	.586%	90.385%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	144.211	9.736	1280.85	.548%	91.078%
39.0	131.273	9.059	1289.91	.510%	91.722%
40.0	120.480	8.493	1298.402	.478%	92.326%
41.0	110.180	7.927	1306.329	.446%	92.889%
42.0	99.759	7.320	1313.649	.412%	93.410%
43.0	90.766	6.788	1320.437	.382%	93.893%
44.0	82.716	6.301	1326.738	.355%	94.341%
45.0	74.925	5.810	1332.548	.327%	94.754%
46.0	68.316	5.389	1337.937	.303%	95.137%
47.0	61.861	4.961	1342.899	.279%	95.490%
48.0	55.772	4.545	1347.444	.256%	95.813%
49.0	50.280	4.161	1351.605	.234%	96.109%
50.0	44.859	3.768	1355.373	.212%	96.377%
51.0	40.085	3.416	1358.79	.192%	96.620%
52.0	36.162	3.125	1361.914	.176%	96.842%
53.0	32.189	2.819	1364.734	.159%	97.042%
54.0	28.547	2.533	1367.266	.143%	97.222%
55.0	25.671	2.306	1369.572	.130%	97.386%
56.0	22.950	2.086	1371.659	.117%	97.535%
57.0	20.370	1.873	1373.532	.105%	97.668%
58.0	18.239	1.696	1375.228	.096%	97.789%
59.0	16.474	1.549	1376.777	.087%	97.899%
60.0	14.927	1.418	1378.194	.080%	97.999%
61.0	13.880	1.331	1379.526	.075%	98.094%
62.0	13.184	1.276	1380.802	.072%	98.185%
63.0	12.663	1.237	1382.039	.070%	98.273%
64.0	12.206	1.203	1383.242	.068%	98.358%
65.0	11.841	1.177	1384.419	.066%	98.442%
66.0	11.524	1.154	1385.574	.065%	98.524%
67.0	11.222	1.133	1386.707	.064%	98.605%
68.0	10.920	1.110	1387.817	.063%	98.684%
69.0	10.673	1.093	1388.909	.062%	98.761%
70.0	10.434	1.075	1389.985	.061%	98.838%
71.0	10.181	1.056	1391.04	.059%	98.913%
72.0	9.928	1.035	1392.076	.058%	98.987%
73.0	9.689	1.016	1393.092	.057%	99.059%
74.0	9.464	0.998	1394.09	.056%	99.130%
75.0	9.183	0.973	1395.062	.055%	99.199%

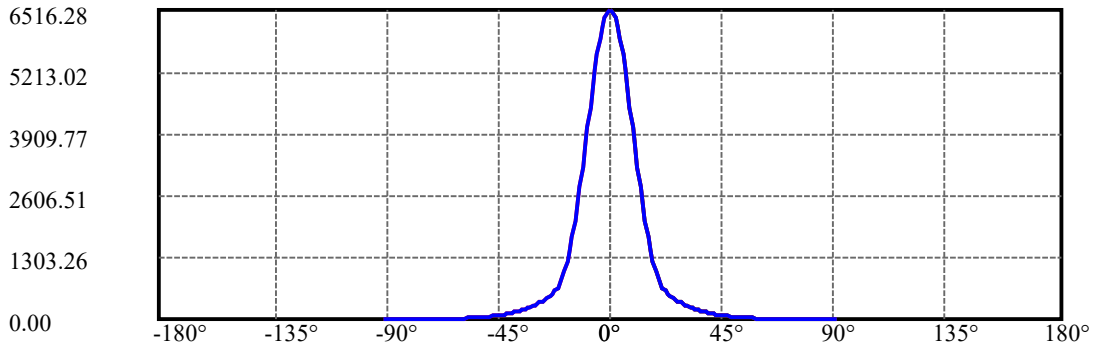
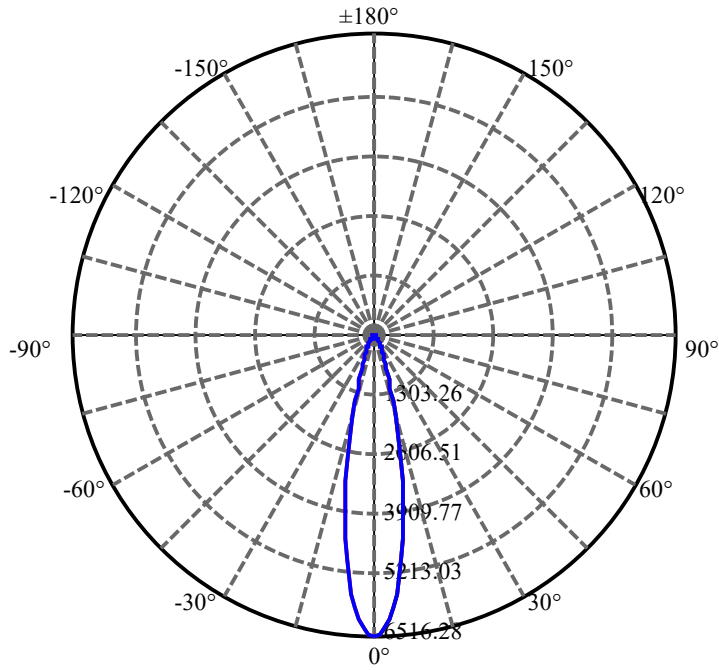
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.923	0.949	1396.012	.053%	99.266%
77.0	8.698	0.929	1396.941	.052%	99.332%
78.0	8.374	0.898	1397.839	.051%	99.396%
79.0	8.093	0.871	1398.71	.049%	99.458%
80.0	7.854	0.848	1399.559	.048%	99.519%
81.0	7.573	0.820	1400.379	.046%	99.577%
82.0	7.305	0.793	1401.172	.045%	99.633%
83.0	7.073	0.770	1401.942	.043%	99.688%
84.0	6.785	0.740	1402.682	.042%	99.741%
85.0	6.553	0.716	1403.398	.040%	99.792%
86.0	6.300	0.689	1404.087	.039%	99.841%
87.0	6.054	0.663	1404.75	.037%	99.888%
88.0	5.857	0.642	1405.392	.036%	99.933%
89.0	5.723	0.628	1406.019	.035%	99.978%
90.0	5.632	0.309	1406.328	.017%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1182.09	66.56%	84.05%
0-40	1298.40	73.11%	92.33%
0-60	1378.19	77.60%	98.00%
0-90	1406.02	79.17%	99.98%
0-120	1406.02	79.17%	99.98%
0-180	1406.33	79.19%	100.00%
60-90	29.24	1.65%	2.08%
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%
0-26.70	1125.06	63.35%	80.00%

ZONAL LUMEN SUMMARY

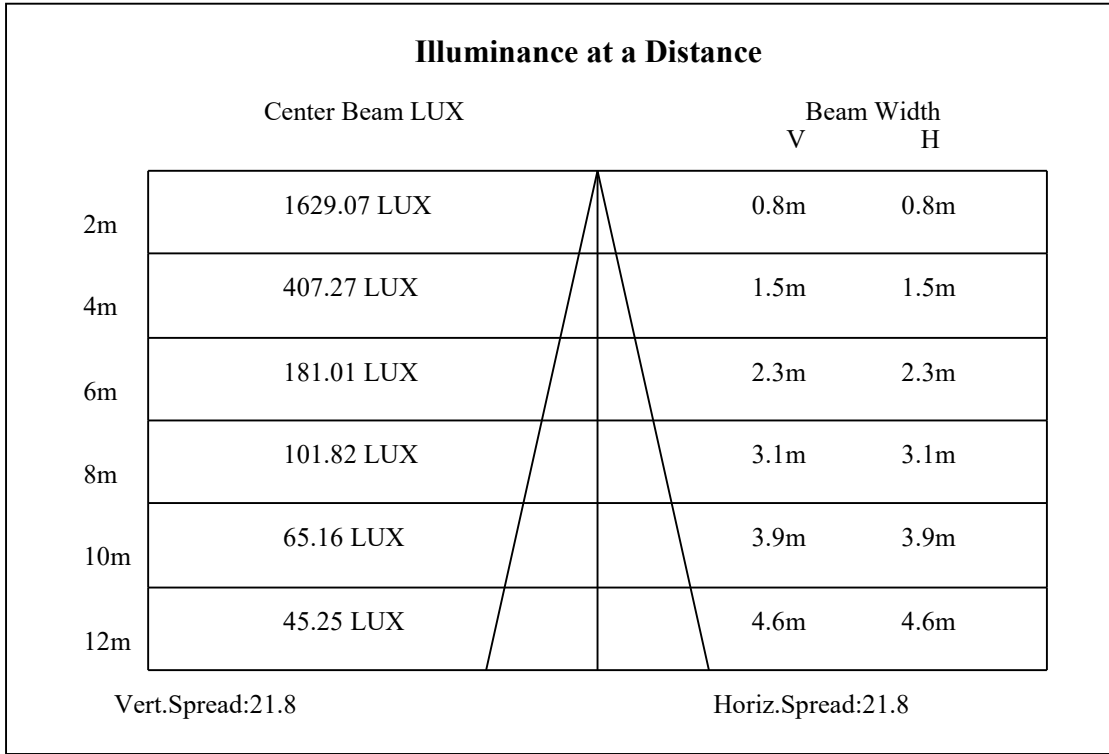
0-10	504.38
10-20	471.65
20-30	206.06
30-40	116.32
40-50	56.97
50-60	22.82
60-70	11.79
70-80	9.57
80-90	6.46
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

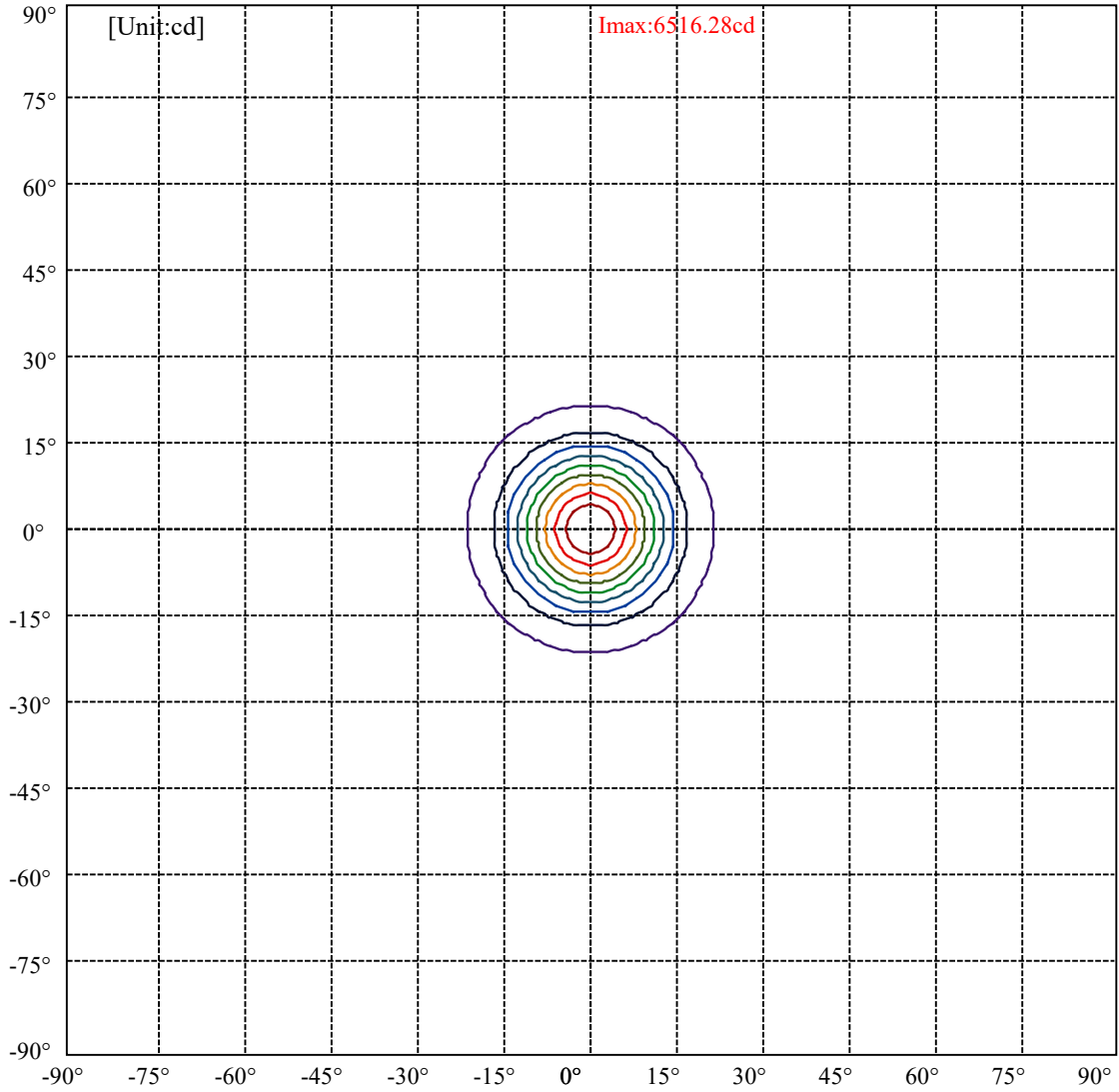


C0(Max): ———
C0/C180: ———
C90/C270: ———

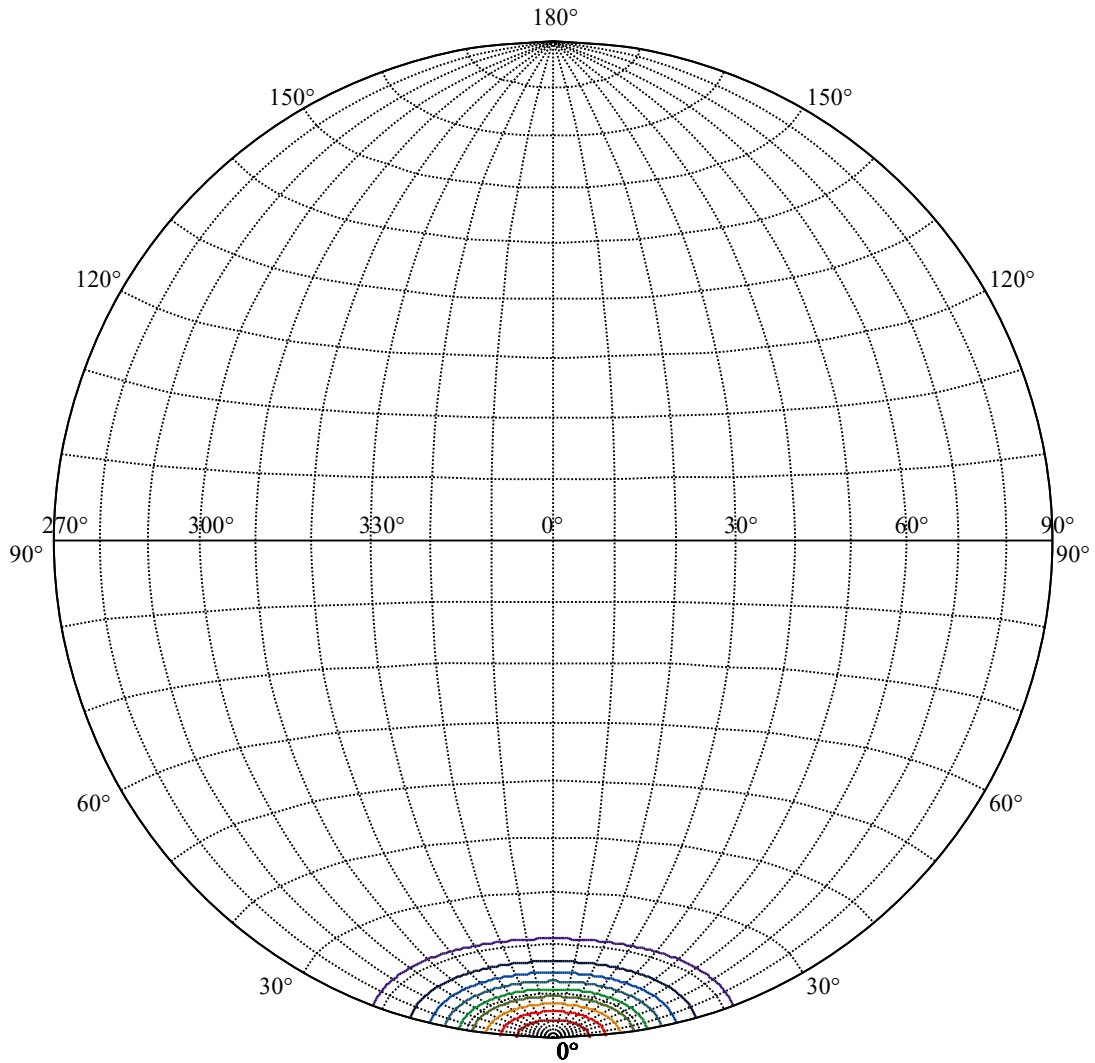
Field angle(10%Imax):C0/180Left:21.1 Right:21.1
:C90/270Left:21.1 Right:21.1

Beam Angle(50%Imax):C0/180Left:10.9 Right:10.9
:C90/270Left:10.9 Right:10.9





(10%Imax) 651.628	—
(20%Imax) 1303.26	—
(30%Imax) 1954.88	—
(40%Imax) 2606.51	—
(50%Imax) 3258.14	—
(60%Imax) 3909.77	—
(70%Imax) 4561.4	—
(80%Imax) 5213.02	—
(90%Imax) 5864.65	—



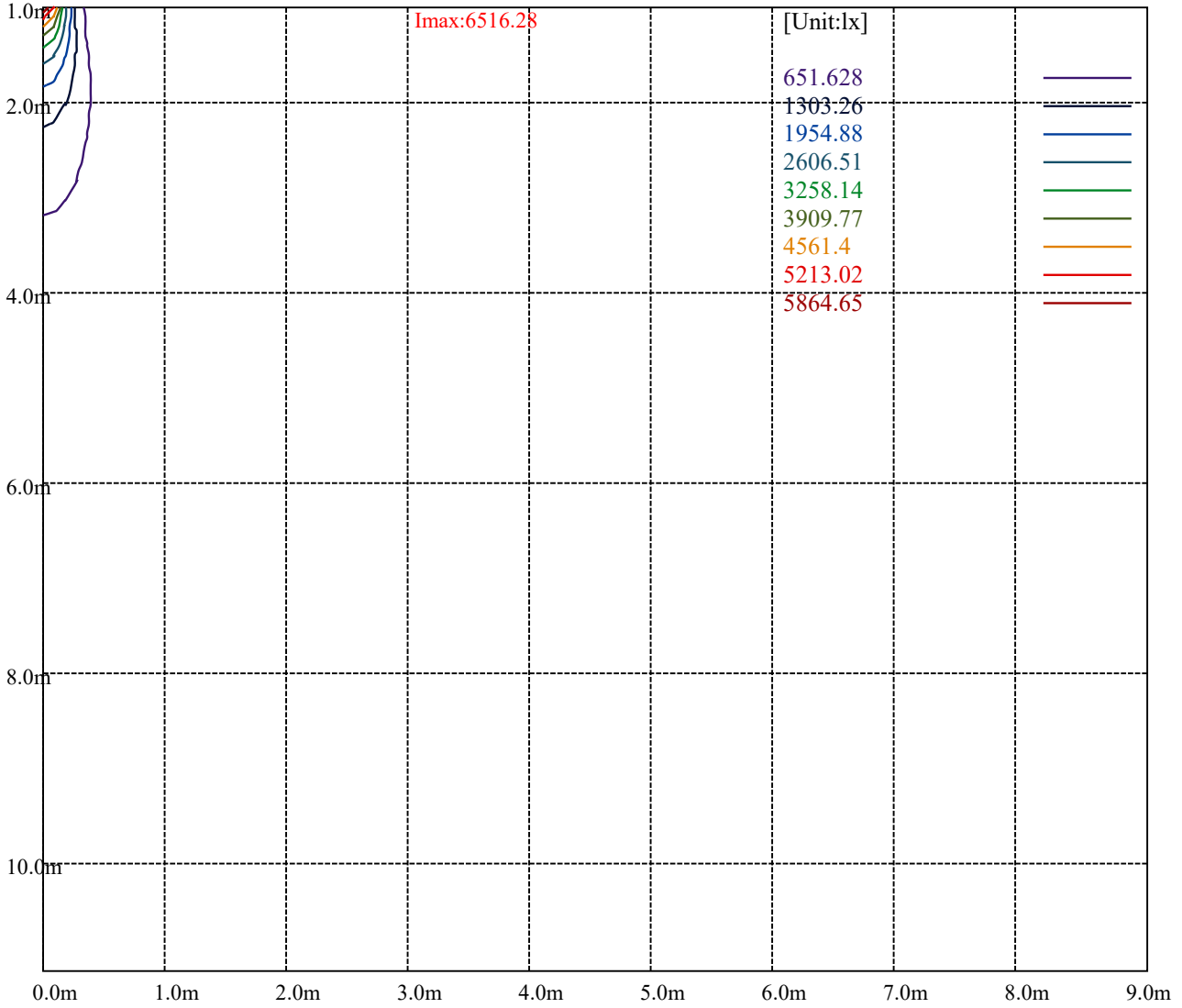
House

[Unit:cd]

Road

Imax:6516.28

(10%Imax) 651.628	—
(20%Imax) 1303.26	—
(30%Imax) 1954.88	—
(40%Imax) 2606.51	—
(50%Imax) 3258.14	—
(60%Imax) 3909.77	—
(70%Imax) 4561.4	—
(80%Imax) 5213.02	—
(90%Imax) 5864.65	—



Luminance Table

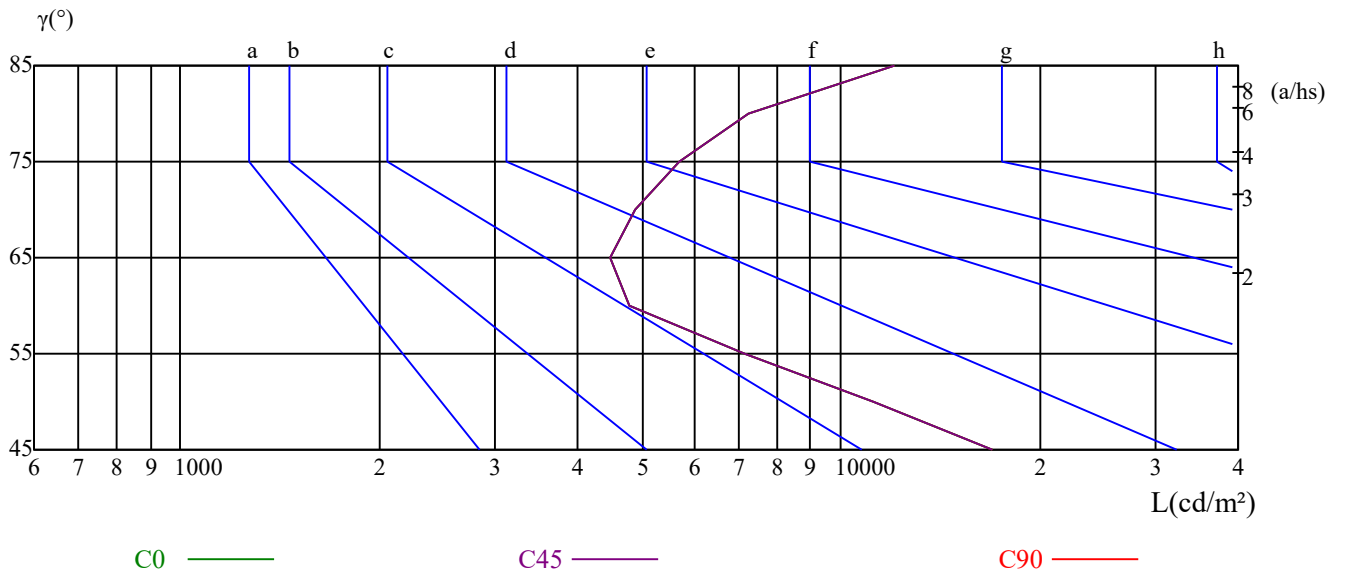
γ	45	50	55	60	65	70	75	80	85
C0	16978	11182	7171	4784	4489	4888	5685	7247	12048
C45	16978	11182	7171	4784	4489	4888	5685	7247	12048
C90	16978	11182	7171	4784	4489	4888	5685	7247	12048

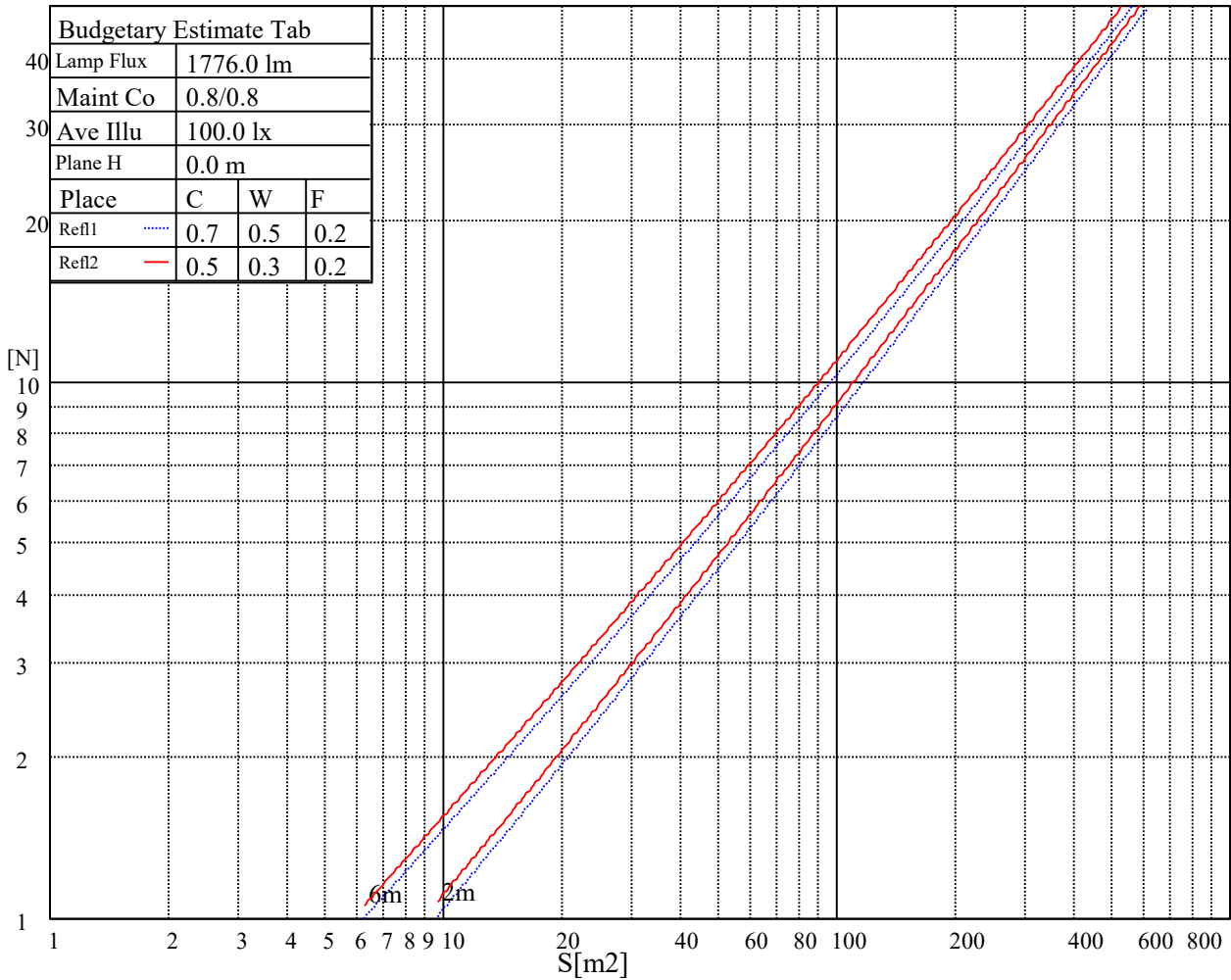
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4489	4489	4489	5685	5685	5685	12048	12048	12048

Glare Table

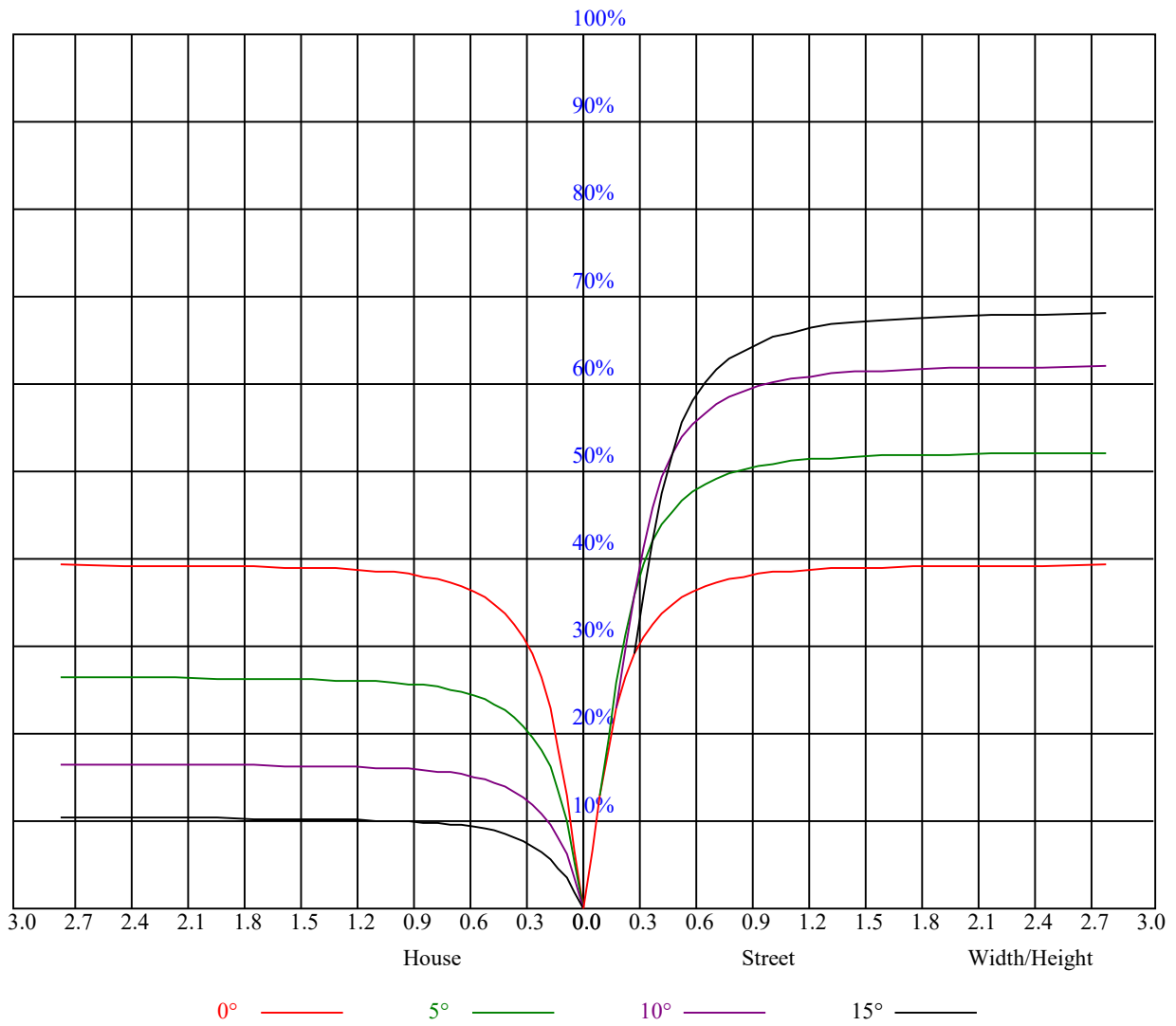
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

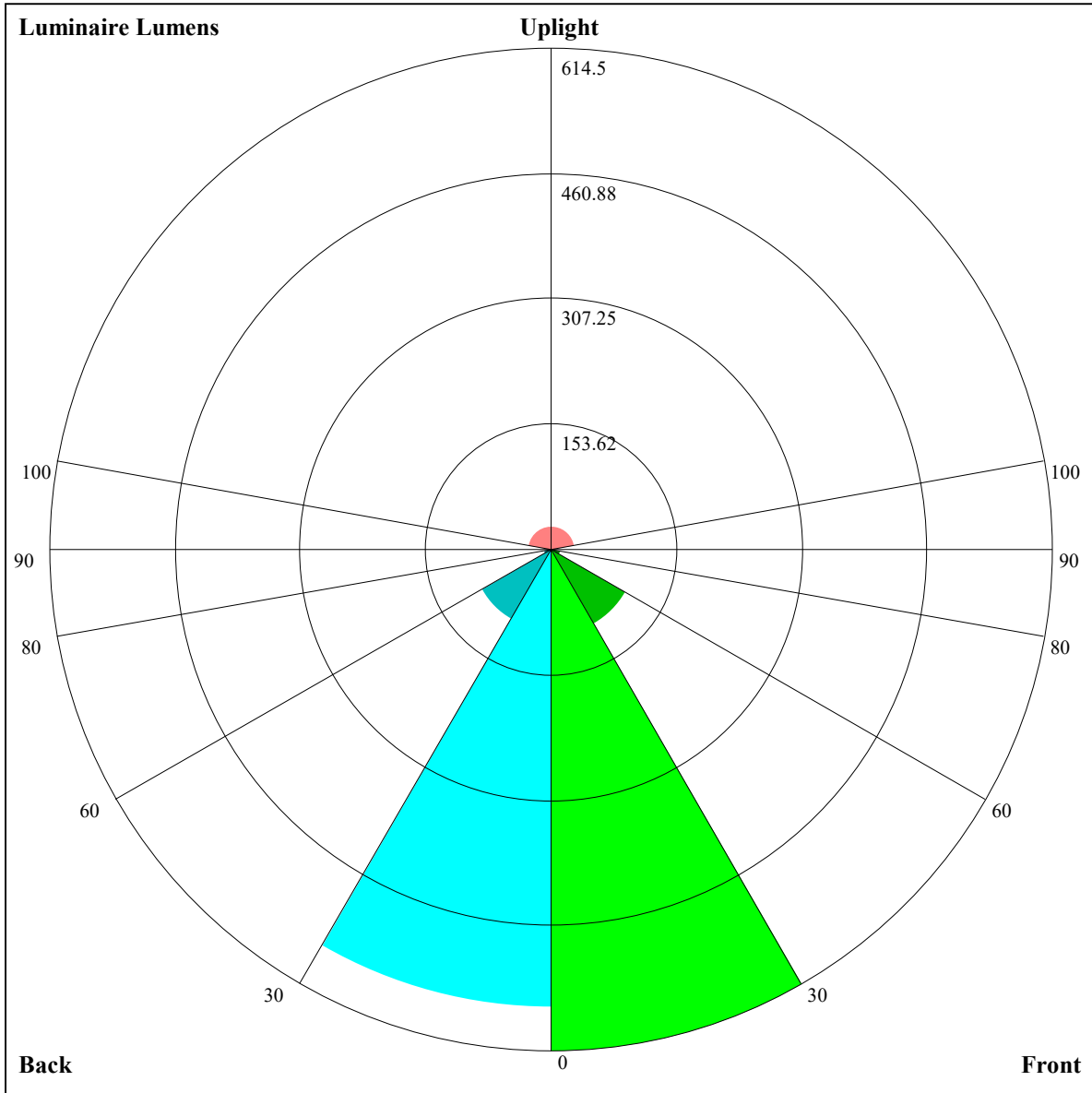
Luminance Limiting Curve





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	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84	0.81	0.81	0.81	0.79
1	0.89	0.87	0.85	0.87	0.85	0.84	0.84	0.82	0.81	0.81	0.80	0.79	0.78	0.77	0.77	0.75
2	0.84	0.81	0.79	0.82	0.80	0.78	0.80	0.78	0.76	0.78	0.76	0.74	0.75	0.74	0.73	0.72
3	0.80	0.76	0.74	0.78	0.75	0.73	0.76	0.74	0.72	0.75	0.73	0.71	0.73	0.71	0.70	0.69
4	0.76	0.72	0.70	0.75	0.72	0.69	0.73	0.71	0.68	0.72	0.70	0.68	0.70	0.69	0.67	0.66
5	0.73	0.69	0.66	0.72	0.69	0.66	0.71	0.68	0.65	0.69	0.67	0.65	0.68	0.66	0.64	0.63
6	0.70	0.66	0.63	0.69	0.66	0.63	0.68	0.65	0.63	0.67	0.64	0.62	0.66	0.64	0.62	0.61
7	0.67	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.60	0.65	0.62	0.60	0.64	0.62	0.60	0.59
8	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
9	0.63	0.59	0.57	0.62	0.59	0.57	0.62	0.59	0.57	0.61	0.58	0.56	0.61	0.58	0.56	0.55
10	0.61	0.57	0.55	0.61	0.57	0.55	0.60	0.57	0.55	0.60	0.57	0.55	0.59	0.56	0.55	0.54





Luminaire Lumens:

FL=614.5,FM=105.5,FH=11.08,FVH=3.67

BL=561.84,BM=99.02,BH=10.67,BVH=3.55

UL=6.14,UH=29.24

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	6454.13	6537.38	6558.19	6477.19	6330.38	6089.63	5784.75	5469.75	5119.88
45.0	6563.81	6509.25	6349.50	6149.25	5893.88	5547.94	5161.50	4791.94	4365.00
90.0	6519.38	6406.88	6206.63	5941.69	5655.94	5280.75	4875.19	4488.75	4036.50
135.0	6527.81	6416.44	6227.44	6009.75	5736.38	5331.94	4978.69	4602.94	4171.50
180.0	6454.13	6286.50	6072.19	5775.19	5428.13	5077.13	4699.69	4214.81	3814.88
225.0	6563.81	6537.94	6429.38	6241.50	6014.81	5701.50	5336.44	4980.94	4515.75
270.0	6519.38	6555.94	6499.13	6381.00	6220.69	5916.94	5579.44	5289.19	4843.69
315.0	6527.81	6548.06	6495.75	6338.25	6140.81	5891.06	5550.75	5168.25	4807.69
360.0	6454.13	6537.38	6558.19	6477.19	6330.38	6089.63	5784.75	5469.75	5119.88
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4664.81	4287.38	3895.88	3448.69	3004.88	2631.38	2234.25	1869.19	1585.69
45.0	3924.56	3527.44	3078.00	2696.63	2295.56	1933.88	1649.81	1401.19	1130.06
90.0	3636.00	3189.38	2770.31	2410.88	2038.50	1706.06	1448.44	1121.40	1010.42
135.0	3729.94	3331.13	2892.94	2522.25	2136.94	1791.00	1526.63	1270.13	1051.88
180.0	3412.13	2931.19	2564.44	2221.88	1833.75	1560.38	1246.50	1095.69	933.75
225.0	4181.63	3743.44	3297.94	2909.25	2494.69	2105.44	1801.69	1533.94	1121.23
270.0	4416.75	4082.06	3592.69	3195.00	2814.19	2361.94	2023.88	1723.50	1396.69
315.0	4381.31	3940.88	3538.13	3089.81	2712.38	2305.13	1941.75	1656.56	1402.31
360.0	4664.81	4287.38	3895.88	3448.69	3004.88	2631.38	2234.25	1869.19	1585.69
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1311.19	1110.94	932.63	795.94	698.63	614.25	549.56	502.31	462.38
45.0	965.25	836.44	709.88	630.56	571.50	516.94	468.56	433.69	398.25
90.0	849.83	739.58	654.24	574.09	524.53	483.08	438.75	406.58	377.04
135.0	905.63	801.56	672.75	603.00	555.19	497.81	453.94	426.38	387.56
180.0	792.96	687.54	615.54	552.60	507.38	464.63	430.88	392.85	364.84
225.0	1055.64	909.90	793.01	683.10	615.54	560.81	504.68	466.03	431.04
270.0	1181.81	1008.00	840.94	736.88	657.56	586.69	531.56	489.38	448.31
315.0	1117.07	974.08	841.84	714.66	636.19	573.08	515.31	468.73	433.97
360.0	1311.19	1110.94	932.63	795.94	698.63	614.25	549.56	502.31	462.38
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	419.63	388.13	360.00	329.63	300.94	285.19	250.54	228.66	210.32
45.0	367.88	336.38	308.25	284.63	257.06	233.04	213.64	196.54	176.96
90.0	345.94	315.56	289.80	263.64	242.10	220.11	200.14	184.28	167.68
135.0	357.75	335.25	304.88	285.75	249.86	226.69	208.46	190.24	173.70
180.0	338.34	312.24	281.08	259.09	238.56	214.93	197.83	182.03	166.11
225.0	396.00	364.44	338.18	310.73	287.38	262.24	238.56	219.15	199.07
270.0	415.13	380.81	348.19	322.31	294.19	285.75	246.38	227.14	205.26
315.0	398.14	369.23	339.30	311.79	288.73	263.42	239.91	220.44	202.78
360.0	419.63	388.13	360.00	329.63	300.94	285.19	250.54	228.66	210.32
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	193.16	176.06	160.09	145.63	134.16	123.81	113.85	102.99	94.22
45.0	162.45	148.73	136.74	124.26	114.41	104.23	92.53	85.22	77.91
90.0	152.94	140.68	129.88	117.68	108.45	98.66	89.49	81.23	74.59
135.0	160.14	147.43	133.03	122.63	112.28	100.74	91.18	84.04	75.71
180.0	151.54	139.73	127.46	117.62	105.86	95.79	87.69	79.26	71.66
225.0	180.79	165.88	152.04	136.91	125.83	115.99	104.40	94.22	86.18
270.0	189.39	174.71	159.19	145.07	133.54	122.40	111.54	101.25	91.69
315.0	182.93	168.47	155.25	140.40	129.32	119.81	107.38	97.93	89.78
360.0	193.16	176.06	160.09	145.63	134.16	123.81	113.85	102.99	94.22

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	84.71	77.91	71.61	65.70	58.56	53.16	47.98	42.86	38.36
45.0	70.65	64.41	58.61	52.82	47.08	42.53	37.86	34.20	30.26
90.0	67.78	61.48	56.08	50.23	45.51	40.67	36.23	32.63	29.36
135.0	68.51	62.33	56.03	50.63	45.06	40.11	36.34	32.74	28.41
180.0	65.36	59.46	52.54	47.42	42.81	37.69	33.75	30.32	26.83
225.0	77.85	70.26	63.79	56.87	51.41	45.62	40.44	36.51	32.91
270.0	83.98	76.16	68.91	62.72	56.87	50.01	45.06	40.67	35.83
315.0	80.55	74.53	67.33	59.79	54.96	49.11	43.03	39.38	35.55
360.0	84.71	77.91	71.61	65.70	58.56	53.16	47.98	42.86	38.36
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	34.65	30.77	27.39	24.69	21.94	19.80	17.55	15.58	14.29
45.0	26.89	24.24	21.94	19.18	17.27	15.64	14.12	13.39	12.88
90.0	25.76	23.18	20.87	18.39	16.59	15.19	13.95	13.33	12.77
135.0	25.54	22.95	20.14	18.06	16.26	14.74	13.61	13.05	12.54
180.0	23.68	21.26	18.84	16.99	15.19	13.95	13.33	12.71	12.21
225.0	28.80	25.88	23.29	20.25	18.17	16.31	14.63	13.61	13.05
270.0	32.34	29.14	25.99	23.12	20.76	18.45	16.37	14.91	13.95
315.0	30.71	27.96	25.14	22.28	19.74	17.72	15.86	14.46	13.78
360.0	34.65	30.77	27.39	24.69	21.94	19.80	17.55	15.58	14.29
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	13.67	12.94	12.49	12.21	11.70	11.42	11.19	10.91	10.58
45.0	12.38	11.93	11.64	11.31	11.03	10.74	10.46	10.29	10.01
90.0	12.26	11.93	11.53	11.25	10.97	10.74	10.46	10.24	10.01
135.0	12.15	11.70	11.36	11.14	10.86	10.52	10.29	10.13	9.84
180.0	11.87	11.53	11.19	10.91	10.69	10.41	10.18	9.96	9.73
225.0	12.49	12.09	11.76	11.42	11.14	10.86	10.63	10.35	10.18
270.0	13.39	12.88	12.49	12.09	11.81	11.42	11.19	10.91	10.63
315.0	13.11	12.66	12.26	11.87	11.59	11.25	10.97	10.69	10.46
360.0	13.67	12.94	12.49	12.21	11.70	11.42	11.19	10.91	10.58
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.35	10.13	9.84	9.68	9.39	9.11	8.94	8.55	8.33
45.0	9.79	9.62	9.45	9.06	8.83	8.61	8.21	7.99	7.76
90.0	9.73	9.51	9.23	8.89	8.72	8.44	8.04	7.82	7.54
135.0	9.56	9.39	9.11	8.83	8.61	8.38	7.99	7.76	7.48
180.0	9.51	9.23	8.94	8.72	8.38	8.16	7.88	7.59	7.31
225.0	9.90	9.68	9.51	9.17	8.94	8.78	8.38	8.10	7.93
270.0	10.41	10.07	9.90	9.62	9.34	9.11	8.83	8.55	8.33
315.0	10.18	9.90	9.73	9.51	9.17	9.00	8.72	8.38	8.16
360.0	10.35	10.13	9.84	9.68	9.39	9.11	8.94	8.55	8.33
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	8.10	7.71	7.48	7.26	6.98	6.69	6.47	6.19	5.96
45.0	7.37	7.14	6.98	6.64	6.41	6.13	5.96	5.74	5.63
90.0	7.14	6.98	6.75	6.47	6.19	6.02	5.79	5.63	5.57
135.0	7.14	6.98	6.69	6.47	6.24	6.02	5.79	5.63	5.63
180.0	7.14	6.86	6.58	6.30	6.08	5.91	5.68	5.63	5.57
225.0	7.65	7.43	7.14	6.86	6.69	6.41	6.13	5.91	5.74
270.0	8.10	7.76	7.54	7.20	6.98	6.64	6.30	6.08	5.85
315.0	7.93	7.59	7.43	7.09	6.86	6.58	6.30	6.08	5.85
360.0	8.10	7.71	7.48	7.26	6.98	6.69	6.47	6.19	5.96

Intensity data(cd)

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