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Nata

LumCAT: 2-2188-M
Luminaire: 92.70.131.00
Report No: NATA0100
Test No: GC20200211711
LampCAT: OSRAM OPTO SOLERIQ S15
Lamp flux(lm): 2836.0
Number of Lamps: 1
Length(mm): 0
Phm Type: C

Voltage(V): 35.5900
Current(A): 0.6000
Power (W): 21.3500
PF: 0.0000
Ballast type: DC
Width(mm): 0
Height(mm): 0

Photometric Results

Lumens(lm): 2270.16
Efficiency(%): 80.05%
Lumens(lm)/Power(W): 106.33
Central intensity(cd): 6677.156
Maximum intensity(cd): 6677.156
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=35.6
 [C90/270]Total=35.6
Field angle(10%Imax): [C0/180]Total=53.4
 [C90/270]Total=53.4
Maximum s/h(1/2): C0_180=0.59 C90_270=0.59
Maximum s/h(1/4): C0_180=0.56 C90_270=0.56
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 80.05%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.699%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6677.156	0.000	0	.000%	.000%
1.0	6663.797	6.383	6.383	.225%	.281%
2.0	6623.719	19.072	25.455	.672%	1.121%
3.0	6553.688	31.516	56.971	1.111%	2.510%
4.0	6459.609	43.560	100.531	1.536%	4.428%
5.0	6349.570	55.104	155.635	1.943%	6.856%
6.0	6201.703	65.960	221.595	2.326%	9.761%
7.0	6022.195	75.874	297.469	2.675%	13.103%
8.0	5848.242	84.954	382.423	2.996%	16.846%
9.0	5637.094	93.082	475.506	3.282%	20.946%
10.0	5398.453	99.868	575.373	3.521%	25.345%
11.0	5184.070	105.741	681.115	3.729%	30.003%
12.0	4948.734	110.766	791.881	3.906%	34.882%
13.0	4681.055	114.281	906.162	4.030%	39.916%
14.0	4432.219	116.649	1022.811	4.113%	45.055%
15.0	4175.297	118.168	1140.979	4.167%	50.260%
16.0	3879.492	118.025	1259.004	4.162%	55.459%
17.0	3583.336	116.216	1375.22	4.098%	60.578%
18.0	3270.727	113.009	1488.229	3.985%	65.556%
19.0	2935.828	107.981	1596.21	3.808%	70.313%
20.0	2617.664	101.644	1697.855	3.584%	74.790%
21.0	2291.273	94.262	1792.116	3.324%	78.942%
22.0	1977.680	85.786	1877.903	3.025%	82.721%
23.0	1663.305	76.398	1954.3	2.694%	86.087%
24.0	1351.132	65.906	2020.207	2.324%	88.990%
25.0	1057.275	54.762	2074.969	1.931%	91.402%
26.0	829.252	44.532	2119.5	1.570%	93.364%
27.0	592.080	34.773	2154.273	1.226%	94.895%
28.0	376.446	24.521	2178.795	.865%	95.976%
29.0	240.075	16.130	2194.924	.569%	96.686%
30.0	123.666	9.821	2204.745	.346%	97.119%
31.0	63.098	5.197	2209.943	.183%	97.348%
32.0	40.648	2.972	2212.915	.105%	97.479%
33.0	29.461	2.065	2214.98	.073%	97.570%
34.0	22.500	1.572	2216.553	.055%	97.639%
35.0	18.577	1.276	2217.829	.045%	97.695%
36.0	16.411	1.114	2218.943	.039%	97.744%
37.0	15.005	1.025	2219.967	.036%	97.789%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	14.055	0.970	2220.937	.034%	97.832%
39.0	13.366	0.936	2221.873	.033%	97.873%
40.0	12.832	0.914	2222.787	.032%	97.913%
41.0	12.424	0.899	2223.686	.032%	97.953%
42.0	12.073	0.890	2224.576	.031%	97.992%
43.0	11.728	0.882	2225.458	.031%	98.031%
44.0	11.475	0.876	2226.334	.031%	98.070%
45.0	11.285	0.875	2227.208	.031%	98.108%
46.0	11.074	0.874	2228.083	.031%	98.147%
47.0	10.898	0.874	2228.957	.031%	98.185%
48.0	10.765	0.876	2229.832	.031%	98.224%
49.0	10.610	0.878	2230.71	.031%	98.262%
50.0	10.484	0.879	2231.59	.031%	98.301%
51.0	10.385	0.883	2232.473	.031%	98.340%
52.0	10.280	0.887	2233.359	.031%	98.379%
53.0	10.188	0.890	2234.25	.031%	98.418%
54.0	10.104	0.894	2235.144	.032%	98.458%
55.0	10.041	0.899	2236.043	.032%	98.497%
56.0	9.977	0.905	2236.948	.032%	98.537%
57.0	9.900	0.909	2237.857	.032%	98.577%
58.0	9.837	0.913	2238.769	.032%	98.617%
59.0	9.802	0.918	2239.687	.032%	98.658%
60.0	9.738	0.923	2240.611	.033%	98.699%
61.0	9.696	0.927	2241.538	.033%	98.739%
62.0	9.661	0.933	2242.471	.033%	98.780%
63.0	9.619	0.938	2243.408	.033%	98.822%
64.0	9.555	0.941	2244.349	.033%	98.863%
65.0	9.541	0.945	2245.294	.033%	98.905%
66.0	9.527	0.951	2246.246	.034%	98.947%
67.0	9.492	0.956	2247.202	.034%	98.989%
68.0	9.464	0.960	2248.162	.034%	99.031%
69.0	9.450	0.965	2249.127	.034%	99.074%
70.0	9.436	0.970	2250.097	.034%	99.116%
71.0	9.422	0.975	2251.072	.034%	99.159%
72.0	9.401	0.979	2252.051	.035%	99.202%
73.0	9.401	0.983	2253.034	.035%	99.246%
74.0	9.394	0.988	2254.022	.035%	99.289%
75.0	9.366	0.991	2255.013	.035%	99.333%

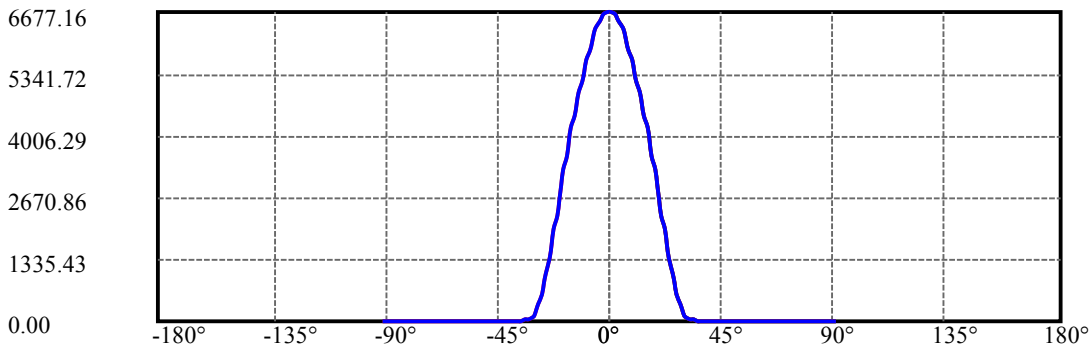
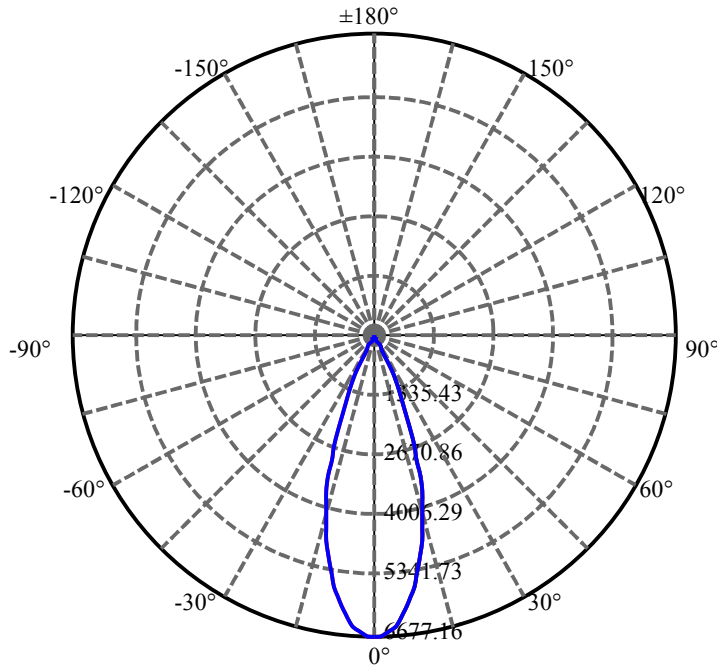
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.359	0.994	2256.007	.035%	99.377%
77.0	9.366	0.998	2257.005	.035%	99.421%
78.0	9.366	1.003	2258.008	.035%	99.465%
79.0	9.366	1.006	2259.015	.035%	99.509%
80.0	9.359	1.009	2260.024	.036%	99.554%
81.0	9.359	1.012	2261.036	.036%	99.598%
82.0	9.359	1.015	2262.051	.036%	99.643%
83.0	9.366	1.018	2263.069	.036%	99.688%
84.0	9.366	1.020	2264.089	.036%	99.733%
85.0	9.359	1.022	2265.111	.036%	99.778%
86.0	9.253	1.017	2266.129	.036%	99.823%
87.0	9.183	1.009	2267.138	.036%	99.867%
88.0	9.183	1.006	2268.144	.035%	99.911%
89.0	9.183	1.007	2269.15	.035%	99.956%
90.0	9.155	1.005	2270.156	.035%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2204.75	77.74%	97.12%
0-40	2222.79	78.38%	97.91%
0-60	2240.61	79.01%	98.70%
0-90	2269.15	80.01%	99.96%
0-120	2269.15	80.01%	99.96%
0-180	2270.16	80.05%	100.00%
60-90	29.46	1.04%	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%
0-21.28	1816.13	64.04%	80.00%

ZONAL LUMEN SUMMARY

0-10	575.37
10-20	1122.48
20-30	506.89
30-40	18.04
40-50	8.80
50-60	9.02
60-70	9.49
70-80	9.93
80-90	9.13
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: —————

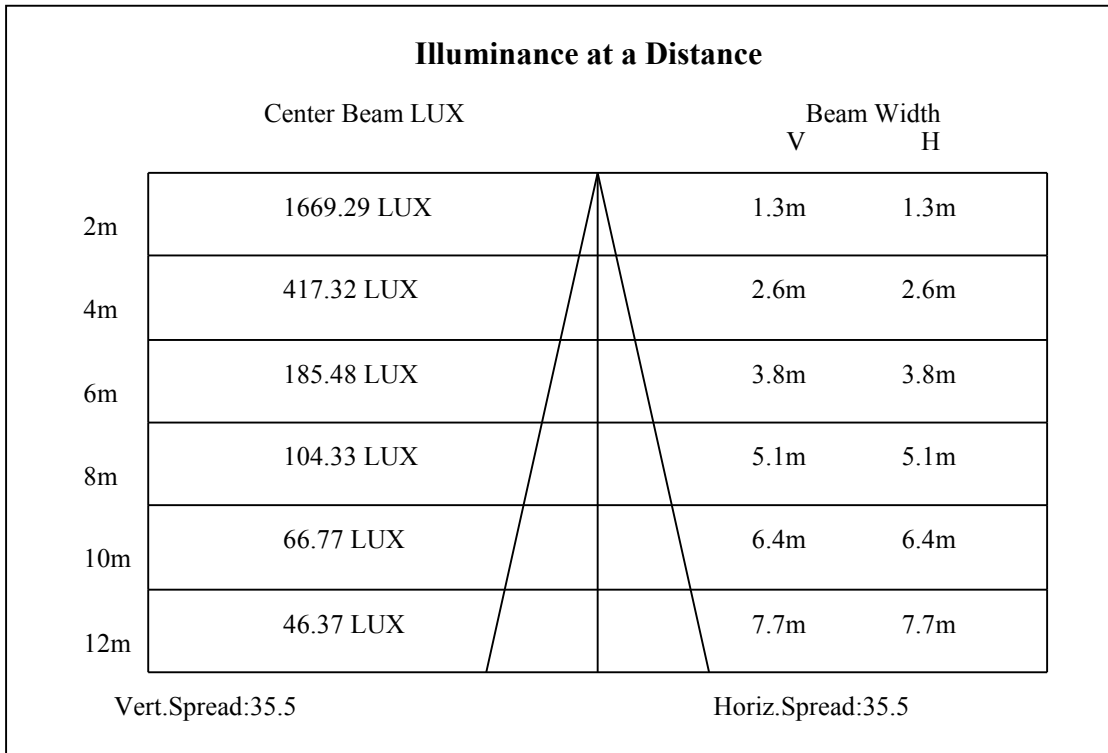
C90/C270: —————

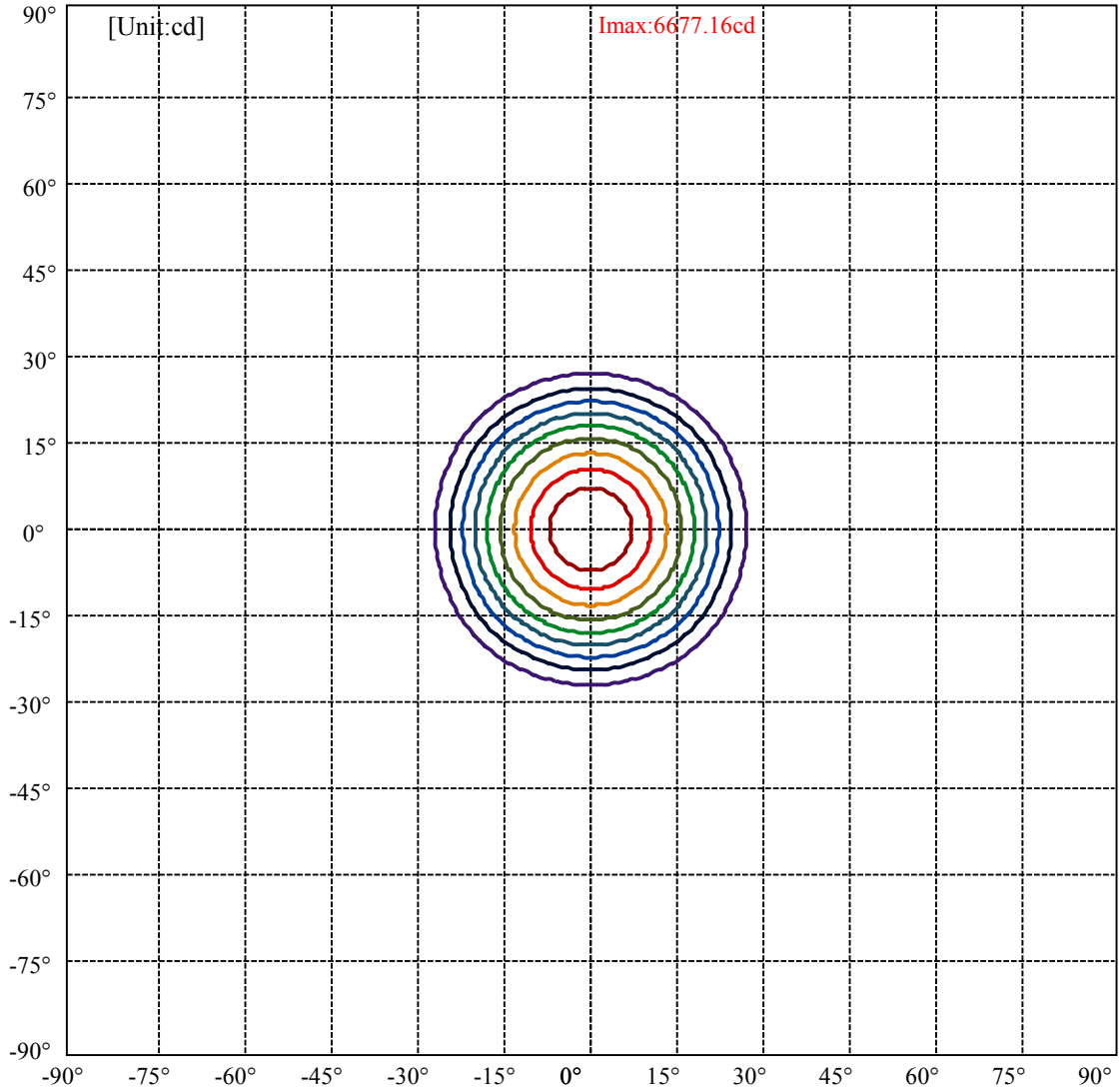
Field angle(10%Imax):C0/180Left:26.7 Right:26.7

:C90/270Left:26.7 Right:26.7

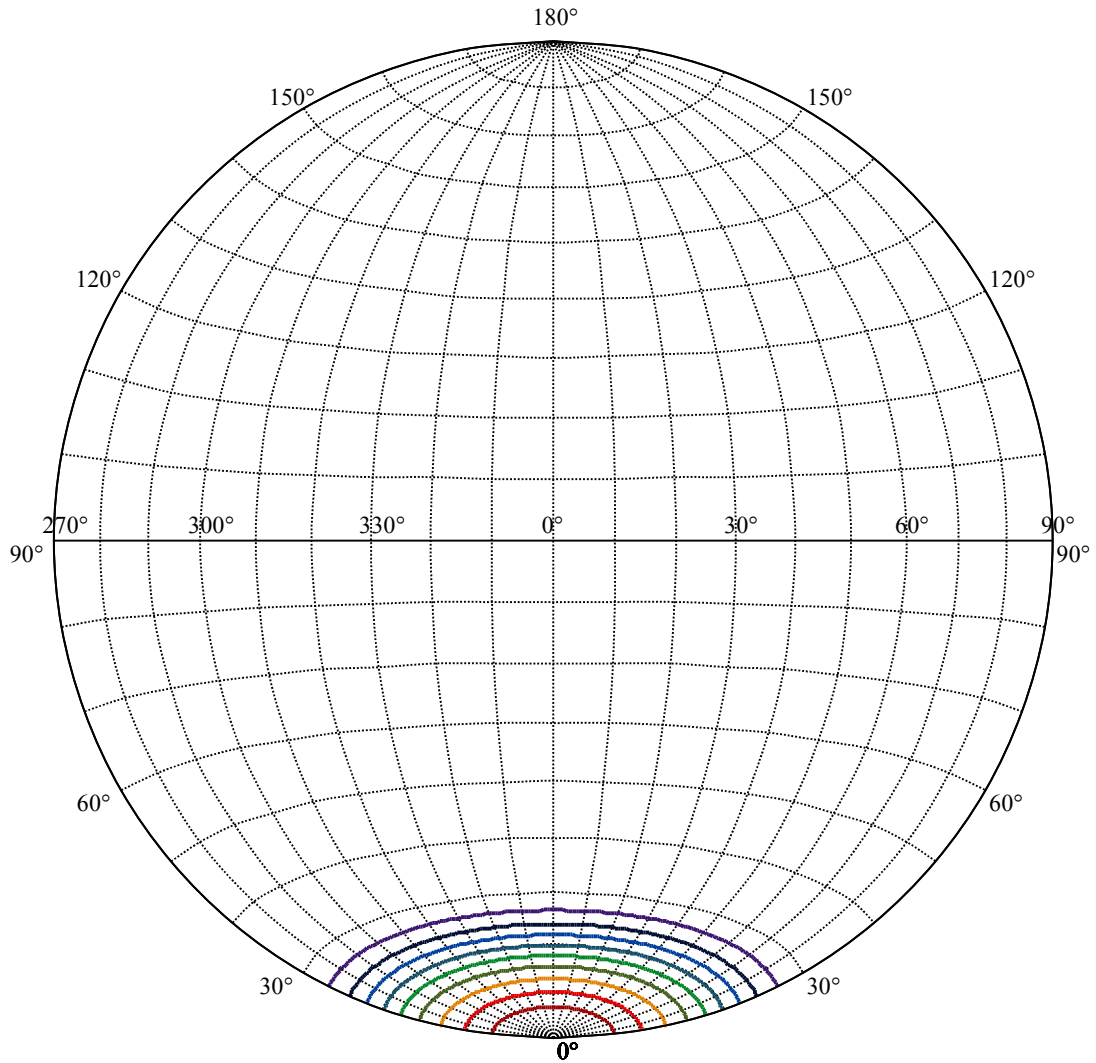
Beam Angle(50%Imax):C0/180Left:17.8 Right:17.8

:C90/270Left:17.8 Right:17.8





(10%I _{max}) 667.716	—
(20%I _{max}) 1335.43	—
(30%I _{max}) 2003.15	—
(40%I _{max}) 2670.86	—
(50%I _{max}) 3338.58	—
(60%I _{max}) 4006.29	—
(70%I _{max}) 4674.01	—
(80%I _{max}) 5341.72	—
(90%I _{max}) 6009.44	—



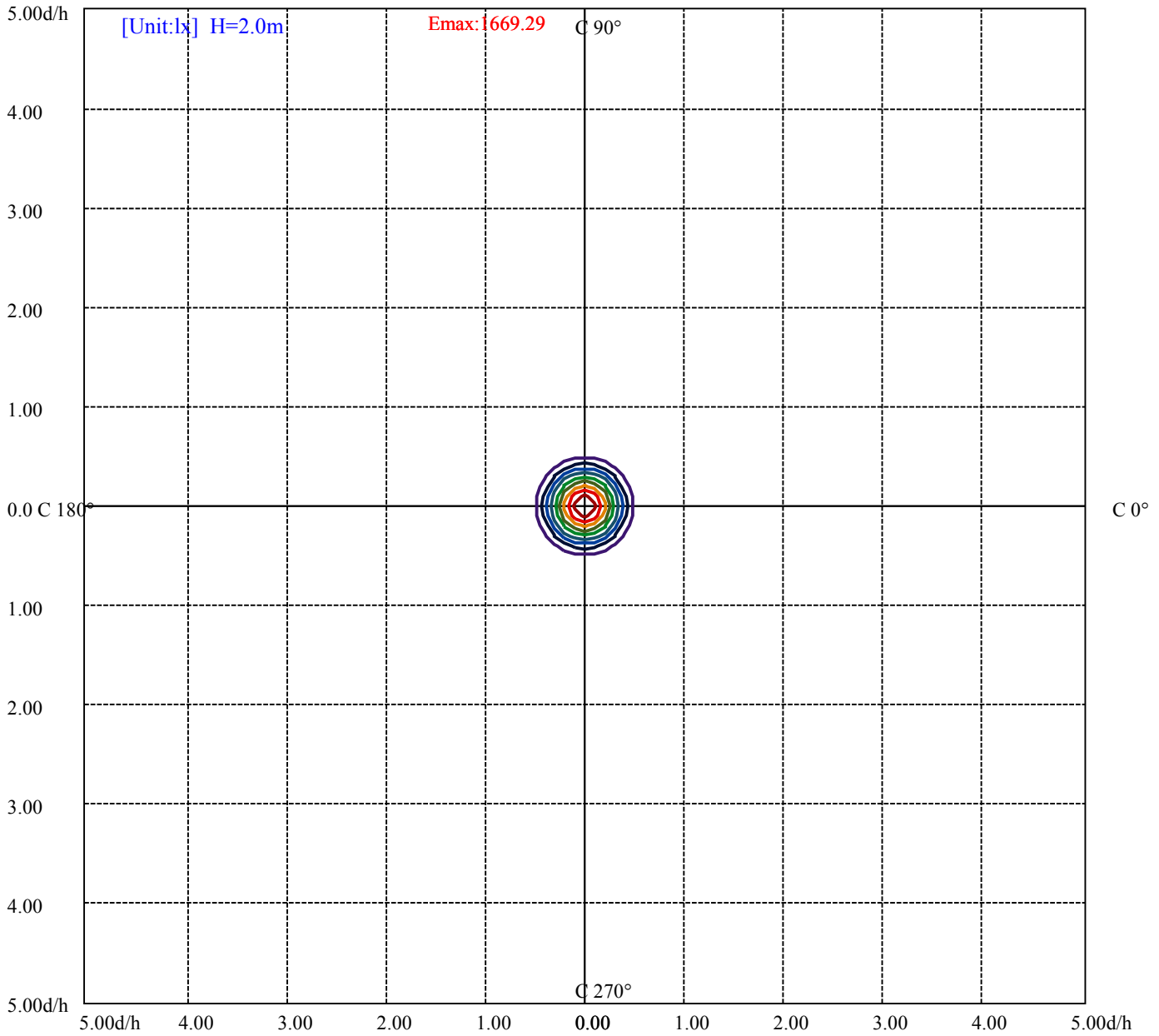
House

[Unit:cd]

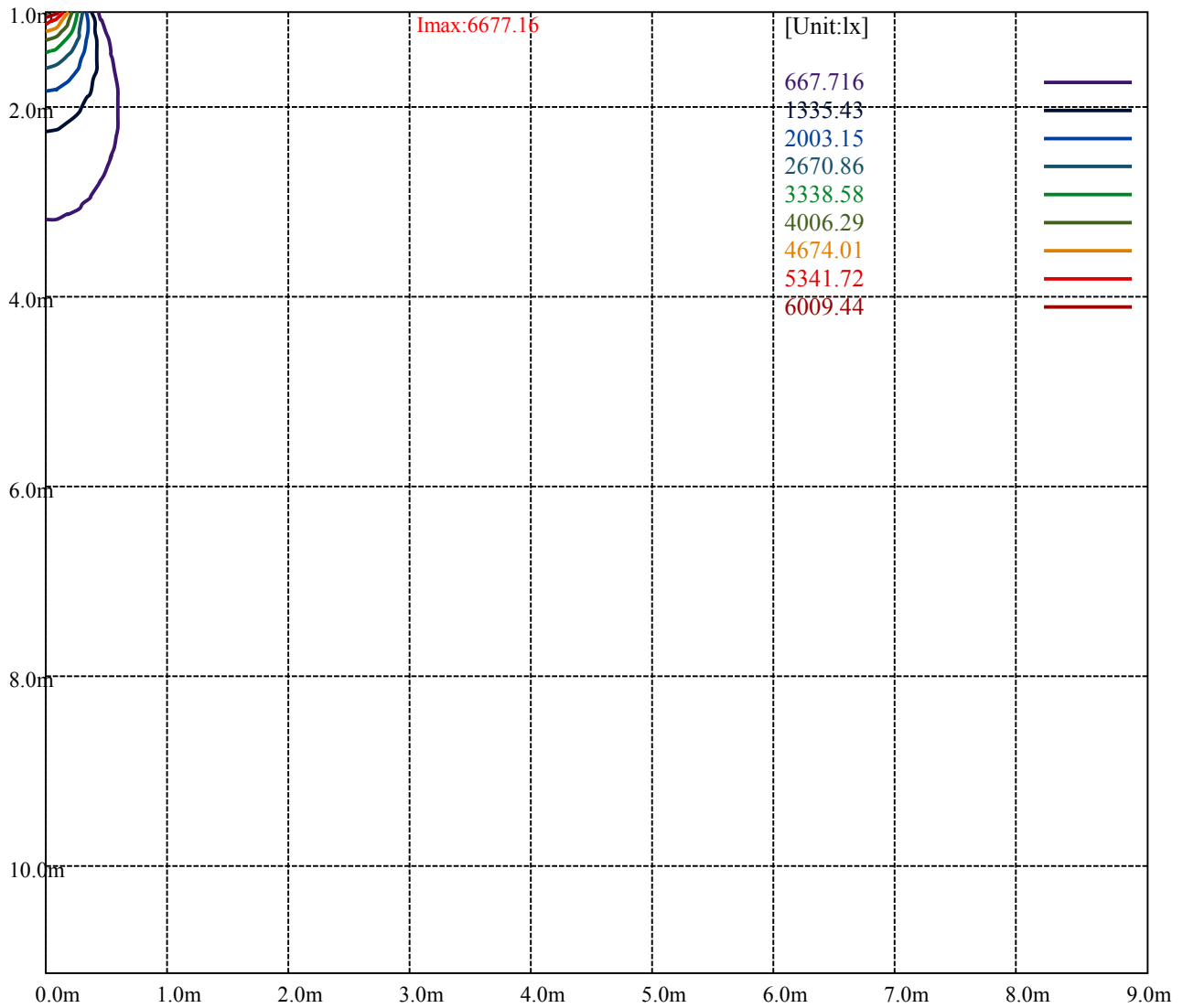
Road

Imax:6677.16

(10%Imax)	667.716	—
(20%Imax)	1335.43	—
(30%Imax)	2003.15	—
(40%Imax)	2670.86	—
(50%Imax)	3338.58	—
(60%Imax)	4006.29	—
(70%Imax)	4674.01	—
(80%Imax)	5341.72	—
(90%Imax)	6009.44	—



- (10%Emax) 166.9288
- (20%Emax) 333.8575
- (30%Emax) 500.7875
- (40%Emax) 667.715
- (50%Emax) 834.645
- (60%Emax) 1001.573
- (70%Emax) 1168.502
- (80%Emax) 1335.43
- (90%Emax) 1502.36



Luminance Table

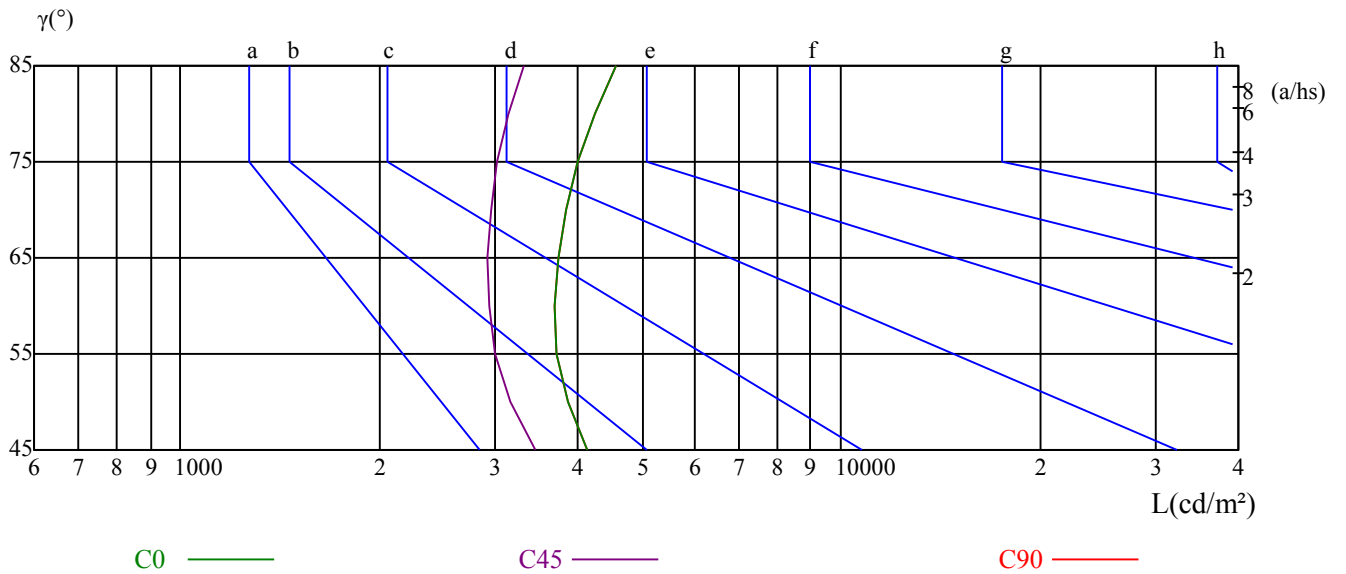
γ	45	50	55	60	65	70	75	80	85
C0	4126	3855	3707	3678	3726	3839	3986	4232	4579
C45	3438	3165	2998	2929	2920	2957	3015	3139	3321
C90	4126	3855	3707	3678	3726	3839	3986	4232	4579

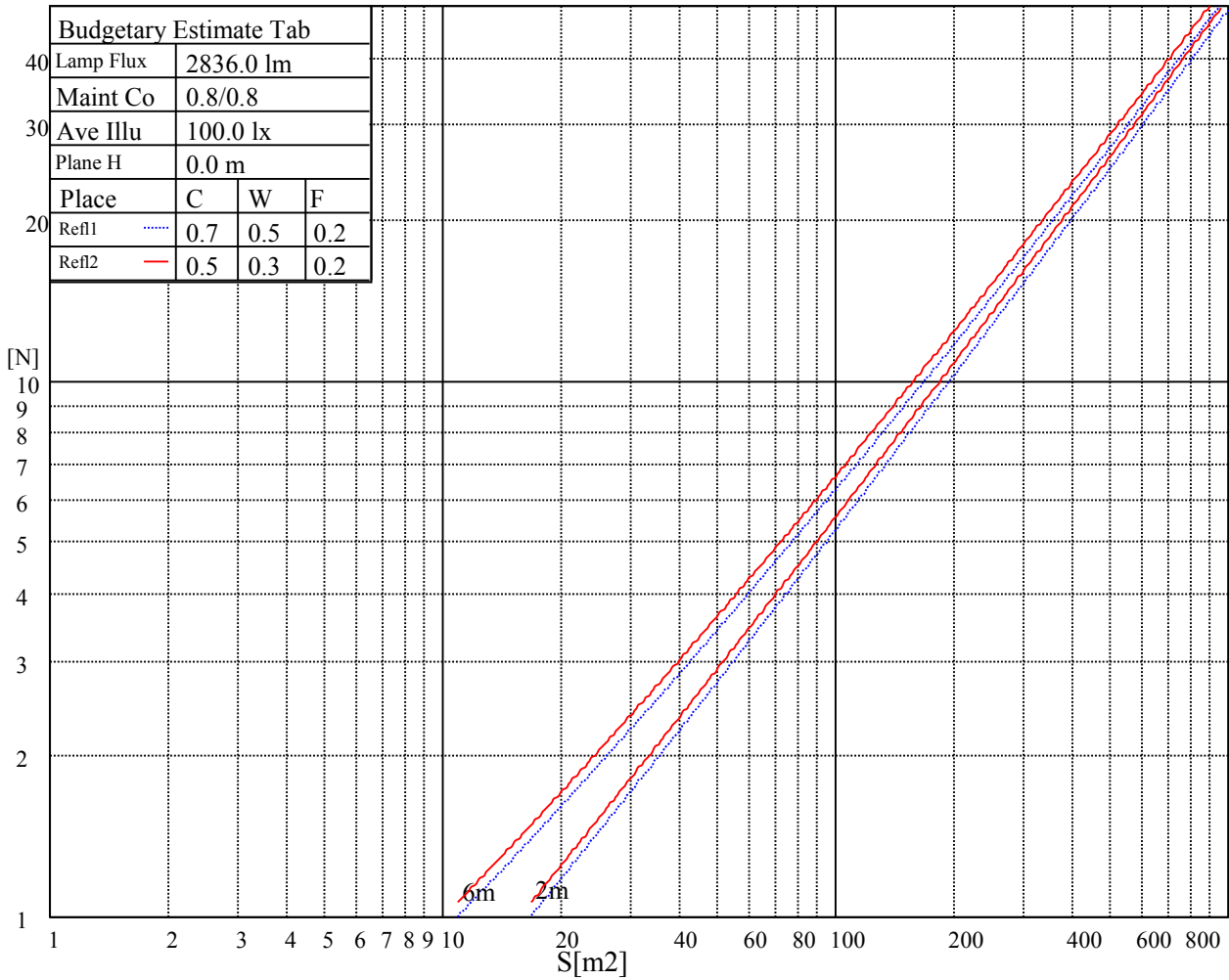
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
11184	11184	11184	17870	17870	17870	53424	53424	53424

Glare Table

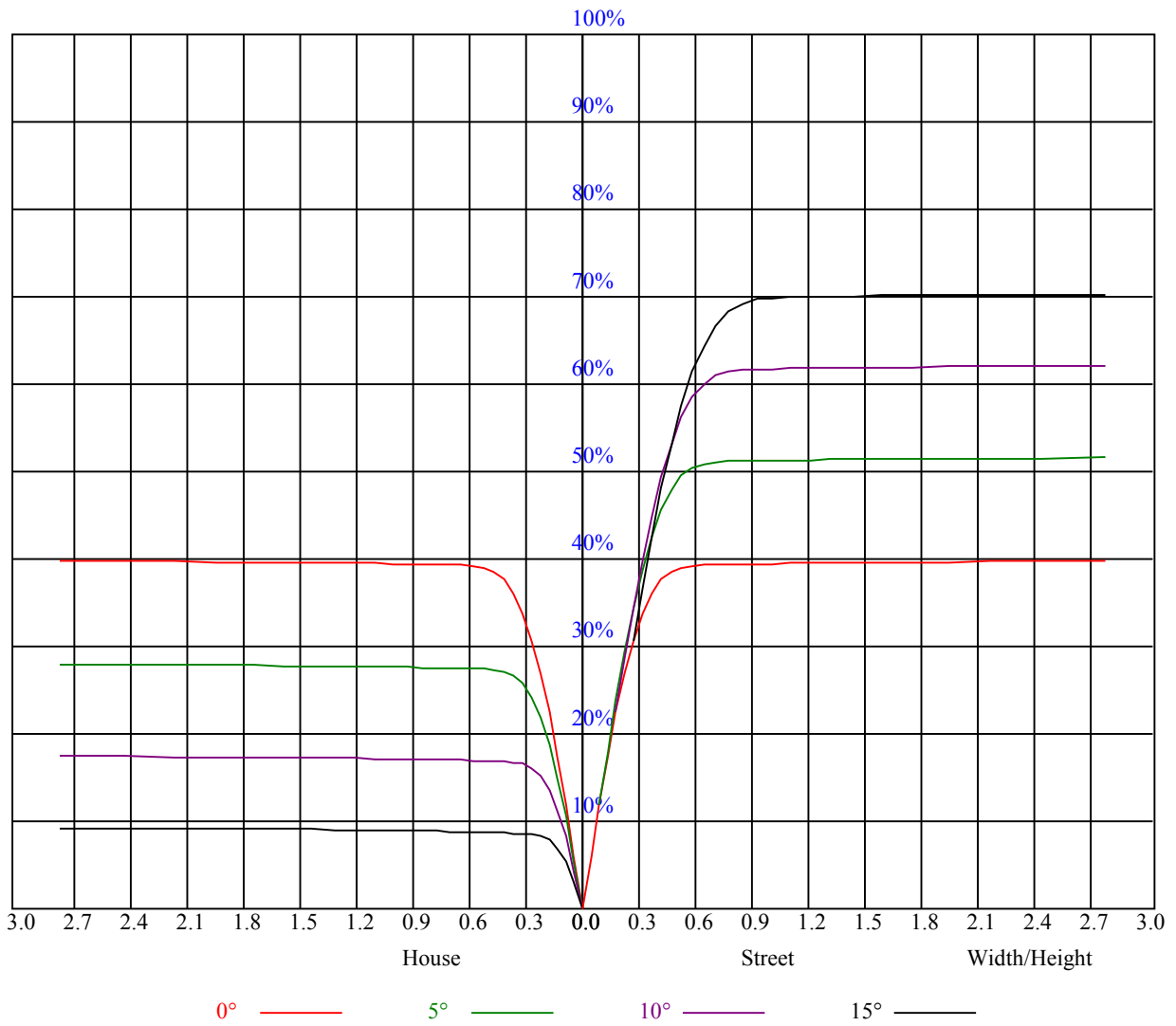
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.93	0.93	0.93	0.89	0.89	0.89	0.85	0.85	0.85	0.82	0.82	0.82	0.80
1	0.90	0.88	0.87	0.88	0.87	0.85	0.85	0.84	0.83	0.82	0.81	0.80	0.79	0.79	0.78	0.77
2	0.85	0.83	0.80	0.84	0.82	0.80	0.81	0.79	0.78	0.79	0.78	0.76	0.77	0.76	0.75	0.73
3	0.81	0.78	0.76	0.80	0.77	0.75	0.78	0.76	0.74	0.76	0.74	0.73	0.75	0.73	0.72	0.71
4	0.78	0.74	0.72	0.77	0.74	0.71	0.75	0.73	0.71	0.74	0.72	0.70	0.72	0.71	0.69	0.68
5	0.75	0.71	0.68	0.74	0.71	0.68	0.73	0.70	0.68	0.71	0.69	0.67	0.70	0.68	0.67	0.66
6	0.72	0.68	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.69	0.67	0.65	0.68	0.66	0.64	0.63
7	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.67	0.64	0.62	0.66	0.64	0.62	0.61
8	0.67	0.63	0.61	0.66	0.63	0.61	0.66	0.63	0.60	0.65	0.62	0.60	0.64	0.62	0.60	0.59
9	0.65	0.61	0.59	0.64	0.61	0.59	0.64	0.60	0.58	0.63	0.60	0.58	0.62	0.60	0.58	0.57
10	0.62	0.59	0.57	0.62	0.59	0.57	0.62	0.59	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.55



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	6671.25	6664.50	6630.75	6567.75	6487.88	6387.75	6228.00	6076.69	5908.50
45.0	6682.50	6658.31	6603.75	6528.38	6422.06	6289.88	6144.19	5952.94	5767.31
90.0	6675.19	6629.63	6563.81	6464.81	6342.75	6207.19	6043.50	5810.06	5607.56
135.0	6679.69	6660.56	6609.38	6527.81	6436.13	6324.19	6147.00	5975.44	5790.38
180.0	6671.25	6649.88	6602.63	6525.56	6409.69	6310.69	6154.88	5942.81	5780.25
225.0	6682.50	6683.06	6655.50	6595.88	6510.38	6410.81	6292.13	6113.81	5945.06
270.0	6675.19	6690.38	6679.69	6636.94	6573.94	6473.81	6351.75	6220.69	6069.94
315.0	6679.69	6674.06	6644.25	6582.38	6494.06	6392.25	6252.19	6085.13	5916.94
360.0	6671.25	6664.50	6630.75	6567.75	6487.88	6387.75	6228.00	6076.69	5908.50
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5702.63	5477.06	5265.56	5018.06	4757.63	4519.13	4245.75	3981.94	3661.88
45.0	5520.94	5307.75	5079.94	4845.94	4552.31	4309.88	4054.50	3712.50	3417.75
90.0	5393.81	5115.38	4885.88	4656.94	4395.94	4122.56	3859.88	3542.06	3246.19
135.0	5548.50	5339.25	5117.63	4859.44	4599.56	4361.06	4082.63	3819.94	3496.50
180.0	5583.38	5294.25	5101.88	4877.44	4620.38	4358.81	4117.50	3825.56	3507.75
225.0	5761.69	5513.06	5301.00	5080.50	4821.19	4559.63	4322.81	4038.75	3767.06
270.0	5853.94	5661.00	5455.13	5209.88	4953.94	4718.25	4451.63	4174.88	3913.88
315.0	5731.88	5479.88	5265.56	5041.69	4747.50	4508.44	4267.69	3940.31	3655.69
360.0	5702.63	5477.06	5265.56	5018.06	4757.63	4519.13	4245.75	3981.94	3661.88
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	3330.00	3029.63	2690.44	2347.88	2055.94	1778.63	1420.88	1137.94	870.75
45.0	3152.25	2759.06	2404.13	2138.63	1807.31	1501.88	1218.38	900.56	672.19
90.0	2899.69	2554.31	2253.94	1934.44	1620.00	1101.88	1069.93	730.24	538.20
135.0	3161.81	2854.69	2496.38	2161.13	1901.81	1604.81	1256.63	1002.38	772.31
180.0	3209.06	2867.06	2568.94	2236.50	1918.13	1640.25	1095.19	1063.01	785.31
225.0	3446.44	3116.81	2818.13	2481.19	2147.63	1873.69	1584.56	1092.43	965.98
270.0	3602.81	3315.38	2983.50	2647.13	2346.19	2027.81	1713.94	1432.13	1150.88
315.0	3363.75	2989.69	2725.88	2383.31	2024.44	1777.50	1449.56	1099.52	878.40
360.0	3330.00	3029.63	2690.44	2347.88	2055.94	1778.63	1420.88	1137.94	870.75
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	598.50	376.88	294.75	102.32	51.47	35.27	25.14	20.42	17.38
45.0	463.50	288.56	121.67	64.24	37.80	27.45	21.66	17.83	16.20
90.0	358.14	199.35	98.21	58.44	39.21	27.79	21.99	18.28	16.37
135.0	527.06	322.31	301.50	97.59	56.53	40.44	29.08	22.95	18.79
180.0	565.88	357.24	196.99	107.10	65.25	42.64	31.73	24.69	19.46
225.0	725.96	487.46	287.89	155.42	82.41	50.18	35.83	26.04	20.93
270.0	849.94	585.56	389.25	287.44	107.83	63.11	42.81	28.52	22.16
315.0	647.66	394.20	230.34	116.78	64.29	38.31	27.45	21.26	17.33
360.0	598.50	376.88	294.75	102.32	51.47	35.27	25.14	20.42	17.38
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	15.75	14.68	13.95	13.22	12.71	12.38	11.93	11.70	11.42
45.0	15.08	14.23	13.56	13.11	12.66	12.32	11.98	11.70	11.48
90.0	15.02	14.12	13.56	13.05	12.60	12.26	11.98	11.64	11.48
135.0	16.65	15.08	14.12	13.39	12.83	12.49	12.15	11.81	11.53
180.0	17.04	15.47	14.29	13.50	13.05	12.49	12.15	11.81	11.53
225.0	17.66	15.81	14.68	13.84	13.11	12.60	12.26	11.81	11.53
270.0	18.45	16.09	14.63	13.78	13.11	12.66	12.26	11.81	11.59
315.0	15.64	14.57	13.67	13.05	12.60	12.21	11.87	11.53	11.25
360.0	15.75	14.68	13.95	13.22	12.71	12.38	11.93	11.70	11.42

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	11.31	11.03	10.91	10.74	10.58	10.46	10.41	10.35	10.18
45.0	11.31	11.08	10.91	10.80	10.58	10.52	10.41	10.29	10.18
90.0	11.25	11.14	10.91	10.74	10.63	10.52	10.41	10.29	10.24
135.0	11.36	11.14	10.97	10.91	10.69	10.58	10.46	10.35	10.29
180.0	11.36	11.14	10.97	10.80	10.69	10.52	10.41	10.29	10.24
225.0	11.31	11.08	10.86	10.74	10.58	10.46	10.29	10.18	10.13
270.0	11.31	11.08	10.97	10.80	10.69	10.46	10.41	10.29	10.18
315.0	11.08	10.91	10.69	10.58	10.46	10.35	10.29	10.18	10.07
360.0	11.31	11.03	10.91	10.74	10.58	10.46	10.41	10.35	10.18
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	10.13	10.07	10.01	9.90	9.84	9.79	9.79	9.68	9.68
45.0	10.07	10.01	9.96	9.84	9.79	9.73	9.68	9.68	9.56
90.0	10.13	10.07	10.01	9.96	9.84	9.84	9.79	9.73	9.73
135.0	10.18	10.13	10.01	10.01	9.96	9.90	9.84	9.73	9.73
180.0	10.18	10.07	10.01	9.90	9.84	9.90	9.73	9.73	9.68
225.0	10.01	9.96	9.90	9.84	9.73	9.68	9.62	9.62	9.56
270.0	10.13	10.07	9.96	9.90	9.90	9.84	9.79	9.73	9.68
315.0	10.01	9.96	9.96	9.84	9.79	9.73	9.68	9.68	9.68
360.0	10.13	10.07	10.01	9.90	9.84	9.79	9.79	9.68	9.68
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.62	9.56	9.56	9.51	9.45	9.39	9.39	9.39	9.39
45.0	9.56	9.51	9.45	9.45	9.39	9.39	9.39	9.34	9.28
90.0	9.68	9.62	9.56	9.56	9.56	9.56	9.56	9.56	9.51
135.0	9.68	9.62	9.62	9.62	9.51	9.51	9.45	9.51	9.51
180.0	9.62	9.56	9.56	9.56	9.56	9.45	9.45	9.45	9.45
225.0	9.56	9.45	9.45	9.39	9.39	9.39	9.34	9.34	9.34
270.0	9.68	9.62	9.62	9.62	9.62	9.56	9.56	9.51	9.51
315.0	9.56	9.51	9.51	9.51	9.45	9.45	9.45	9.39	9.39
360.0	9.62	9.56	9.56	9.51	9.45	9.39	9.39	9.39	9.39
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.39	9.39	9.39	9.34	9.28	9.34	9.28	9.34	9.28
45.0	9.28	9.28	9.28	9.23	9.23	9.23	9.23	9.23	9.17
90.0	9.56	9.56	9.62	9.56	9.62	9.62	9.68	9.62	9.68
135.0	9.39	9.45	9.39	9.39	9.34	9.34	9.34	9.39	9.34
180.0	9.39	9.34	9.34	9.34	9.28	9.34	9.34	9.28	9.28
225.0	9.28	9.28	9.23	9.23	9.23	9.17	9.17	9.17	9.17
270.0	9.56	9.56	9.56	9.56	9.56	9.62	9.62	9.62	9.68
315.0	9.34	9.34	9.34	9.28	9.34	9.28	9.28	9.28	9.28
360.0	9.39	9.39	9.39	9.34	9.28	9.34	9.28	9.34	9.28
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.28	9.28	9.28	9.28	9.28	9.23	9.17	9.23	9.23
45.0	9.17	9.23	9.17	9.23	9.23	9.11	9.11	9.11	9.11
90.0	9.73	9.73	9.79	9.51	9.39	9.17	9.17	9.17	9.17
135.0	9.39	9.39	9.39	9.39	9.45	9.51	9.17	9.17	9.23
180.0	9.28	9.28	9.28	9.28	9.28	9.28	9.28	9.23	9.23
225.0	9.17	9.11	9.11	9.17	9.11	9.11	9.11	9.11	9.11
270.0	9.62	9.62	9.68	9.79	9.84	9.39	9.23	9.23	9.17
315.0	9.23	9.23	9.23	9.28	9.28	9.23	9.23	9.23	9.23
360.0	9.28	9.28	9.28	9.28	9.28	9.23	9.17	9.23	9.23

Intensity data(cd)

C/γ(°)	90.0
0.0	9.23
45.0	9.06
90.0	9.11
135.0	9.23
180.0	9.17
225.0	9.06
270.0	9.17
315.0	9.23
360.0	9.23