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## Nata

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LumCAT: 2-2181-M  
Luminaire: BJB 47.360.1010  
Report No: NATA0100  
Test No: GC202002107  
LampCAT: OSRAM OPTO SOLERIQ S15  
Lamp flux(lm): 2825.0  
Number of Lamps: 1  
Length(mm): 0  
Phm Type: C

Voltage(V): 35.7200  
Current(A): 0.5970  
Power (W): 21.3000  
PF: 0.0000  
Ballast type: DC  
Width(mm): 0  
Height(mm): 0

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## Photometric Results

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Lumens(lm): 2233.27  
Efficiency(%): 79.05%  
Lumens(lm)/Power(W): 104.85  
Central intensity(cd): 10456.170  
Maximum intensity(cd): 10456.170  
Angle of maximum intensity: C=0.0  $\gamma$ =0.0  
Beam Angle(50%Imax): [C0/180]Total=24.1  
                                  [C90/270]Total=24.1  
Field angle(10%Imax): [C0/180]Total=46.7  
                                  [C90/270]Total=46.7  
Maximum s/h(1/2): C0\_180=0.41 C90\_270=0.41  
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(%): 79.05%  
Up flux rate of LUM(%): - -  
Down flux rate of LUM(%): 100.00%  
CIE Type : Direct lighting  
Output flux ratio in  $\pi$  solid angle : 98.025%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10456.172	0.000	0	.000%	.000%
1.0	10406.320	9.982	9.982	.353%	.447%
2.0	10261.266	29.664	39.646	1.050%	1.775%
3.0	10023.328	48.514	88.16	1.717%	3.948%
4.0	9718.523	66.082	154.243	2.339%	6.907%
5.0	9331.453	81.952	236.195	2.901%	10.576%
6.0	8839.547	95.493	331.688	3.380%	14.852%
7.0	8304.680	106.414	438.102	3.767%	19.617%
8.0	7755.328	114.938	553.041	4.069%	24.764%
9.0	7113.656	120.505	673.546	4.266%	30.160%
10.0	6458.344	122.822	796.367	4.348%	35.659%
11.0	5854.781	123.033	919.401	4.355%	41.168%
12.0	5266.125	121.567	1040.968	4.303%	46.612%
13.0	4671.000	117.929	1158.897	4.174%	51.892%
14.0	4141.969	112.805	1271.702	3.993%	56.943%
15.0	3671.508	107.267	1378.969	3.797%	61.747%
16.0	3253.219	101.467	1480.435	3.592%	66.290%
17.0	2820.938	94.591	1575.026	3.348%	70.525%
18.0	2469.305	87.225	1662.251	3.088%	74.431%
19.0	2167.453	80.670	1742.921	2.856%	78.043%
20.0	1867.641	73.853	1816.775	2.614%	81.350%
21.0	1591.805	66.428	1883.203	2.351%	84.325%
22.0	1338.476	58.885	1942.088	2.084%	86.962%
23.0	1120.345	51.593	1993.681	1.826%	89.272%
24.0	898.207	44.133	2037.814	1.562%	91.248%
25.0	698.934	36.316	2074.129	1.286%	92.874%
26.0	512.599	28.598	2102.728	1.012%	94.155%
27.0	350.880	21.125	2123.853	.748%	95.100%
28.0	217.294	14.385	2138.238	.509%	95.745%
29.0	132.124	9.142	2147.379	.324%	96.154%
30.0	46.259	4.816	2152.196	.170%	96.370%
31.0	24.532	1.970	2154.166	.070%	96.458%
32.0	19.638	1.265	2155.431	.045%	96.514%
33.0	18.302	1.118	2156.549	.040%	96.565%
34.0	17.606	1.087	2157.636	.038%	96.613%
35.0	16.966	1.074	2158.709	.038%	96.661%
36.0	16.460	1.064	2159.774	.038%	96.709%
37.0	16.102	1.062	2160.836	.038%	96.756%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	15.764	1.064	2161.899	.038%	96.804%
39.0	15.469	1.066	2162.965	.038%	96.852%
40.0	15.265	1.072	2164.037	.038%	96.900%
41.0	15.061	1.080	2165.117	.038%	96.948%
42.0	14.871	1.087	2166.205	.038%	96.997%
43.0	14.730	1.097	2167.301	.039%	97.046%
44.0	14.646	1.109	2168.41	.039%	97.096%
45.0	14.604	1.124	2169.534	.040%	97.146%
46.0	14.611	1.143	2170.676	.040%	97.197%
47.0	14.653	1.164	2171.84	.041%	97.249%
48.0	14.702	1.187	2173.027	.042%	97.302%
49.0	14.752	1.210	2174.237	.043%	97.357%
50.0	14.801	1.232	2175.469	.044%	97.412%
51.0	14.829	1.254	2176.722	.044%	97.468%
52.0	14.906	1.276	2177.998	.045%	97.525%
53.0	14.991	1.301	2179.299	.046%	97.583%
54.0	15.054	1.324	2180.623	.047%	97.643%
55.0	15.173	1.349	2181.972	.048%	97.703%
56.0	15.293	1.377	2183.349	.049%	97.765%
57.0	15.434	1.405	2184.754	.050%	97.827%
58.0	15.609	1.436	2186.189	.051%	97.892%
59.0	15.827	1.470	2187.659	.052%	97.958%
60.0	16.066	1.507	2189.166	.053%	98.025%
61.0	16.369	1.548	2190.714	.055%	98.094%
62.0	16.678	1.592	2192.306	.056%	98.166%
63.0	16.966	1.636	2193.943	.058%	98.239%
64.0	17.318	1.682	2195.625	.060%	98.314%
65.0	17.592	1.728	2197.353	.061%	98.392%
66.0	17.803	1.766	2199.119	.063%	98.471%
67.0	17.923	1.796	2200.915	.064%	98.551%
68.0	18.183	1.829	2202.744	.065%	98.633%
69.0	18.281	1.860	2204.604	.066%	98.716%
70.0	18.253	1.876	2206.48	.066%	98.800%
71.0	17.979	1.873	2208.353	.066%	98.884%
72.0	17.416	1.840	2210.194	.065%	98.967%
73.0	16.474	1.772	2211.966	.063%	99.046%
74.0	15.209	1.666	2213.631	.059%	99.121%
75.0	14.140	1.551	2215.182	.055%	99.190%

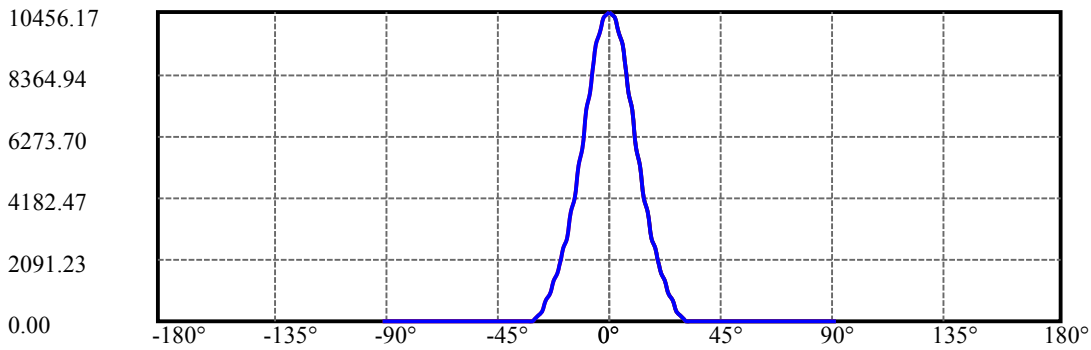
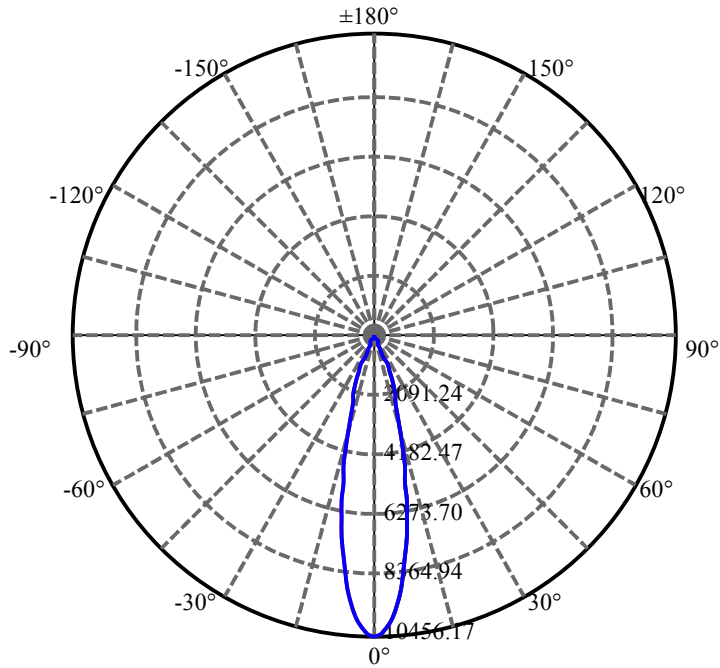
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	13.444	1.464	2216.646	.052%	99.256%
77.0	12.762	1.397	2218.044	.049%	99.318%
78.0	12.023	1.327	2219.37	.047%	99.377%
79.0	11.665	1.273	2220.643	.045%	99.434%
80.0	11.461	1.247	2221.89	.044%	99.490%
81.0	11.292	1.230	2223.12	.044%	99.545%
82.0	11.138	1.216	2224.337	.043%	99.600%
83.0	11.039	1.206	2225.542	.043%	99.654%
84.0	10.934	1.197	2226.739	.042%	99.707%
85.0	10.730	1.182	2227.921	.042%	99.760%
86.0	10.624	1.167	2229.089	.041%	99.813%
87.0	10.181	1.139	2230.227	.040%	99.864%
88.0	9.246	1.064	2231.292	.038%	99.911%
89.0	9.000	1.000	2232.292	.035%	99.956%
90.0	8.888	0.981	2233.272	.035%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2152.20	76.18%	96.37%
0-40	2164.04	76.60%	96.90%
0-60	2189.17	77.49%	98.03%
0-90	2232.29	79.02%	99.96%
0-120	2232.29	79.02%	99.96%
0-180	2233.27	79.05%	100.00%
60-90	44.63	1.58%	2.00%
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%
0-19.59	1786.62	63.24%	80.00%

ZONAL LUMEN SUMMARY

0-10	796.37
10-20	1020.41
20-30	335.42
30-40	11.84
40-50	11.43
50-60	13.70
60-70	17.31
70-80	15.41
80-90	10.40
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: ———

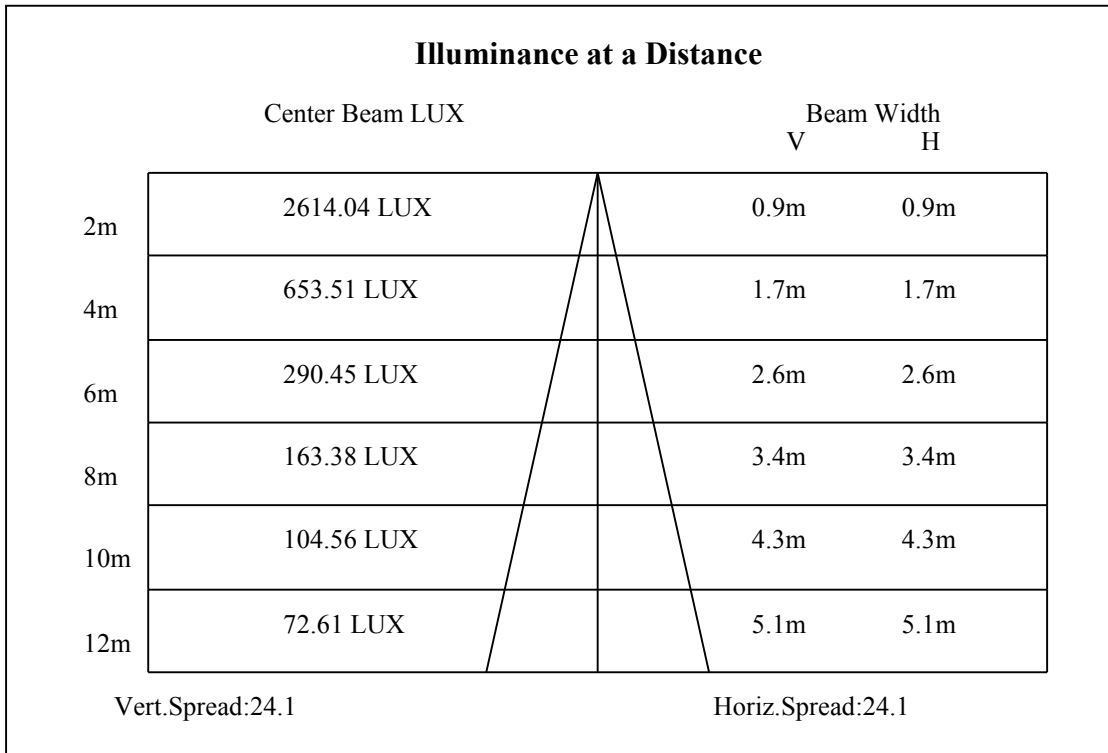
C90/C270: ———

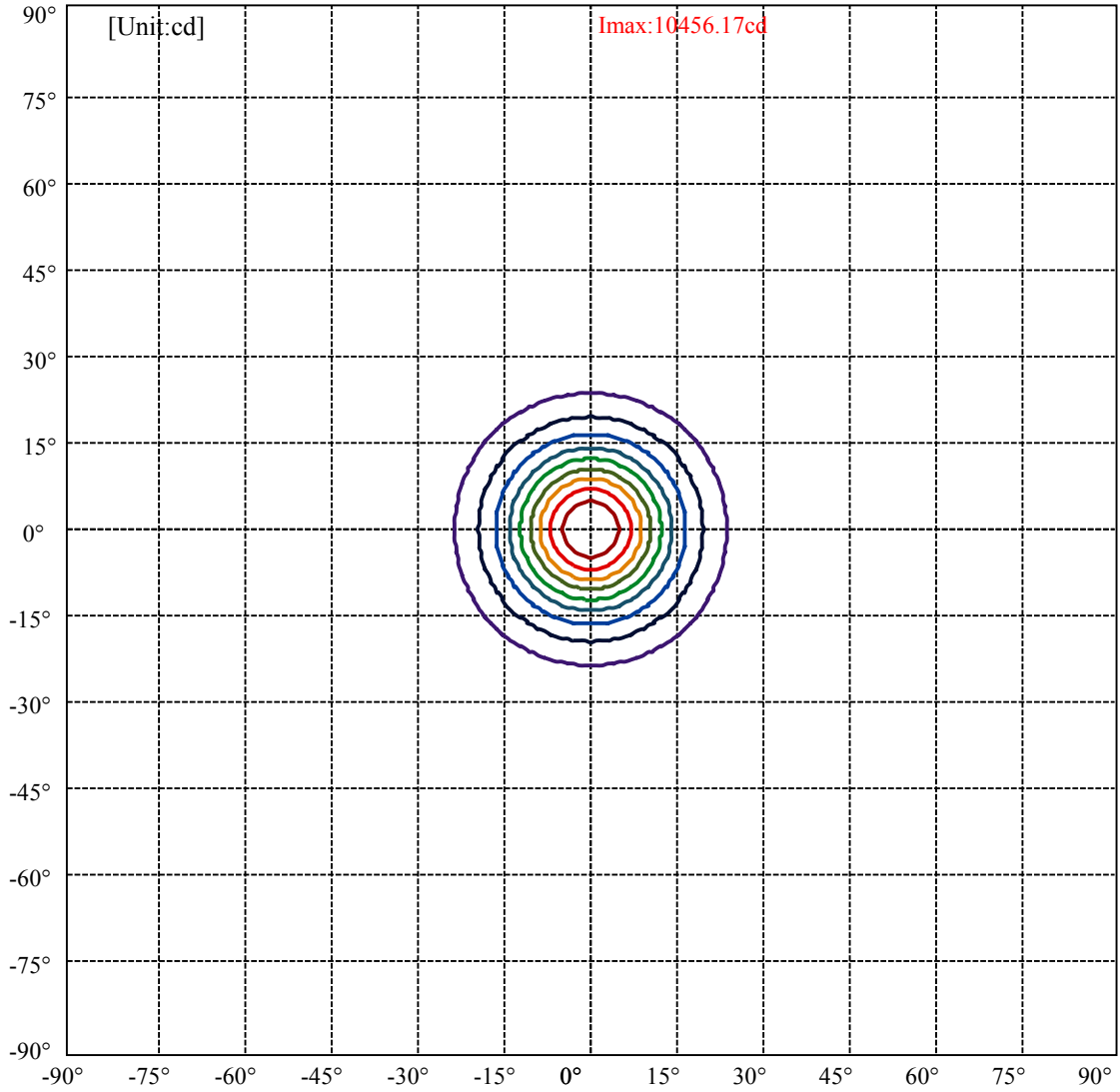
Field angle(10%Imax):C0/180Left:23.3 Right:23.3

:C90/270Left:23.3 Right:23.3

Beam Angle(50%Imax):C0/180Left:12.1 Right:12.1

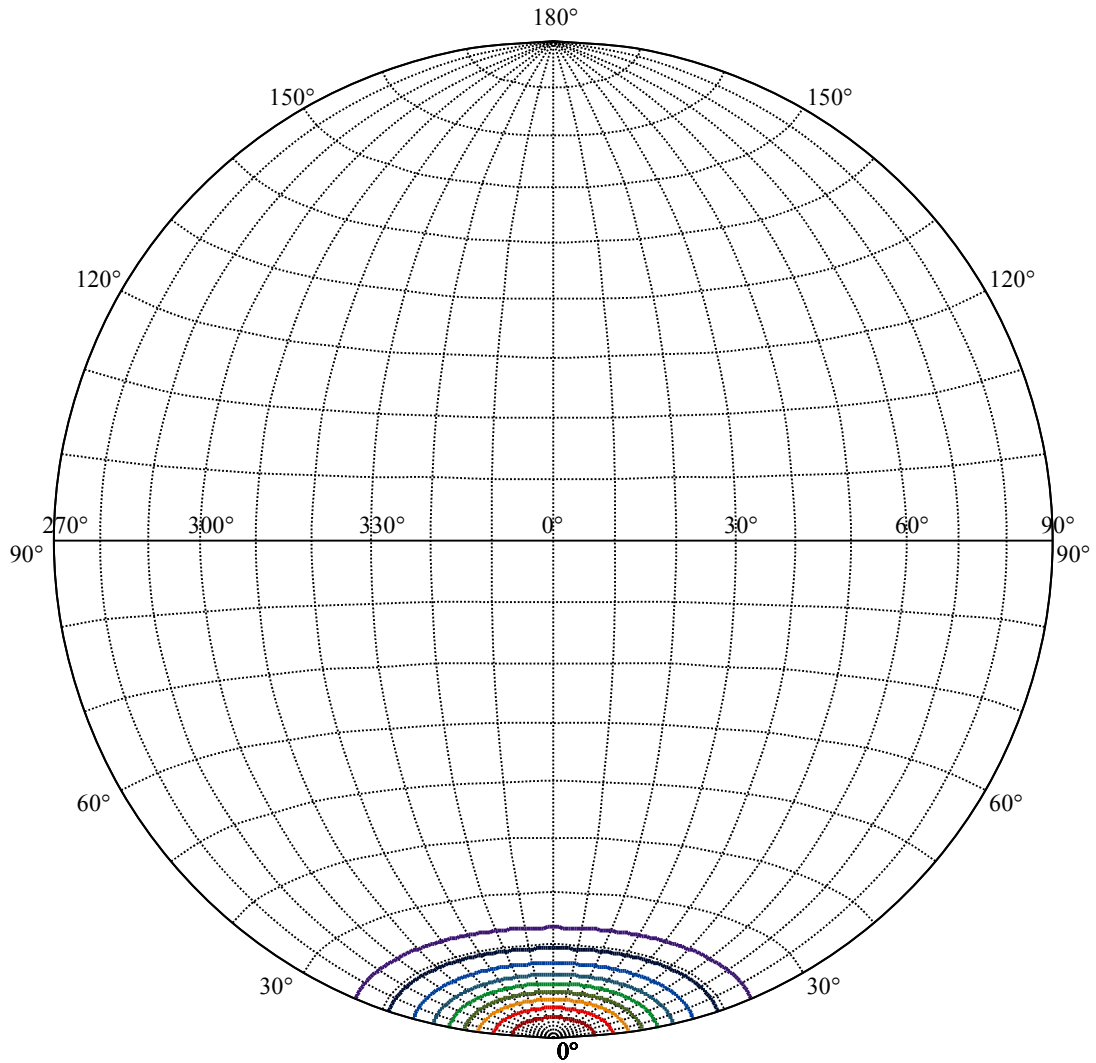
:C90/270Left:12.1 Right:12.1





(10%Imax) 1045.62	—
(20%Imax) 2091.23	—
(30%Imax) 3136.85	—
(40%Imax) 4182.47	—
(50%Imax) 5228.09	—
(60%Imax) 6273.7	—
(70%Imax) 7319.32	—
(80%Imax) 8364.94	—
(90%Imax) 9410.56	—





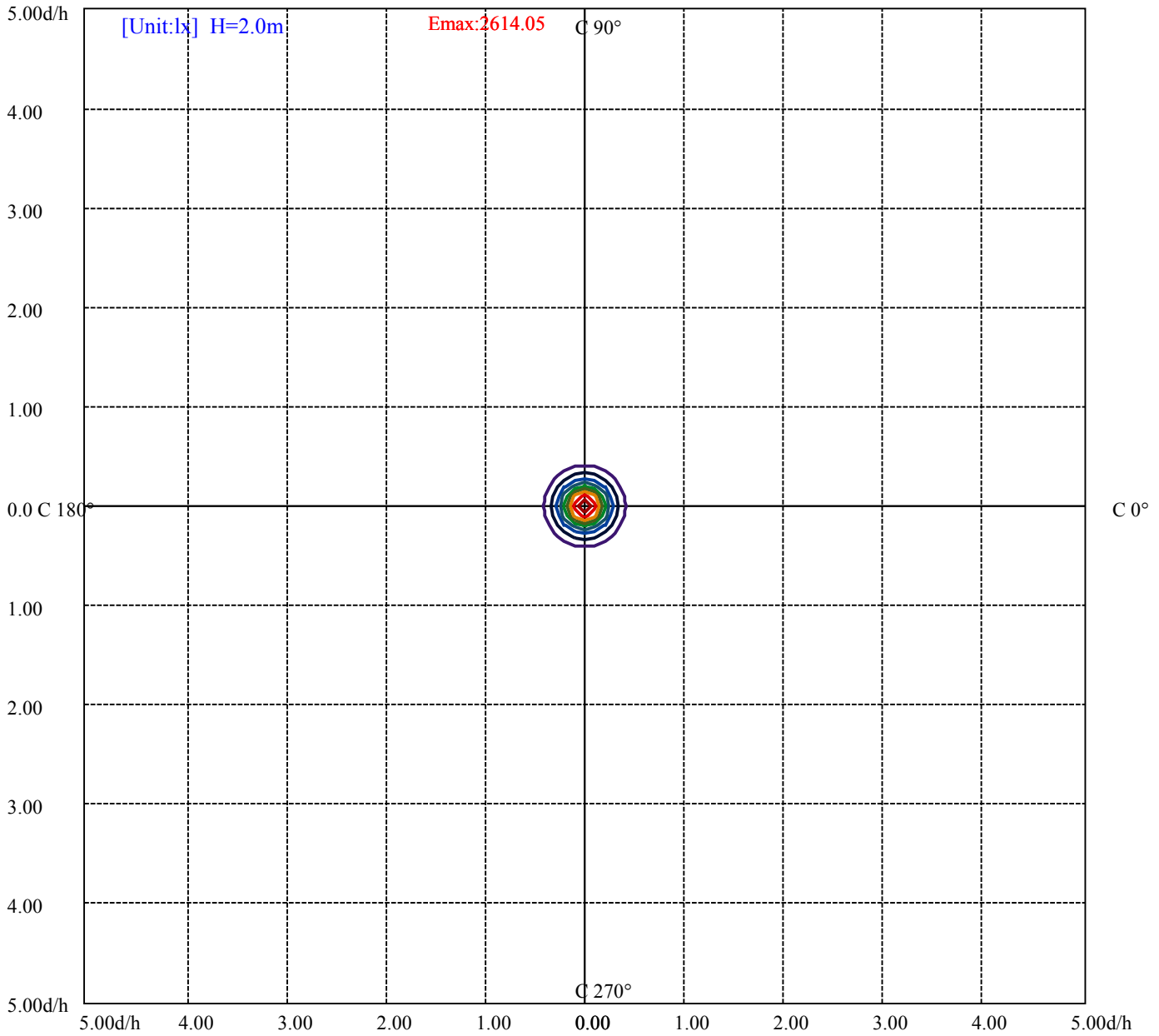
House

[Unit:cd]

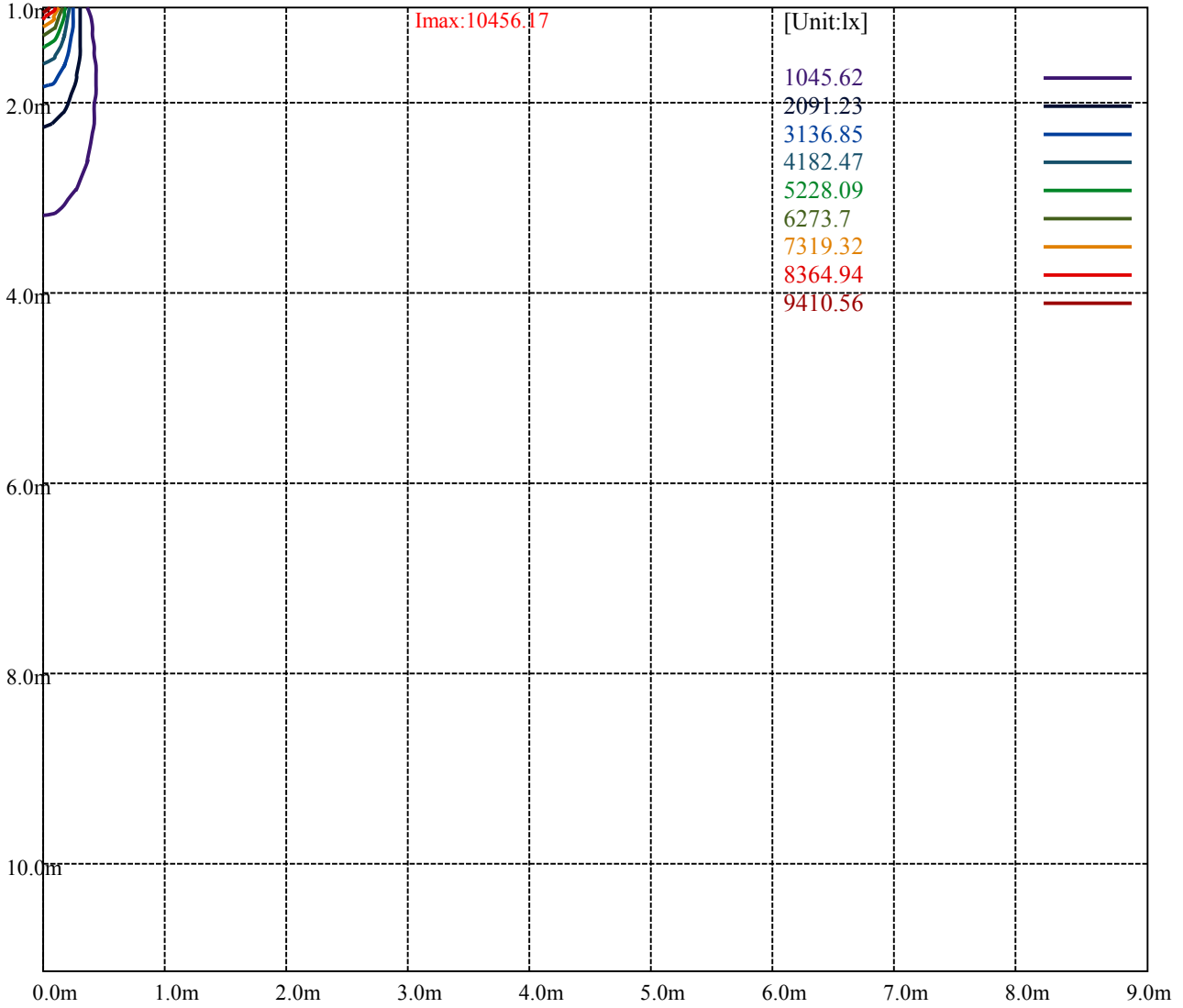
Road

**Imax:10456.17**

(10%Imax) 1045.62	—
(20%Imax) 2091.23	—
(30%Imax) 3136.85	—
(40%Imax) 4182.47	—
(50%Imax) 5228.09	—
(60%Imax) 6273.7	—
(70%Imax) 7319.32	—
(80%Imax) 8364.94	—
(90%Imax) 9410.56	—



(10%Emax) 261.405	—
(20%Emax) 522.8075	—
(30%Emax) 784.2125	—
(40%Emax) 1045.618	—
(50%Emax) 1307.02	—
(60%Emax) 1568.425	—
(70%Emax) 1829.83	—
(80%Emax) 2091.232	—
(90%Emax) 2352.637	—



Luminance Table

$\gamma$	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

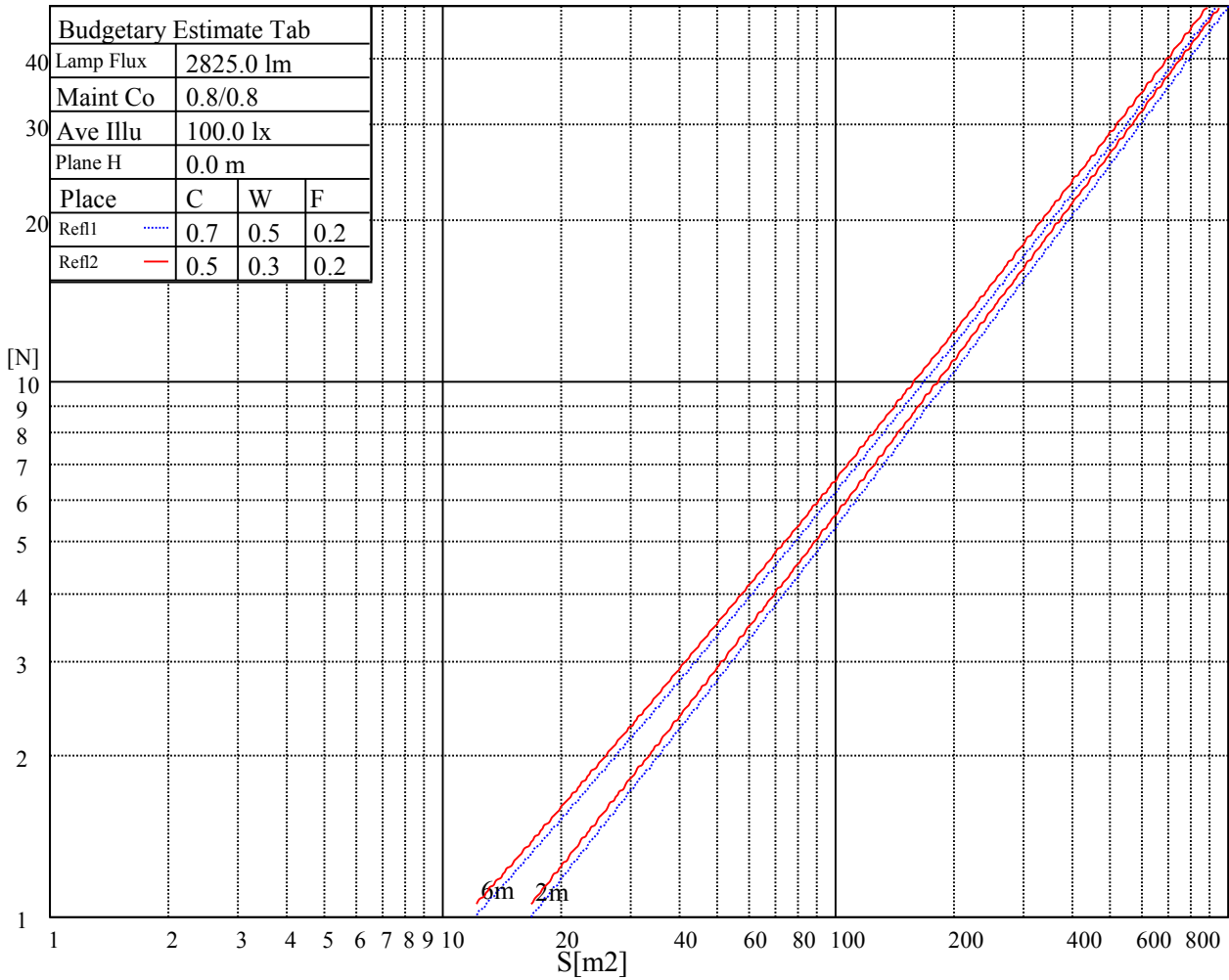
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

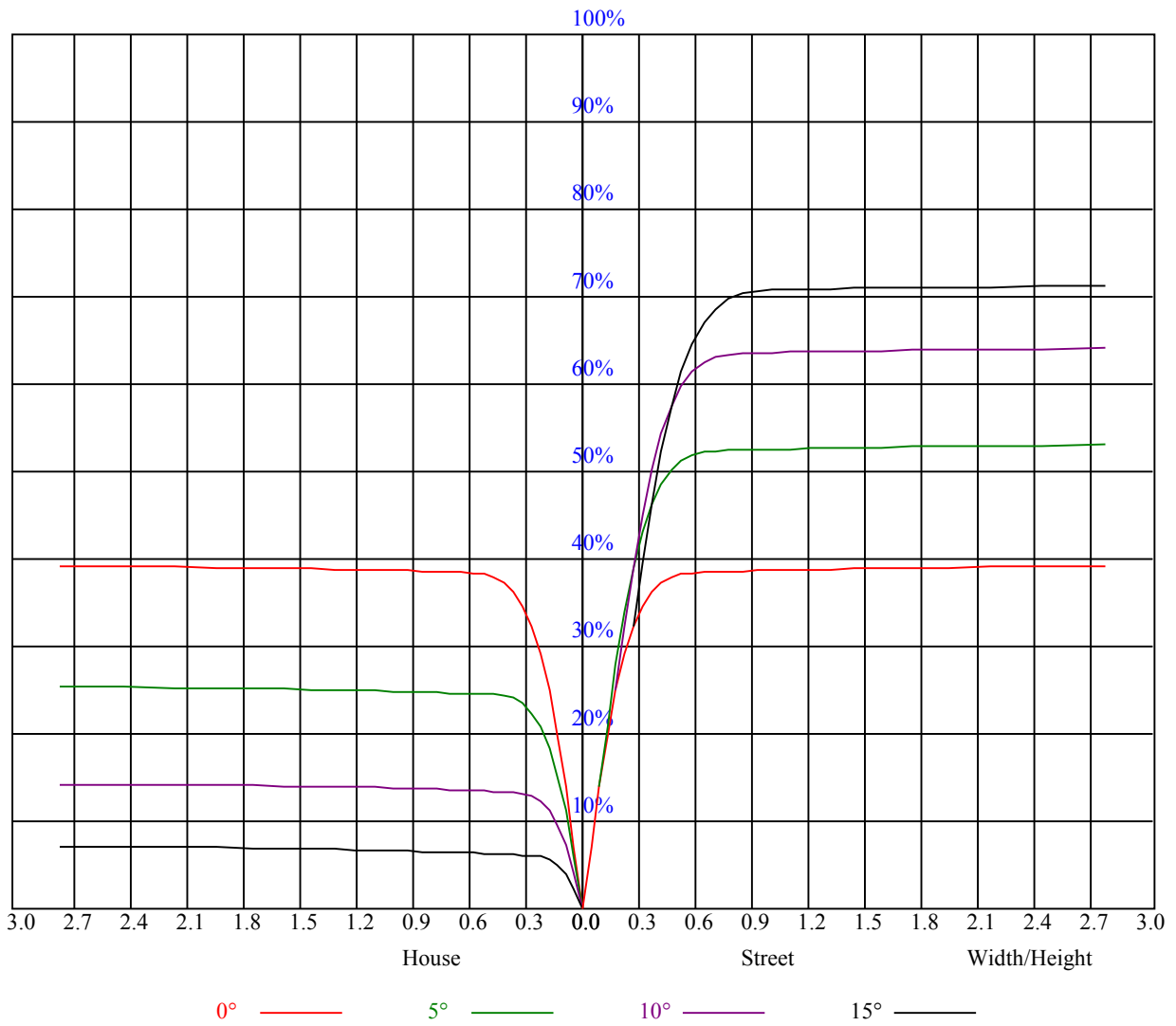
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	0.86	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	0.85	0.82	0.80	0.83	0.81	0.79	0.81	0.79	0.77	0.79	0.77	0.76	0.76	0.75	0.74	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	0.75	0.72	0.77	0.74	0.72	0.75	0.73	0.71	0.74	0.72	0.70	0.73	0.71	0.69	0.69
5	0.75	0.72	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.72	0.70	0.68	0.71	0.69	0.67	0.67
6	0.73	0.69	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.70	0.68	0.66	0.69	0.67	0.65	0.65
7	0.70	0.67	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.68	0.66	0.64	0.67	0.65	0.64	0.63
8	0.68	0.65	0.63	0.68	0.65	0.63	0.67	0.64	0.62	0.66	0.64	0.62	0.66	0.64	0.62	0.61
9	0.66	0.63	0.61	0.66	0.63	0.61	0.65	0.63	0.61	0.65	0.62	0.61	0.64	0.62	0.60	0.60
10	0.65	0.61	0.59	0.64	0.61	0.59	0.64	0.61	0.59	0.63	0.61	0.59	0.63	0.61	0.59	0.58



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	10425.94	10480.50	10411.88	10267.88	10045.13	9711.00	9285.75	8835.19	8333.44
45.0	10472.63	10458.00	10359.00	10125.56	9860.63	9525.38	9004.50	8503.88	7964.44
90.0	10450.13	10325.25	10137.94	9844.31	9456.19	9028.69	8539.88	7844.63	7257.38
135.0	10476.00	10372.50	10146.38	9889.31	9564.75	9111.94	8572.50	8034.75	7472.25
180.0	10425.94	10296.56	10062.56	9748.13	9394.31	8910.00	8352.56	7805.81	7155.00
225.0	10472.63	10357.31	10208.81	9934.88	9541.69	9195.19	8687.81	8062.88	7590.94
270.0	10450.13	10477.69	10392.19	10204.31	9965.25	9615.94	9177.19	8723.81	8227.13
315.0	10476.00	10482.75	10371.38	10172.25	9920.25	9553.50	9096.19	8626.50	8042.06
360.0	10425.94	10480.50	10411.88	10267.88	10045.13	9711.00	9285.75	8835.19	8333.44
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	7644.94	7059.38	6387.75	5797.13	5156.44	4556.81	4067.44	3610.69	3099.94
45.0	7251.19	6647.06	6035.06	5375.25	4764.94	4259.81	3741.75	3327.19	2910.38
90.0	6652.69	5899.50	5329.69	4799.81	4308.19	3736.13	3322.13	2946.38	2565.56
135.0	6751.13	6158.25	5574.94	4957.31	4388.06	3918.38	3432.38	3046.50	2661.75
180.0	6562.69	5905.69	5277.38	4757.63	4217.06	3711.94	3300.19	2927.81	2509.88
225.0	7020.00	6217.88	5713.31	5157.00	4506.75	4034.25	3601.13	3196.69	2741.06
270.0	7548.75	6964.88	6378.19	5725.69	5096.81	4566.94	4024.69	3525.75	3125.81
315.0	7477.88	6814.13	6141.94	5559.19	4929.75	4351.50	3882.38	3444.75	2953.13
360.0	7644.94	7059.38	6387.75	5797.13	5156.44	4556.81	4067.44	3610.69	3099.94
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	2739.38	2421.56	2067.19	1807.88	1567.69	1351.13	1090.69	879.75	685.69
45.0	2524.50	2217.38	1915.88	1618.88	1398.38	1194.19	931.50	730.69	546.75
90.0	2219.06	1937.25	1654.31	1398.38	1102.89	946.86	749.25	549.45	374.34
135.0	2305.69	2017.13	1731.94	1447.31	1236.94	1061.44	779.06	578.25	431.44
180.0	2207.25	1930.50	1647.00	1390.50	1116.79	901.46	702.79	529.76	343.63
225.0	2422.69	2100.94	1837.13	1560.38	1252.13	1091.64	857.53	659.87	460.91
270.0	2724.75	2408.63	2090.25	1796.63	1557.00	1314.00	1072.69	861.19	664.88
315.0	2611.13	2306.25	1997.44	1714.50	1476.00	1102.05	1002.15	802.52	593.16
360.0	2739.38	2421.56	2067.19	1807.88	1567.69	1351.13	1090.69	879.75	685.69
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	492.19	322.88	289.13	77.46	31.22	20.76	16.54	15.53	14.57
45.0	366.19	297.56	113.57	43.14	21.43	18.73	17.94	17.38	16.76
90.0	239.96	128.19	42.19	23.57	20.81	19.74	19.07	18.51	18.06
135.0	286.88	128.03	56.25	23.57	19.46	18.73	18.11	17.66	17.33
180.0	230.63	107.78	35.38	21.09	18.06	16.71	16.09	15.47	14.85
225.0	310.16	177.47	83.08	36.51	23.18	20.42	19.58	18.84	18.11
270.0	454.50	311.06	295.88	78.13	32.85	22.89	20.87	19.91	19.18
315.0	426.54	265.39	141.53	66.60	29.25	19.13	18.23	17.55	16.88
360.0	492.19	322.88	289.13	77.46	31.22	20.76	16.54	15.53	14.57
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	13.78	13.22	12.71	12.32	12.04	11.81	11.59	11.42	11.36
45.0	16.26	15.92	15.64	15.41	15.24	15.08	14.91	14.79	14.74
90.0	17.72	17.44	17.16	16.99	16.82	16.65	16.54	16.43	16.43
135.0	16.93	16.71	16.54	16.20	16.09	15.92	15.69	15.53	15.36
180.0	14.46	14.18	13.89	13.67	13.50	13.28	13.16	13.05	12.99
225.0	17.61	17.21	16.82	16.43	16.20	15.98	15.75	15.64	15.53
270.0	18.51	18.11	17.72	17.38	17.10	16.93	16.65	16.48	16.43
315.0	16.43	16.03	15.64	15.36	15.13	14.85	14.68	14.51	14.34
360.0	13.78	13.22	12.71	12.32	12.04	11.81	11.59	11.42	11.36



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	11.25	11.19	11.19	11.14	11.14	11.14	11.14	11.14	11.25
45.0	14.57	14.51	14.46	14.34	14.23	14.18	14.06	14.01	14.06
90.0	16.54	16.82	17.21	17.44	17.72	18.00	18.17	18.45	18.73
135.0	15.30	15.19	15.13	15.13	15.08	15.08	15.02	15.13	15.08
180.0	12.94	12.94	12.88	12.94	12.94	13.05	13.05	13.16	13.16
225.0	15.41	15.30	15.19	15.13	15.08	14.85	14.79	14.79	14.74
270.0	16.54	16.76	17.10	17.44	17.89	18.28	18.62	18.90	19.24
315.0	14.29	14.18	14.06	14.06	13.95	13.84	13.78	13.67	13.67
360.0	11.25	11.19	11.19	11.14	11.14	11.14	11.14	11.14	11.25
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	11.19	11.25	11.19	11.25	11.31	11.31	11.31	11.25	11.31
45.0	14.12	14.23	14.29	14.34	14.40	14.51	14.46	14.57	14.57
90.0	19.01	19.35	19.86	20.25	20.98	21.71	22.67	23.79	25.14
135.0	15.02	15.02	15.08	15.08	15.13	15.24	15.19	15.24	15.13
180.0	13.16	13.22	13.22	13.33	13.28	13.44	13.39	13.50	13.39
225.0	14.79	14.91	14.91	15.02	15.08	15.02	14.96	14.91	14.91
270.0	19.58	19.91	20.36	20.81	21.32	21.99	23.18	24.30	25.59
315.0	13.56	13.50	13.44	13.39	13.39	13.39	13.39	13.39	13.39
360.0	11.19	11.25	11.19	11.25	11.31	11.31	11.31	11.25	11.31
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	11.31	11.25	11.25	11.19	11.19	11.19	11.19	11.19	11.25
45.0	14.51	14.57	14.57	14.63	14.51	14.51	14.40	14.34	14.12
90.0	26.27	27.45	28.29	28.58	28.58	28.63	28.24	27.34	25.09
135.0	15.02	15.13	15.36	16.14	16.59	18.00	19.24	20.53	21.99
180.0	13.44	13.33	13.39	13.39	13.56	14.01	14.29	14.79	15.41
225.0	14.85	14.85	14.74	14.74	14.68	14.63	14.57	14.46	14.29
270.0	26.94	28.58	29.76	30.49	30.94	31.11	30.94	29.93	27.96
315.0	13.39	13.39	13.39	13.28	13.33	13.39	13.39	13.44	13.73
360.0	11.31	11.25	11.25	11.19	11.19	11.19	11.19	11.19	11.25
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	11.25	11.31	11.42	11.59	11.70	11.59	11.14	10.52	10.13
45.0	13.95	13.73	13.33	12.88	12.49	12.21	11.93	11.48	11.14
90.0	22.78	19.29	14.57	12.43	12.04	11.76	11.59	11.48	11.31
135.0	21.83	21.54	21.83	20.42	18.62	16.88	13.95	13.73	13.78
180.0	15.81	16.20	16.14	15.58	14.51	13.16	11.98	11.42	11.36
225.0	14.12	13.73	13.39	12.94	12.60	12.32	12.15	11.93	11.64
270.0	25.48	21.71	16.99	13.33	12.09	11.93	11.70	11.42	11.25
315.0	14.12	14.29	14.01	13.95	13.50	12.26	11.76	11.36	11.08
360.0	11.25	11.31	11.42	11.59	11.70	11.59	11.14	10.52	10.13
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.96	9.84	9.73	9.68	9.56	9.51	9.28	9.11	9.06
45.0	10.80	10.52	10.29	10.07	9.90	9.68	9.00	8.94	8.89
90.0	11.08	10.80	10.63	10.46	10.46	9.06	8.83	8.78	8.78
135.0	13.78	13.73	14.01	13.73	12.38	12.94	10.18	9.39	9.17
180.0	11.48	11.70	11.81	12.09	12.32	12.88	13.16	9.51	9.28
225.0	11.48	11.25	11.08	11.08	11.14	11.14	11.48	9.56	9.00
270.0	10.97	10.74	10.52	10.29	10.18	10.07	9.96	9.68	8.94
315.0	10.80	10.52	10.24	10.07	9.90	9.73	9.56	9.00	8.89
360.0	9.96	9.84	9.73	9.68	9.56	9.51	9.28	9.11	9.06

Intensity data(cd)

<b>C/γ(°)</b>	<b>90.0</b>
<b>0.0</b>	<b>9.06</b>
<b>45.0</b>	<b>8.89</b>
<b>90.0</b>	<b>8.78</b>
<b>135.0</b>	<b>8.89</b>
<b>180.0</b>	<b>9.00</b>
<b>225.0</b>	<b>8.89</b>
<b>270.0</b>	<b>8.78</b>
<b>315.0</b>	<b>8.83</b>
<b>360.0</b>	<b>9.06</b>