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NATA

LumCAT: 4-2273-M	
Luminaire: 92.70.131.00	
Report No: NATA0100	Voltage(V): 36.2000
Test No: GC2018111304	Current(A): 0.5500
LampCAT: OSRAM SOLERIQ S15	Power (W): 19.9100
Lamp flux(lm): 2619.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 100	Width(mm): 100
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 2355.40
Efficiency(%): 89.94%
Lumens(lm)/Power(W): 118.68
Central intensity(cd): 32189.060
Maximum intensity(cd): 32189.060
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=10.5
 [C90/270]Total=10.5
Field angle(10%Imax): [C0/180]Total=21.5
 [C90/270]Total=21.5
Maximum s/h(1/2): C0_180=0.18 C90_270=0.18
Maximum s/h(1/4): C0_180=0.19 C90_270=0.19
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 90.23%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.435%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	32189.063	7.701	7.701	.294%	.327%
1.0	31401.563	60.098	67.799	2.295%	2.878%
2.0	29263.359	111.994	179.793	4.276%	7.633%
3.0	25710.469	147.558	327.351	5.634%	13.898%
4.0	21352.289	163.336	490.686	6.237%	20.832%
5.0	16944.609	161.949	652.636	6.184%	27.708%
6.0	13315.289	152.629	805.264	5.828%	34.188%
7.0	9402.188	125.654	930.918	4.798%	39.523%
8.0	7321.641	111.742	1042.66	4.267%	44.267%
9.0	5310.844	91.106	1133.766	3.479%	48.135%
10.0	3944.250	75.108	1208.874	2.868%	51.323%
11.0	2949.820	61.723	1270.597	2.357%	53.944%
12.0	2264.063	51.620	1322.217	1.971%	56.135%
13.0	1798.945	44.377	1366.594	1.694%	58.020%
14.0	1426.978	37.857	1404.451	1.445%	59.627%
15.0	1254.930	35.618	1440.069	1.360%	61.139%
16.0	1125.190	34.011	1474.079	1.299%	62.583%
17.0	1060.418	33.999	1508.078	1.298%	64.026%
18.0	1013.379	34.340	1542.419	1.311%	65.484%
19.0	980.445	35.004	1577.423	1.337%	66.970%
20.0	954.323	35.793	1613.216	1.367%	68.490%
21.0	930.804	36.580	1649.795	1.397%	70.043%
22.0	909.387	37.357	1687.153	1.426%	71.629%
23.0	891.190	38.186	1725.338	1.458%	73.250%
24.0	876.023	39.073	1764.412	1.492%	74.909%
25.0	862.348	39.965	1804.377	1.526%	76.606%
26.0	850.634	40.892	1845.269	1.561%	78.342%
27.0	838.898	41.765	1887.033	1.595%	80.115%
28.0	827.423	42.598	1929.631	1.626%	81.924%
29.0	815.850	43.374	1973.006	1.656%	83.765%
30.0	803.735	44.069	2017.075	1.683%	85.636%
31.0	790.847	44.667	2061.741	1.705%	87.532%
32.0	769.416	44.712	2106.453	1.707%	89.431%
33.0	725.034	43.303	2149.756	1.653%	91.269%
34.0	658.146	40.359	2190.115	1.541%	92.983%
35.0	565.988	35.600	2225.715	1.359%	94.494%
36.0	448.650	28.919	2254.633	1.104%	95.722%
37.0	339.251	22.389	2277.023	.855%	96.672%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	209.145	14.120	2291.143	.539%	97.272%
39.0	130.866	9.031	2300.174	.345%	97.655%
40.0	64.983	4.581	2304.755	.175%	97.850%
41.0	32.794	2.359	2307.114	.090%	97.950%
42.0	22.423	1.645	2308.759	.063%	98.020%
43.0	17.564	1.314	2310.073	.050%	98.075%
44.0	15.209	1.159	2311.231	.044%	98.125%
45.0	13.148	1.020	2312.251	.039%	98.168%
46.0	11.630	0.917	2313.168	.035%	98.207%
47.0	11.398	0.914	2314.082	.035%	98.246%
48.0	11.215	0.914	2314.996	.035%	98.285%
49.0	11.025	0.912	2315.909	.035%	98.323%
50.0	10.870	0.913	2316.822	.035%	98.362%
51.0	10.709	0.913	2317.735	.035%	98.401%
52.0	10.575	0.914	2318.648	.035%	98.440%
53.0	10.441	0.914	2319.563	.035%	98.478%
54.0	10.329	0.916	2320.479	.035%	98.517%
55.0	10.216	0.918	2321.397	.035%	98.556%
56.0	10.118	0.920	2322.317	.035%	98.595%
57.0	10.062	0.925	2323.242	.035%	98.635%
58.0	9.977	0.928	2324.17	.035%	98.674%
59.0	9.900	0.931	2325.101	.036%	98.714%
60.0	9.851	0.936	2326.036	.036%	98.753%
61.0	9.795	0.939	2326.975	.036%	98.793%
62.0	9.745	0.944	2327.919	.036%	98.833%
63.0	9.696	0.947	2328.866	.036%	98.873%
64.0	9.661	0.952	2329.819	.036%	98.914%
65.0	9.619	0.956	2330.775	.037%	98.954%
66.0	9.563	0.958	2331.733	.037%	98.995%
67.0	9.534	0.962	2332.695	.037%	99.036%
68.0	9.513	0.967	2333.662	.037%	99.077%
69.0	9.492	0.972	2334.634	.037%	99.118%
70.0	9.478	0.977	2335.611	.037%	99.160%
71.0	9.457	0.981	2336.591	.037%	99.201%
72.0	9.450	0.986	2337.577	.038%	99.243%
73.0	9.415	0.987	2338.564	.038%	99.285%
74.0	9.401	0.991	2339.555	.038%	99.327%
75.0	9.415	0.997	2340.552	.038%	99.370%

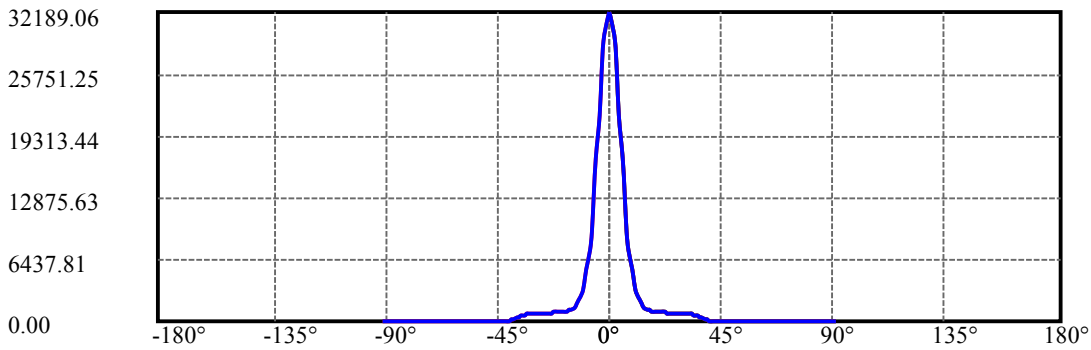
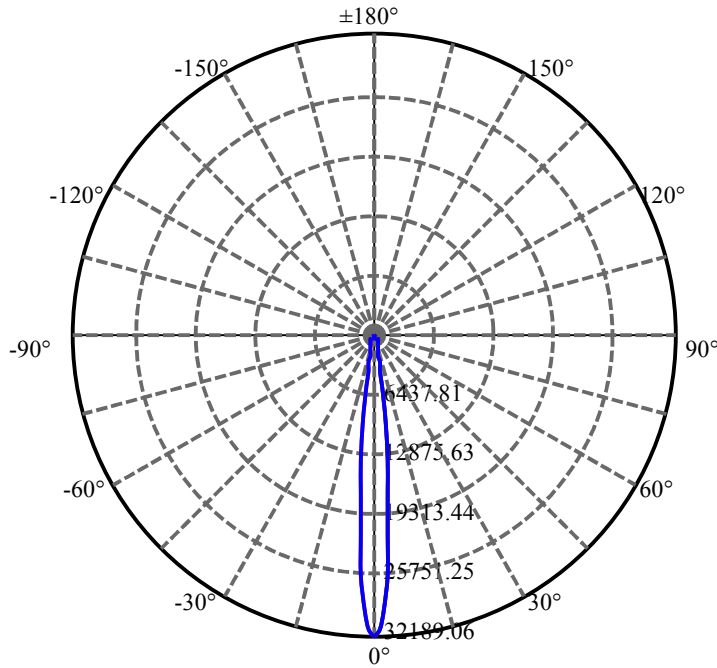
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.436	1.004	2341.556	.038%	99.412%
77.0	9.485	1.013	2342.57	.039%	99.455%
78.0	9.520	1.021	2343.591	.039%	99.499%
79.0	9.548	1.028	2344.619	.039%	99.542%
80.0	9.584	1.035	2345.654	.040%	99.586%
81.0	9.570	1.036	2346.69	.040%	99.630%
82.0	9.570	1.039	2347.73	.040%	99.674%
83.0	9.513	1.035	2348.765	.040%	99.718%
84.0	9.464	1.032	2349.797	.039%	99.762%
85.0	9.408	1.028	2350.825	.039%	99.806%
86.0	9.373	1.025	2351.85	.039%	99.849%
87.0	9.345	1.023	2352.874	.039%	99.893%
88.0	9.239	1.013	2353.886	.039%	99.936%
89.0	9.225	1.011	2354.898	.039%	99.979%
90.0	9.211	0.505	2355.403	.019%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2017.07	77.02%	85.64%
0-40	2304.75	88.00%	97.85%
0-60	2326.04	88.81%	98.75%
0-90	2354.90	89.92%	99.98%
0-120	2354.90	89.92%	99.98%
0-180	2355.40	89.94%	100.00%
60-90	29.80	1.14%	1.27%
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%
0-26.94	1884.32	71.95%	80.00%

ZONAL LUMEN SUMMARY

0-10	1208.87
10-20	404.34
20-30	403.86
30-40	287.68
40-50	12.07
50-60	9.21
60-70	9.57
70-80	10.04
80-90	9.24
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



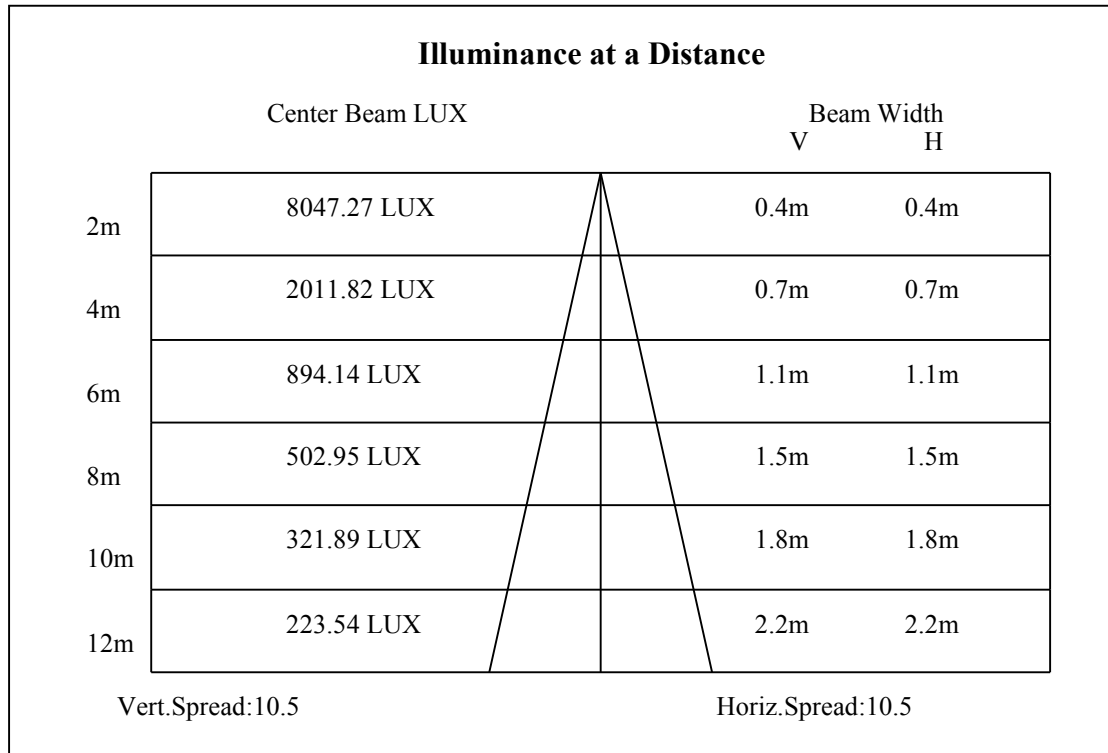
C0(Max): —————

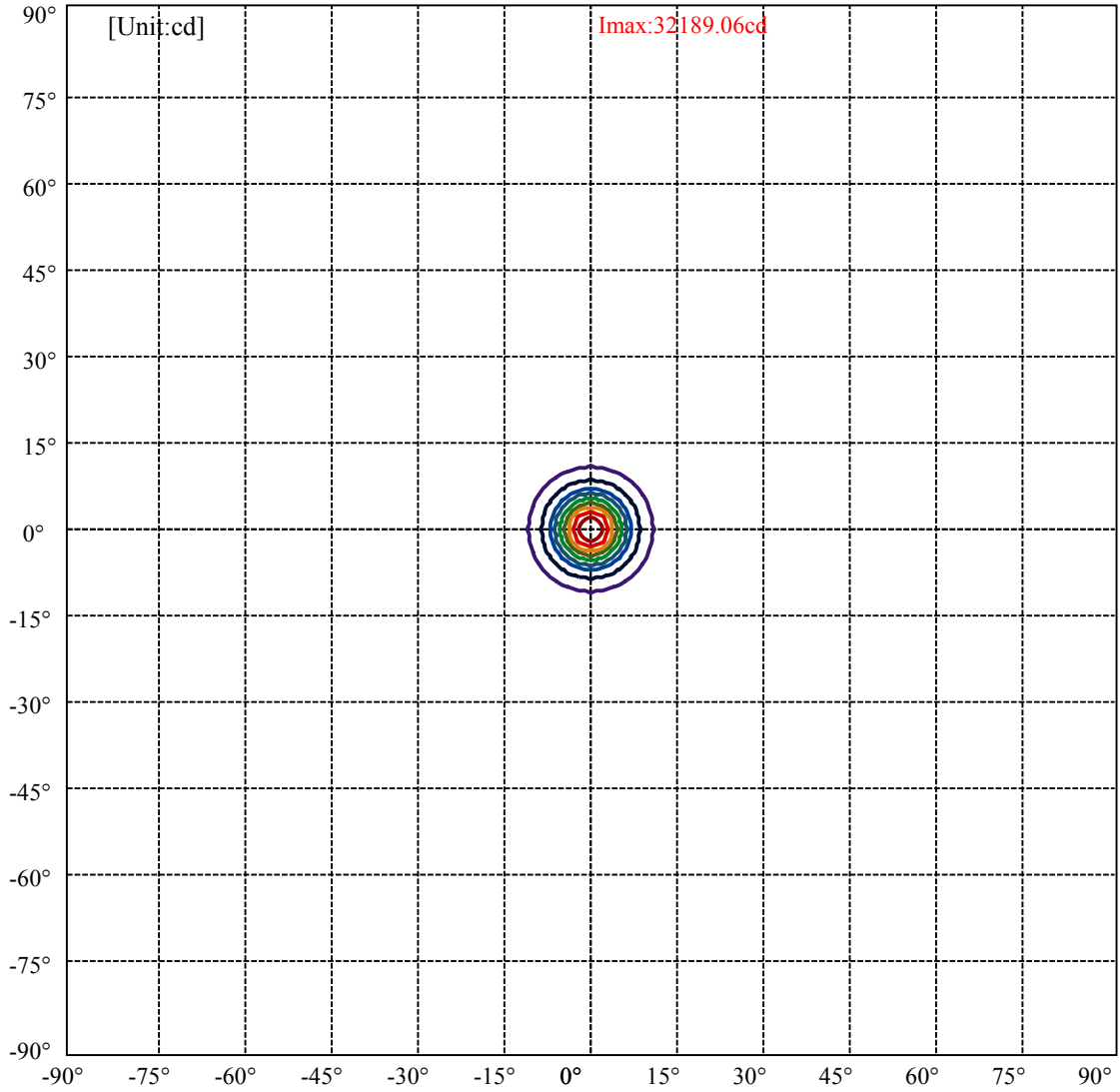
C0/C180: —————

C90/C270: —————

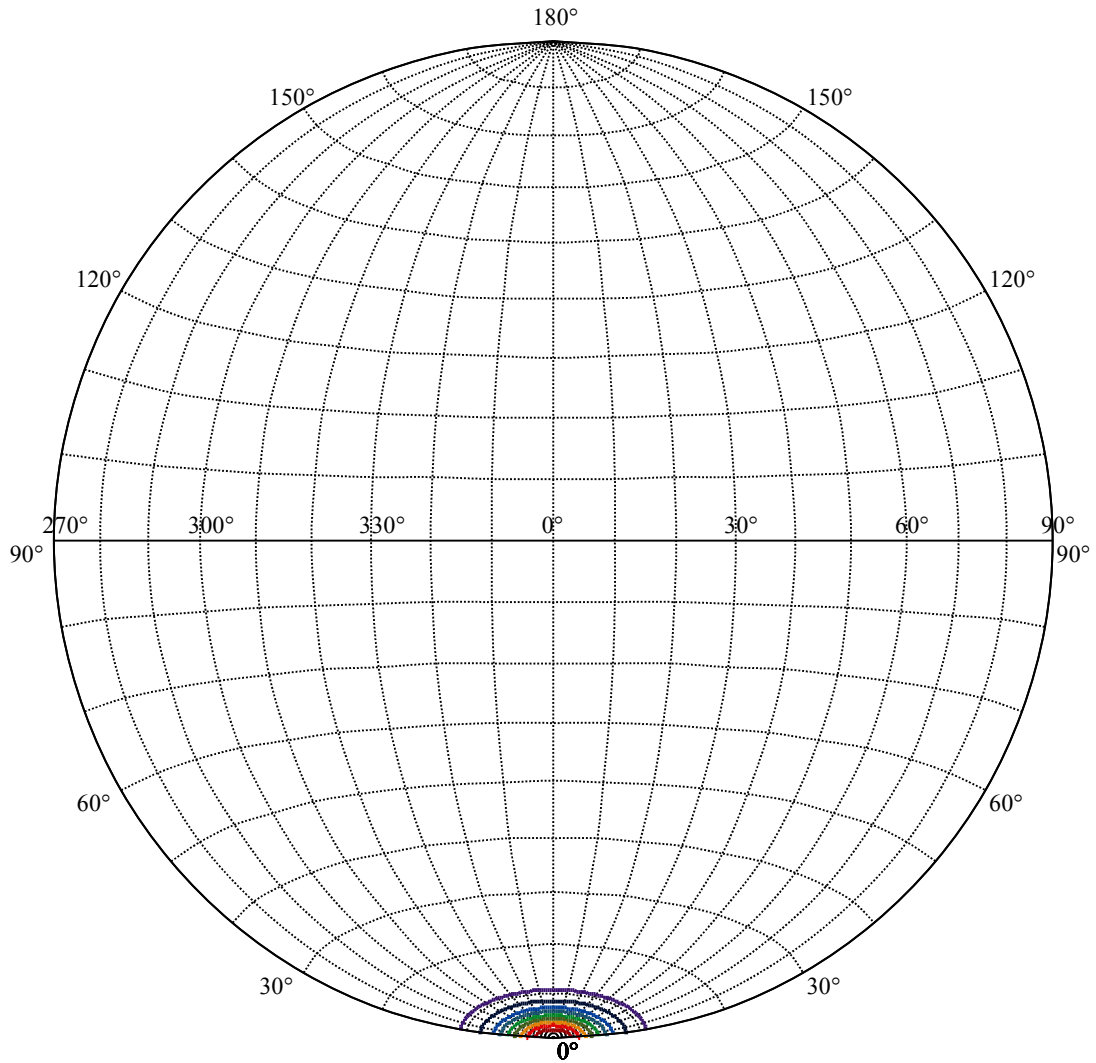
Field angle(10%Imax):C0/180Left:10.7 Right:10.7
:C90/270Left:10.7 Right:10.7

Beam Angle(50%Imax):C0/180Left:5.2 Right:5.2
:C90/270Left:5.2 Right:5.2





(10%I _{max}) 3218.91	—
(20%I _{max}) 6437.81	—
(30%I _{max}) 9656.72	—
(40%I _{max}) 12875.6	—
(50%I _{max}) 16094.5	—
(60%I _{max}) 19313.4	—
(70%I _{max}) 22532.3	—
(80%I _{max}) 25751.3	—
(90%I _{max}) 28970.2	—



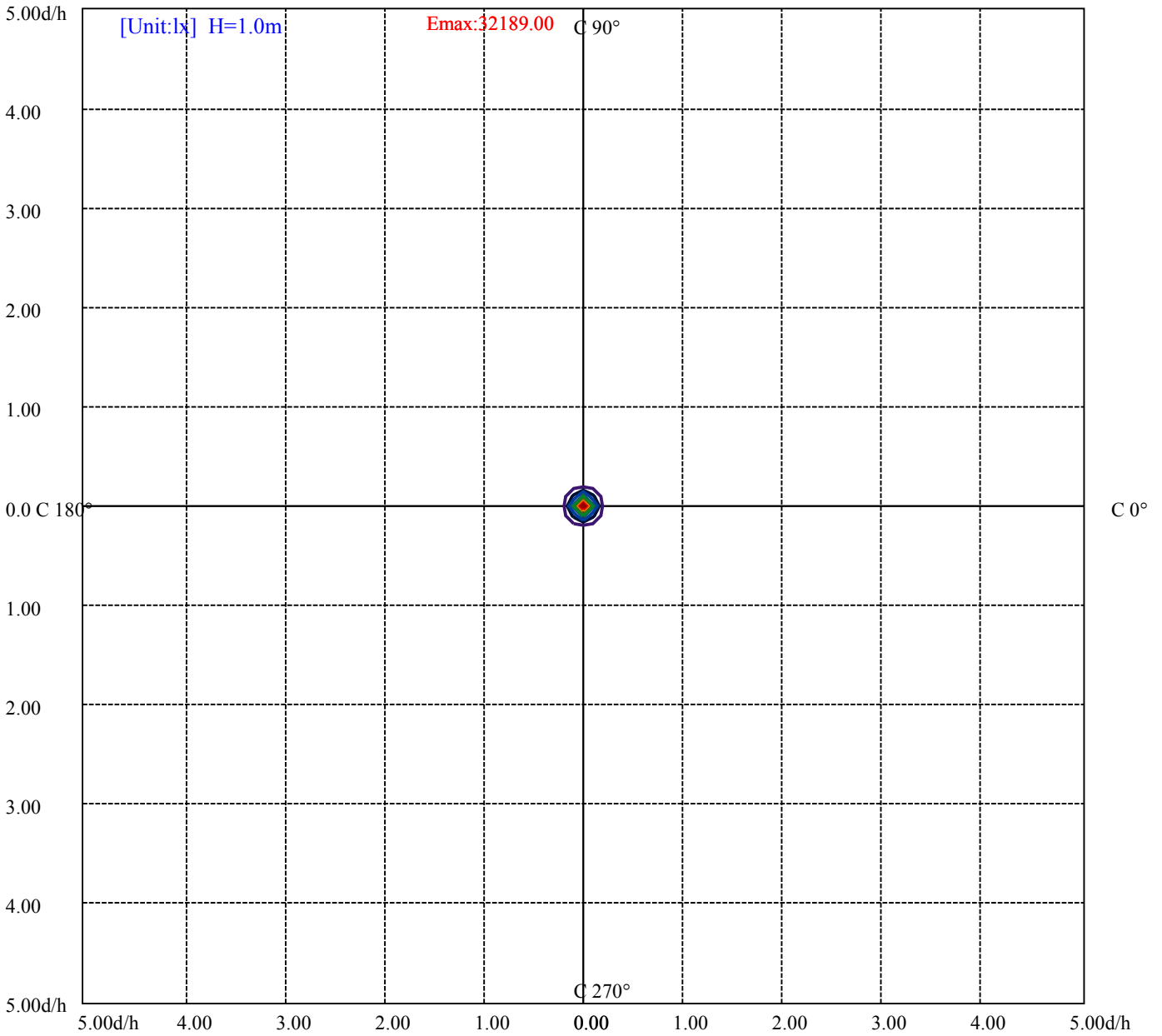
House

[Unit:cd]

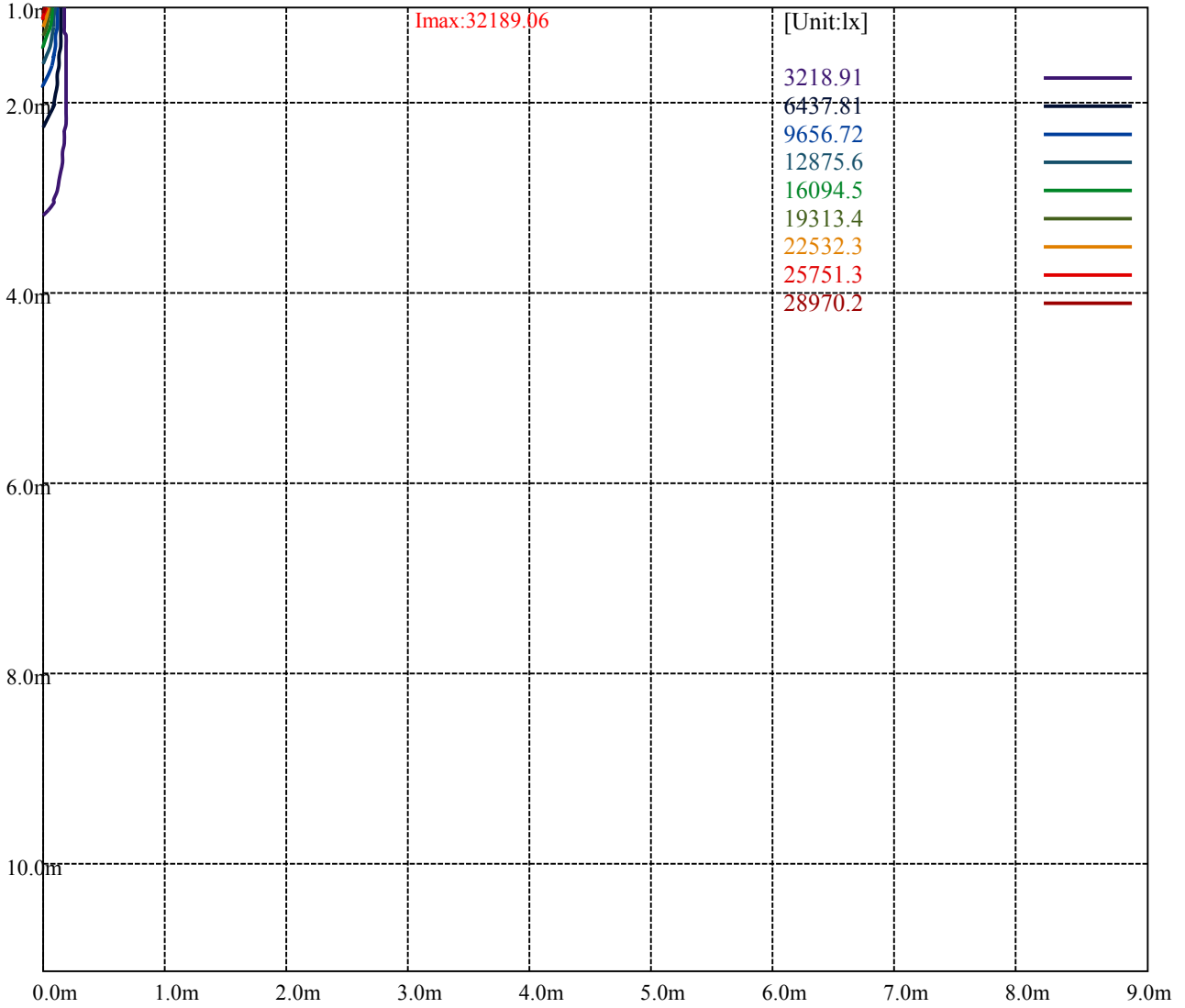
Road

Imax:32189.06

(10%Imax) 3218.91	—
(20%Imax) 6437.81	—
(30%Imax) 9656.72	—
(40%Imax) 12875.6	—
(50%Imax) 16094.5	—
(60%Imax) 19313.4	—
(70%Imax) 22532.3	—
(80%Imax) 25751.3	—
(90%Imax) 28970.2	—



(10%Emax) 3218.89	—
(20%Emax) 6437.79	—
(30%Emax) 9656.68	—
(40%Emax) 12875.6	—
(50%Emax) 16094.5	—
(60%Emax) 19313.4	—
(70%Emax) 22532.3	—
(80%Emax) 25751.2	—
(90%Emax) 28970	—



Luminance Table

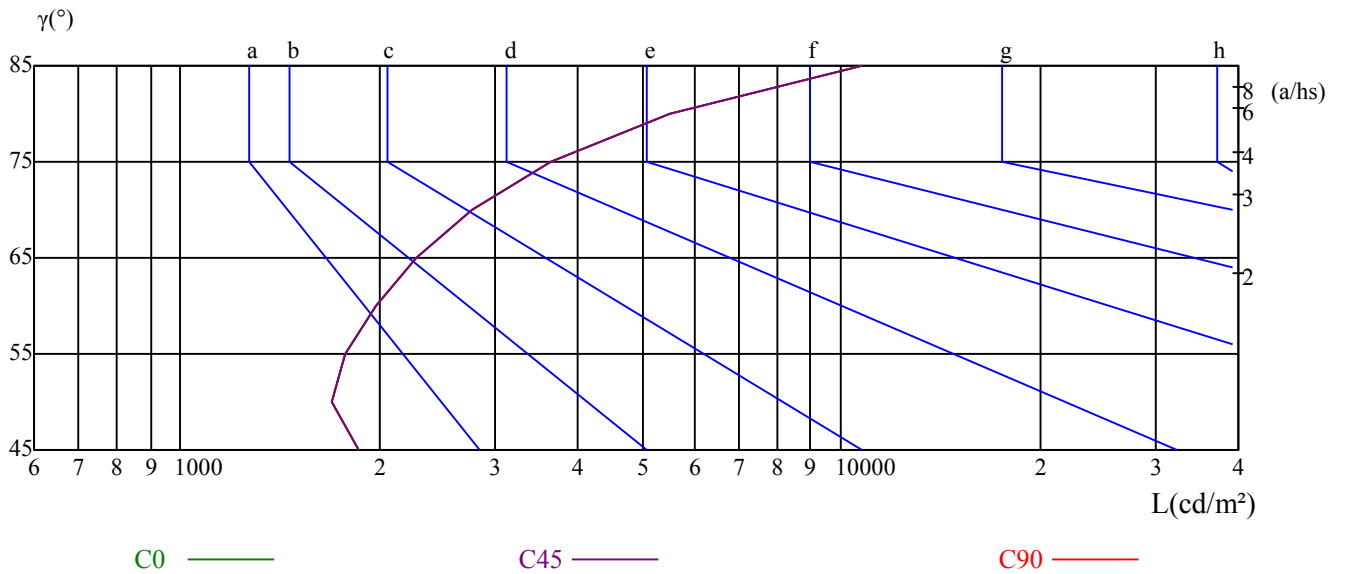
γ	45	50	55	60	65	70	75	80	85
C0	1859	1691	1781	1970	2276	2771	3638	5519	10794
C45	1859	1691	1781	1970	2276	2771	3638	5519	10794
C90	1859	1691	1781	1970	2276	2771	3638	5519	10794

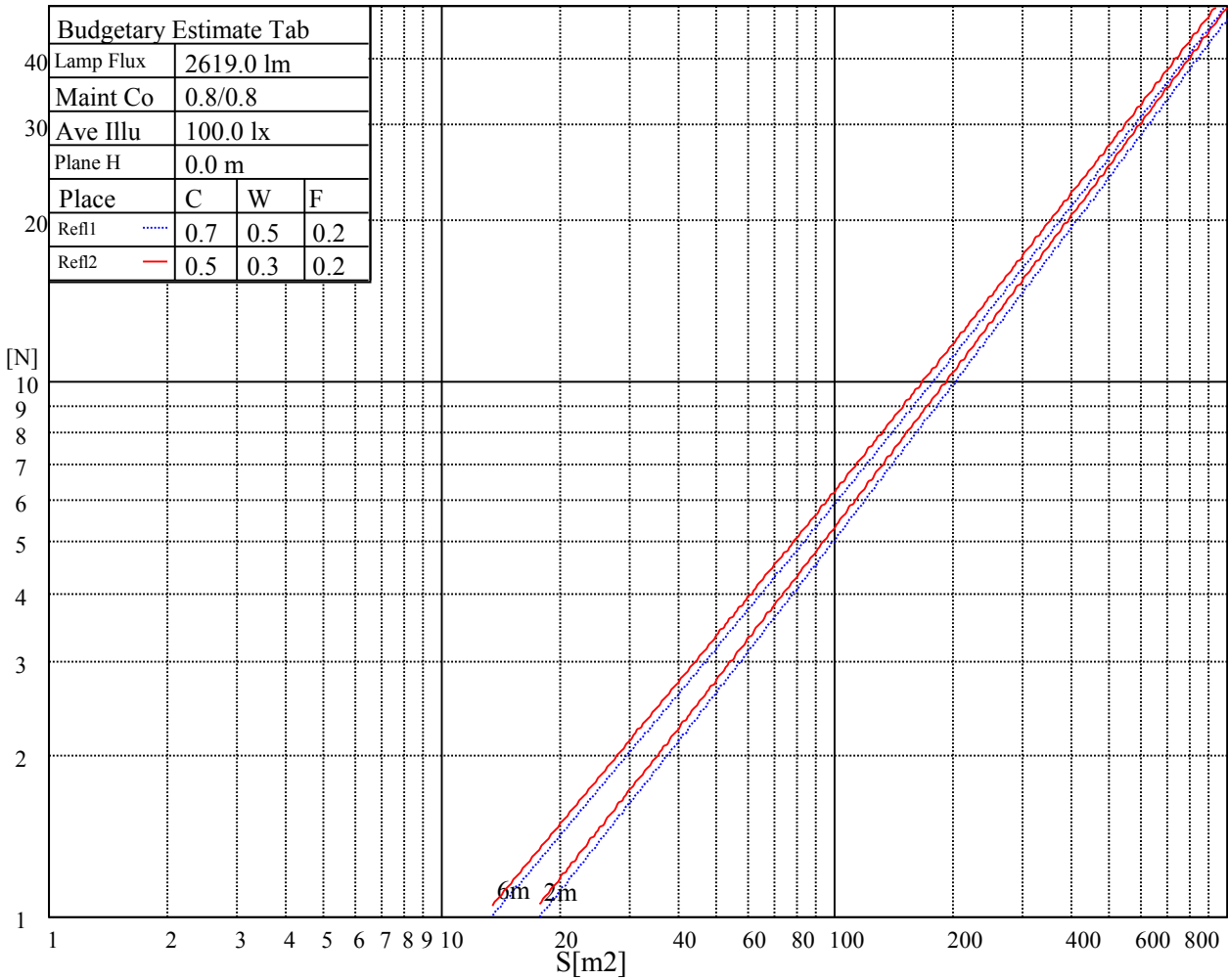
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
2276	2276	2276	3638	3638	3638	10794	10794	10794

Glare Table

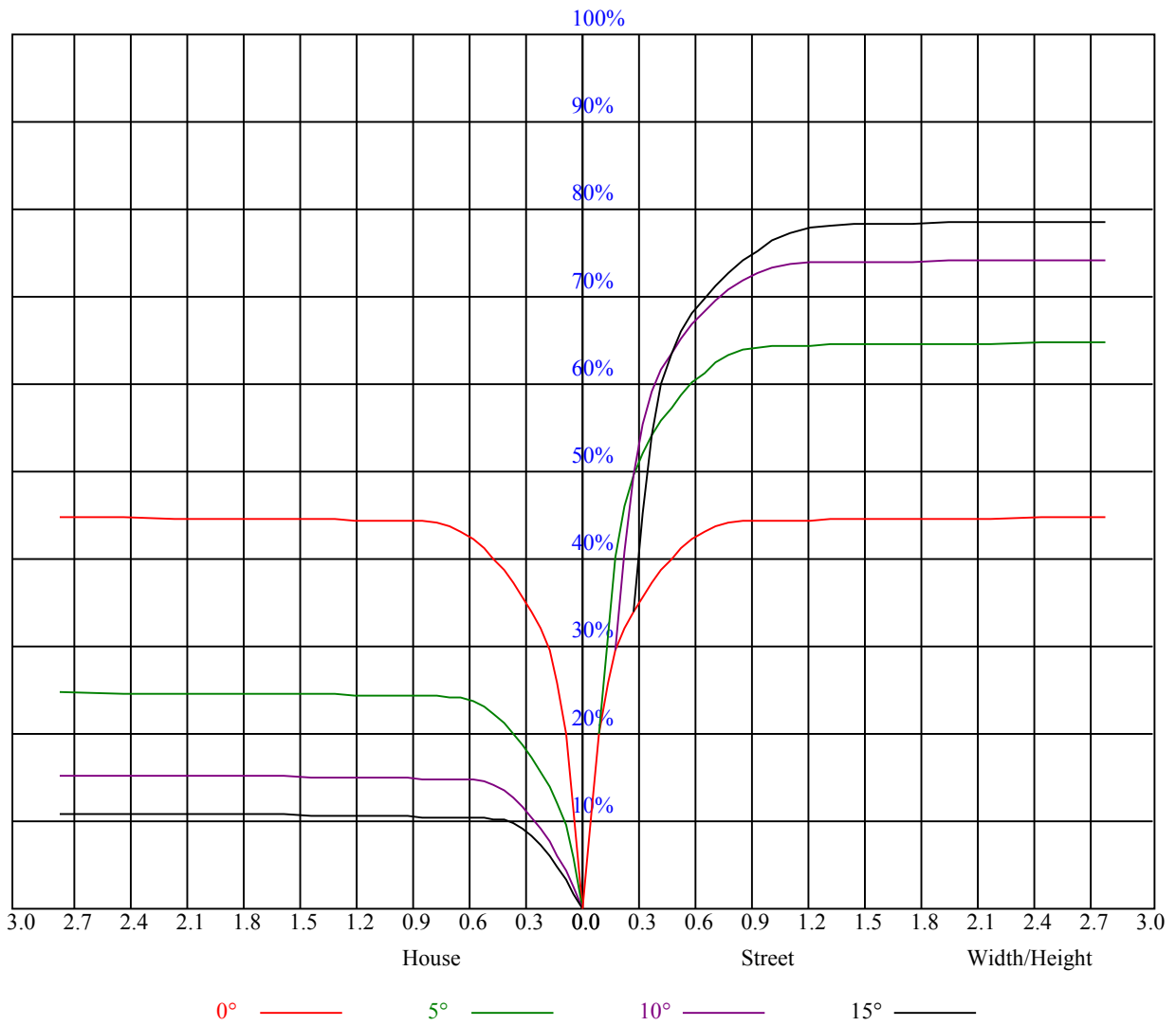
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

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	1.07	1.07	1.07	1.05	1.05	1.05	1.00	1.00	1.00	0.96	0.96	0.96	0.92	0.92	0.92	0.90
1	1.01	0.99	0.98	0.99	0.98	0.96	0.96	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.88	0.86
2	0.96	0.93	0.91	0.95	0.92	0.90	0.92	0.90	0.88	0.89	0.88	0.86	0.87	0.86	0.84	0.83
3	0.92	0.89	0.86	0.91	0.88	0.85	0.89	0.86	0.84	0.87	0.85	0.83	0.85	0.83	0.81	0.80
4	0.88	0.85	0.82	0.88	0.84	0.82	0.86	0.83	0.81	0.84	0.82	0.80	0.83	0.81	0.79	0.78
5	0.85	0.81	0.79	0.85	0.81	0.78	0.83	0.80	0.78	0.82	0.79	0.77	0.80	0.78	0.76	0.75
6	0.82	0.79	0.76	0.82	0.78	0.76	0.81	0.77	0.75	0.80	0.77	0.75	0.78	0.76	0.74	0.73
7	0.80	0.76	0.73	0.79	0.76	0.73	0.78	0.75	0.73	0.77	0.75	0.73	0.77	0.74	0.72	0.71
8	0.78	0.74	0.71	0.77	0.74	0.71	0.76	0.73	0.71	0.76	0.73	0.71	0.75	0.72	0.70	0.69
9	0.76	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.68
10	0.74	0.70	0.68	0.73	0.70	0.68	0.73	0.70	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.66



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	33294.38	33339.38	31612.50	28428.75	24615.00	19648.13	15311.25	11210.63	8139.38
45.0	31730.63	28850.63	25138.13	19760.63	15480.00	11739.38	8184.38	6136.88	4629.38
90.0	30954.38	27489.38	23551.88	18585.00	11152.69	10375.88	7765.88	5374.13	4003.31
135.0	32776.88	30661.88	27472.50	23023.13	18596.25	13826.25	9939.38	7475.63	5625.00
180.0	33294.38	31376.25	27894.38	23911.88	19451.25	11049.75	10235.81	7597.13	5638.50
225.0	31730.63	33598.13	33480.00	31601.25	28046.25	24013.13	19513.13	10845.56	10453.50
270.0	30954.38	32872.50	33406.88	31803.75	29041.88	24755.63	19749.38	15395.63	11655.00
315.0	32776.88	33024.38	31550.63	28569.38	24435.00	20148.75	15823.13	11181.94	8429.06
360.0	33294.38	33339.38	31612.50	28428.75	24615.00	19648.13	15311.25	11210.63	8139.38
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	6131.25	4477.50	3285.00	2874.38	1995.19	1572.75	1355.06	1217.25	1121.63
45.0	3240.00	2925.00	1938.94	1559.25	1319.63	1188.56	1099.69	1036.69	998.44
90.0	2992.50	2128.50	1710.00	1440.00	1260.00	1120.28	1052.72	1003.22	965.31
135.0	3886.88	2880.00	2477.81	1670.63	1362.38	1199.25	1114.31	1034.44	994.50
180.0	3890.25	2886.19	2149.31	1644.75	1370.81	1119.49	1092.04	1029.77	989.72
225.0	7834.50	5653.69	4052.81	3015.00	2306.25	1702.69	1422.56	1249.31	1120.73
270.0	8178.75	6181.88	4657.50	3386.25	2857.50	1954.69	1553.63	1312.88	1182.94
315.0	6332.63	4421.25	3327.19	2522.25	1919.81	1558.13	1349.44	1117.97	1110.09
360.0	6131.25	4477.50	3285.00	2874.38	1995.19	1572.75	1355.06	1217.25	1121.63
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1056.38	1017.56	986.63	956.81	932.06	911.81	896.63	881.44	869.06
45.0	968.06	943.31	918.56	897.19	882.00	869.06	853.88	842.63	832.50
90.0	943.99	925.14	905.34	887.29	872.33	857.03	845.44	834.19	823.44
135.0	971.44	949.50	932.63	916.88	890.44	873.00	861.19	848.25	838.13
180.0	960.98	942.53	923.46	904.44	887.40	870.92	856.80	845.89	835.88
225.0	1061.04	1014.86	982.63	955.74	933.41	911.48	894.77	879.08	864.90
270.0	1100.25	1049.63	1010.81	979.88	953.44	927.56	906.75	891.56	877.50
315.0	1044.90	1001.03	974.53	948.21	924.02	908.66	892.74	875.76	863.66
360.0	1056.38	1017.56	986.63	956.81	932.06	911.81	896.63	881.44	869.06
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	857.81	848.25	837.00	821.81	811.13	797.63	786.38	761.63	680.06
45.0	819.00	806.06	794.81	782.44	769.50	738.00	639.00	516.94	402.75
90.0	811.69	798.98	785.98	775.80	763.48	701.49	607.89	496.24	362.59
135.0	828.56	815.63	804.38	792.56	778.50	762.75	707.06	579.94	465.19
180.0	824.91	814.50	802.63	791.33	777.77	763.20	703.63	600.64	483.13
225.0	853.48	841.44	830.25	819.34	807.36	795.04	782.78	770.18	710.04
270.0	862.88	852.19	842.06	831.38	816.19	805.50	793.13	780.19	748.69
315.0	852.86	842.34	829.69	815.23	802.86	791.72	780.41	759.43	675.45
360.0	857.81	848.25	837.00	821.81	811.13	797.63	786.38	761.63	680.06
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	560.81	435.38	290.25	213.53	71.04	34.93	25.31	20.93	17.89
45.0	289.13	160.20	60.69	27.06	23.18	19.18	16.20	12.09	11.87
90.0	232.43	131.29	50.79	24.69	22.22	18.39	15.19	11.70	11.48
135.0	346.50	289.13	101.48	39.66	24.30	21.94	19.41	12.38	11.70
180.0	339.41	219.83	111.32	41.96	26.61	23.79	19.74	14.34	11.93
225.0	608.23	492.47	346.95	230.12	122.34	40.89	27.79	23.96	19.74
270.0	660.94	553.50	415.13	289.13	158.29	74.08	32.57	25.93	21.77
315.0	551.76	432.23	296.55	180.79	71.89	29.14	23.18	19.18	15.30
360.0	560.81	435.38	290.25	213.53	71.04	34.93	25.31	20.93	17.89

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	12.26	11.98	11.76	11.48	11.25	11.08	10.86	10.74	10.58
45.0	11.64	11.42	11.25	11.14	10.91	10.80	10.63	10.52	10.35
90.0	11.25	11.08	10.91	10.80	10.63	10.52	10.41	10.35	10.24
135.0	11.42	11.25	11.08	10.97	10.80	10.69	10.58	10.41	10.29
180.0	11.64	11.42	11.25	11.08	10.91	10.80	10.63	10.52	10.41
225.0	16.03	12.15	11.76	11.53	11.36	11.14	10.97	10.80	10.63
270.0	18.45	11.98	11.76	11.48	11.25	11.08	10.91	10.74	10.63
315.0	12.49	11.76	11.42	11.25	11.08	10.86	10.69	10.52	10.41
360.0	12.26	11.98	11.76	11.48	11.25	11.08	10.86	10.74	10.58
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	10.41	10.29	10.24	10.13	10.07	9.96	9.90	9.84	9.79
45.0	10.29	10.18	10.07	10.01	9.96	9.84	9.79	9.79	9.73
90.0	10.13	10.07	9.96	9.96	9.90	9.79	9.79	9.73	9.68
135.0	10.24	10.13	10.01	10.01	9.90	9.84	9.79	9.79	9.73
180.0	10.29	10.18	10.13	10.01	9.96	9.90	9.84	9.73	9.73
225.0	10.46	10.35	10.24	10.18	10.07	9.96	9.96	9.84	9.79
270.0	10.52	10.35	10.24	10.18	10.07	10.01	9.96	9.90	9.84
315.0	10.29	10.18	10.07	10.01	9.90	9.90	9.79	9.73	9.68
360.0	10.41	10.29	10.24	10.13	10.07	9.96	9.90	9.84	9.79
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.73	9.73	9.68	9.56	9.56	9.51	9.51	9.51	9.51
45.0	9.68	9.62	9.56	9.56	9.51	9.51	9.51	9.45	9.45
90.0	9.68	9.62	9.62	9.56	9.56	9.56	9.51	9.51	9.51
135.0	9.68	9.62	9.62	9.56	9.51	9.51	9.45	9.45	9.39
180.0	9.68	9.62	9.62	9.51	9.51	9.45	9.45	9.45	9.45
225.0	9.73	9.73	9.62	9.56	9.56	9.51	9.51	9.45	9.45
270.0	9.79	9.73	9.68	9.68	9.56	9.56	9.56	9.56	9.51
315.0	9.62	9.62	9.56	9.51	9.51	9.51	9.45	9.45	9.39
360.0	9.73	9.73	9.68	9.56	9.56	9.51	9.51	9.51	9.51
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.51	9.45	9.45	9.51	9.51	9.68	9.84	10.07	10.35
45.0	9.45	9.45	9.45	9.45	9.62	9.84	10.01	10.01	9.79
90.0	9.51	9.51	9.45	9.51	9.45	9.45	9.45	9.45	9.51
135.0	9.45	9.39	9.39	9.39	9.45	9.45	9.45	9.45	9.51
180.0	9.39	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.45
225.0	9.39	9.39	9.34	9.34	9.34	9.34	9.28	9.28	9.28
270.0	9.51	9.45	9.45	9.45	9.45	9.45	9.45	9.45	9.45
315.0	9.39	9.34	9.34	9.34	9.34	9.34	9.34	9.34	9.34
360.0	9.51	9.45	9.45	9.51	9.51	9.68	9.84	10.07	10.35
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.41	10.35	10.13	9.96	9.84	9.84	9.79	9.23	9.28
45.0	9.62	9.56	9.51	9.51	9.45	9.23	9.17	9.23	9.23
90.0	9.56	9.62	9.56	9.39	9.23	9.23	9.23	9.23	9.17
135.0	9.45	9.45	9.39	9.34	9.28	9.28	9.23	9.23	9.23
180.0	9.39	9.39	9.34	9.28	9.28	9.23	9.23	9.17	9.23
225.0	9.28	9.28	9.28	9.28	9.23	9.28	9.28	9.23	9.23
270.0	9.51	9.51	9.51	9.56	9.62	9.51	9.45	9.39	9.23
315.0	9.34	9.39	9.39	9.39	9.34	9.39	9.39	9.23	9.23
360.0	10.41	10.35	10.13	9.96	9.84	9.84	9.79	9.23	9.28

Intensity data(cd)

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