NATA LIGHTING CO.,LTD
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Nata

LumCAT: 2-1122-A4
Luminaire: TE 2213130-1+92.76.365.000
Report No: NT20170511504
Test No: GC20170511504
LampCAT: LUXEON CoB 1208
Lamp flux(lm): 3194.0
Number of Lamps: 1
Length(mm): 70
Phm Type: C

Voltage(V): 219.9000
Current(A): 0.1360
Power (W): 28.1000
PF: 0.9420
Ballast type: DC
Width(mm): 70
Height(mm): 0

Photometric Results

Lumens(lm): 2932.23
Efficiency(%): 91.80%
Lumens(lm)/Power(W): 104.35
Central intensity(cd): 6354.610
Maximum intensity(cd): 6354.610
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=36.4
[C90/270]Total=36.4
Field angle(10%Imax): [C0/180]Total=71.7
[C90/270]Total=71.7
Maximum s/h(1/2): C0_180=0.60 C90_270=0.60
Maximum s/h(1/4): C0_180=0.59 C90_270=0.59
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 91.80%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.723%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6354.610	0.000	0	.000%	.000%
1.0	6332.862	6.071	6.071	.190%	.207%
2.0	6273.126	18.093	24.164	.566%	.824%
3.0	6181.320	29.787	53.951	.933%	1.840%
4.0	6072.033	41.016	94.967	1.284%	3.239%
5.0	5951.734	51.726	146.692	1.619%	5.003%
6.0	5811.754	61.820	208.513	1.936%	7.111%
7.0	5666.818	71.247	279.76	2.231%	9.541%
8.0	5527.800	80.118	359.878	2.508%	12.273%
9.0	5351.069	88.167	448.045	2.760%	15.280%
10.0	5173.237	95.241	543.286	2.982%	18.528%
11.0	4996.781	101.619	644.906	3.182%	21.994%
12.0	4787.154	106.952	751.858	3.349%	25.641%
13.0	4550.824	110.818	862.676	3.470%	29.421%
14.0	4321.377	113.563	976.24	3.556%	33.293%
15.0	4061.235	115.080	1091.32	3.603%	37.218%
16.0	3793.524	115.094	1206.414	3.603%	41.143%
17.0	3518.655	113.870	1320.284	3.565%	45.027%
18.0	3232.637	111.314	1431.599	3.485%	48.823%
19.0	2949.922	107.564	1539.162	3.368%	52.491%
20.0	2668.859	102.839	1642.002	3.220%	55.998%
21.0	2379.538	96.939	1738.941	3.035%	59.304%
22.0	2144.309	90.909	1829.85	2.846%	62.405%
23.0	1928.213	85.453	1915.302	2.675%	65.319%
24.0	1734.001	80.069	1995.371	2.507%	68.050%
25.0	1585.211	75.472	2070.843	2.363%	70.624%
26.0	1469.455	72.106	2142.949	2.258%	73.083%
27.0	1371.593	69.507	2212.456	2.176%	75.453%
28.0	1283.778	67.228	2279.684	2.105%	77.746%
29.0	1211.929	65.295	2344.979	2.044%	79.973%
30.0	1143.274	63.590	2408.569	1.991%	82.141%
31.0	1082.312	61.935	2470.504	1.939%	84.253%
32.0	1010.065	59.944	2530.448	1.877%	86.298%
33.0	925.787	57.031	2587.479	1.786%	88.243%
34.0	825.006	52.984	2640.463	1.659%	90.050%
35.0	725.726	48.160	2688.623	1.508%	91.692%
36.0	621.697	42.902	2731.525	1.343%	93.155%
37.0	514.736	37.064	2768.589	1.160%	94.419%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	415.263	31.042	2799.631	.972%	95.478%
39.0	316.313	24.971	2824.602	.782%	96.330%
40.0	222.029	18.775	2843.377	.588%	96.970%
41.0	142.417	12.978	2856.355	.406%	97.412%
42.0	79.020	8.045	2864.4	.252%	97.687%
43.0	45.449	4.611	2869.011	.144%	97.844%
44.0	37.204	3.120	2872.131	.098%	97.950%
45.0	33.020	2.699	2874.829	.084%	98.043%
46.0	27.349	2.361	2877.19	.074%	98.123%
47.0	21.692	1.951	2879.141	.061%	98.190%
48.0	16.407	1.540	2880.681	.048%	98.242%
49.0	14.273	1.260	2881.941	.039%	98.285%
50.0	13.929	1.176	2883.117	.037%	98.325%
51.0	13.668	1.168	2884.284	.037%	98.365%
52.0	13.489	1.165	2885.45	.036%	98.405%
53.0	13.255	1.163	2886.613	.036%	98.444%
54.0	13.090	1.161	2887.774	.036%	98.484%
55.0	12.952	1.162	2888.937	.036%	98.524%
56.0	12.801	1.164	2890.1	.036%	98.563%
57.0	12.704	1.166	2891.266	.037%	98.603%
58.0	12.594	1.170	2892.436	.037%	98.643%
59.0	12.525	1.174	2893.611	.037%	98.683%
60.0	12.429	1.179	2894.79	.037%	98.723%
61.0	12.319	1.181	2895.971	.037%	98.764%
62.0	12.264	1.185	2897.155	.037%	98.804%
63.0	12.209	1.190	2898.345	.037%	98.845%
64.0	12.181	1.197	2899.542	.037%	98.885%
65.0	12.195	1.206	2900.749	.038%	98.926%
66.0	12.223	1.218	2901.967	.038%	98.968%
67.0	12.223	1.229	2903.196	.038%	99.010%
68.0	12.223	1.238	2904.434	.039%	99.052%
69.0	12.209	1.246	2905.681	.039%	99.095%
70.0	12.167	1.252	2906.933	.039%	99.137%
71.0	12.126	1.256	2908.188	.039%	99.180%
72.0	12.099	1.260	2909.448	.039%	99.223%
73.0	12.057	1.263	2910.711	.040%	99.266%
74.0	12.030	1.266	2911.977	.040%	99.309%
75.0	11.989	1.269	2913.246	.040%	99.353%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	11.975	1.272	2914.518	.040%	99.396%
77.0	11.933	1.275	2915.793	.040%	99.440%
78.0	11.892	1.275	2917.068	.040%	99.483%
79.0	11.823	1.274	2918.343	.040%	99.527%
80.0	11.796	1.273	2919.616	.040%	99.570%
81.0	11.823	1.277	2920.893	.040%	99.613%
82.0	11.837	1.283	2922.176	.040%	99.657%
83.0	11.768	1.283	2923.46	.040%	99.701%
84.0	11.658	1.276	2924.736	.040%	99.745%
85.0	11.534	1.266	2926.002	.040%	99.788%
86.0	11.479	1.258	2927.26	.039%	99.831%
87.0	11.369	1.250	2928.51	.039%	99.873%
88.0	11.300	1.242	2929.752	.039%	99.916%
89.0	11.287	1.238	2930.99	.039%	99.958%
90.0	11.273	1.237	2932.227	.039%	100.000%

Zonal flux distribution table

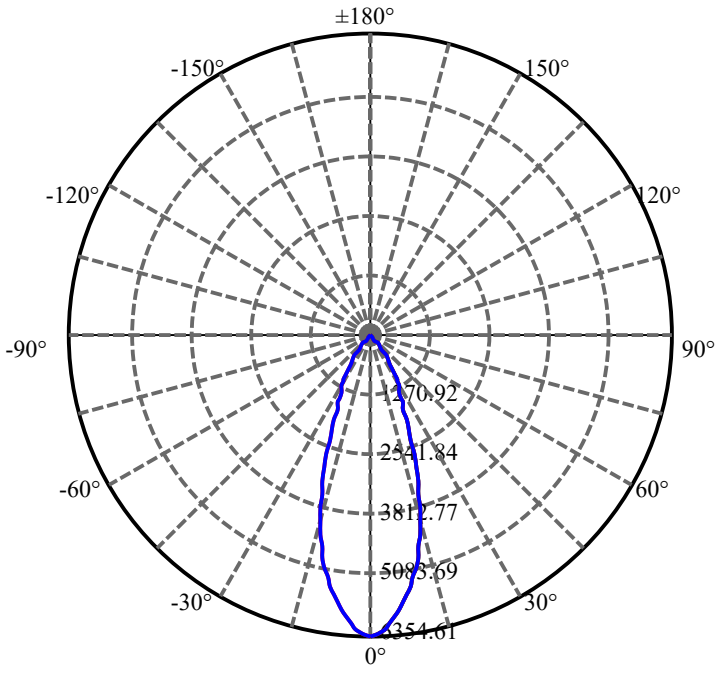
ZONAL LUMEN SUMMARY

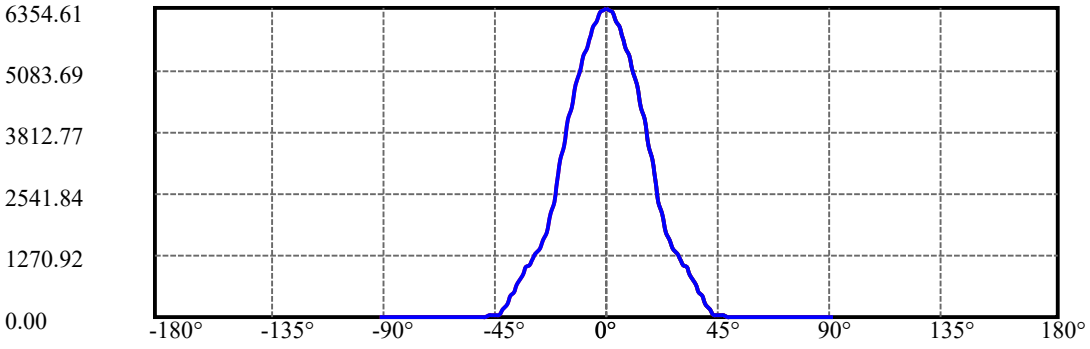
Zone	Lumens	%Lamp	%Fixt
0-30	2408.57	75.41%	82.14%
0-40	2843.38	89.02%	96.97%
0-60	2894.79	90.63%	98.72%
0-90	2930.99	91.77%	99.96%
0-120	2930.99	91.77%	99.96%
0-180	2932.23	91.80%	100.00%
60-90	37.38	1.17%	1.27%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-29.01	2345.78	73.44%	80.00%

ZONAL LUMEN SUMMARY

0-10	543.29
10-20	1098.72
20-30	766.57
30-40	434.81
40-50	39.74
50-60	11.67
60-70	12.14
70-80	12.68
80-90	11.37
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

Light Distribution Curve [Unit:cd]





C0(Max):

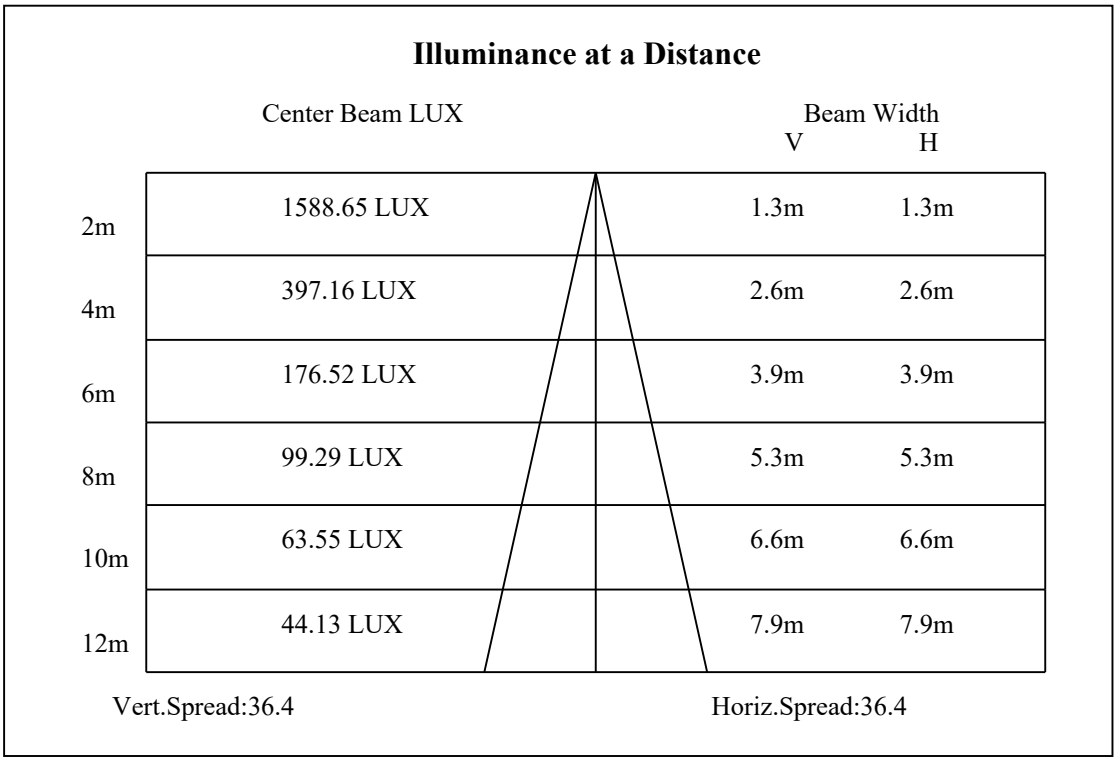
C0/C180:

C90/C270:

Field angle(10%Imax):C0/180Left:35.9 Right:35.9
:C90/270Left:35.9 Right:35.9

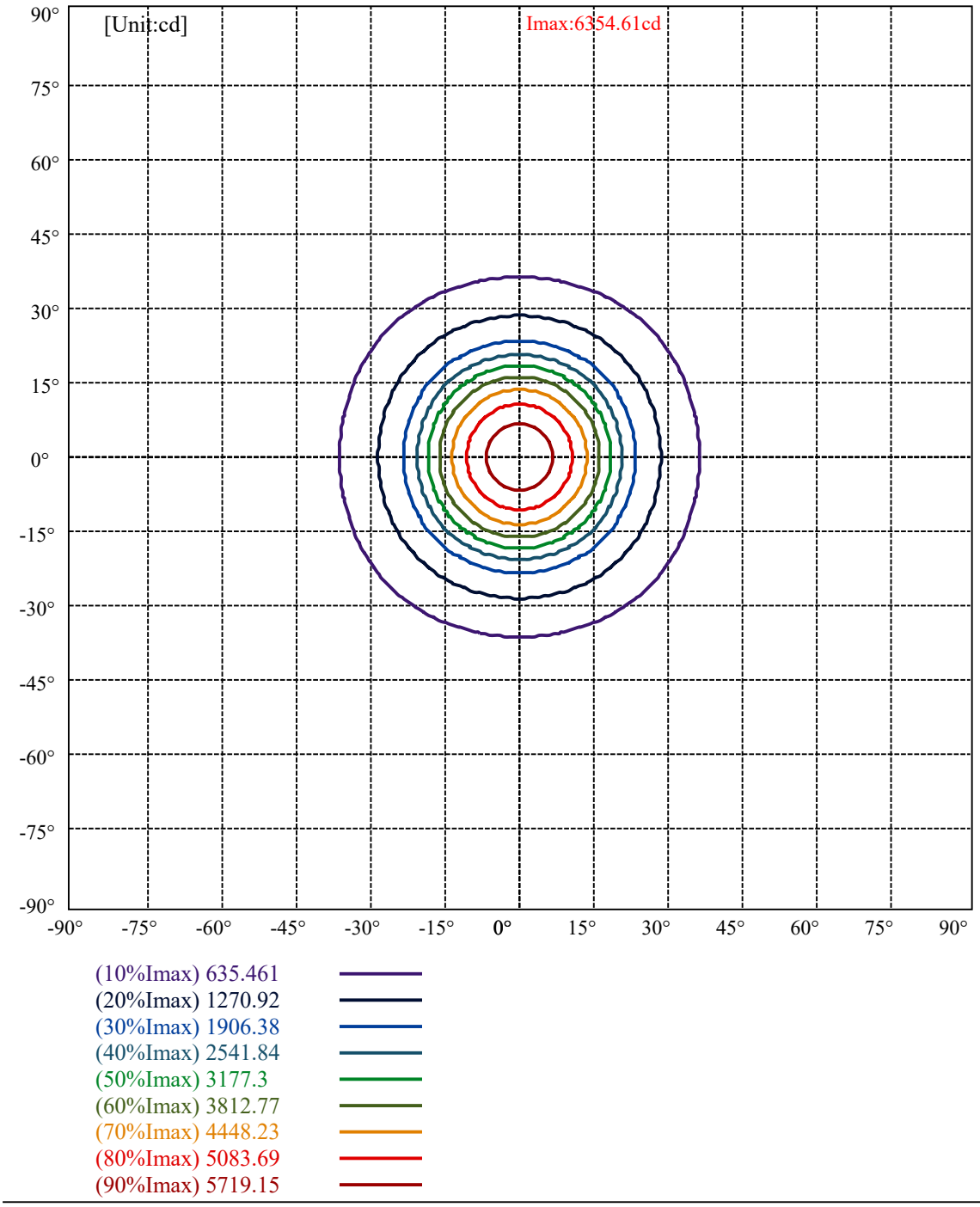
Beam Angle(50%Imax):C0/180Left:18.2 Right:18.2
:C90/270Left:18.2 Right:18.2

Lux distance Curve



Equipment: gms1980 Date: 2017/5/15 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

ISO-Intensity(V-H)

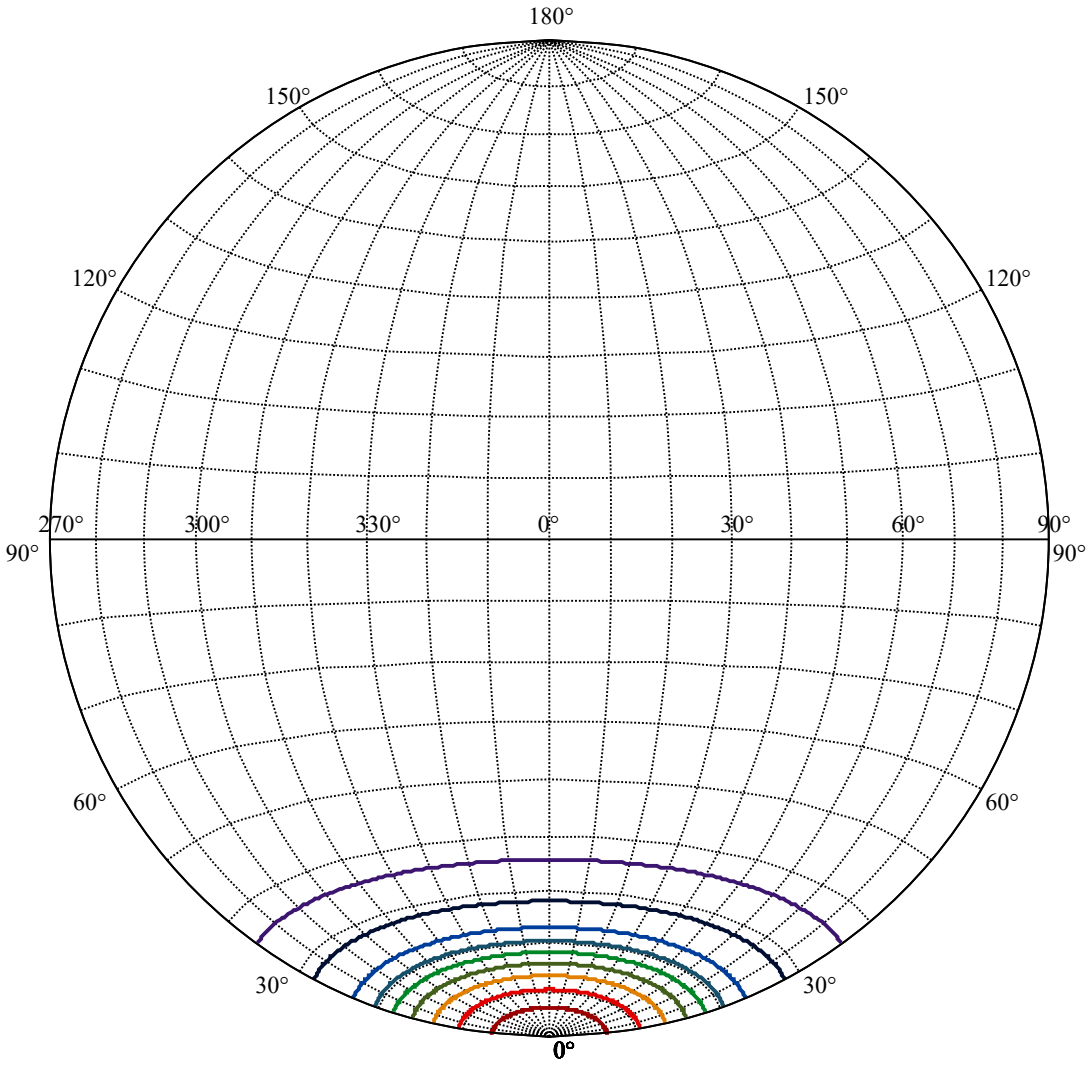


Equipment: gms1980
Temperature(°C): 25.0

Date: 2017/5/15
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

ISO candela diagram on circular web



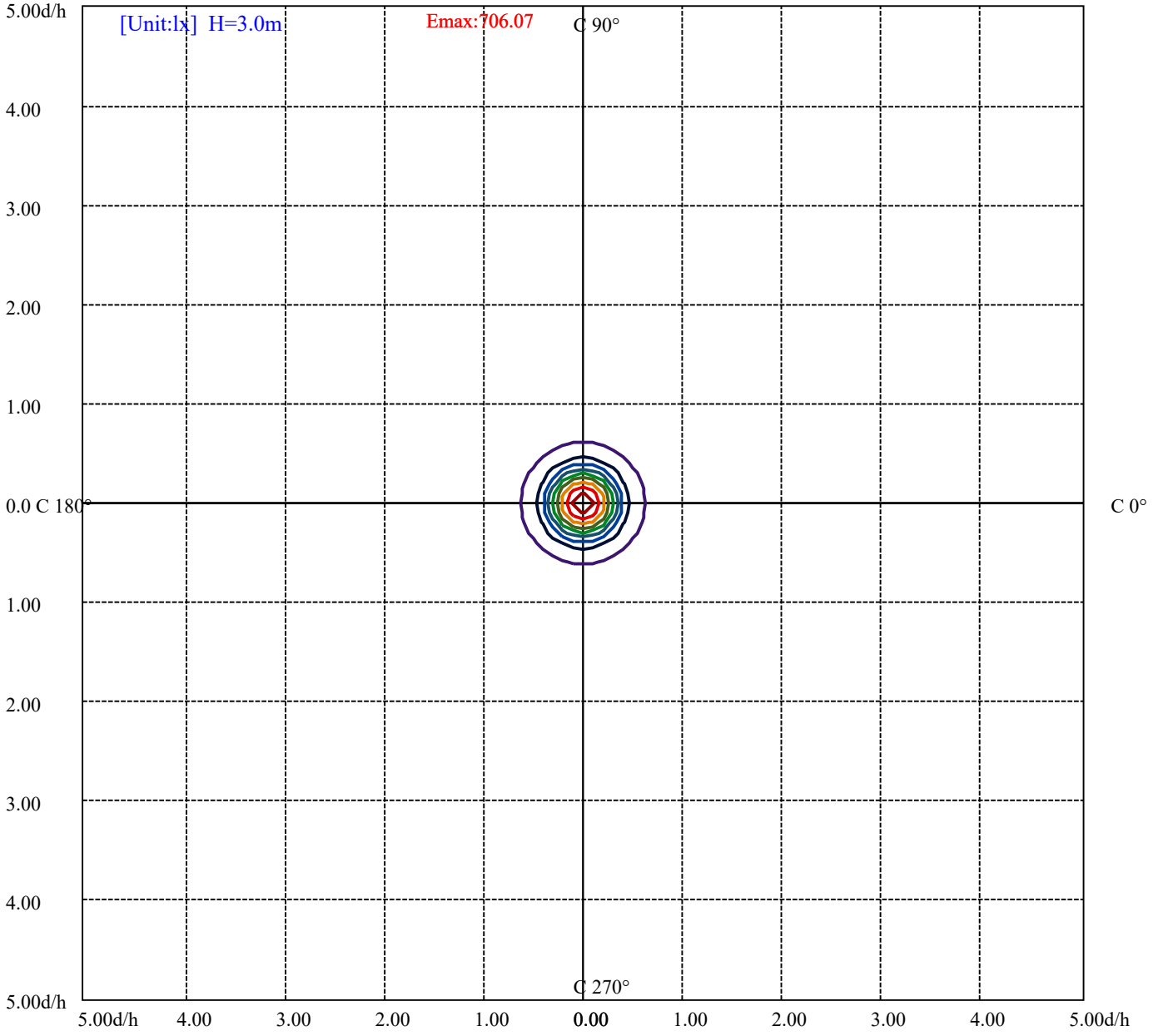
House [Unit:cd] Road

Imax:6354.61

(10%Imax) 635.461
(20%Imax) 1270.92
(30%Imax) 1906.38
(40%Imax) 2541.84
(50%Imax) 3177.3
(60%Imax) 3812.77
(70%Imax) 4448.23
(80%Imax) 5083.69
(90%Imax) 5719.15

Equipment: gms1980 Date: 2017/5/15 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

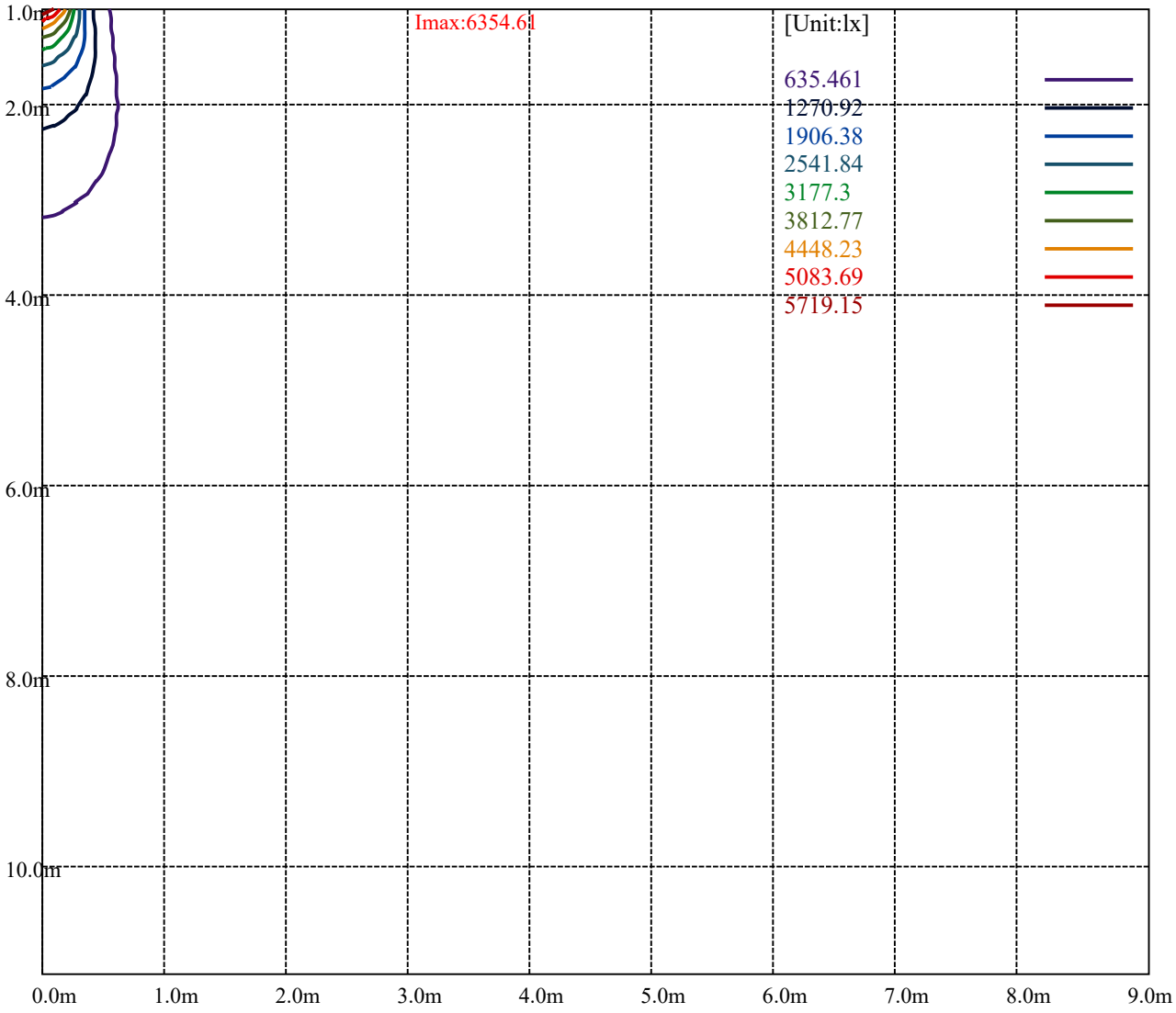
ISO illuminance diagram



(10%Emax) 70.60678
(20%Emax) 141.2133
(30%Emax) 211.82
(40%Emax) 282.4267
(50%Emax) 353.0333
(60%Emax) 423.64
(70%Emax) 494.2467
(80%Emax) 564.8544
(90%Emax) 635.4611

Equipment: gms1980
Temperature(°C): 25.0
Date: 2017/5/15
Humidity(%): 60.0%
Operator: NT07
Distance(m): 7.42

Space ISO Lux diagram



Equipment: gms1980
Temperature(°C): 25.0

Date: 2017/5/15
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

Luminance Limitting Curve(no luminous side)

Luminance Table

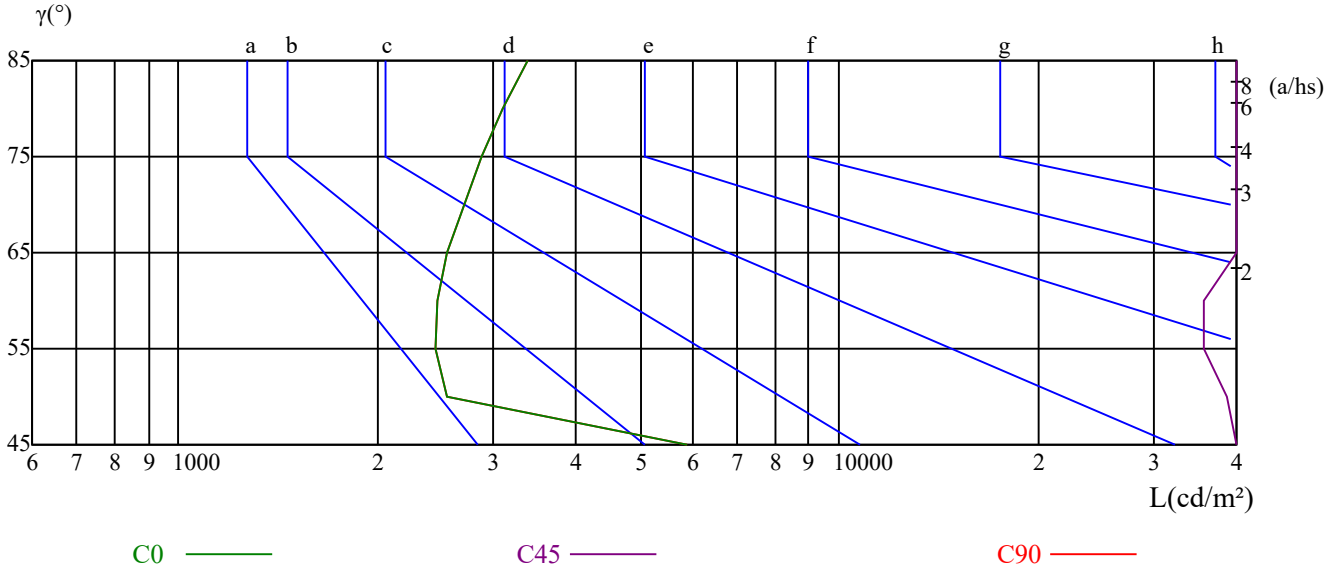
γ	45	50	55	60	65	70	75	80	85
C0	5904	2553	2455	2458	2541	2701	2871	3092	3367
C45	52716	38708	35756	35720	44017	81244	109134	112018	47758
C90	5904	2553	2455	2458	2541	2701	2871	3092	3367

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
5889	5889	126021	9453	9453	462963	27008	27008	521975

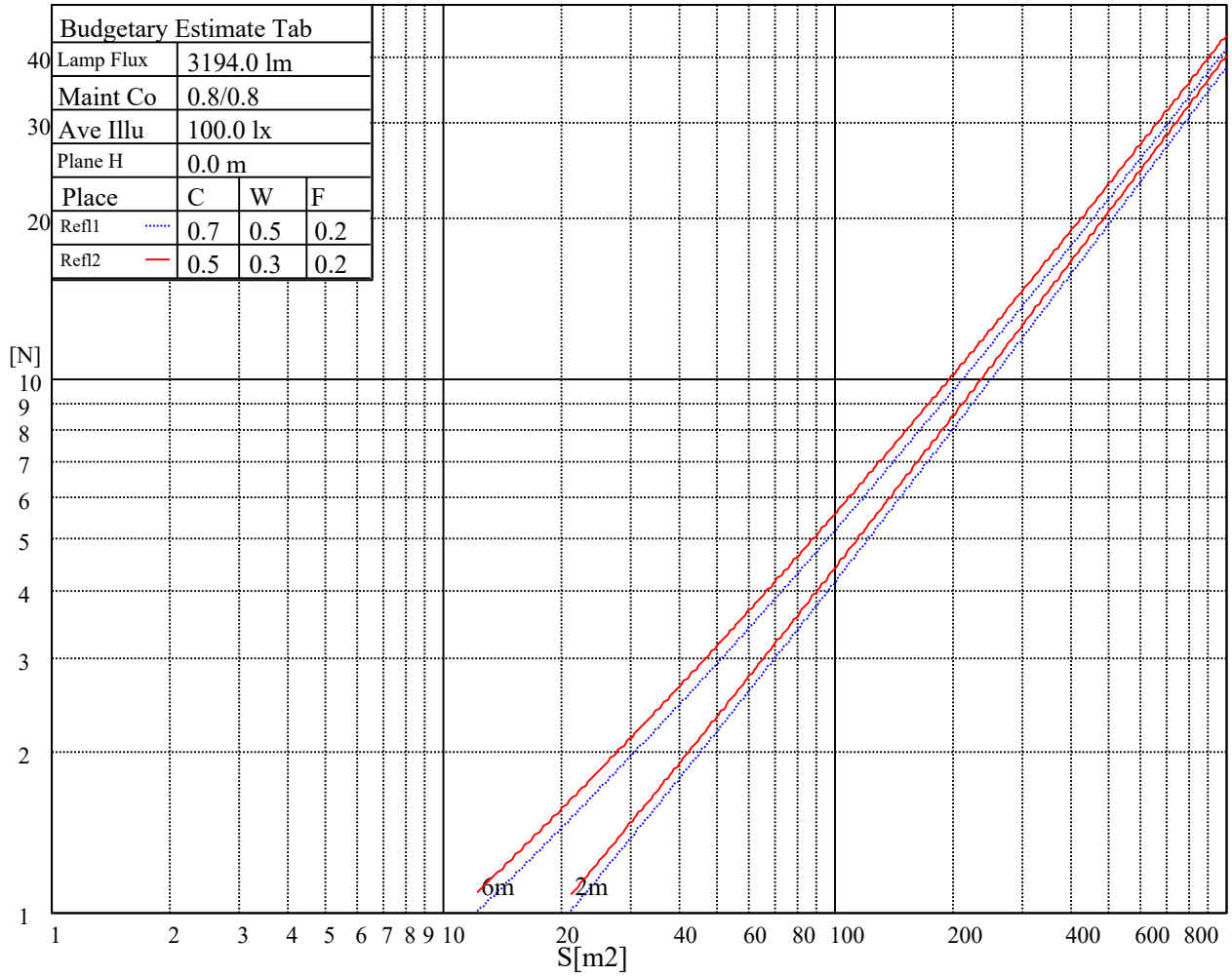
Glare Table

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 Limitting Curve



Budgetary Estimate Table



Equipment: gms1980 Date: 2017/5/15 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

Utilization factor table for indoor luminaire

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	COEFFCIENTS OF UTILIZATION RHOFC=20 CU															
0	1.09	1.09	1.09	1.07	1.07	1.07	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.92
1	1.02	1.00	0.98	1.00	0.98	0.97	0.97	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87
2	0.96	0.93	0.90	0.95	0.91	0.89	0.92	0.89	0.87	0.89	0.87	0.85	0.86	0.85	0.83	0.82
3	0.91	0.87	0.83	0.89	0.86	0.83	0.87	0.84	0.81	0.85	0.82	0.80	0.83	0.81	0.79	0.77
4	0.86	0.81	0.78	0.85	0.81	0.77	0.83	0.79	0.76	0.81	0.78	0.76	0.79	0.77	0.75	0.73
5	0.81	0.77	0.73	0.80	0.76	0.73	0.79	0.75	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.70
6	0.77	0.72	0.69	0.77	0.72	0.69	0.75	0.71	0.68	0.74	0.71	0.68	0.73	0.70	0.67	0.66
7	0.74	0.69	0.65	0.73	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.64	0.63
8	0.70	0.65	0.62	0.70	0.65	0.62	0.69	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.61	0.60
9	0.67	0.62	0.59	0.67	0.62	0.59	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.58
10	0.64	0.60	0.57	0.64	0.60	0.57	0.63	0.59	0.56	0.63	0.59	0.56	0.62	0.59	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	6339.74	6307.26	6234.04	6133.28	6022.62	5881.68	5734.12	5595.38	5445.08
90.0	6369.47	6366.72	6319.37	6236.79	6144.29	6036.93	5886.63	5754.49	5633.37
180.0	6339.74	6332.59	6285.24	6204.86	6095.84	5985.73	5866.81	5706.60	5567.85
270.0	6369.47	6324.88	6253.86	6150.35	6025.37	5902.60	5759.45	5610.80	5464.90
360.0	6339.74	6307.26	6234.04	6133.28	6022.62	5881.68	5734.12	5595.38	5445.08

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5247.43	5082.26	4903.32	4685.85	4446.91	4221.72	3949.75	3661.80	3401.38
90.0	5429.11	5270.55	5120.25	4886.26	4652.27	4460.67	4168.87	3922.77	3666.76
180.0	5420.85	5224.30	5053.08	4865.88	4635.20	4389.10	4156.76	3878.17	3621.61
270.0	5306.89	5115.84	4910.48	4710.63	4468.93	4214.02	3969.57	3711.35	3384.87
360.0	5247.43	5082.26	4903.32	4685.85	4446.91	4221.72	3949.75	3661.80	3401.38

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	3144.82	2859.08	2573.34	2301.36	2083.33	1862.56	1678.12	1544.33	1436.42
90.0	3343.02	3078.20	2810.63	2488.00	2244.10	2027.18	1795.39	1647.29	1525.61
180.0	3321.55	3013.24	2742.91	2453.86	2192.90	1986.99	1806.95	1622.51	1505.24
270.0	3121.15	2849.17	2548.56	2274.93	2056.91	1836.13	1655.55	1526.71	1410.54
360.0	3144.82	2859.08	2573.34	2301.36	2083.33	1862.56	1678.12	1544.33	1436.42

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	1335.67	1250.88	1185.36	1125.90	1054.33	977.80	892.46	777.40	681.05
90.0	1417.15	1326.86	1256.39	1184.26	1121.50	1068.64	985.51	897.97	796.67
180.0	1408.89	1314.75	1233.81	1169.95	1097.99	1035.34	954.73	845.45	764.84
270.0	1324.66	1242.62	1172.15	1092.98	1055.43	958.48	870.44	779.21	660.35
360.0	1335.67	1250.88	1185.36	1125.90	1054.33	977.80	892.46	777.40	681.05

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	581.95	472.38	364.47	296.75	180.47	113.69	58.36	37.38	34.30
90.0	683.25	581.40	482.84	361.72	281.34	184.82	99.05	53.79	36.23
180.0	656.82	536.08	451.63	345.59	245.11	165.22	100.20	49.39	40.08
270.0	564.77	469.08	362.11	261.19	181.19	105.93	58.47	41.24	38.21
360.0	581.95	472.38	364.47	296.75	180.47	113.69	58.36	37.38	34.30

C/γ(°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	29.95	24.61	19.60	14.70	14.15	13.93	13.60	13.43	13.32
90.0	31.49	26.04	21.69	17.01	14.53	14.20	13.93	13.76	13.32
180.0	36.39	30.83	25.05	19.82	14.65	14.09	13.82	13.60	13.43
270.0	34.25	27.91	20.43	14.09	13.76	13.49	13.32	13.16	12.94
360.0	29.95	24.61	19.60	14.70	14.15	13.93	13.60	13.43	13.32

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	13.16	12.99	12.83	12.72	12.61	12.55	12.50	12.39	12.33
90.0	13.16	13.05	12.88	12.77	12.66	12.61	12.44	12.33	12.28
180.0	13.21	13.05	12.88	12.83	12.66	12.61	12.50	12.39	12.33
270.0	12.83	12.72	12.61	12.50	12.44	12.33	12.28	12.17	12.11
360.0	13.16	12.99	12.83	12.72	12.61	12.55	12.50	12.39	12.33

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	12.28	12.22	12.17	12.17	12.22	12.22	12.17	12.17	12.11
90.0	12.22	12.17	12.17	12.22	12.22	12.17	12.17	12.11	12.06
180.0	12.28	12.28	12.33	12.33	12.28	12.33	12.33	12.28	12.22
270.0	12.06	12.06	12.11	12.17	12.17	12.17	12.17	12.11	12.11
360.0	12.28	12.22	12.17	12.17	12.22	12.22	12.17	12.17	12.11

Intensity data(cd)

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	12.11	12.00	11.95	11.95	11.95	11.89	11.84	11.78	11.67
90.0	12.06	12.00	12.00	11.95	11.95	11.89	11.89	11.78	11.84
180.0	12.17	12.17	12.11	12.11	12.06	12.06	12.00	11.95	11.89
270.0	12.06	12.06	12.06	11.95	11.95	11.89	11.84	11.78	11.78
360.0	12.11	12.00	11.95	11.95	11.95	11.89	11.84	11.78	11.67

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	11.67	11.73	11.62	11.56	11.51	11.45	11.29	11.29	11.34
90.0	11.89	11.95	11.84	11.73	11.56	11.51	11.45	11.29	11.29
180.0	11.95	11.89	11.89	11.78	11.56	11.51	11.45	11.34	11.23
270.0	11.78	11.78	11.73	11.56	11.51	11.45	11.29	11.29	11.29
360.0	11.67	11.73	11.62	11.56	11.51	11.45	11.29	11.29	11.34

C/γ(°)	90.0
0.0	11.29
90.0	11.23
180.0	11.34
270.0	11.23
360.0	11.29