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Nata

LumCAT: 3-2040-M
Luminaire: 92.70.131.00
Report No: GC2017061903
Test No: NT-0010
LampCAT: BMTC MA-1919 20W
Lamp flux(lm): 2561.0
Number of Lamps: 1
Length(mm): 79
Phm Type: C

Voltage(V): 219.9000
Current(A): 0.1300
Power (W): 26.9000
PF: 0.9410
Ballast type: DC
Width(mm): 79
Height(mm): 0

Photometric Results

Lumens(lm): 2332.94
Efficiency(%): 91.09%
Lumens(lm)/Power(W): 86.73
Central intensity(cd): 10474.760
Maximum intensity(cd): 10474.760
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=21.2
[C90/270]Total=21.2
Field angle(10%Imax): [C0/180]Total=46.9
[C90/270]Total=46.9
Maximum s/h(1/2): C0_180=0.36 C90_270=0.36
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(%): 91.09%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.784%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	10474.755	0.000	0	.000%	.000%
1.0	10422.452	9.999	9.999	.390%	.429%
2.0	10217.780	29.625	39.624	1.157%	1.698%
3.0	9836.514	47.963	87.587	1.873%	3.754%
4.0	9391.934	64.364	151.951	2.513%	6.513%
5.0	8853.482	78.491	230.442	3.065%	9.878%
6.0	8276.078	90.020	320.462	3.515%	13.736%
7.0	7600.123	98.543	419.005	3.848%	17.960%
8.0	6978.949	104.340	523.345	4.074%	22.433%
9.0	6292.809	107.560	630.905	4.200%	27.043%
10.0	5621.396	107.819	738.725	4.210%	31.665%
11.0	4978.750	105.917	844.642	4.136%	36.205%
12.0	4359.641	102.082	946.724	3.986%	40.581%
13.0	3802.883	96.869	1043.592	3.782%	44.733%
14.0	3266.771	90.491	1134.083	3.533%	48.612%
15.0	2832.789	83.737	1217.821	3.270%	52.201%
16.0	2435.420	77.194	1295.015	3.014%	55.510%
17.0	2121.048	70.956	1365.971	2.771%	58.552%
18.0	1844.252	65.379	1431.35	2.553%	61.354%
19.0	1635.313	60.537	1491.888	2.364%	63.949%
20.0	1437.880	56.248	1548.136	2.196%	66.360%
21.0	1308.360	52.733	1600.869	2.059%	68.620%
22.0	1191.187	50.229	1651.099	1.961%	70.773%
23.0	1069.498	47.435	1698.534	1.852%	72.807%
24.0	1019.521	45.673	1744.207	1.783%	74.764%
25.0	951.898	44.826	1789.033	1.750%	76.686%
26.0	905.361	43.841	1832.874	1.712%	78.565%
27.0	864.564	43.302	1876.175	1.691%	80.421%
28.0	836.637	43.071	1919.246	1.682%	82.267%
29.0	812.164	43.137	1962.384	1.684%	84.116%
30.0	783.769	43.090	2005.473	1.683%	85.963%
31.0	745.615	42.561	2048.034	1.662%	87.788%
32.0	696.463	41.314	2089.348	1.613%	89.559%
33.0	635.268	39.233	2128.581	1.532%	91.240%
34.0	553.757	35.983	2164.565	1.405%	92.783%
35.0	468.709	31.754	2196.319	1.240%	94.144%
36.0	373.200	26.807	2223.125	1.047%	95.293%
37.0	295.157	21.798	2244.923	.851%	96.227%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	199.648	16.516	2261.439	.645%	96.935%
39.0	134.214	11.396	2272.835	.445%	97.424%
40.0	83.479	7.592	2280.427	.296%	97.749%
41.0	51.134	4.794	2285.221	.187%	97.955%
42.0	25.959	2.801	2288.022	.109%	98.075%
43.0	16.352	1.567	2289.589	.061%	98.142%
44.0	13.778	1.137	2290.726	.044%	98.191%
45.0	12.236	1.000	2291.726	.039%	98.234%
46.0	11.383	0.924	2292.65	.036%	98.273%
47.0	10.653	0.876	2293.526	.034%	98.311%
48.0	10.199	0.843	2294.369	.033%	98.347%
49.0	10.048	0.831	2295.2	.032%	98.382%
50.0	9.938	0.833	2296.034	.033%	98.418%
51.0	9.828	0.836	2296.87	.033%	98.454%
52.0	9.731	0.839	2297.709	.033%	98.490%
53.0	9.635	0.842	2298.552	.033%	98.526%
54.0	9.580	0.847	2299.398	.033%	98.562%
55.0	9.483	0.851	2300.249	.033%	98.599%
56.0	9.428	0.855	2301.104	.033%	98.635%
57.0	9.387	0.860	2301.964	.034%	98.672%
58.0	9.318	0.865	2302.829	.034%	98.709%
59.0	9.291	0.870	2303.699	.034%	98.747%
60.0	9.249	0.876	2304.575	.034%	98.784%
61.0	9.208	0.881	2305.456	.034%	98.822%
62.0	9.181	0.886	2306.342	.035%	98.860%
63.0	9.181	0.893	2307.235	.035%	98.898%
64.0	9.126	0.898	2308.133	.035%	98.937%
65.0	9.098	0.902	2309.035	.035%	98.975%
66.0	9.057	0.906	2309.941	.035%	99.014%
67.0	9.071	0.911	2310.853	.036%	99.053%
68.0	9.057	0.918	2311.771	.036%	99.093%
69.0	9.043	0.923	2312.694	.036%	99.132%
70.0	9.043	0.929	2313.623	.036%	99.172%
71.0	9.002	0.933	2314.556	.036%	99.212%
72.0	8.988	0.935	2315.491	.037%	99.252%
73.0	8.988	0.940	2316.431	.037%	99.292%
74.0	8.988	0.945	2317.376	.037%	99.333%
75.0	9.002	0.951	2318.327	.037%	99.374%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	8.988	0.955	2319.282	.037%	99.415%
77.0	8.974	0.958	2320.239	.037%	99.456%
78.0	8.974	0.961	2321.2	.038%	99.497%
79.0	8.960	0.964	2322.164	.038%	99.538%
80.0	8.960	0.966	2323.13	.038%	99.580%
81.0	8.988	0.971	2324.101	.038%	99.621%
82.0	8.988	0.975	2325.075	.038%	99.663%
83.0	8.988	0.977	2326.053	.038%	99.705%
84.0	9.002	0.980	2327.033	.038%	99.747%
85.0	9.015	0.983	2328.016	.038%	99.789%
86.0	8.974	0.983	2328.999	.038%	99.831%
87.0	9.002	0.984	2329.983	.038%	99.873%
88.0	8.988	0.985	2330.968	.038%	99.916%
89.0	8.974	0.985	2331.953	.038%	99.958%
90.0	8.974	0.984	2332.937	.038%	100.000%

Zonal flux distribution table

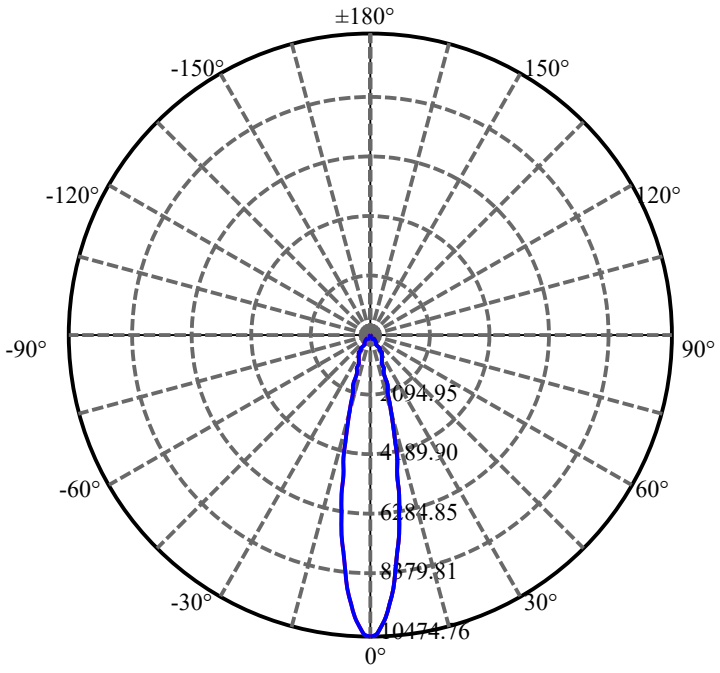
ZONAL LUMEN SUMMARY

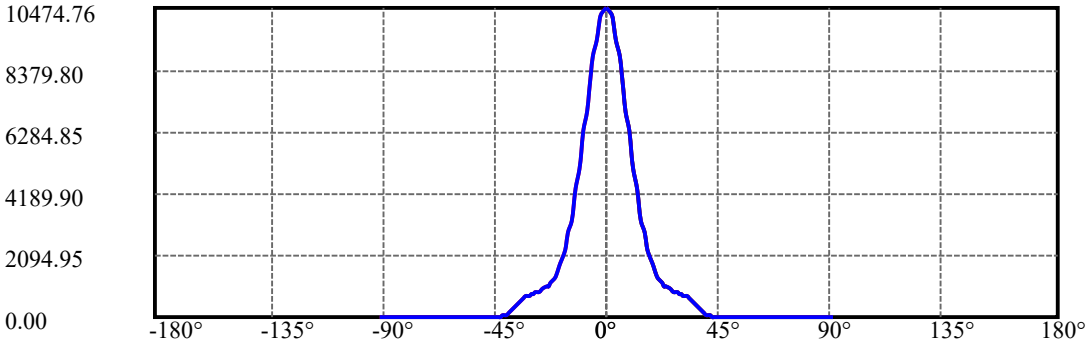
Zone	Lumens	%Lamp	%Fixt
0-30	2005.47	78.31%	85.96%
0-40	2280.43	89.04%	97.75%
0-60	2304.58	89.99%	98.78%
0-90	2331.95	91.06%	99.96%
0-120	2331.95	91.06%	99.96%
0-180	2332.94	91.09%	100.00%
60-90	28.25	1.10%	1.21%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.77	1866.35	72.88%	80.00%

ZONAL LUMEN SUMMARY

0-10	738.72
10-20	809.41
20-30	457.34
30-40	274.95
40-50	15.61
50-60	8.54
60-70	9.05
70-80	9.51
80-90	8.82
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:

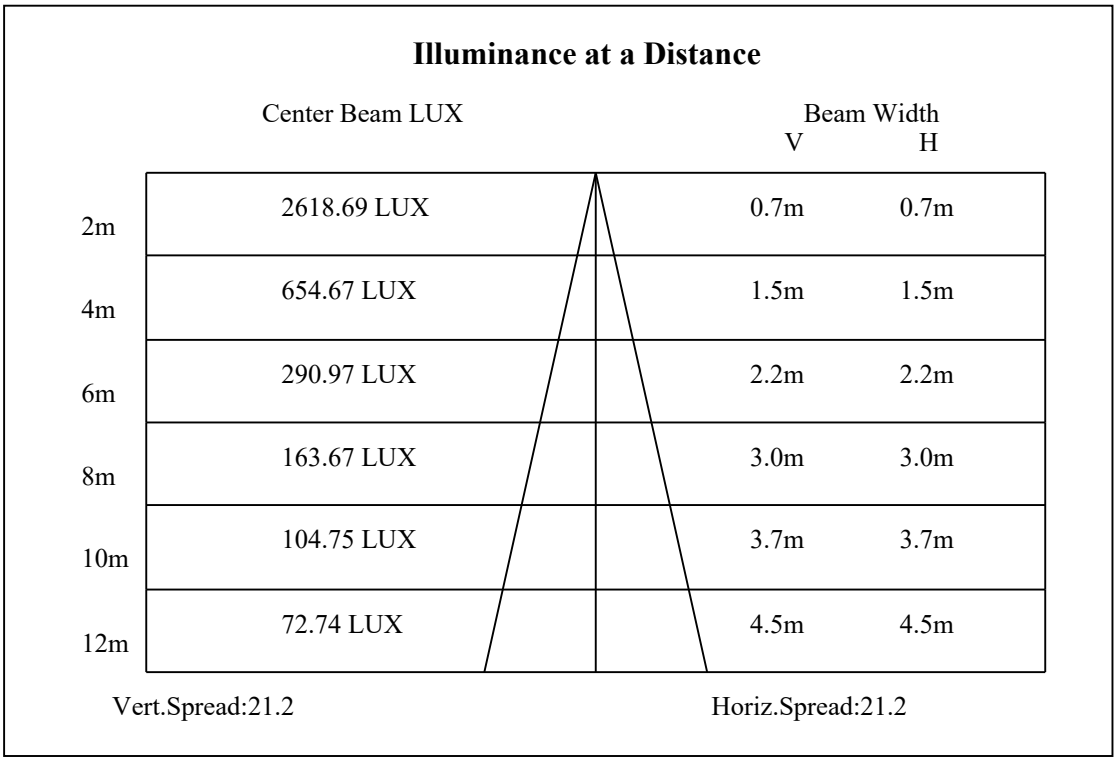
C90/C270:

Field angle(10%Imax):C0/180Left:23.4 Right:23.4
:C90/270Left:23.4 Right:23.4

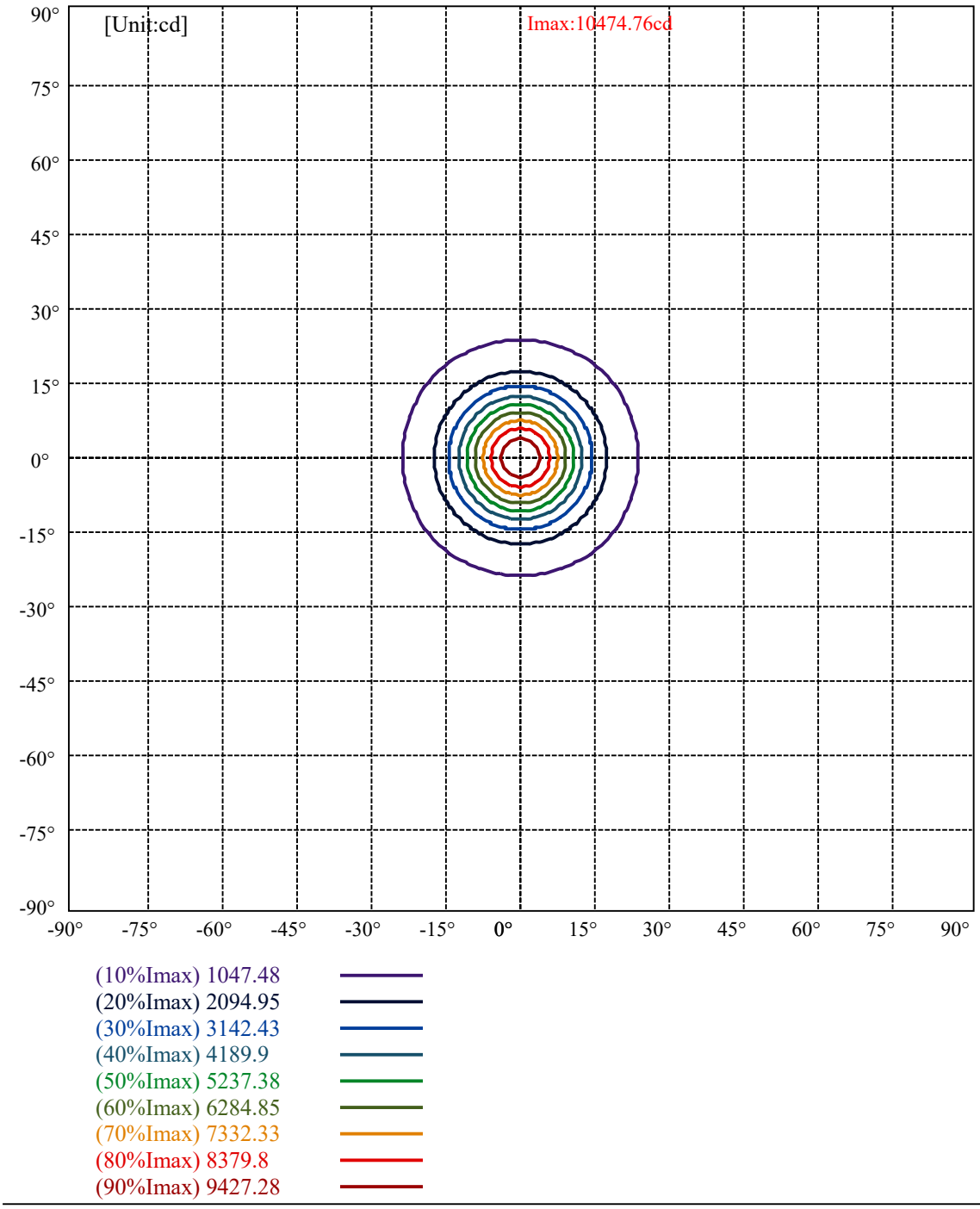
Beam Angle(50%Imax):C0/180Left:10.6 Right:10.6
:C90/270Left:10.6 Right:10.6

Equipment: gms1980 Date: 2017/5/18 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

Lux distance Curve



ISO-Intensity(V-H)

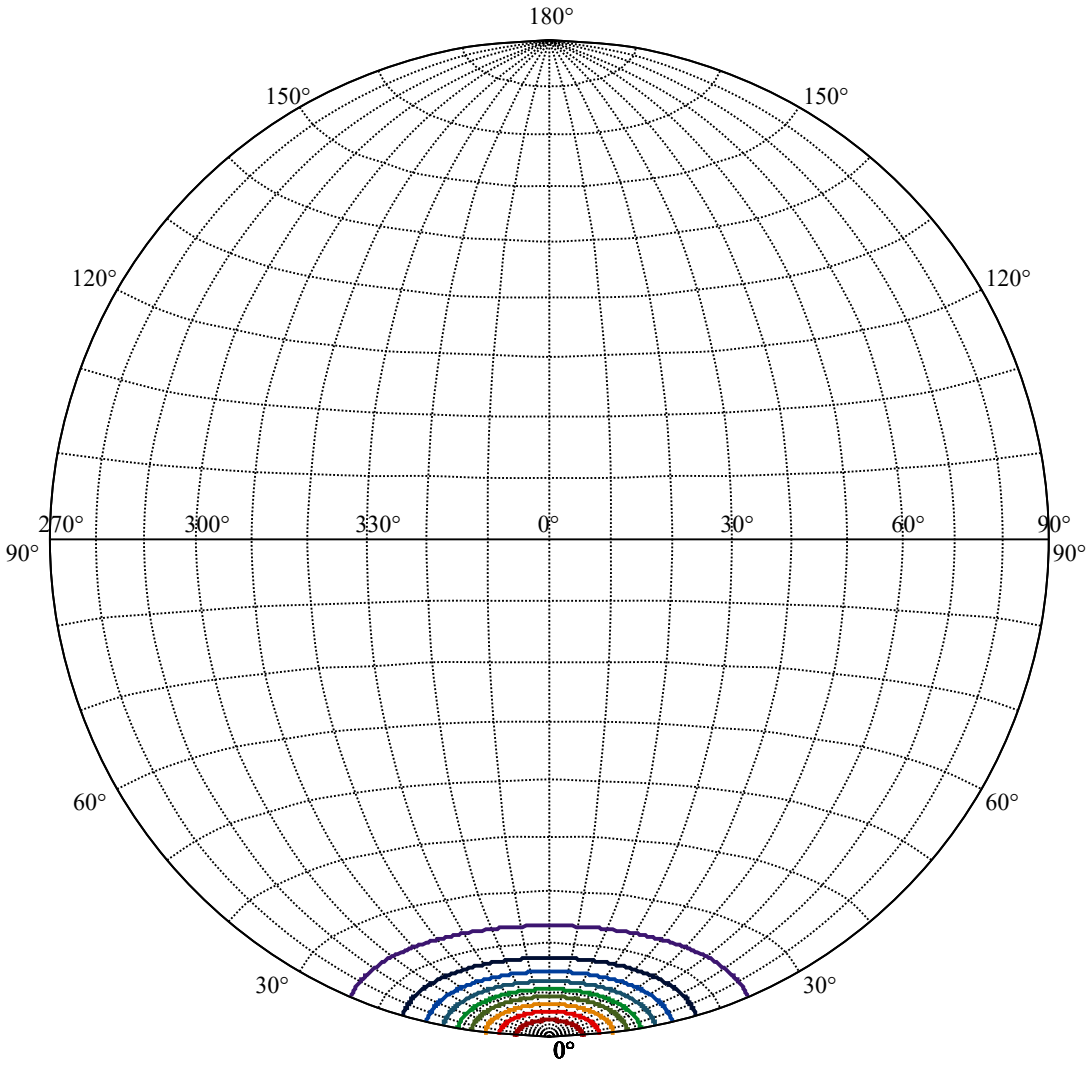


Equipment: gms1980
Temperature(°C): 25.0

Date: 2017/5/18
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

ISO candela diagram on circular web



[Unit:cd]

Imax:10474.76

(10%Imax) 1047.48
(20%Imax) 2094.95
(30%Imax) 3142.43
(40%Imax) 4189.9
(50%Imax) 5237.38
(60%Imax) 6284.85
(70%Imax) 7332.33
(80%Imax) 8379.8
(90%Imax) 9427.28

Equipment: gms1980	Date: 2017/5/18	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 60.0%	Distance(m): 7.42

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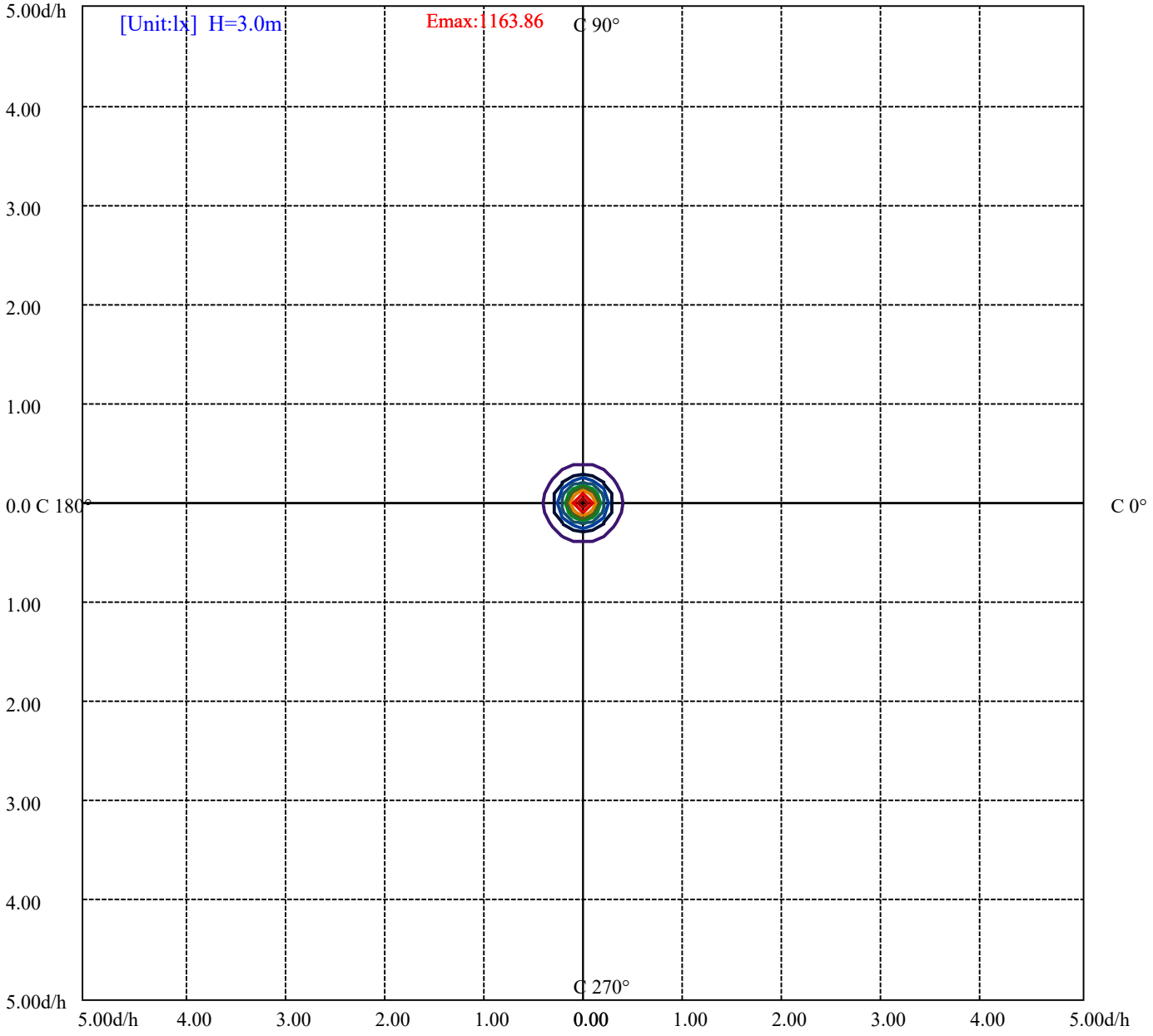
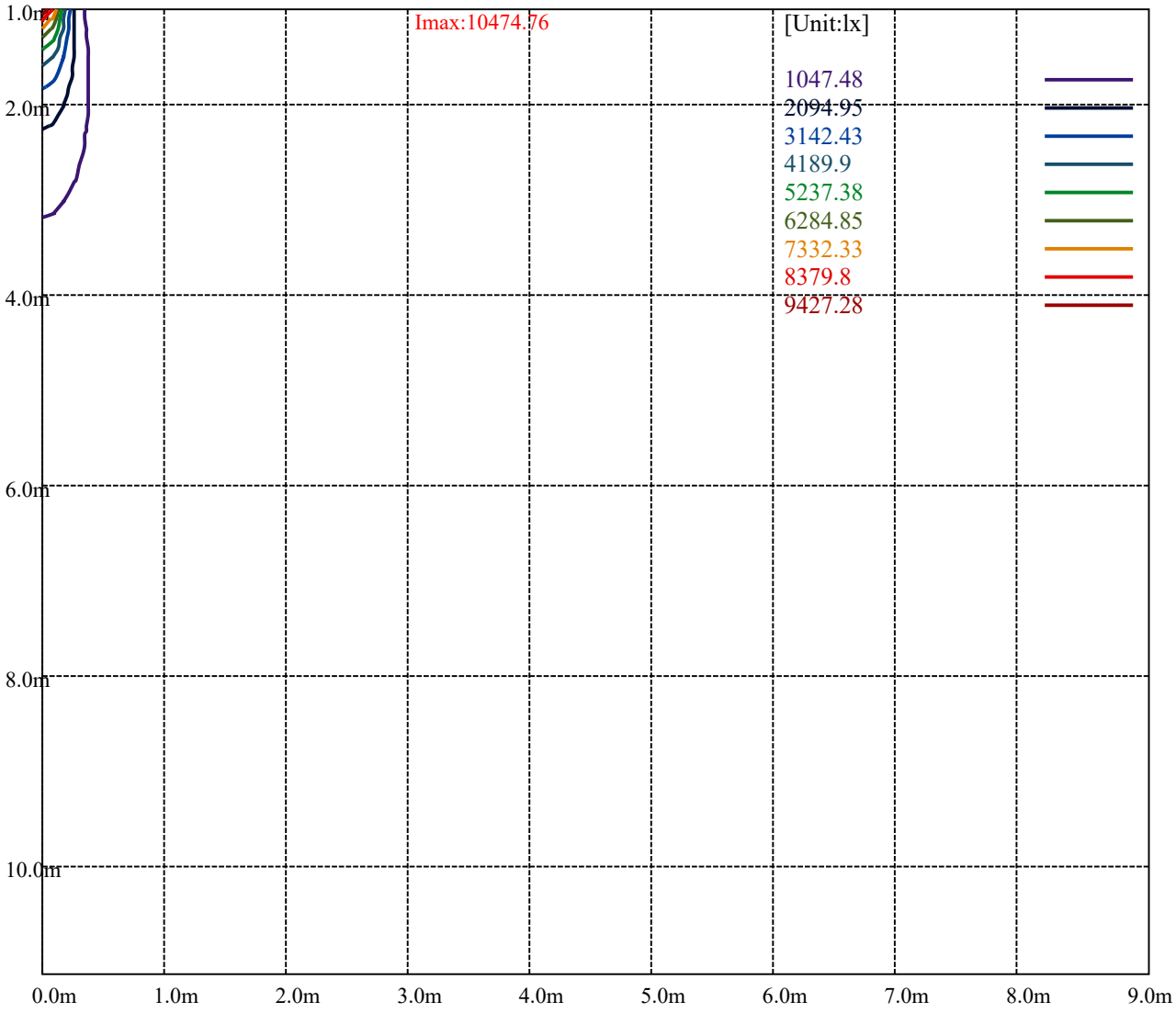
ISO illuminance diagram



Equipment: gms1980 Date: 2017/5/18 Operator: NT07

Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

Space ISO Lux diagram



Equipment: gms1980
Temperature(°C): 25.0

Date: 2017/5/18
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

Nata 3-2040-M

Luminance Limitting Curve(no luminous side)

Luminance Table

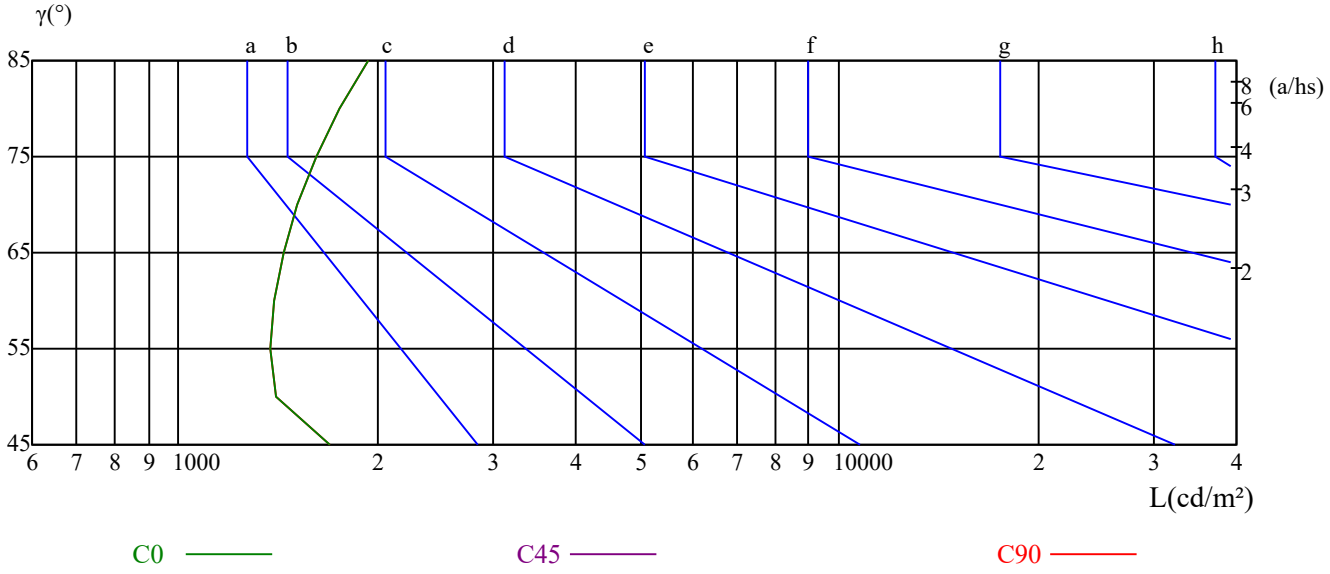
γ	45	50	55	60	65	70	75	80	85
C0	1694	1404	1379	1397	1440	1516	1617	1747	1939
C45	0	0	0	0	0	0	0	0	0
C90	1694	1404	1379	1397	1440	1516	1617	1747	1939

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
3538	3538	0	5717	5717	0	17002	17002	0

Glare Table

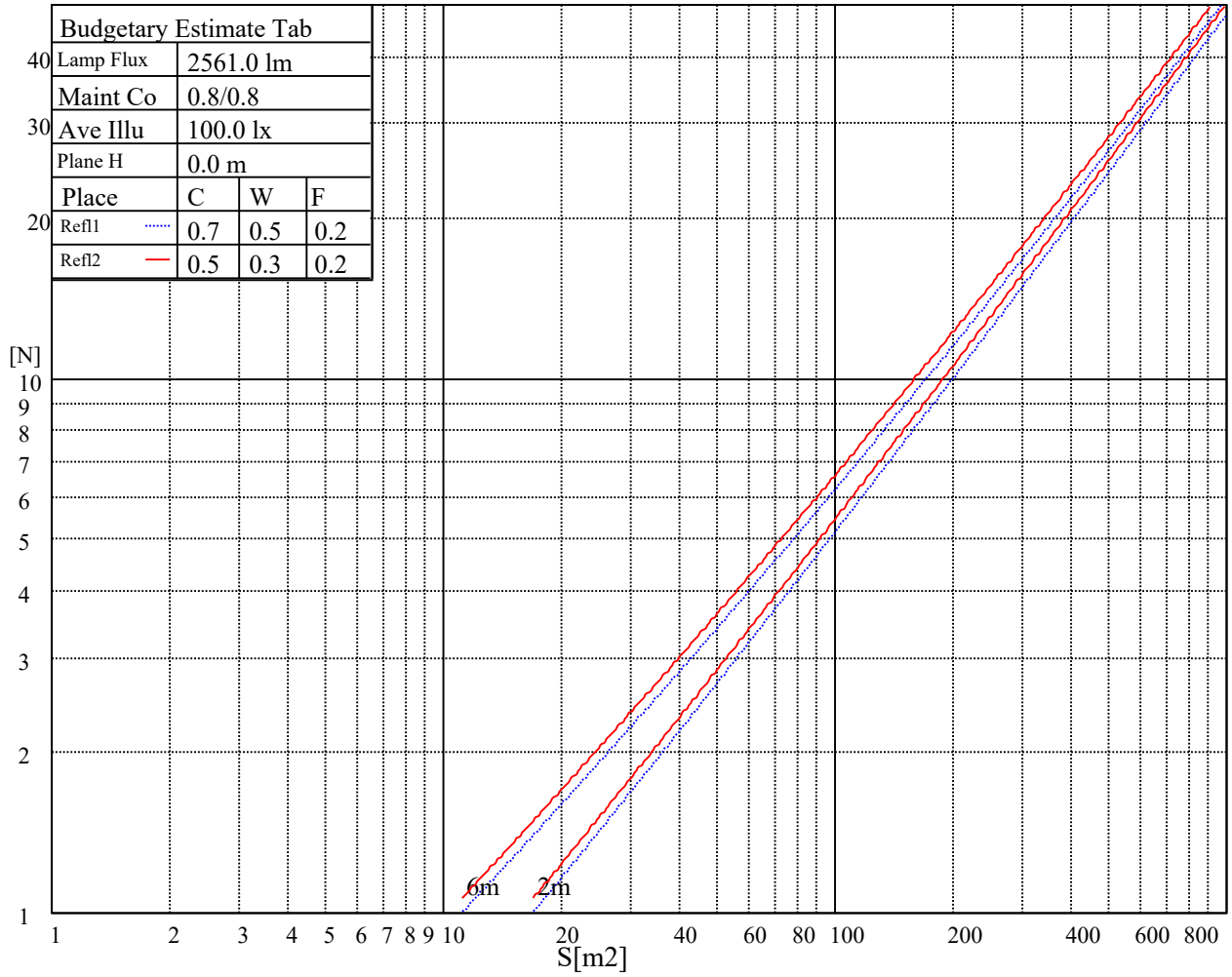
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

Luminance Limitting Curve



Equipment: gms1980 Date: 2017/5/18 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

Budgetary Estimate Table

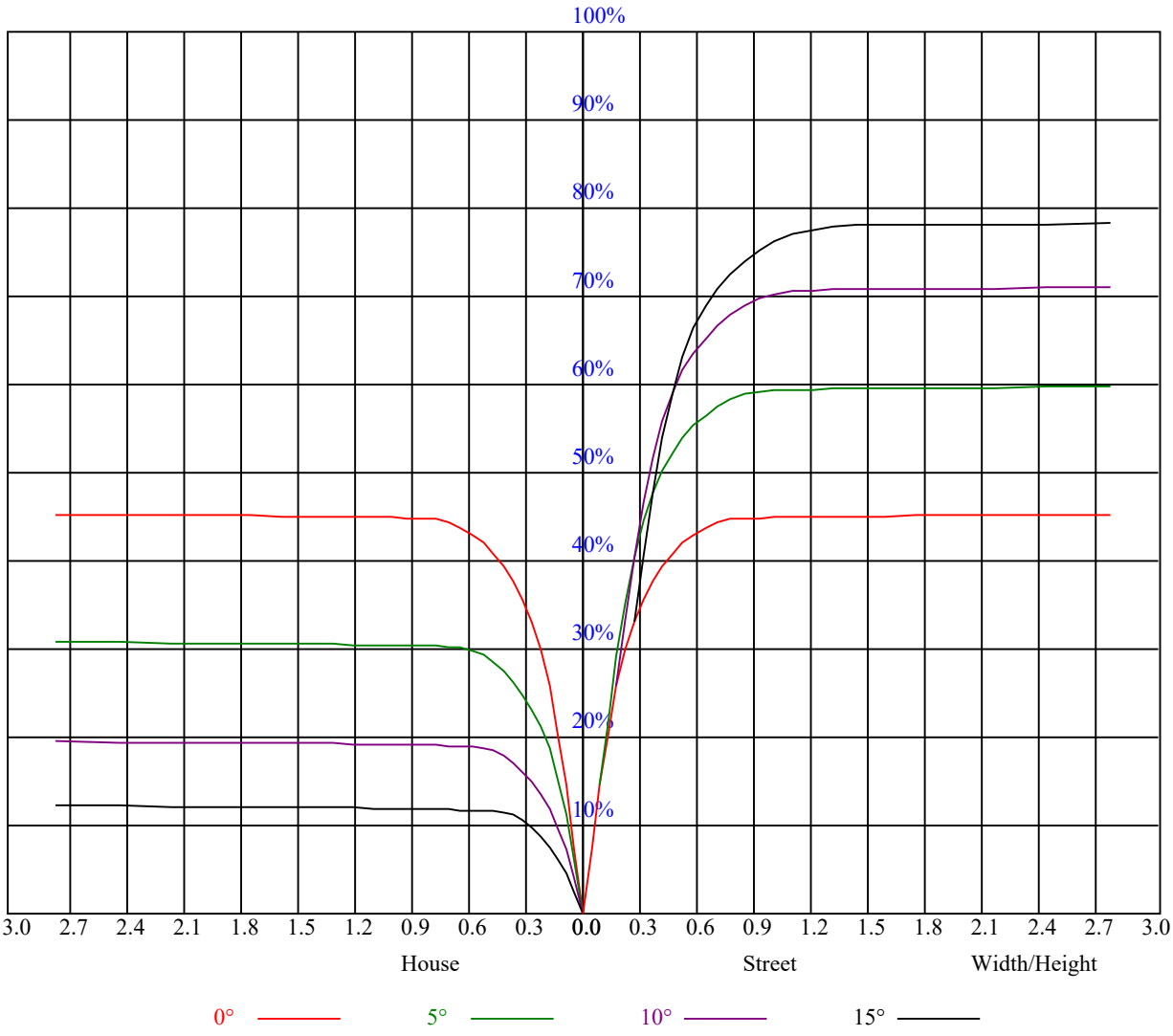


Equipment: gms1980 Date: 2017/5/18 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

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	1.08	1.08	1.08	1.06	1.06	1.06	1.01	1.01	1.01	0.97	0.97	0.97	0.93	0.93	0.93	0.91
1	1.02	1.00	0.98	1.00	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87
2	0.97	0.94	0.91	0.95	0.92	0.90	0.92	0.90	0.88	0.90	0.88	0.86	0.87	0.86	0.84	0.83
3	0.92	0.88	0.85	0.91	0.87	0.85	0.88	0.86	0.83	0.86	0.84	0.82	0.84	0.82	0.81	0.79
4	0.88	0.84	0.81	0.87	0.83	0.80	0.85	0.82	0.79	0.83	0.80	0.78	0.81	0.79	0.77	0.76
5	0.84	0.80	0.77	0.83	0.79	0.76	0.82	0.78	0.76	0.80	0.77	0.75	0.79	0.76	0.74	0.73
6	0.80	0.76	0.73	0.80	0.76	0.73	0.79	0.75	0.72	0.77	0.74	0.72	0.76	0.74	0.71	0.70
7	0.77	0.73	0.70	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.69	0.74	0.71	0.69	0.68
8	0.75	0.70	0.67	0.74	0.70	0.67	0.73	0.70	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.66
9	0.72	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.64	0.69	0.66	0.64	0.63
10	0.70	0.65	0.63	0.69	0.65	0.63	0.69	0.65	0.63	0.68	0.65	0.62	0.67	0.64	0.62	0.61

Coefficient Utilization Curve



Equipment: gms1980	Date: 2017/5/18	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 60.0%	Distance(m): 7.42

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	10595.05	10265.82	9807.20	9304.53	8670.28	8000.25	7396.28	6721.84	6114.01
90.0	10354.46	10670.48	10765.18	10705.17	10432.64	10025.77	9616.15	8983.55	8379.03
180.0	10595.05	10731.04	10721.13	10524.03	10189.84	9742.23	9148.17	8475.93	7844.44
270.0	10354.46	10022.47	9577.61	8812.33	8274.98	7645.68	6943.71	6219.17	5578.31
360.0	10595.05	10265.82	9807.20	9304.53	8670.28	8000.25	7396.28	6721.84	6114.01

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	5424.71	4896.72	4177.68	3584.72	3170.70	2667.48	2327.78	2043.14	1766.76
90.0	7690.83	6993.81	6341.95	5705.49	4904.97	4303.21	3758.15	3142.62	2722.54
180.0	7106.68	6397.55	5755.60	5051.42	4451.31	3809.90	3245.57	2809.53	2427.44
270.0	4949.02	4197.50	3639.78	3096.92	2684.55	2286.49	1999.65	1746.39	1567.46
360.0	5424.71	4896.72	4177.68	3584.72	3170.70	2667.48	2327.78	2043.14	1766.76

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1586.73	1432.02	1270.15	1166.09	1075.80	985.51	932.66	888.06	850.07
90.0	2361.92	2042.04	1781.07	1594.43	1422.66	1281.71	1175.45	1070.85	997.62
180.0	2047.55	1805.85	1609.85	1412.75	1286.67	1079.82	1079.82	996.30	940.86
270.0	1380.81	1261.34	1090.45	1060.17	979.62	930.95	890.15	852.38	832.89
360.0	1586.73	1432.02	1270.15	1166.09	1075.80	985.51	932.66	888.06	850.07

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	824.74	809.33	791.16	771.34	728.95	652.97	571.49	474.04	372.73
90.0	934.86	884.76	850.07	823.09	799.97	785.10	771.89	718.49	657.37
180.0	886.30	855.58	826.73	805.48	788.68	767.05	704.56	640.09	559.59
270.0	812.36	796.89	780.70	735.17	664.86	580.73	493.14	382.42	285.14
360.0	824.74	809.33	791.16	771.34	728.95	652.97	571.49	474.04	372.73

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	282.99	228.92	96.46	44.54	22.41	17.73	14.76	12.94	11.62
90.0	580.29	481.74	374.38	284.64	189.01	121.51	54.51	23.29	18.22
180.0	440.56	362.60	277.54	186.26	105.10	50.49	21.80	17.45	14.92
270.0	188.95	107.36	50.21	21.42	17.40	14.81	12.77	11.73	10.35
360.0	282.99	228.92	96.46	44.54	22.41	17.73	14.76	12.94	11.62

C/γ(°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0
0.0	10.52	10.35	10.19	10.08	9.91	9.80	9.69	9.58	9.47
90.0	15.31	12.99	11.95	10.52	10.35	10.24	10.13	10.02	9.91
180.0	12.94	12.22	10.63	10.46	10.30	10.19	10.02	9.97	9.86
270.0	10.19	9.97	9.86	9.74	9.63	9.52	9.47	9.36	9.30
360.0	10.52	10.35	10.19	10.08	9.91	9.80	9.69	9.58	9.47

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	9.41	9.36	9.30	9.25	9.19	9.19	9.14	9.08	9.08
90.0	9.86	9.69	9.63	9.58	9.52	9.47	9.47	9.41	9.36
180.0	9.80	9.69	9.63	9.58	9.47	9.41	9.36	9.30	9.30
270.0	9.25	9.19	9.14	9.14	9.08	9.08	9.03	9.03	8.97
360.0	9.41	9.36	9.30	9.25	9.19	9.19	9.14	9.08	9.08

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.08	9.08	9.03	8.97	8.97	8.97	8.97	9.03	8.97
90.0	9.36	9.25	9.25	9.19	9.25	9.25	9.19	9.19	9.08
180.0	9.30	9.19	9.19	9.14	9.14	9.08	9.08	9.03	9.03
270.0	8.97	8.97	8.92	8.92	8.92	8.92	8.92	8.92	8.92
360.0	9.08	9.08	9.03	8.97	8.97	8.97	8.97	9.03	8.97

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	8.97	8.97	8.97	9.03	9.03	9.03	8.97	8.97	9.03
90.0	9.08	9.08	9.08	9.08	9.08	9.03	9.03	9.03	8.97
180.0	9.03	8.97	8.97	8.97	8.92	8.92	8.97	8.92	8.92
270.0	8.86	8.92	8.92	8.92	8.92	8.92	8.92	8.92	8.92
360.0	8.97	8.97	8.97	9.03	9.03	9.03	8.97	8.97	9.03

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.03	9.03	9.08	9.08	9.03	9.03	9.03	9.03	9.03
90.0	9.03	8.97	8.97	9.03	9.03	8.97	8.97	8.97	8.97
180.0	8.92	8.97	8.92	8.92	8.97	8.92	8.97	8.92	8.92
270.0	8.97	8.97	8.97	8.97	9.03	8.97	9.03	9.03	8.97
360.0	9.03	9.03	9.08	9.08	9.03	9.03	9.03	9.03	9.03

C/γ(°)	90.0
0.0	9.03
90.0	9.03
180.0	8.86
270.0	8.97
360.0	9.03