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Nata

LumCAT: 2-2180-M
Luminaire: BJB 47.360.1040

Report No: NATA0100	Voltage(V): 35.6700
Test No: GC2020021312	Current(A): 0.5970
LampCAT: CREE CXA1830	Power (W): 21.3000
Lamp flux(lm): 3087.9	PF: 1.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 0	Width(mm): 0
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 2411.30
Efficiency(%): 78.09%
Lumens(lm)/Power(W): 113.21
Central intensity(cd): 16022.810
Maximum intensity(cd): 16022.810
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=17.7
[C90/270]Total=17.7
Field angle(10%Imax): [C0/180]Total=41.6
[C90/270]Total=41.6
Maximum s/h(1/2): C0_180=0.30 C90_270=0.30
Maximum s/h(1/4): C0_180=0.35 C90_270=0.35
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 78.09%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.513%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	16022.813	0.000	0	.000%	.000%
1.0	15874.453	15.262	15.262	.494%	.633%
2.0	15380.859	44.861	60.123	1.453%	2.493%
3.0	14564.531	71.620	131.742	2.319%	5.464%
4.0	13582.969	94.219	225.961	3.051%	9.371%
5.0	12337.242	111.507	337.468	3.611%	13.995%
6.0	11081.461	123.072	460.54	3.986%	19.099%
7.0	10035.492	131.073	591.613	4.245%	24.535%
8.0	8951.555	135.887	727.499	4.401%	30.170%
9.0	7871.836	136.344	863.844	4.415%	35.825%
10.0	6955.453	134.182	998.025	4.345%	41.389%
11.0	6138.492	130.835	1128.861	4.237%	46.815%
12.0	5426.227	126.419	1255.28	4.094%	52.058%
13.0	4755.164	120.827	1376.107	3.913%	57.069%
14.0	4209.680	114.749	1490.856	3.716%	61.828%
15.0	3721.570	108.884	1599.74	3.526%	66.343%
16.0	3288.234	102.713	1702.453	3.326%	70.603%
17.0	2894.836	96.287	1798.74	3.118%	74.596%
18.0	2536.523	89.551	1888.292	2.900%	78.310%
19.0	2209.008	82.563	1970.854	2.674%	81.734%
20.0	1867.359	74.609	2045.463	2.416%	84.828%
21.0	1528.235	65.202	2110.665	2.112%	87.532%
22.0	1289.398	56.622	2167.287	1.834%	89.880%
23.0	1033.734	48.746	2216.032	1.579%	91.902%
24.0	783.703	39.736	2255.768	1.287%	93.550%
25.0	575.592	30.907	2286.675	1.001%	94.832%
26.0	395.648	22.926	2309.602	.742%	95.782%
27.0	247.380	15.732	2325.334	.509%	96.435%
28.0	141.413	9.843	2335.177	.319%	96.843%
29.0	58.929	5.241	2340.418	.170%	97.060%
30.0	29.313	2.383	2342.801	.077%	97.159%
31.0	20.123	1.376	2344.177	.045%	97.216%
32.0	18.401	1.104	2345.28	.036%	97.262%
33.0	17.325	1.052	2346.333	.034%	97.306%
34.0	16.474	1.023	2347.356	.033%	97.348%
35.0	15.673	0.998	2348.354	.032%	97.389%
36.0	15.138	0.981	2349.335	.032%	97.430%
37.0	14.730	0.974	2350.309	.032%	97.471%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	14.365	0.971	2351.28	.031%	97.511%
39.0	14.055	0.970	2352.251	.031%	97.551%
40.0	13.852	0.973	2353.224	.032%	97.591%
41.0	13.683	0.980	2354.204	.032%	97.632%
42.0	13.514	0.988	2355.192	.032%	97.673%
43.0	13.409	0.997	2356.19	.032%	97.714%
44.0	13.303	1.008	2357.198	.033%	97.756%
45.0	13.219	1.019	2358.217	.033%	97.798%
46.0	13.163	1.032	2359.249	.033%	97.841%
47.0	13.106	1.045	2360.294	.034%	97.885%
48.0	13.064	1.058	2361.352	.034%	97.928%
49.0	13.022	1.071	2362.423	.035%	97.973%
50.0	13.015	1.086	2363.508	.035%	98.018%
51.0	13.036	1.102	2364.611	.036%	98.064%
52.0	13.057	1.120	2365.73	.036%	98.110%
53.0	13.120	1.139	2366.869	.037%	98.157%
54.0	13.205	1.160	2368.029	.038%	98.205%
55.0	13.282	1.182	2369.212	.038%	98.254%
56.0	13.352	1.204	2370.415	.039%	98.304%
57.0	13.451	1.226	2371.641	.040%	98.355%
58.0	13.521	1.247	2372.888	.040%	98.407%
59.0	13.627	1.269	2374.157	.041%	98.460%
60.0	13.732	1.293	2375.45	.042%	98.513%
61.0	13.816	1.315	2376.764	.043%	98.568%
62.0	13.887	1.335	2378.099	.043%	98.623%
63.0	13.943	1.354	2379.453	.044%	98.679%
64.0	13.978	1.370	2380.823	.044%	98.736%
65.0	13.887	1.379	2382.202	.045%	98.793%
66.0	13.767	1.380	2383.581	.045%	98.850%
67.0	13.549	1.374	2384.955	.044%	98.907%
68.0	13.219	1.356	2386.311	.044%	98.964%
69.0	12.853	1.330	2387.641	.043%	99.019%
70.0	12.459	1.300	2388.941	.042%	99.073%
71.0	12.108	1.270	2390.211	.041%	99.125%
72.0	11.827	1.245	2391.455	.040%	99.177%
73.0	11.616	1.226	2392.681	.040%	99.228%
74.0	11.461	1.213	2393.894	.039%	99.278%
75.0	11.341	1.205	2395.099	.039%	99.328%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	11.173	1.195	2396.294	.039%	99.378%
77.0	10.898	1.177	2397.471	.038%	99.426%
78.0	10.512	1.146	2398.617	.037%	99.474%
79.0	10.230	1.114	2399.732	.036%	99.520%
80.0	10.055	1.094	2400.825	.035%	99.565%
81.0	9.928	1.081	2401.906	.035%	99.610%
82.0	9.809	1.070	2402.976	.035%	99.655%
83.0	9.717	1.061	2404.038	.034%	99.699%
84.0	9.647	1.055	2405.092	.034%	99.742%
85.0	9.555	1.048	2406.141	.034%	99.786%
86.0	9.520	1.043	2407.183	.034%	99.829%
87.0	9.450	1.038	2408.221	.034%	99.872%
88.0	9.380	1.031	2409.253	.033%	99.915%
89.0	9.345	1.026	2410.279	.033%	99.958%
90.0	9.323	1.024	2411.303	.033%	100.000%

Zonal flux distribution table

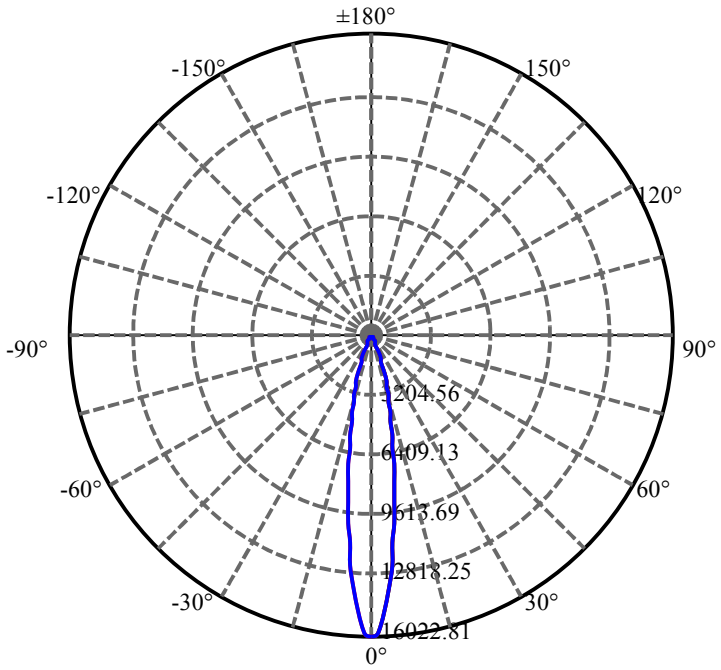
ZONAL LUMEN SUMMARY

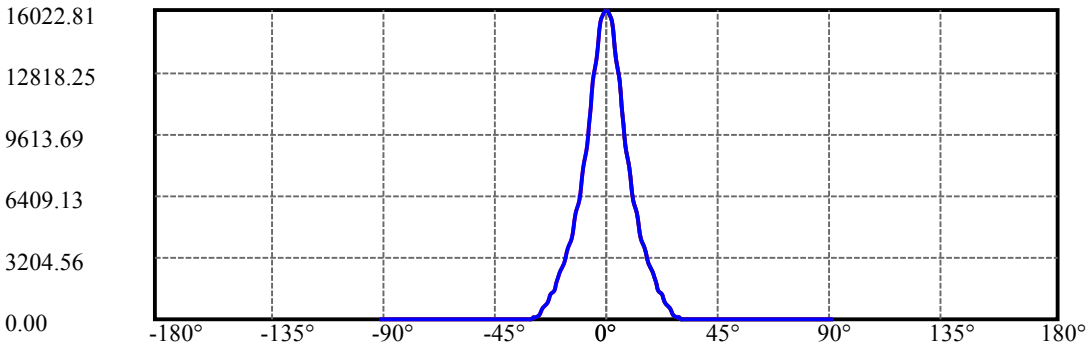
Zone	Lumens	%Lamp	%Fixt
0-30	2342.80	75.87%	97.16%
0-40	2353.22	76.21%	97.59%
0-60	2375.45	76.93%	98.51%
0-90	2410.28	78.06%	99.96%
0-120	2410.28	78.06%	99.96%
0-180	2411.30	78.09%	100.00%
60-90	36.12	1.17%	1.50%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-18.49	1929.04	62.47%	80.00%

ZONAL LUMEN SUMMARY

0-10	998.03
10-20	1047.44
20-30	297.34
30-40	10.42
40-50	10.28
50-60	11.94
60-70	13.49
70-80	11.88
80-90	9.45
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):

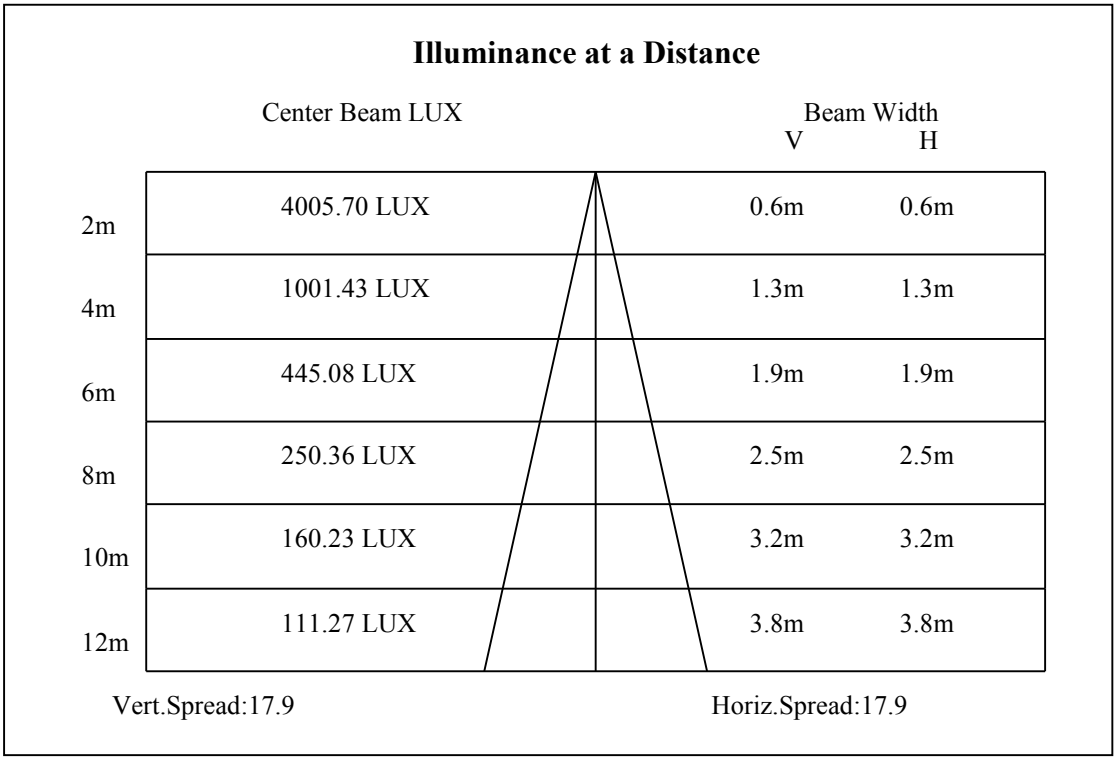
C0/C180:

C90/C270:

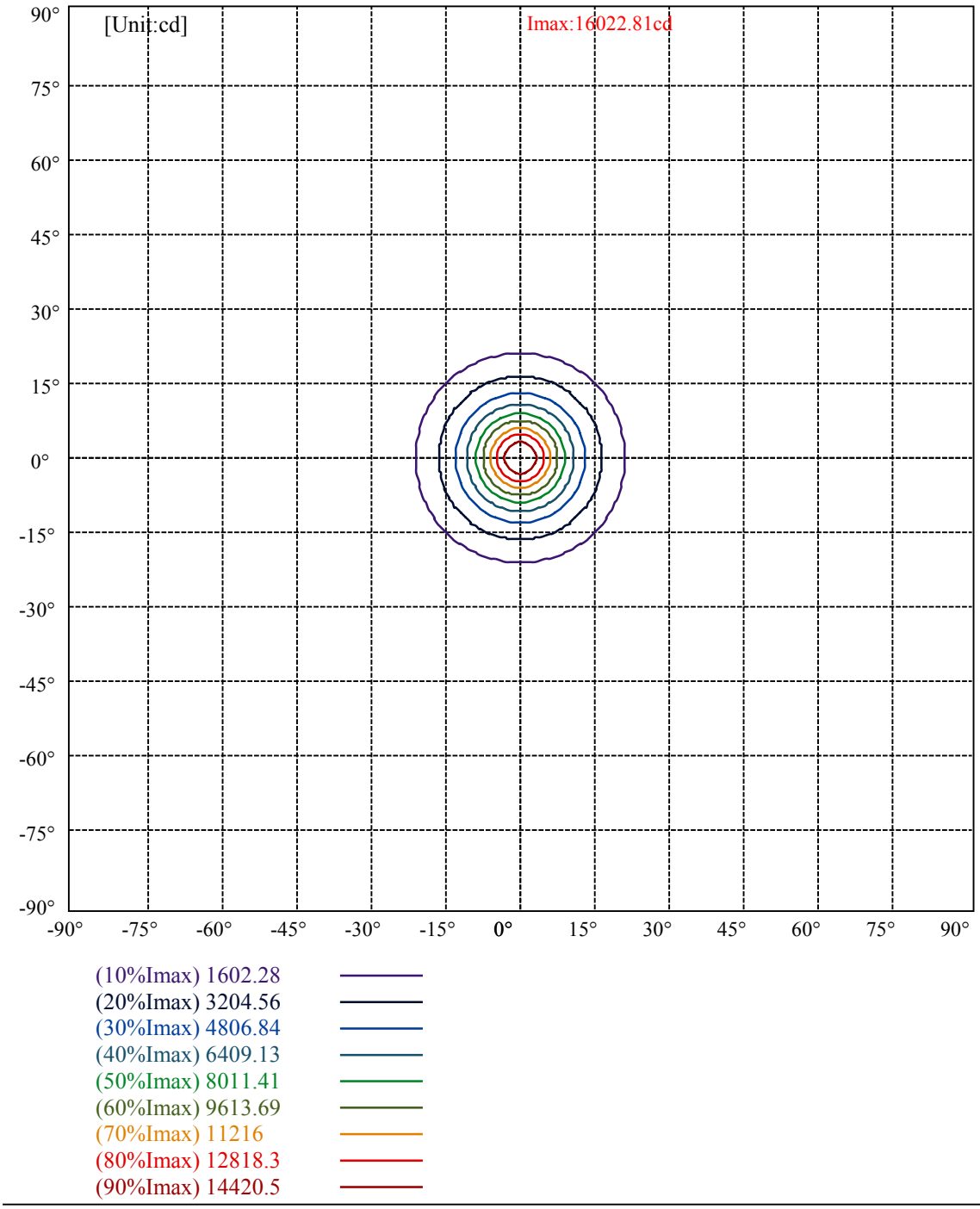
Field angle(10%Imax):C0/180Left:20.8 Right:20.8
:C90/270Left:20.8 Right:20.8

Beam Angle(50%Imax):C0/180Left:8.9 Right:8.9
:C90/270Left:8.9 Right:8.9

Lux distance Curve



ISO-Intensity(V-H)

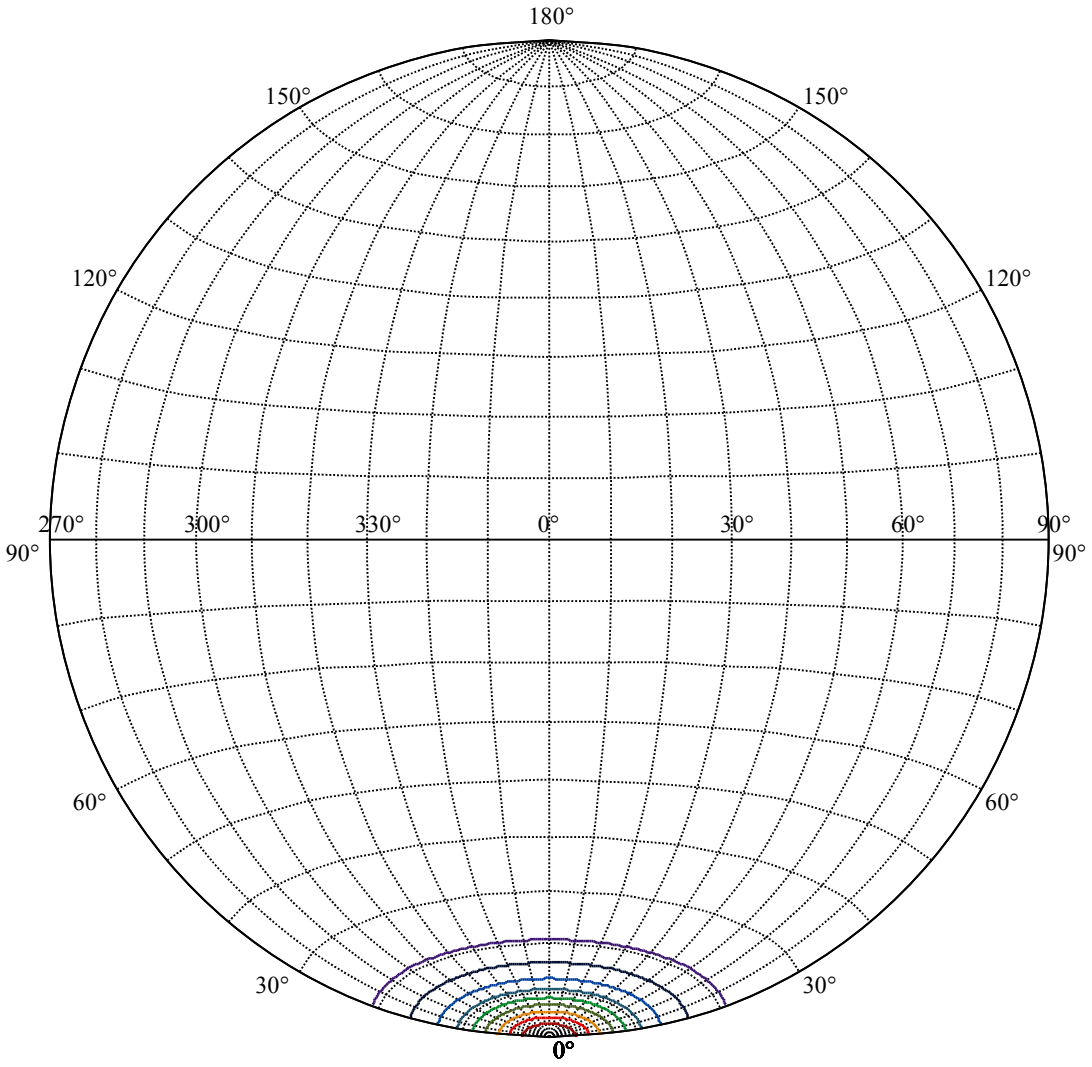


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2020/2/13
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



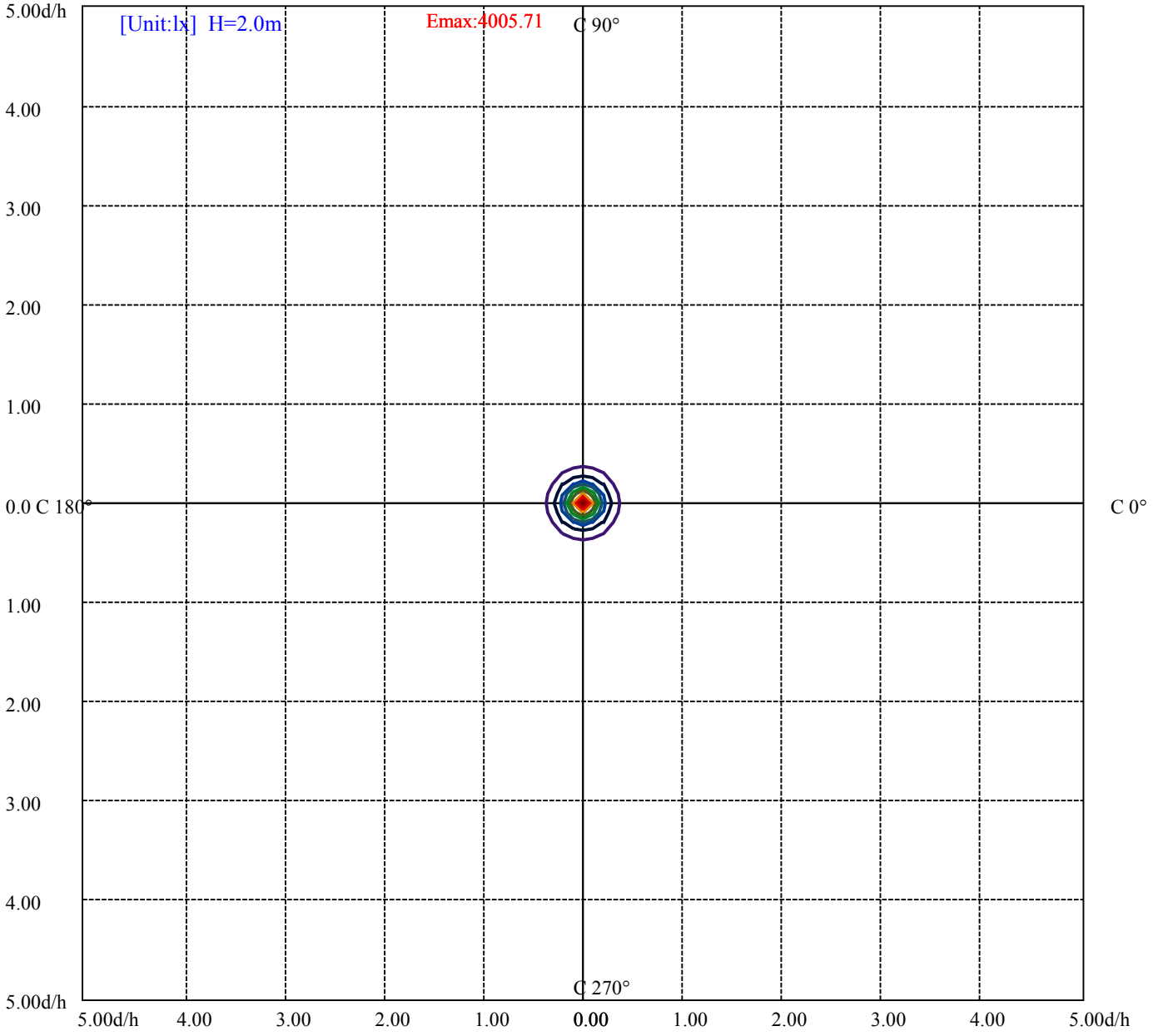
House [Unit:cd] Road

Imax:16022.81

(10%Imax) 1602.28
(20%Imax) 3204.56
(30%Imax) 4806.84
(40%Imax) 6409.13
(50%Imax) 8011.41
(60%Imax) 9613.69
(70%Imax) 11216
(80%Imax) 12818.3
(90%Imax) 14420.5

Equipment: GMS1980 Date: 2020/2/13 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

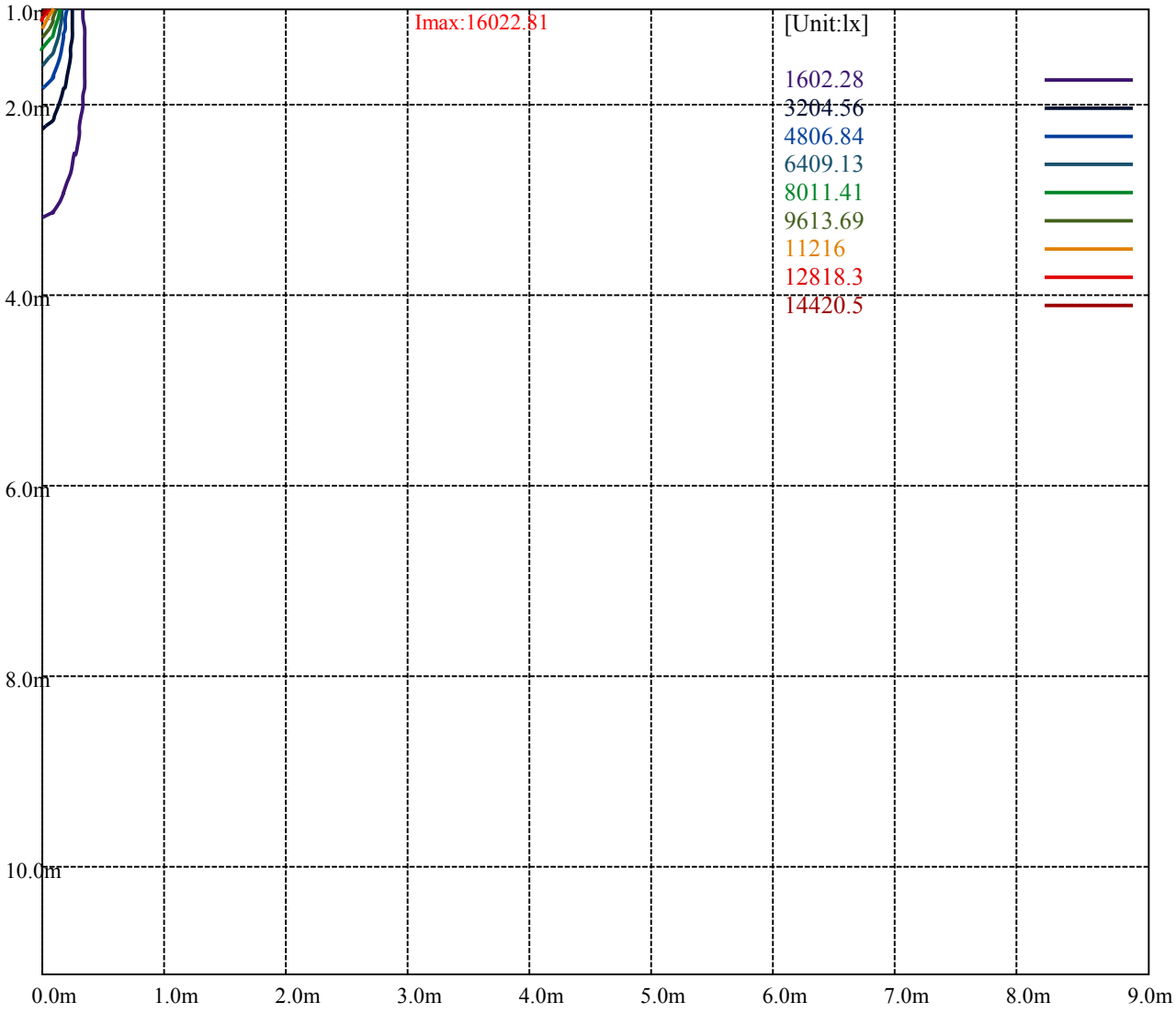
ISO illuminance diagram



(10%Emax) 400.57
(20%Emax) 801.14
(30%Emax) 1201.71
(40%Emax) 1602.28
(50%Emax) 2002.85
(60%Emax) 2403.417
(70%Emax) 2804
(80%Emax) 3204.55
(90%Emax) 3605.125

Equipment: GMS1980
Temperature(°C): 25.0
Date: 2020/2/13
Humidity(%): 65.0%
Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2020/2/13
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

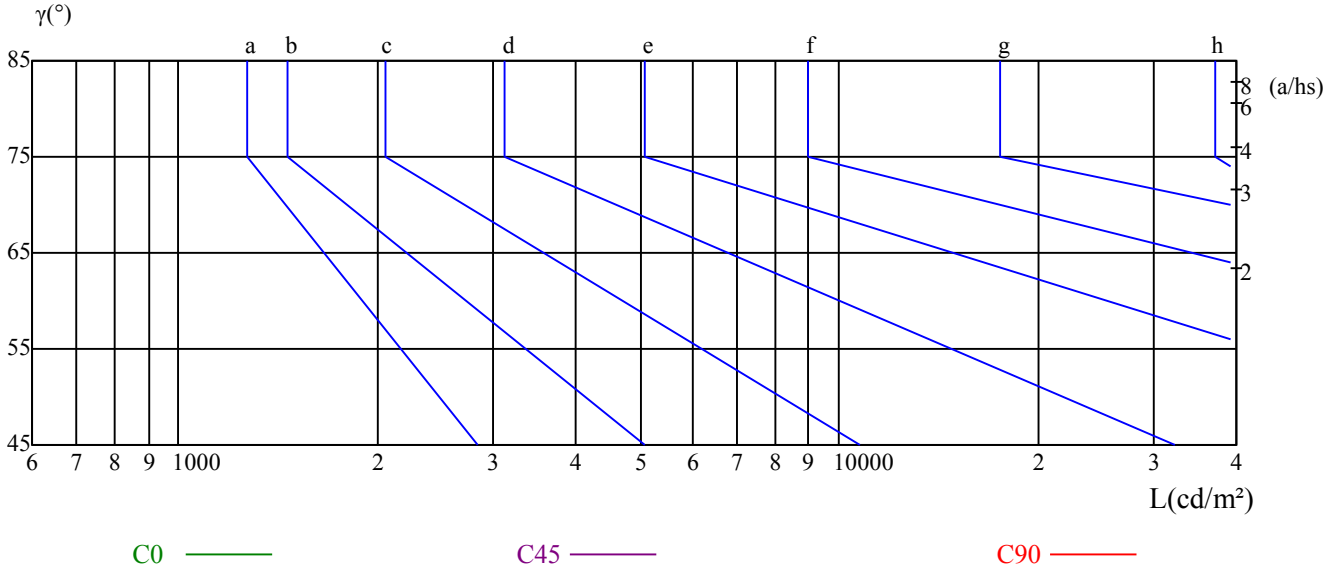
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

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

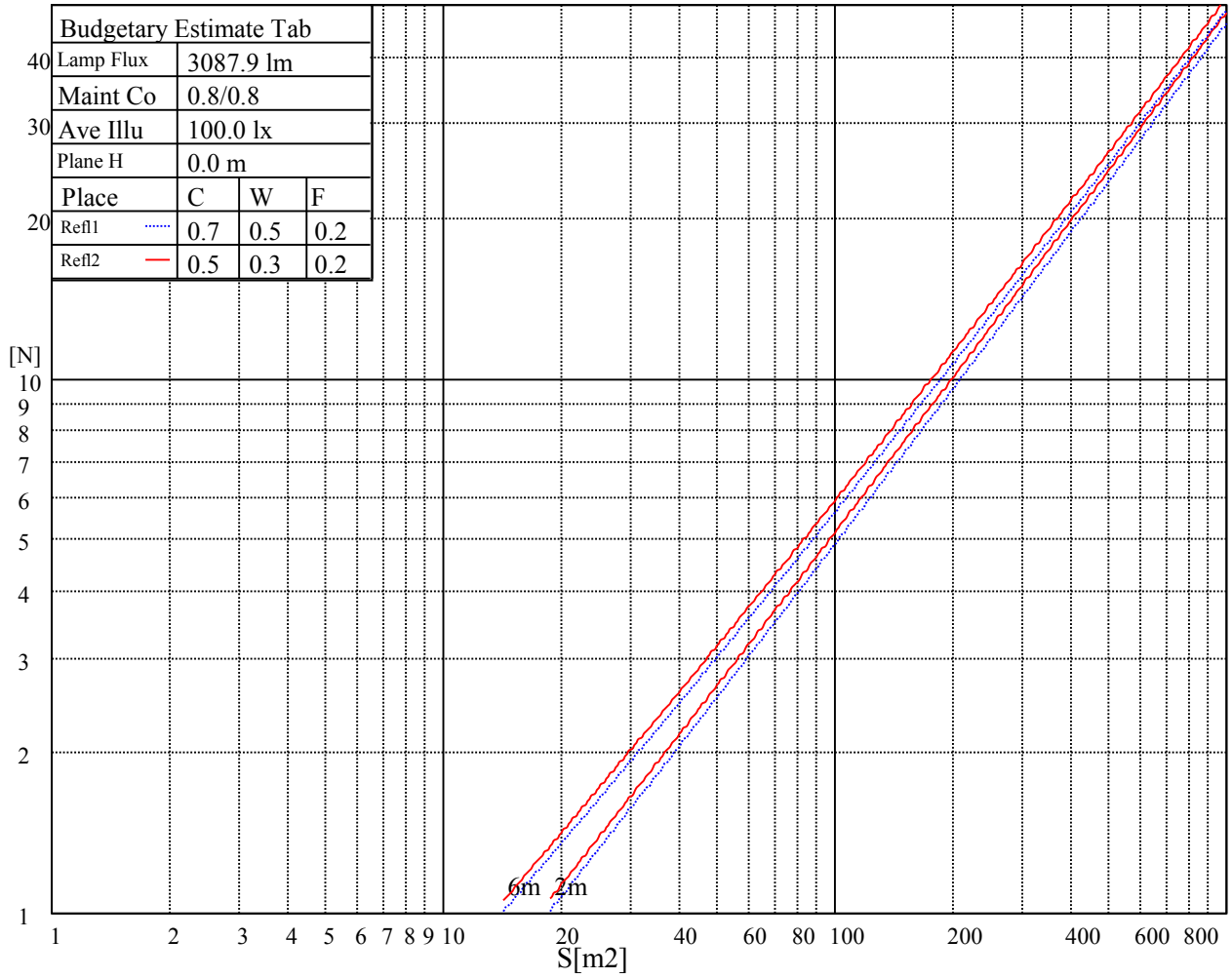
Glare Table

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 Limitting Curve



Budgetary Estimate Table

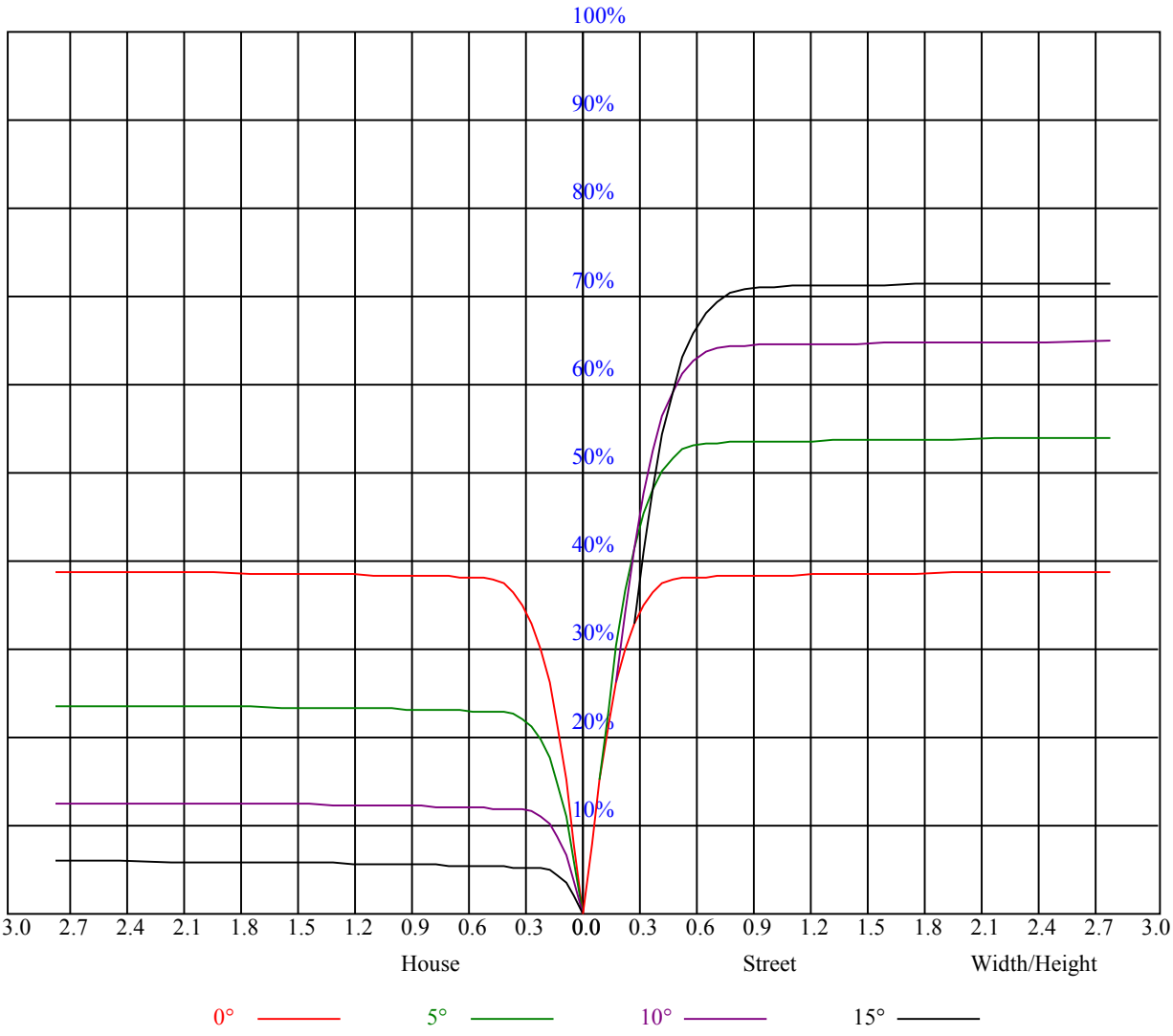


Equipment: GMS1980 Date: 2020/2/13 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

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	0.93	0.93	0.93	0.91	0.91	0.91	0.87	0.87	0.87	0.83	0.83	0.83	0.80	0.80	0.80	0.78
1	0.88	0.87	0.85	0.86	0.85	0.84	0.83	0.82	0.81	0.80	0.80	0.79	0.78	0.77	0.77	0.75
2	0.84	0.82	0.80	0.83	0.81	0.79	0.80	0.79	0.77	0.78	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	0.74	0.73	0.72	0.71
4	0.78	0.75	0.73	0.77	0.74	0.72	0.76	0.73	0.71	0.74	0.72	0.71	0.73	0.71	0.70	0.69
5	0.75	0.72	0.70	0.75	0.72	0.70	0.73	0.71	0.69	0.72	0.70	0.69	0.71	0.69	0.68	0.67
6	0.73	0.70	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.71	0.68	0.67	0.70	0.68	0.66	0.66
7	0.71	0.68	0.66	0.71	0.68	0.66	0.70	0.67	0.65	0.69	0.67	0.65	0.68	0.66	0.65	0.64
8	0.69	0.66	0.64	0.69	0.66	0.64	0.68	0.65	0.64	0.67	0.65	0.63	0.67	0.65	0.63	0.62
9	0.67	0.64	0.62	0.67	0.64	0.62	0.66	0.64	0.62	0.66	0.64	0.62	0.65	0.63	0.62	0.61
10	0.66	0.63	0.61	0.66	0.63	0.61	0.65	0.62	0.61	0.65	0.62	0.61	0.64	0.62	0.60	0.60

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2020/2/13	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

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	15913.13	16138.13	16025.63	15609.38	15035.63	13905.00	12712.50	11745.00	10383.75
45.0	16042.50	16081.88	15772.50	15193.13	14287.50	13297.50	12082.50	10800.00	9697.50
90.0	16036.88	15738.75	15181.88	14152.50	13134.38	11158.31	10578.38	9453.94	8413.31
135.0	16098.75	15800.63	15030.00	14141.25	13106.25	11840.63	10546.88	9270.00	8251.88
180.0	15913.13	15412.50	14512.50	13370.63	11902.50	11082.94	9641.81	8560.13	7588.69
225.0	16042.50	15688.13	15046.88	13927.50	12870.00	11139.19	10154.81	9204.75	8197.88
270.0	16036.88	16036.88	15660.00	15024.38	14056.88	13010.63	11745.00	10479.38	9399.38
315.0	16098.75	16098.75	15817.50	15097.50	14270.63	13263.75	11189.81	10770.75	9680.06
360.0	15913.13	16138.13	16025.63	15609.38	15035.63	13905.00	12712.50	11745.00	10383.75

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	9202.50	8336.25	7233.75	6451.88	5754.38	4989.38	4449.38	3960.00	3420.00
45.0	8561.25	7520.63	6693.75	5962.50	5175.00	4618.13	4111.88	3566.25	3178.13
90.0	7376.63	6461.44	5749.88	5051.81	4439.81	3957.75	3474.56	3088.13	2692.69
135.0	7239.38	6423.75	5619.38	4995.00	4381.88	3836.25	3414.38	3031.88	2851.88
180.0	6627.38	5784.75	5135.63	4500.00	3944.25	3506.63	3063.38	2712.38	2348.44
225.0	7175.81	6277.50	5571.00	4876.88	4268.81	3796.88	3328.88	2947.50	2557.69
270.0	8268.75	7357.50	6446.25	5731.88	4955.63	4410.00	3920.63	3431.25	2992.50
315.0	8523.00	7481.81	6658.31	5839.88	5121.56	4562.44	4009.50	3568.50	3117.38
360.0	9202.50	8336.25	7233.75	6451.88	5754.38	4989.38	4449.38	3960.00	3420.00

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	3037.50	2863.13	2303.44	2002.50	1722.94	1430.44	1145.25	902.81	651.94
45.0	2857.50	2440.13	2100.38	1802.81	1498.50	1248.19	974.25	720.56	518.63
90.0	2322.56	2015.44	1731.38	1407.94	1096.31	921.49	654.58	467.55	307.18
135.0	2284.31	1982.81	1644.75	1378.13	1116.00	866.25	630.56	439.31	288.00
180.0	2005.31	1722.94	1458.56	1115.83	914.85	701.89	469.29	313.26	190.18
225.0	2206.69	1918.69	1648.13	1102.61	1072.52	843.58	609.53	408.32	262.58
270.0	2857.50	2333.25	1962.00	1683.00	1423.69	1141.31	877.50	662.06	450.56
315.0	2720.81	2395.69	2090.25	1733.06	1470.38	1116.73	908.66	690.86	496.13
360.0	3037.50	2863.13	2303.44	2002.50	1722.94	1430.44	1145.25	902.81	651.94

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	458.44	297.56	144.23	64.69	23.63	19.80	18.28	17.04	15.86
45.0	349.88	295.88	85.78	32.79	21.43	19.80	18.73	17.94	16.99
90.0	178.59	68.68	27.62	20.64	19.01	17.78	16.99	16.26	15.69
135.0	148.28	59.29	22.73	18.39	16.88	15.69	14.79	14.12	13.44
180.0	87.69	30.77	19.91	18.17	17.10	16.09	15.36	14.79	14.29
225.0	148.39	53.72	25.71	22.61	20.87	19.58	18.62	17.72	17.04
270.0	292.50	151.43	62.66	27.39	21.99	20.31	19.13	18.23	17.27
315.0	315.28	173.98	82.80	29.81	20.08	18.17	16.71	15.69	14.79
360.0	458.44	297.56	144.23	64.69	23.63	19.80	18.28	17.04	15.86

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	15.08	14.46	13.89	13.39	13.05	12.83	12.60	12.43	12.32
45.0	16.48	16.14	15.69	15.47	15.24	15.08	14.96	14.91	14.79
90.0	15.30	14.91	14.68	14.46	14.34	14.23	14.12	14.06	14.06
135.0	13.05	12.71	12.38	12.09	11.93	11.76	11.59	11.53	11.42
180.0	13.89	13.61	13.33	13.16	12.99	12.83	12.66	12.54	12.38
225.0	16.59	16.20	15.92	15.64	15.41	15.24	15.08	14.91	14.79
270.0	16.71	16.26	15.86	15.53	15.36	15.19	15.02	14.91	14.79
315.0	14.01	13.56	13.16	12.71	12.49	12.32	12.09	11.98	11.87
360.0	15.08	14.46	13.89	13.39	13.05	12.83	12.60	12.43	12.32

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	12.15	12.04	11.93	11.87	11.76	11.70	11.64	11.53	11.53
45.0	14.74	14.68	14.63	14.57	14.57	14.68	14.79	14.91	15.19
90.0	14.01	14.01	14.01	14.01	14.01	14.06	14.06	14.12	14.23
135.0	11.31	11.25	11.19	11.19	11.14	11.14	11.08	11.08	11.03
180.0	12.26	12.21	12.09	12.04	11.93	11.87	11.81	11.76	11.70
225.0	14.74	14.68	14.68	14.63	14.63	14.63	14.79	15.02	15.19
270.0	14.74	14.68	14.63	14.57	14.57	14.57	14.63	14.63	14.79
315.0	11.81	11.76	11.70	11.64	11.59	11.48	11.48	11.42	11.31
360.0	12.15	12.04	11.93	11.87	11.76	11.70	11.64	11.53	11.53

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	11.48	11.42	11.36	11.36	11.31	11.31	11.31	11.25	11.25
45.0	15.41	15.64	15.81	16.09	16.31	16.65	17.04	17.33	17.49
90.0	14.40	14.57	14.63	14.74	14.85	14.91	14.96	15.02	15.13
135.0	10.97	10.91	10.86	10.86	10.80	10.74	10.74	10.69	10.69
180.0	11.64	11.59	11.53	11.48	11.42	11.42	11.36	11.31	11.25
225.0	15.41	15.64	15.86	16.14	16.37	16.65	16.99	17.38	17.61
270.0	15.02	15.24	15.58	15.81	16.03	16.26	16.43	16.59	16.71
315.0	11.31	11.25	11.19	11.14	11.08	11.08	11.03	10.97	10.97
360.0	11.48	11.42	11.36	11.36	11.31	11.31	11.31	11.25	11.25

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	11.19	11.19	11.14	11.14	11.08	11.08	11.03	10.97	10.91
45.0	17.61	17.55	17.33	16.99	16.43	15.58	14.79	14.01	13.11
90.0	15.19	15.19	15.13	14.96	14.57	14.12	13.56	12.94	12.26
135.0	10.63	10.63	10.58	10.58	10.58	10.63	10.74	10.97	11.36
180.0	11.25	11.25	11.14	11.14	11.08	11.03	10.91	10.86	10.80
225.0	17.83	18.06	17.89	17.49	16.93	15.92	14.96	13.73	12.99
270.0	16.93	17.10	17.10	17.10	16.99	16.65	16.14	15.47	14.51
315.0	10.91	10.86	10.80	10.74	10.74	10.74	10.69	10.74	10.91
360.0	11.19	11.19	11.14	11.14	11.08	11.08	11.03	10.97	10.91

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	10.80	10.74	10.69	10.69	10.63	10.58	10.46	10.41	10.35
45.0	12.54	12.04	11.59	11.31	11.19	11.03	10.74	10.52	10.24
90.0	11.70	11.36	11.19	11.03	10.86	10.69	10.46	10.24	10.01
135.0	11.70	11.87	11.93	11.81	11.48	10.80	10.07	9.96	9.79
180.0	10.69	10.63	10.58	10.52	10.41	10.35	10.24	10.18	10.13
225.0	12.21	11.64	11.36	11.08	10.69	10.41	10.13	9.96	9.79
270.0	13.61	12.71	12.04	11.64	11.36	11.08	10.74	10.41	10.07
315.0	11.36	11.93	12.32	12.66	12.77	12.26	11.25	10.18	10.07
360.0	10.80	10.74	10.69	10.69	10.63	10.58	10.46	10.41	10.35

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	10.24	10.13	10.07	9.96	9.84	9.73	9.68	9.62	9.56
45.0	10.07	9.90	9.73	9.62	9.51	9.51	9.45	9.39	9.34
90.0	9.84	9.68	9.56	9.45	9.45	9.39	9.39	9.28	9.23
135.0	9.73	9.68	9.68	9.62	9.51	9.51	9.45	9.34	9.28
180.0	10.01	9.90	9.73	9.68	9.62	9.62	9.56	9.51	9.51
225.0	9.73	9.68	9.62	9.56	9.56	9.51	9.28	9.23	9.28
270.0	9.84	9.73	9.68	9.62	9.34	9.28	9.34	9.28	9.23
315.0	9.96	9.79	9.68	9.68	9.62	9.62	9.45	9.39	9.34
360.0	10.24	10.13	10.07	9.96	9.84	9.73	9.68	9.62	9.56

Intensity data(cd)

C/γ(°)	90.0
0.0	9.51
45.0	9.28
90.0	9.17
135.0	9.34
180.0	9.51
225.0	9.28
270.0	9.23
315.0	9.28
360.0	9.51