NATA LIGHTING CO.,LTD.
www.nata.cn
Email:info@nata.com
Tel:+86-750-3770000 Fax:+86-750-3771111
Address:380JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

NATA

LumCAT: CR01D03524BM
Luminaire: 92.70.110.00

Report No: NATA0100	Voltage(V): 10.0000
Test No: GC2018123001	Current(A): 0.4500
LampCAT: CREE CXA1304	Power (W): 4.5000
Lamp flux(lm): 440.0	PF: 0.0000
Number of Lamps: 1	Ballast type:
Length(mm): 35	Width(mm): 35
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 378.57
Efficiency(%): 86.04%
Lumens(lm)/Power(W): 84.18
Central intensity(cd): 1031.119
Maximum intensity(cd): 1031.119
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=24.4
[C90/270]Total=24.4
Field angle(10%Imax): [C0/180]Total=51.3
[C90/270]Total=51.3
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(%): 86.09%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 84.589%

Equipment: GMS1980	Date: 2018/12/30	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1031.119	0.247	0.247	.056%	.065%
1.0	1026.816	1.965	2.212	.447%	.584%
2.0	1013.815	3.880	6.092	.882%	1.609%
3.0	991.357	5.690	11.781	1.293%	3.112%
4.0	960.785	7.350	19.131	1.670%	5.053%
5.0	922.542	8.817	27.948	2.004%	7.383%
6.0	875.250	10.033	37.981	2.280%	10.033%
7.0	824.787	11.023	49.004	2.505%	12.944%
8.0	769.373	11.742	60.746	2.669%	16.046%
9.0	711.408	12.204	72.95	2.774%	19.270%
10.0	648.155	12.342	85.292	2.805%	22.530%
11.0	587.187	12.286	97.579	2.792%	25.776%
12.0	527.295	12.022	109.601	2.732%	28.951%
13.0	469.041	11.570	121.171	2.630%	32.008%
14.0	415.821	11.031	132.203	2.507%	34.922%
15.0	365.878	10.384	142.587	2.360%	37.665%
16.0	321.574	9.720	152.307	2.209%	40.232%
17.0	280.898	9.006	161.313	2.047%	42.611%
18.0	246.108	8.340	169.653	1.895%	44.814%
19.0	216.197	7.719	177.372	1.754%	46.853%
20.0	189.914	7.123	184.495	1.619%	48.735%
21.0	167.695	6.590	191.085	1.498%	50.476%
22.0	149.006	6.121	197.206	1.391%	52.092%
23.0	133.643	5.726	202.933	1.301%	53.605%
24.0	120.122	5.358	208.29	1.218%	55.020%
25.0	109.413	5.071	213.361	1.152%	56.360%
26.0	99.795	4.797	218.159	1.090%	57.627%
27.0	91.828	4.572	222.73	1.039%	58.835%
28.0	84.656	4.358	227.089	.991%	59.986%
29.0	78.504	4.174	231.262	.949%	61.088%
30.0	73.463	4.028	235.29	.915%	62.152%
31.0	68.716	3.881	239.171	.882%	63.178%
32.0	64.568	3.752	242.923	.853%	64.169%
33.0	60.863	3.635	246.558	.826%	65.129%
34.0	57.600	3.532	250.091	.803%	66.062%
35.0	54.141	3.405	253.496	.774%	66.961%
36.0	51.293	3.306	256.802	.751%	67.835%
37.0	48.945	3.230	260.032	.734%	68.688%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	46.751	3.156	263.189	.717%	69.522%
39.0	44.459	3.068	266.257	.697%	70.332%
40.0	42.405	2.989	269.246	.679%	71.122%
41.0	40.451	2.910	272.156	.661%	71.891%
42.0	38.693	2.839	274.995	.645%	72.641%
43.0	37.273	2.788	277.783	.634%	73.377%
44.0	36.169	2.755	280.538	.626%	74.105%
45.0	35.044	2.717	283.255	.618%	74.822%
46.0	33.588	2.650	285.905	.602%	75.522%
47.0	32.189	2.582	288.487	.587%	76.204%
48.0	30.945	2.522	291.008	.573%	76.870%
49.0	29.960	2.480	293.488	.564%	77.525%
50.0	29.257	2.458	295.946	.559%	78.175%
51.0	28.807	2.455	298.401	.558%	78.823%
52.0	28.209	2.438	300.838	.554%	79.467%
53.0	27.654	2.422	303.26	.550%	80.107%
54.0	27.260	2.418	305.679	.550%	80.746%
55.0	26.958	2.422	308.1	.550%	81.385%
56.0	26.761	2.433	310.533	.553%	82.028%
57.0	26.620	2.448	312.981	.556%	82.675%
58.0	26.487	2.463	315.445	.560%	83.325%
59.0	26.402	2.482	317.926	.564%	83.981%
60.0	26.304	2.498	320.424	.568%	84.641%
61.0	26.227	2.515	322.94	.572%	85.305%
62.0	26.156	2.533	325.472	.576%	85.974%
63.0	26.044	2.545	328.017	.578%	86.646%
64.0	25.903	2.553	330.57	.580%	87.321%
65.0	25.741	2.558	333.129	.581%	87.997%
66.0	25.601	2.565	335.693	.583%	88.674%
67.0	25.383	2.562	338.255	.582%	89.351%
68.0	25.073	2.549	340.805	.579%	90.024%
69.0	24.666	2.525	343.33	.574%	90.691%
70.0	24.180	2.492	345.822	.566%	91.350%
71.0	23.653	2.453	348.274	.557%	91.997%
72.0	23.020	2.401	350.675	.546%	92.632%
73.0	22.366	2.346	353.021	.533%	93.251%
74.0	21.663	2.284	355.304	.519%	93.854%
75.0	20.869	2.211	357.515	.502%	94.438%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	20.032	2.131	359.646	.484%	95.001%
77.0	19.160	2.047	361.694	.465%	95.542%
78.0	18.288	1.962	363.655	.446%	96.060%
79.0	17.318	1.864	365.519	.424%	96.553%
80.0	16.446	1.776	367.296	.404%	97.022%
81.0	15.588	1.688	368.984	.384%	97.468%
82.0	14.738	1.600	370.584	.364%	97.891%
83.0	13.845	1.507	372.091	.342%	98.289%
84.0	12.945	1.412	373.503	.321%	98.662%
85.0	12.087	1.320	374.823	.300%	99.010%
86.0	11.166	1.221	376.045	.278%	99.333%
87.0	9.865	1.080	377.125	.246%	99.618%
88.0	7.305	0.801	377.926	.182%	99.830%
89.0	4.584	0.503	378.428	.114%	99.963%
90.0	2.580	0.141	378.57	.032%	100.000%

Zonal flux distribution table

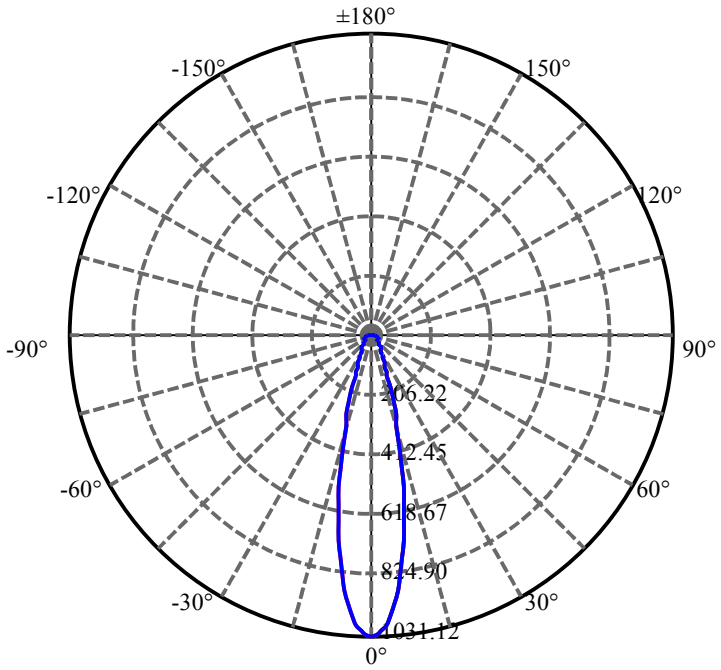
ZONAL LUMEN SUMMARY

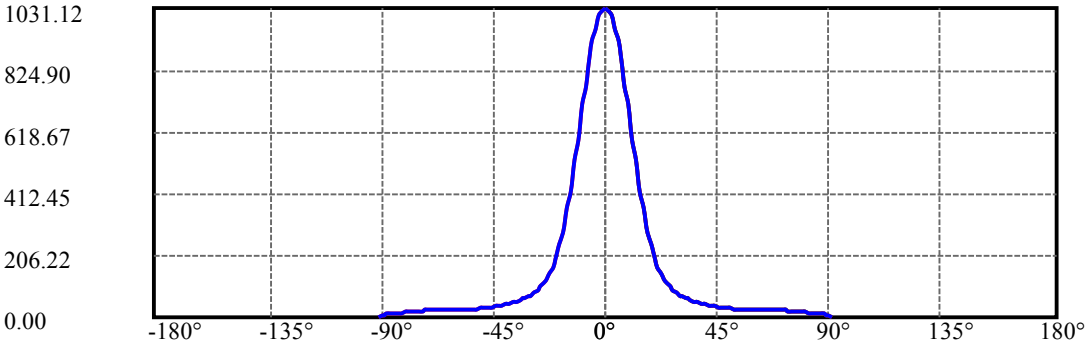
Zone	Lumens	%Lamp	%Fixt
0-30	235.29	53.48%	62.15%
0-40	269.25	61.19%	71.12%
0-60	320.42	72.82%	84.64%
0-90	378.43	86.01%	99.96%
0-120	378.43	86.01%	99.96%
0-180	378.57	86.04%	100.00%
60-90	60.50	13.75%	15.98%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-52.83	302.86	68.83%	80.00%

ZONAL LUMEN SUMMARY

0-10	85.29
10-20	99.20
20-30	50.80
30-40	33.96
40-50	26.70
50-60	24.48
60-70	25.40
70-80	21.47
80-90	11.13
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:25.7 Right:25.7
:C90/270Left:25.7 Right:25.7

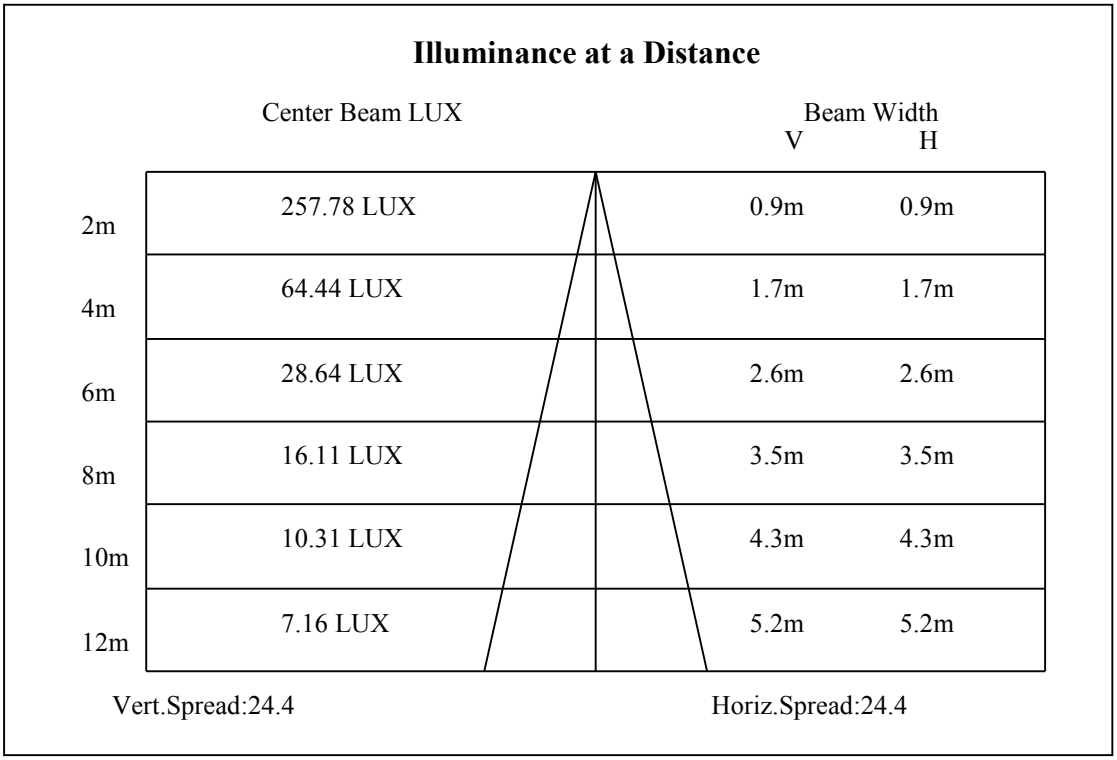
Beam Angle(50%Imax):C0/180Left:12.2 Right:12.2
:C90/270Left:12.2 Right:12.2

Equipment: GMS1980
Temperature(°C): 25.0

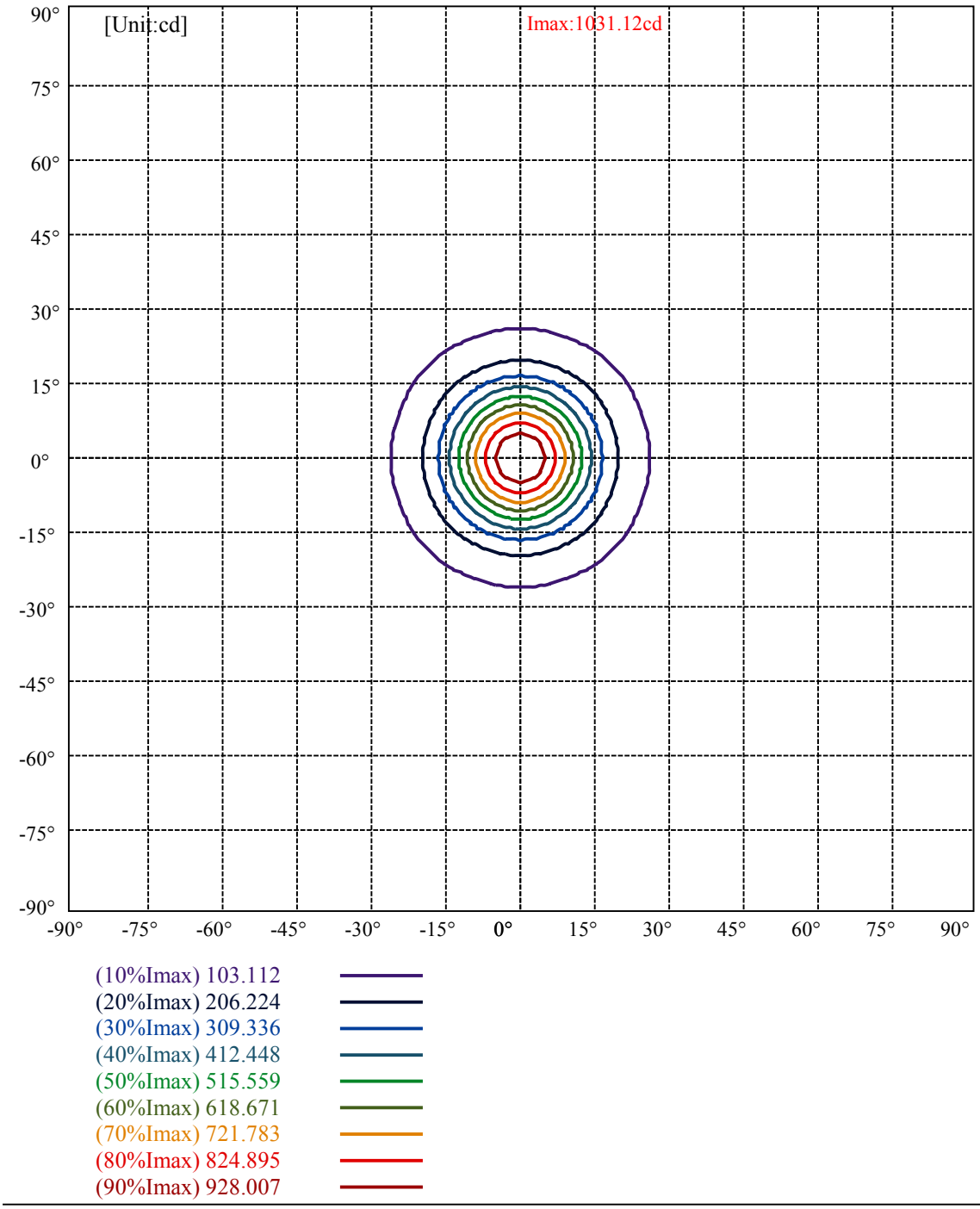
Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Lux distance Curve



ISO-Intensity(V-H)



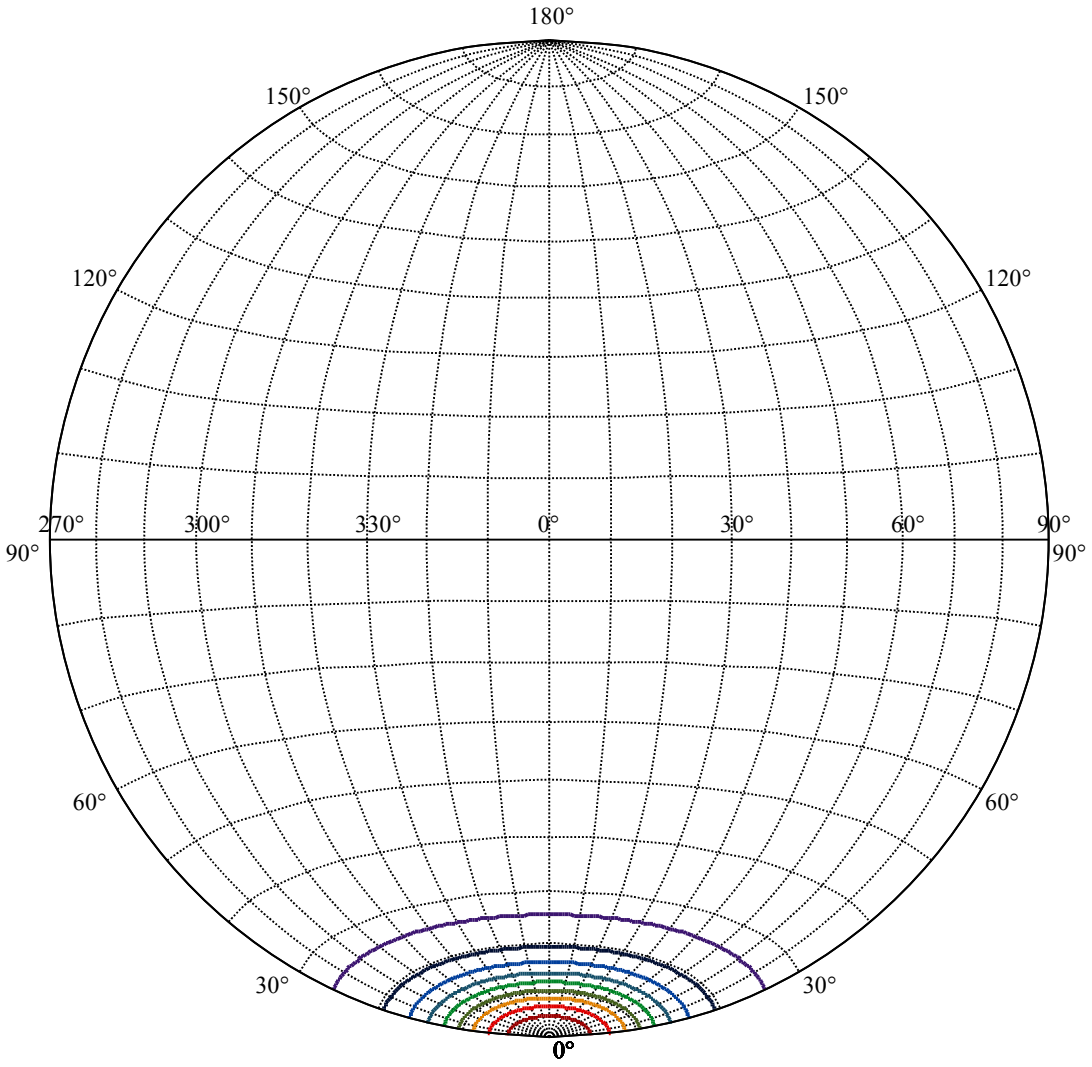
(10%Imax) 103.112
(20%Imax) 206.224
(30%Imax) 309.336
(40%Imax) 412.448
(50%Imax) 515.559
(60%Imax) 618.671
(70%Imax) 721.783
(80%Imax) 824.895
(90%Imax) 928.007

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:1031.12

(10%Imax) 103.112
(20%Imax) 206.224
(30%Imax) 309.336
(40%Imax) 412.448
(50%Imax) 515.559
(60%Imax) 618.671
(70%Imax) 721.783
(80%Imax) 824.895
(90%Imax) 928.007

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

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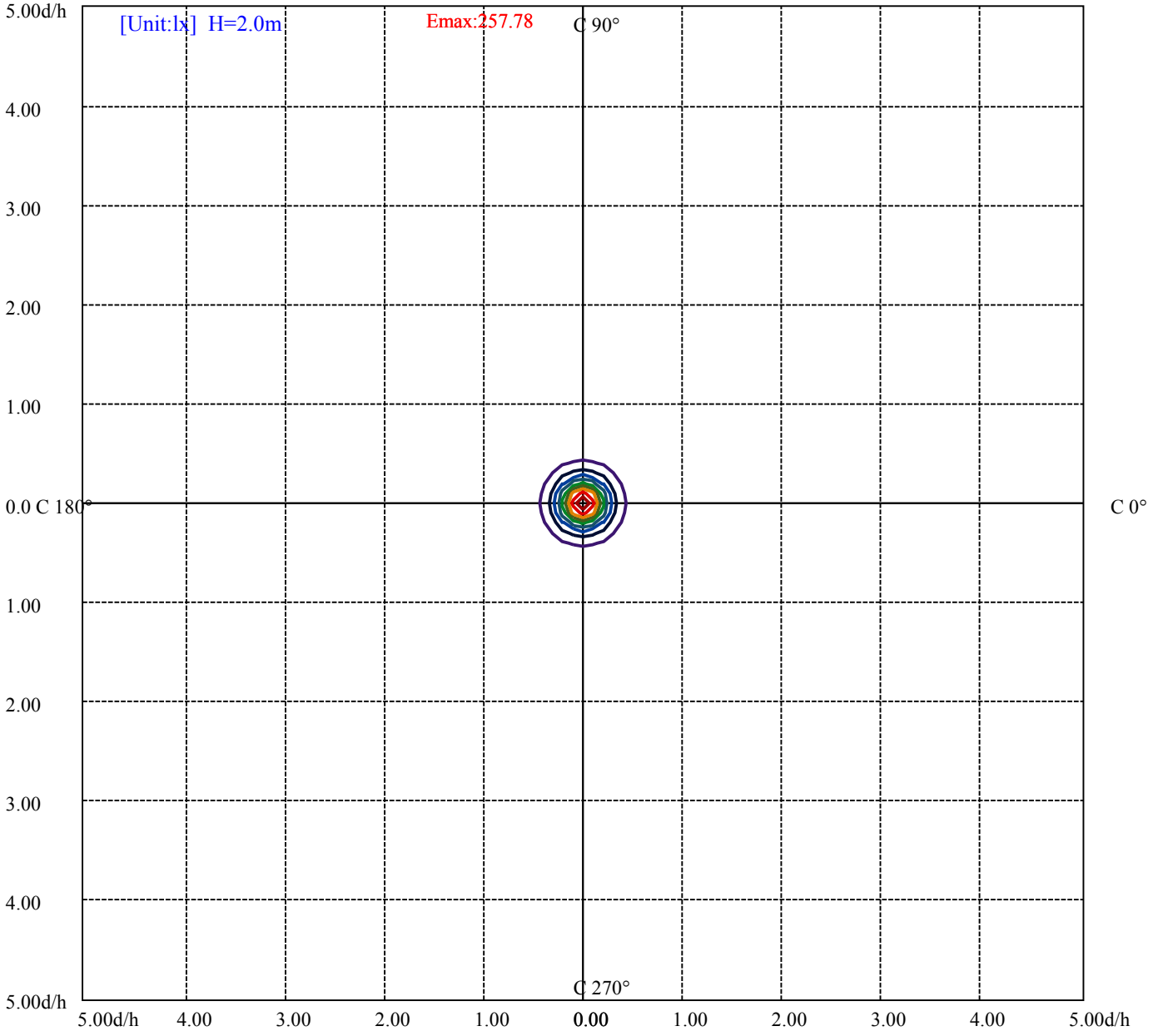
ISO illuminance diagram

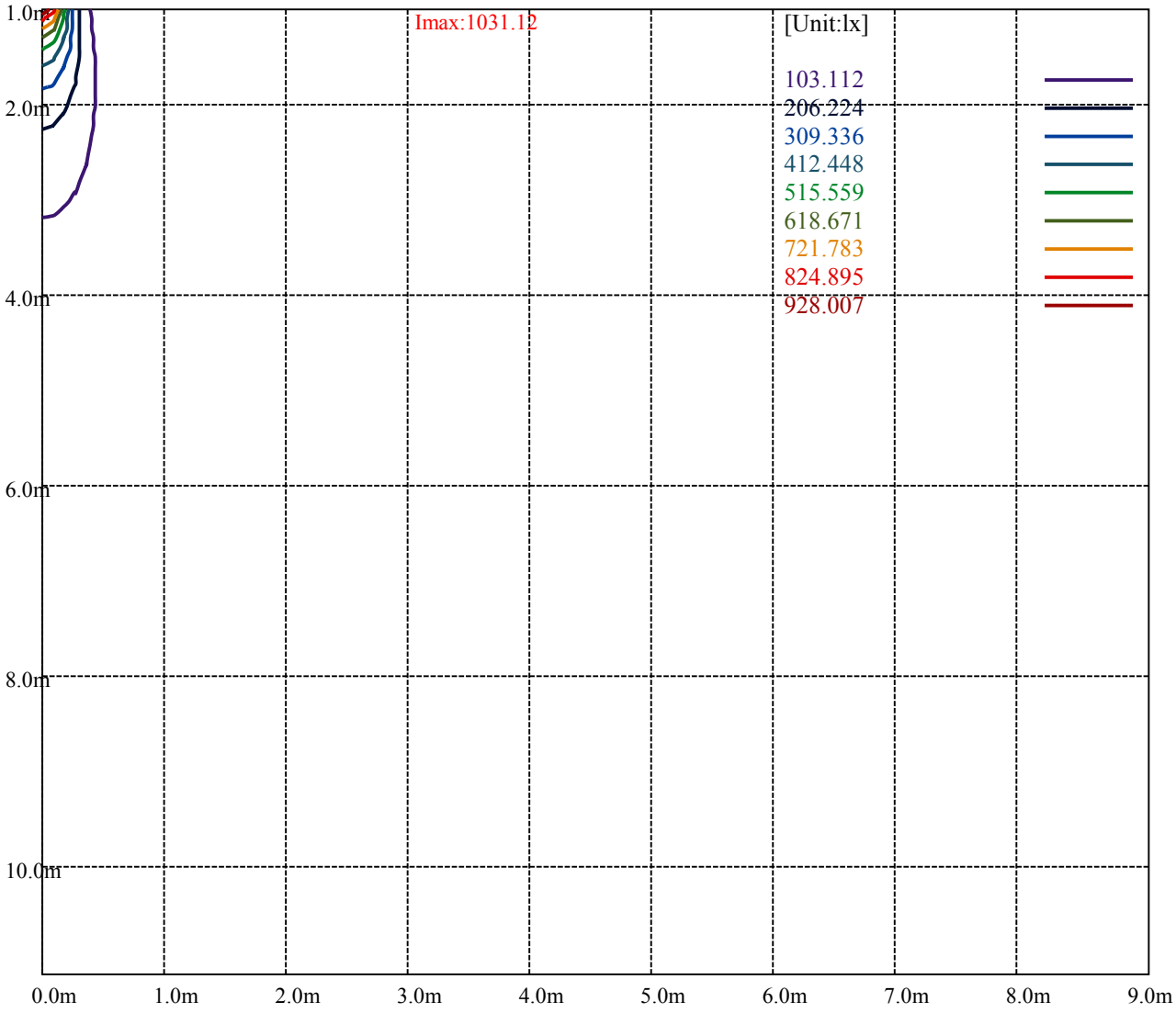


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

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Luminance Limitting Curve(no luminous side)

Luminance Table

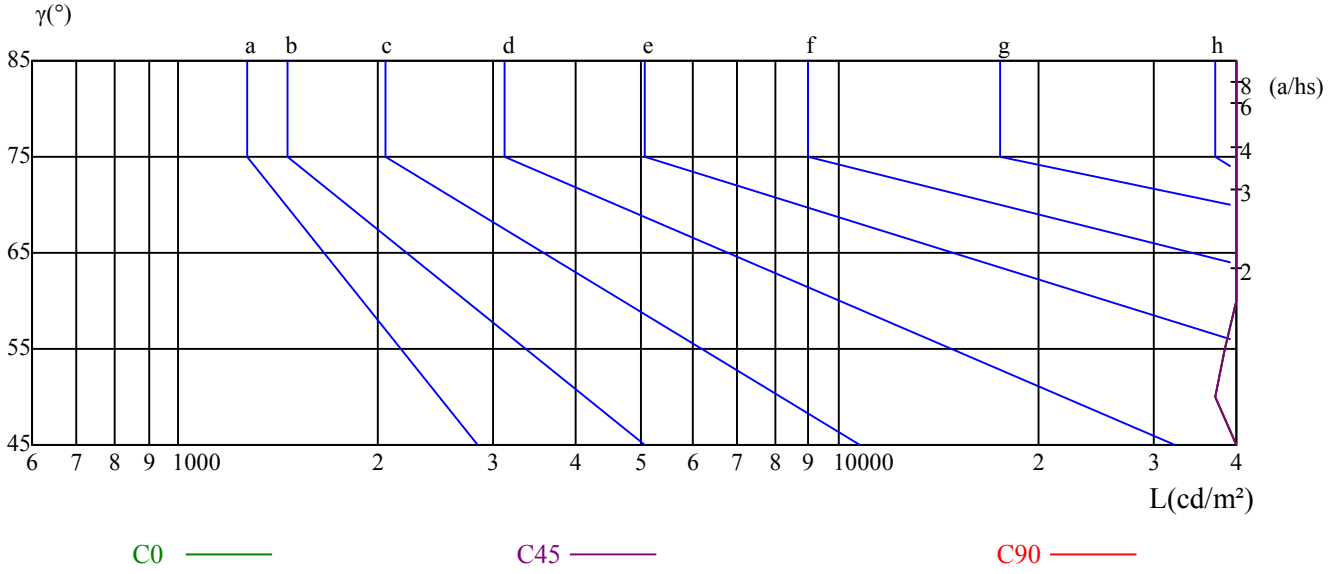
γ	45	50	55	60	65	70	75	80	85
C0	40457	37156	38367	42945	49722	57713	65821	77314	113208
C45	40457	37156	38367	42945	49722	57713	65821	77314	113208
C90	40457	37156	38367	42945	49722	57713	65821	77314	113208

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
49722	49722	49722	65821	65821	65821	113208	113208	113208

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

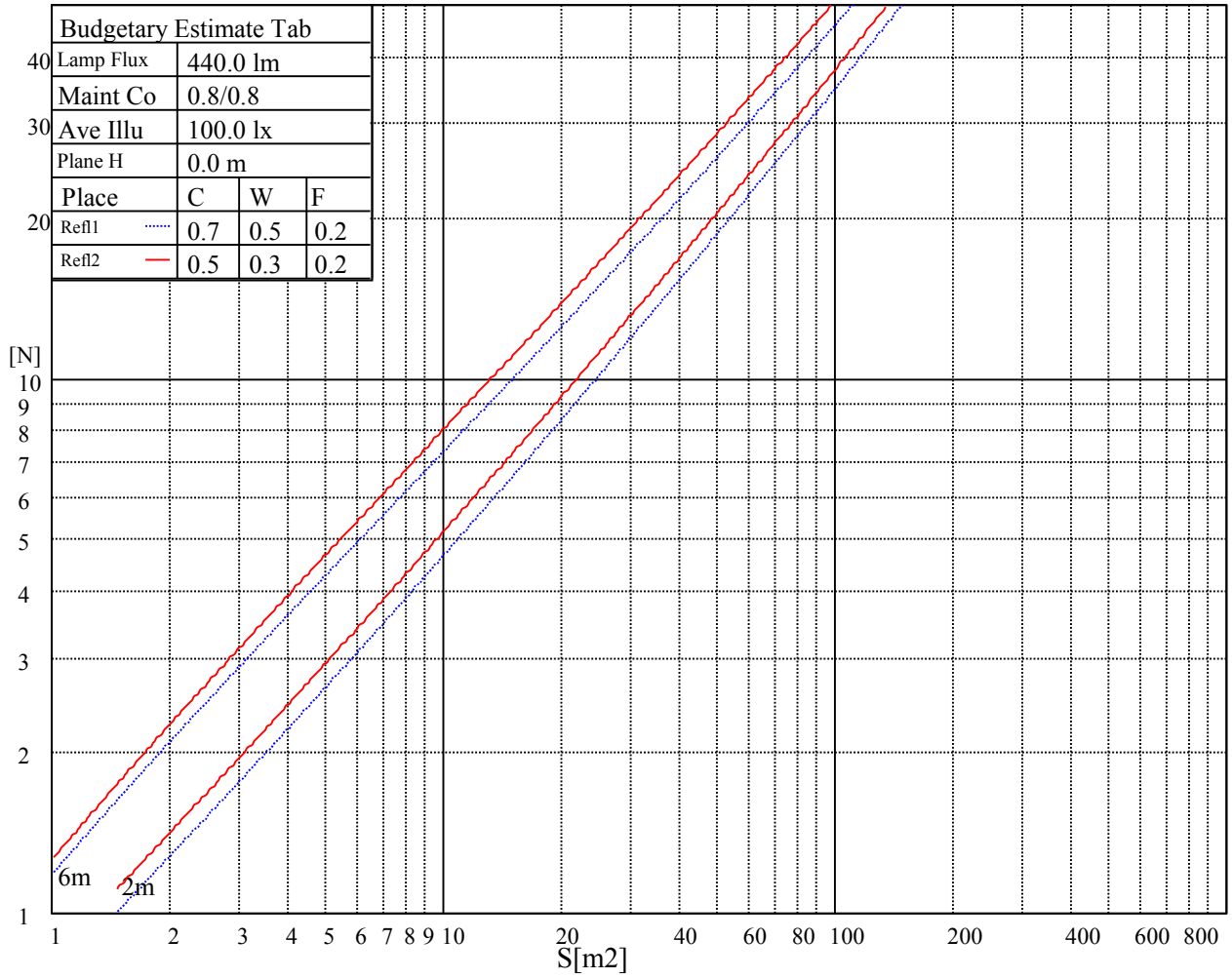


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Budgetary Estimate Table



Equipment: GMS1980
Temperature(°C): 25.0

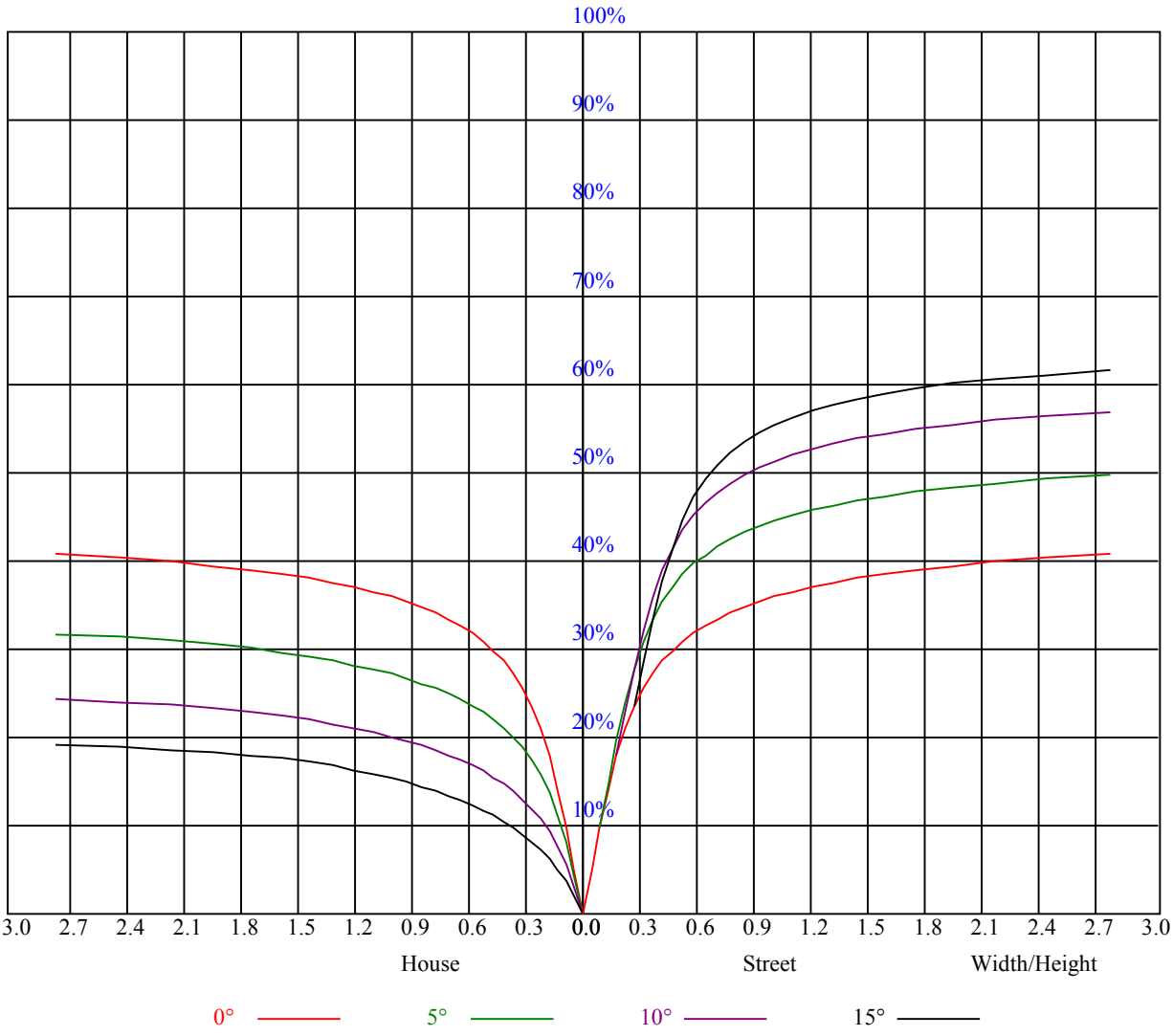
Date: 2018/12/30
Humidity(%): 65.0%

Operator: NT07
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	1.02	1.02	1.02	1.00	1.00	1.00	0.96	0.96	0.96	0.92	0.92	0.92	0.88	0.88	0.88	0.86
1	0.92	0.89	0.86	0.90	0.87	0.85	0.87	0.84	0.82	0.83	0.81	0.80	0.80	0.79	0.77	0.76
2	0.84	0.79	0.76	0.82	0.78	0.75	0.79	0.76	0.73	0.77	0.74	0.71	0.74	0.72	0.70	0.68
3	0.77	0.72	0.68	0.76	0.71	0.67	0.74	0.70	0.66	0.72	0.68	0.65	0.70	0.67	0.64	0.62
4	0.72	0.66	0.62	0.71	0.66	0.62	0.69	0.65	0.61	0.67	0.63	0.60	0.66	0.62	0.59	0.58
5	0.68	0.62	0.58	0.67	0.61	0.57	0.65	0.60	0.57	0.64	0.60	0.56	0.62	0.59	0.56	0.54
6	0.64	0.58	0.54	0.63	0.58	0.54	0.62	0.57	0.53	0.60	0.56	0.53	0.59	0.56	0.53	0.51
7	0.61	0.55	0.51	0.60	0.55	0.51	0.59	0.54	0.51	0.58	0.54	0.50	0.57	0.53	0.50	0.49
8	0.58	0.52	0.49	0.57	0.52	0.48	0.56	0.52	0.48	0.55	0.51	0.48	0.54	0.51	0.48	0.47
9	0.55	0.50	0.46	0.55	0.50	0.46	0.54	0.49	0.46	0.53	0.49	0.46	0.52	0.49	0.46	0.45
10	0.53	0.48	0.45	0.53	0.48	0.44	0.52	0.47	0.44	0.51	0.47	0.44	0.51	0.47	0.44	0.43

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2018/12/30	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	1029.71	1020.88	1000.63	974.08	938.08	889.09	842.46	789.47	722.64
45.0	1033.48	1020.54	1001.81	974.76	937.18	889.20	842.23	783.90	729.06
90.0	1031.23	1018.35	999.28	966.54	926.21	882.45	828.17	767.64	713.25
135.0	1030.05	1027.41	1017.68	997.88	966.94	930.83	882.34	836.49	779.63
180.0	1029.71	1029.77	1022.06	1006.54	980.89	945.62	906.58	862.65	801.23
225.0	1033.48	1038.21	1032.24	1017.90	995.01	966.21	927.34	878.96	831.66
270.0	1031.23	1035.90	1030.78	1014.81	993.49	965.76	918.96	874.24	827.61
315.0	1030.05	1023.47	1006.03	978.36	948.49	911.19	853.93	804.94	749.93
360.0	1029.71	1020.88	1000.63	974.08	938.08	889.09	842.46	789.47	722.64

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	665.49	608.57	543.88	481.95	430.03	376.59	327.21	288.51	250.14
45.0	665.61	598.67	542.53	480.49	421.43	374.34	331.76	283.61	250.71
90.0	656.83	583.43	528.53	474.92	413.38	367.71	326.03	284.74	247.44
135.0	726.75	658.46	600.81	545.12	485.44	427.78	382.11	334.41	292.22
180.0	748.29	694.29	623.42	568.91	515.42	456.41	402.81	358.48	312.19
225.0	773.78	716.12	648.56	584.94	528.47	468.45	410.01	362.76	321.30
270.0	767.93	704.48	646.20	581.29	516.83	463.16	405.68	359.16	311.57
315.0	686.59	621.23	563.57	500.74	441.34	392.12	341.44	300.94	261.62
360.0	665.49	608.57	543.88	481.95	430.03	376.59	327.21	288.51	250.14

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	221.79	194.40	171.28	153.28	136.29	122.01	111.77	102.77	92.87
45.0	221.12	193.05	169.59	152.04	134.89	120.99	110.48	100.80	92.98
90.0	218.53	190.29	169.82	149.91	133.48	121.73	110.53	100.46	92.93
135.0	258.75	228.32	197.66	176.29	157.50	139.78	125.04	114.24	103.44
180.0	275.34	239.79	208.63	185.06	162.73	144.56	130.89	119.59	106.88
225.0	274.28	242.16	214.14	183.77	164.19	146.81	128.98	117.17	107.21
270.0	270.56	239.29	207.96	184.28	162.00	145.69	129.66	115.88	105.86
315.0	228.49	202.28	180.23	156.94	140.96	127.58	113.63	104.40	96.19
360.0	221.79	194.40	171.28	153.28	136.29	122.01	111.77	102.77	92.87

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	86.06	80.27	74.64	69.81	65.87	61.93	58.33	55.35	52.20
45.0	85.61	79.59	74.59	70.31	65.14	61.88	58.56	54.79	51.86
90.0	86.63	79.31	74.25	69.86	65.59	61.71	58.33	55.07	51.98
135.0	95.57	88.37	81.45	76.44	70.93	66.66	63.11	60.19	55.80
180.0	98.16	90.68	82.69	77.12	72.34	67.11	63.45	60.13	56.14
225.0	97.09	89.55	82.35	76.28	71.66	67.05	62.44	59.40	56.08
270.0	97.26	88.14	81.84	76.61	70.88	66.94	63.39	59.68	56.19
315.0	88.26	81.34	76.22	71.27	67.33	63.28	59.29	56.19	52.88
360.0	86.06	80.27	74.64	69.81	65.87	61.93	58.33	55.35	52.20

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	49.56	47.19	45.73	43.26	41.34	39.04	37.58	36.56	35.72
45.0	49.39	47.59	45.39	43.31	41.34	39.38	37.80	36.56	35.83
90.0	49.61	47.93	45.51	43.26	41.18	39.38	37.97	36.73	35.94
135.0	53.21	50.96	48.49	45.84	43.99	41.79	39.94	38.76	37.18
180.0	53.55	50.74	48.21	46.01	43.82	41.91	40.11	38.48	37.13
225.0	51.98	49.67	47.31	45.51	42.86	41.06	38.98	37.24	35.94
270.0	53.16	50.06	47.48	45.28	43.20	41.34	39.38	37.41	36.11
315.0	49.89	47.42	45.90	43.20	41.51	39.71	37.80	36.45	35.49
360.0	49.56	47.19	45.73	43.26	41.34	39.04	37.58	36.56	35.72

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	34.59	33.13	31.44	30.15	29.48	28.86	28.46	28.01	27.34
45.0	34.82	33.47	32.06	30.94	30.15	29.53	29.36	28.41	28.01
90.0	34.99	33.36	31.95	30.83	29.81	29.53	29.03	28.29	28.01
135.0	36.06	34.82	33.13	31.78	30.99	29.70	29.25	28.52	27.68
180.0	36.00	34.54	33.24	31.78	30.60	29.93	29.48	28.63	27.90
225.0	34.48	33.24	32.18	30.94	29.87	29.14	28.52	28.35	27.79
270.0	35.04	33.36	32.29	31.22	29.76	28.86	28.29	27.84	27.51
315.0	34.37	32.79	31.22	29.93	29.03	28.52	28.07	27.62	27.00
360.0	34.59	33.13	31.44	30.15	29.48	28.86	28.46	28.01	27.34

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	27.06	26.78	26.66	26.55	26.38	26.33	26.21	26.16	26.16
45.0	27.73	27.51	27.34	27.28	27.06	26.94	26.83	26.78	26.66
90.0	27.79	27.56	27.51	27.45	27.39	27.39	27.34	27.28	27.28
135.0	27.34	27.00	26.72	26.55	26.38	26.27	26.16	26.04	25.93
180.0	27.39	27.06	26.83	26.66	26.55	26.44	26.33	26.27	26.16
225.0	27.17	26.89	26.61	26.49	26.38	26.33	26.21	26.16	26.10
270.0	27.06	26.55	26.27	26.04	25.88	25.76	25.71	25.59	25.48
315.0	26.55	26.33	26.16	25.93	25.88	25.76	25.65	25.54	25.48
360.0	27.06	26.78	26.66	26.55	26.38	26.33	26.21	26.16	26.16

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	25.99	25.88	25.71	25.59	25.48	25.26	24.92	24.53	24.19
45.0	26.44	26.27	26.04	25.93	25.65	25.26	24.75	24.24	23.51
90.0	27.23	27.11	27.00	26.89	26.55	26.10	25.65	25.03	24.47
135.0	25.88	25.71	25.54	25.43	25.26	24.92	24.47	24.08	23.46
180.0	26.04	25.93	25.76	25.65	25.43	25.09	24.75	24.30	23.85
225.0	26.04	25.93	25.82	25.71	25.54	25.31	24.92	24.41	23.96
270.0	25.43	25.26	25.14	24.92	24.69	24.53	24.19	23.74	23.12
315.0	25.31	25.14	24.92	24.69	24.47	24.13	23.68	23.12	22.67
360.0	25.99	25.88	25.71	25.59	25.48	25.26	24.92	24.53	24.19

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	23.68	23.18	22.61	21.83	20.98	19.86	18.96	17.83	17.04
45.0	22.89	22.16	21.26	20.48	19.63	18.73	17.83	16.99	15.98
90.0	23.74	22.89	22.11	21.26	20.31	19.41	18.56	17.49	16.65
135.0	22.84	22.28	21.49	20.64	19.86	18.96	18.11	17.21	16.26
180.0	23.34	22.73	22.16	21.49	20.81	19.97	19.13	18.06	17.10
225.0	23.23	22.56	21.88	21.15	20.19	19.35	18.51	17.55	16.59
270.0	22.56	21.88	21.21	20.42	19.58	18.84	18.06	17.04	16.31
315.0	21.88	21.26	20.59	19.69	18.90	18.17	17.16	16.37	15.64
360.0	23.68	23.18	22.61	21.83	20.98	19.86	18.96	17.83	17.04

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	15.98	15.02	13.95	12.83	11.87	10.86	9.56	5.79	3.54
45.0	15.08	14.18	13.33	12.66	11.81	11.03	10.13	7.54	4.61
90.0	15.86	15.02	14.18	13.39	12.54	11.76	10.80	8.89	5.40
135.0	15.41	14.68	13.73	12.99	12.26	11.42	10.69	9.73	7.20
180.0	16.37	15.47	14.46	13.50	12.49	11.53	10.52	8.72	5.29
225.0	15.75	14.79	13.95	13.05	12.21	11.36	10.24	7.14	4.61
270.0	15.53	14.68	13.84	12.88	11.98	11.08	9.45	6.02	3.77
315.0	14.74	14.06	13.33	12.26	11.53	10.29	7.54	4.61	2.25
360.0	15.98	15.02	13.95	12.83	11.87	10.86	9.56	5.79	3.54

Intensity data(cd)

C/γ(°)	90.0
0.0	1.74
45.0	2.08
90.0	2.93
135.0	4.61
180.0	3.49
225.0	2.19
270.0	1.80
315.0	1.80
360.0	1.74