NATA LIGHTING CO.,LTD.
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Address:380JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

LumCAT: 1655-S
Luminaire: 90.70.043.00
Report No: NATA0100
Test No: GC2019112711
LampCAT: CITIZEN CLU028
Lamp flux(lm): 597.0
Number of Lamps: 1
Length(mm): 0
Phm Type: C

Voltage(V): 35.0300
Current(A): 0.1470
Power (W): 5.1400
PF: 1.0000
Ballast type: DC
Width(mm): 0
Height(mm): 0

Photometric Results

Lumens(lm): 493.73
Efficiency(%): 82.70%
Lumens(lm)/Power(W): 96.06
Central intensity(cd): 1403.719
Maximum intensity(cd): 1403.719
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=28.5
[C90/270]Total=28.5
Field angle(10%Imax): [C0/180]Total=65.9
[C90/270]Total=65.9
Maximum s/h(1/2): C0_180=0.47 C90_270=0.47
Maximum s/h(1/4): C0_180=0.50 C90_270=0.50
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 82.70%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.927%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1403.719	0.000	0	.000%	.000%
1.0	1399.219	1.341	1.341	.225%	.272%
2.0	1381.289	3.991	5.332	.668%	1.080%
3.0	1350.141	6.533	11.865	1.094%	2.403%
4.0	1312.734	8.913	20.778	1.493%	4.208%
5.0	1264.359	11.087	31.865	1.857%	6.454%
6.0	1203.152	12.967	44.832	2.172%	9.080%
7.0	1142.170	14.557	59.39	2.438%	12.029%
8.0	1090.055	15.976	75.365	2.676%	15.264%
9.0	1025.494	17.145	92.51	2.872%	18.737%
10.0	959.709	17.965	110.476	3.009%	22.376%
11.0	900.717	18.589	129.065	3.114%	26.141%
12.0	842.266	19.053	148.119	3.192%	30.000%
13.0	776.834	19.215	167.333	3.219%	33.892%
14.0	716.224	19.111	186.444	3.201%	37.762%
15.0	656.677	18.848	205.292	3.157%	41.580%
16.0	593.557	18.319	223.612	3.069%	45.290%
17.0	535.071	17.576	241.187	2.944%	48.850%
18.0	483.947	16.801	257.989	2.814%	52.253%
19.0	437.140	16.025	274.014	2.684%	55.499%
20.0	397.526	15.277	289.29	2.559%	58.593%
21.0	362.320	14.591	303.881	2.444%	61.548%
22.0	331.615	13.945	317.826	2.336%	64.372%
23.0	306.647	13.392	331.218	2.243%	67.085%
24.0	283.845	12.910	344.129	2.163%	69.700%
25.0	261.415	12.398	356.527	2.077%	72.211%
26.0	241.995	11.883	368.41	1.990%	74.618%
27.0	225.766	11.444	379.854	1.917%	76.936%
28.0	212.773	11.103	390.956	1.860%	79.184%
29.0	203.098	10.880	401.837	1.823%	81.388%
30.0	195.616	10.765	412.602	1.803%	83.568%
31.0	184.409	10.576	423.177	1.771%	85.710%
32.0	163.758	9.975	433.152	1.671%	87.731%
33.0	139.634	8.938	442.09	1.497%	89.541%
34.0	112.521	7.631	449.721	1.278%	91.087%
35.0	85.233	6.142	455.863	1.029%	92.330%
36.0	59.520	4.609	460.471	.772%	93.264%
37.0	39.185	3.219	463.691	.539%	93.916%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	25.615	2.163	465.854	.362%	94.354%
39.0	19.849	1.552	467.405	.260%	94.668%
40.0	18.098	1.323	468.729	.222%	94.936%
41.0	16.580	1.235	469.964	.207%	95.187%
42.0	15.068	1.150	471.114	.193%	95.419%
43.0	13.458	1.057	472.17	.177%	95.633%
44.0	12.087	0.964	473.134	.161%	95.829%
45.0	11.180	0.894	474.029	.150%	96.010%
46.0	10.455	0.846	474.875	.142%	96.181%
47.0	9.802	0.806	475.68	.135%	96.344%
48.0	9.218	0.769	476.449	.129%	96.500%
49.0	8.698	0.736	477.185	.123%	96.649%
50.0	8.135	0.702	477.887	.118%	96.791%
51.0	7.657	0.668	478.555	.112%	96.927%
52.0	7.249	0.640	479.195	.107%	97.056%
53.0	6.863	0.614	479.808	.103%	97.180%
54.0	6.483	0.588	480.397	.099%	97.300%
55.0	6.166	0.565	480.961	.095%	97.414%
56.0	5.857	0.543	481.505	.091%	97.524%
57.0	5.576	0.523	482.027	.088%	97.630%
58.0	5.330	0.504	482.532	.084%	97.732%
59.0	5.112	0.488	483.02	.082%	97.831%
60.0	4.915	0.474	483.493	.079%	97.927%
61.0	4.697	0.459	483.952	.077%	98.020%
62.0	4.535	0.445	484.397	.075%	98.110%
63.0	4.380	0.434	484.831	.073%	98.198%
64.0	4.233	0.423	485.253	.071%	98.283%
65.0	4.106	0.413	485.666	.069%	98.367%
66.0	3.980	0.403	486.069	.068%	98.449%
67.0	3.839	0.393	486.462	.066%	98.528%
68.0	3.734	0.384	486.846	.064%	98.606%
69.0	3.628	0.376	487.222	.063%	98.682%
70.0	3.551	0.369	487.59	.062%	98.757%
71.0	3.452	0.362	487.952	.061%	98.830%
72.0	3.361	0.354	488.307	.059%	98.902%
73.0	3.291	0.348	488.654	.058%	98.972%
74.0	3.192	0.341	488.995	.057%	99.041%
75.0	3.122	0.334	489.329	.056%	99.109%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	3.059	0.328	489.657	.055%	99.175%
77.0	2.988	0.322	489.979	.054%	99.240%
78.0	2.932	0.317	490.296	.053%	99.305%
79.0	2.869	0.312	490.608	.052%	99.368%
80.0	2.813	0.306	490.914	.051%	99.430%
81.0	2.763	0.302	491.216	.051%	99.491%
82.0	2.700	0.296	491.512	.050%	99.551%
83.0	2.658	0.291	491.803	.049%	99.610%
84.0	2.616	0.287	492.091	.048%	99.668%
85.0	2.602	0.285	492.375	.048%	99.726%
86.0	2.545	0.281	492.657	.047%	99.783%
87.0	2.510	0.277	492.933	.046%	99.839%
88.0	2.454	0.272	493.205	.046%	99.894%
89.0	2.384	0.265	493.47	.044%	99.948%
90.0	2.341	0.259	493.729	.043%	100.000%

Zonal flux distribution table

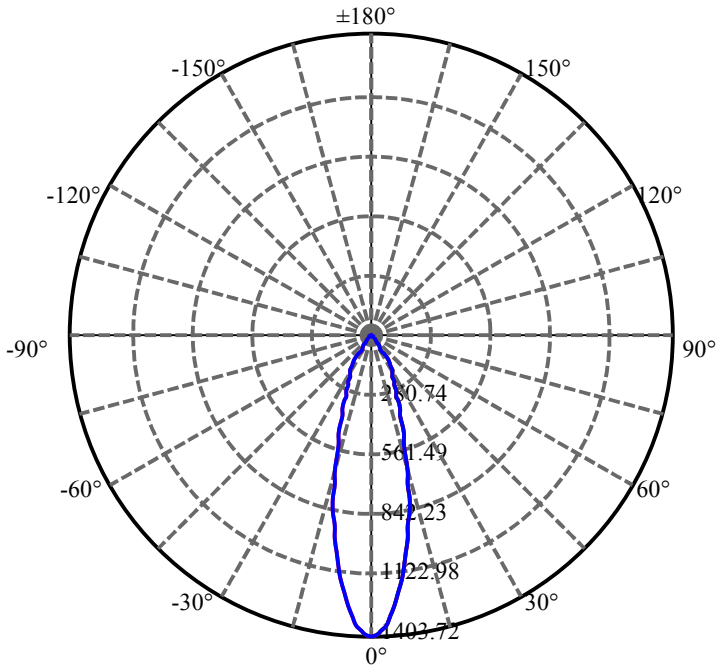
ZONAL LUMEN SUMMARY

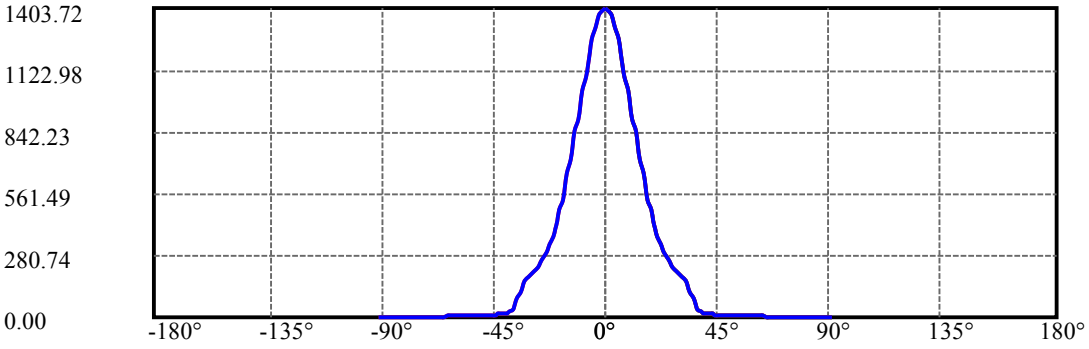
Zone	Lumens	%Lamp	%Fixt
0-30	412.60	69.11%	83.57%
0-40	468.73	78.51%	94.94%
0-60	483.49	80.99%	97.93%
0-90	493.47	82.66%	99.95%
0-120	493.47	82.66%	99.95%
0-180	493.73	82.70%	100.00%
60-90	10.45	1.75%	2.12%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-28.37	394.98	66.16%	80.00%

ZONAL LUMEN SUMMARY

0-10	110.48
10-20	178.81
20-30	123.31
30-40	56.13
40-50	9.16
50-60	5.61
60-70	4.10
70-80	3.32
80-90	2.56
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:33.0 Right:33.0
:C90/270Left:33.0 Right:33.0

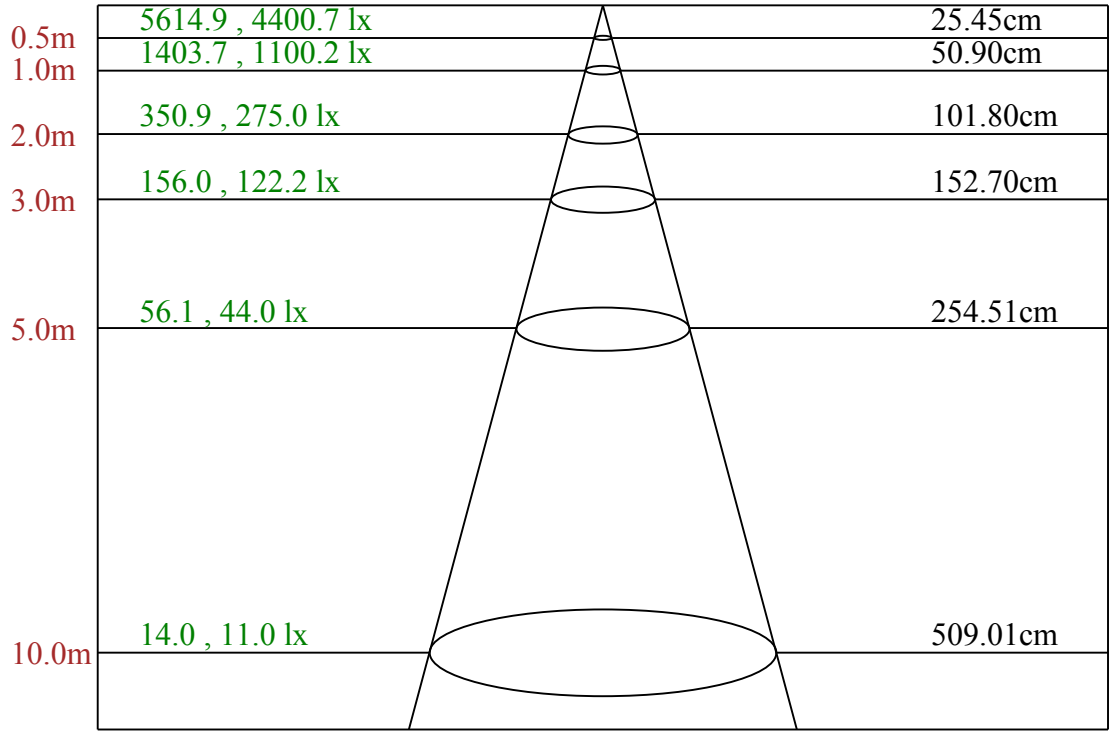
Beam Angle(50%Imax):C0/180Left:14.2 Right:14.2
:C90/270Left:14.2 Right:14.2

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/27
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

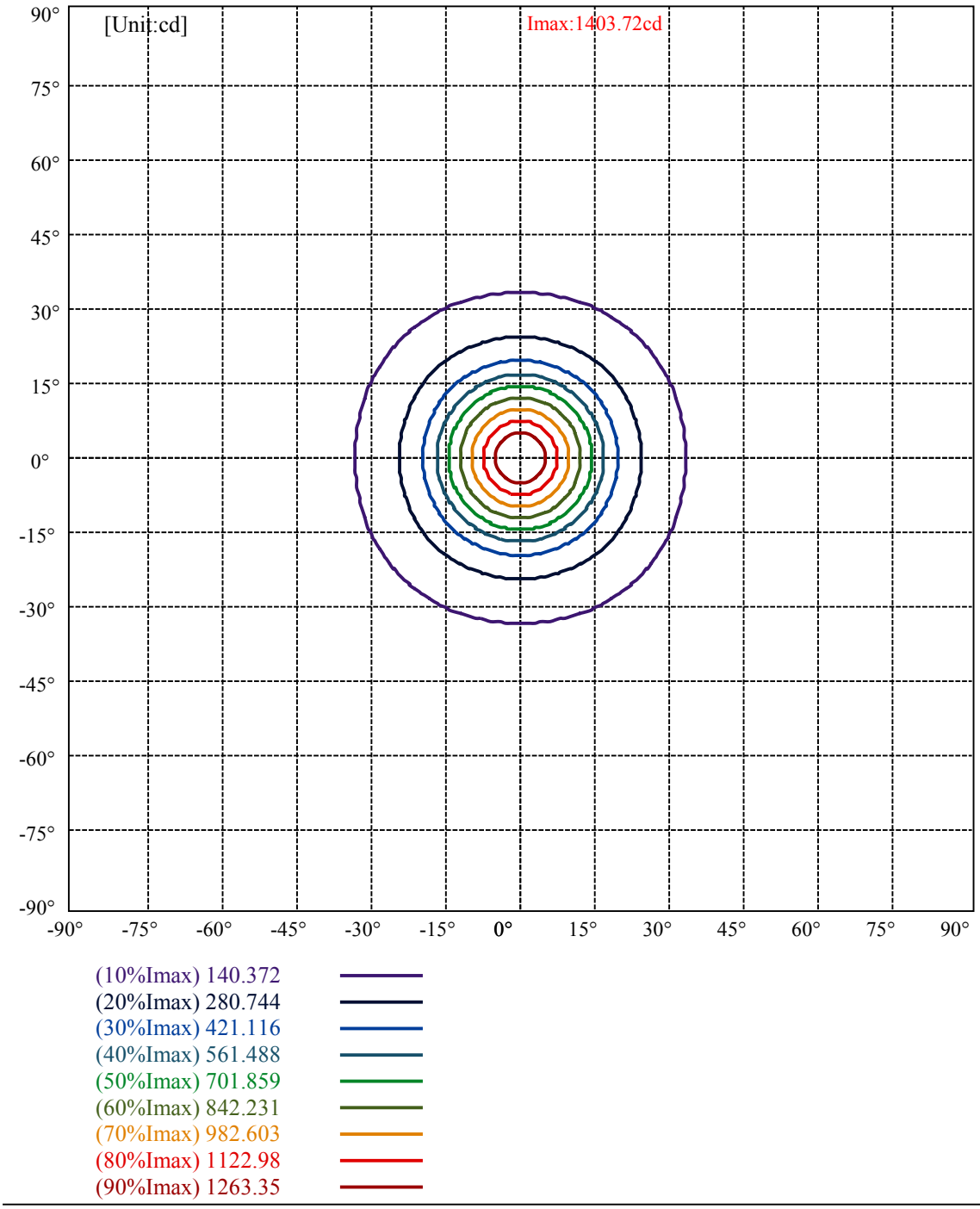
Lux distance Curve



Max , Ave

Beam angle of C0 plane 28.56

ISO-Intensity(V-H)

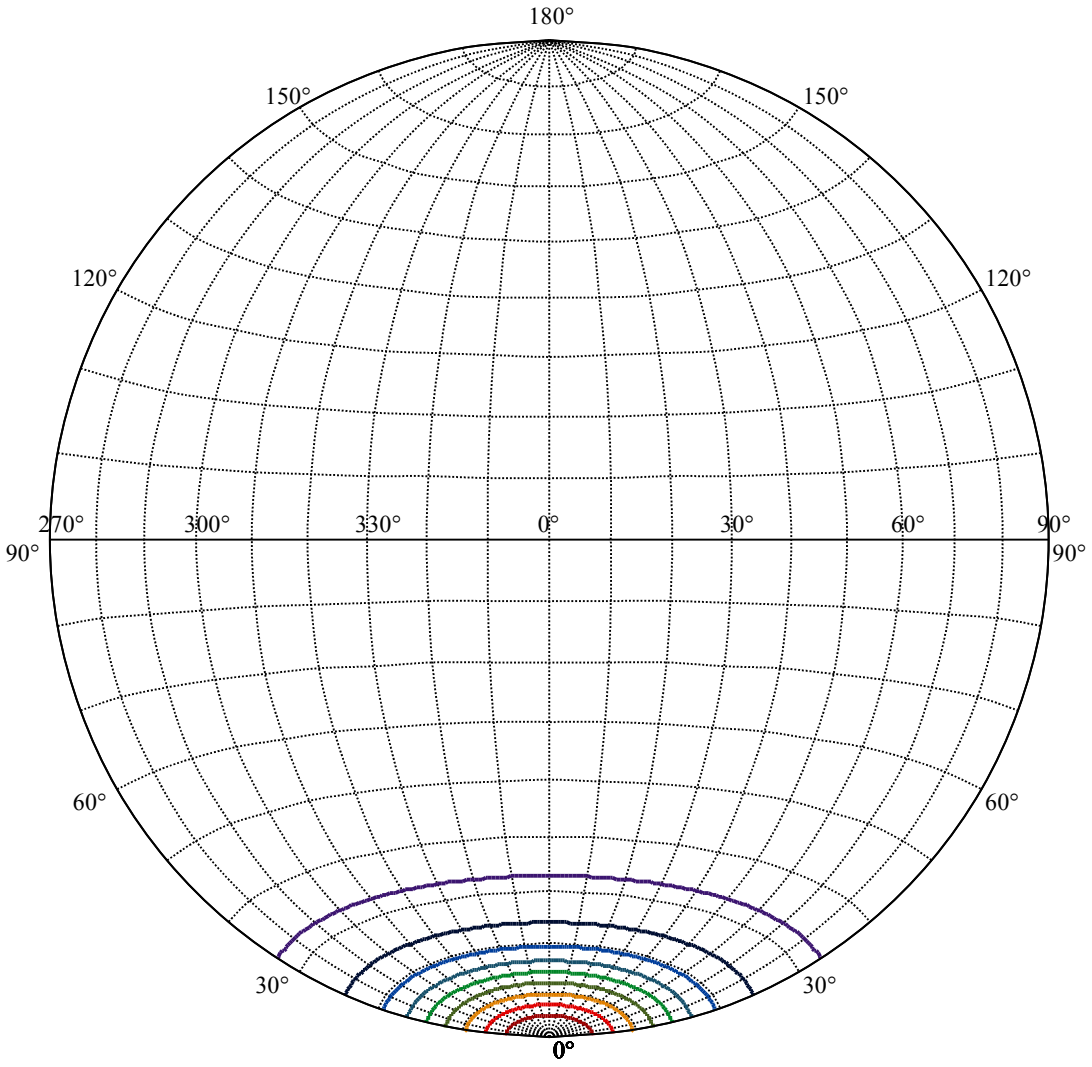


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/27
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:1403.72

(10%Imax) 140.372
(20%Imax) 280.744
(30%Imax) 421.116
(40%Imax) 561.488
(50%Imax) 701.859
(60%Imax) 842.231
(70%Imax) 982.603
(80%Imax) 1122.98
(90%Imax) 1263.35

Equipment: GMS1980 Date: 2019/11/27 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

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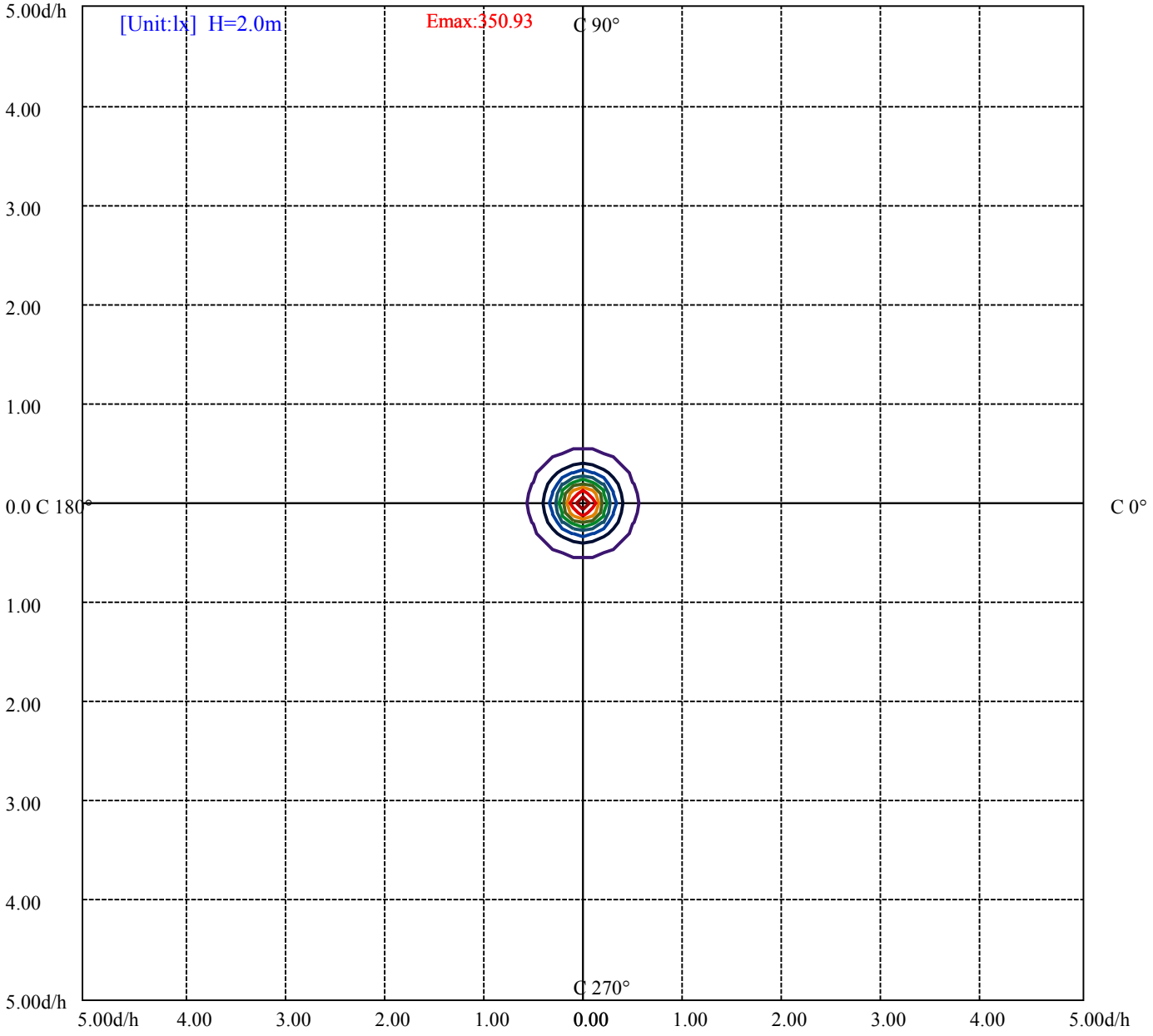
ISO illuminance diagram

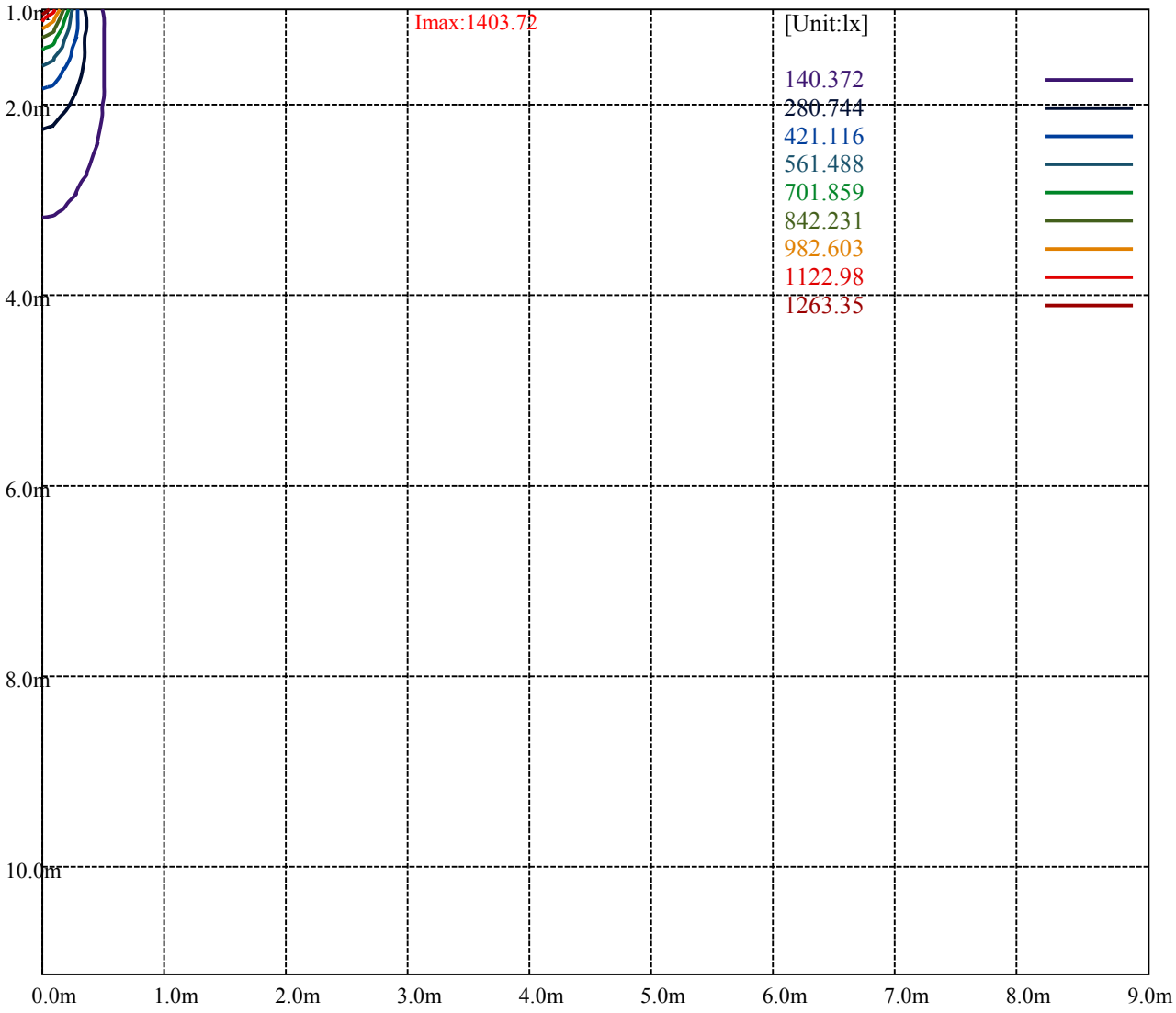


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/27
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/27
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

1655-S

Luminance Limitting Curve(no luminous side)

Luminance Table

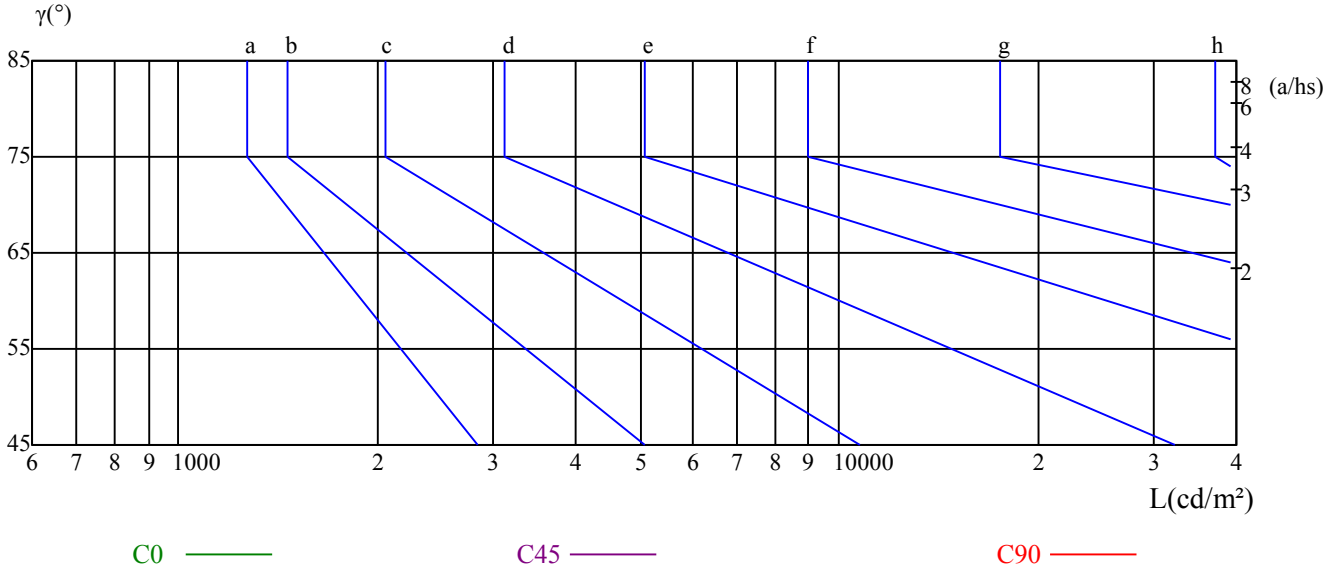
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

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

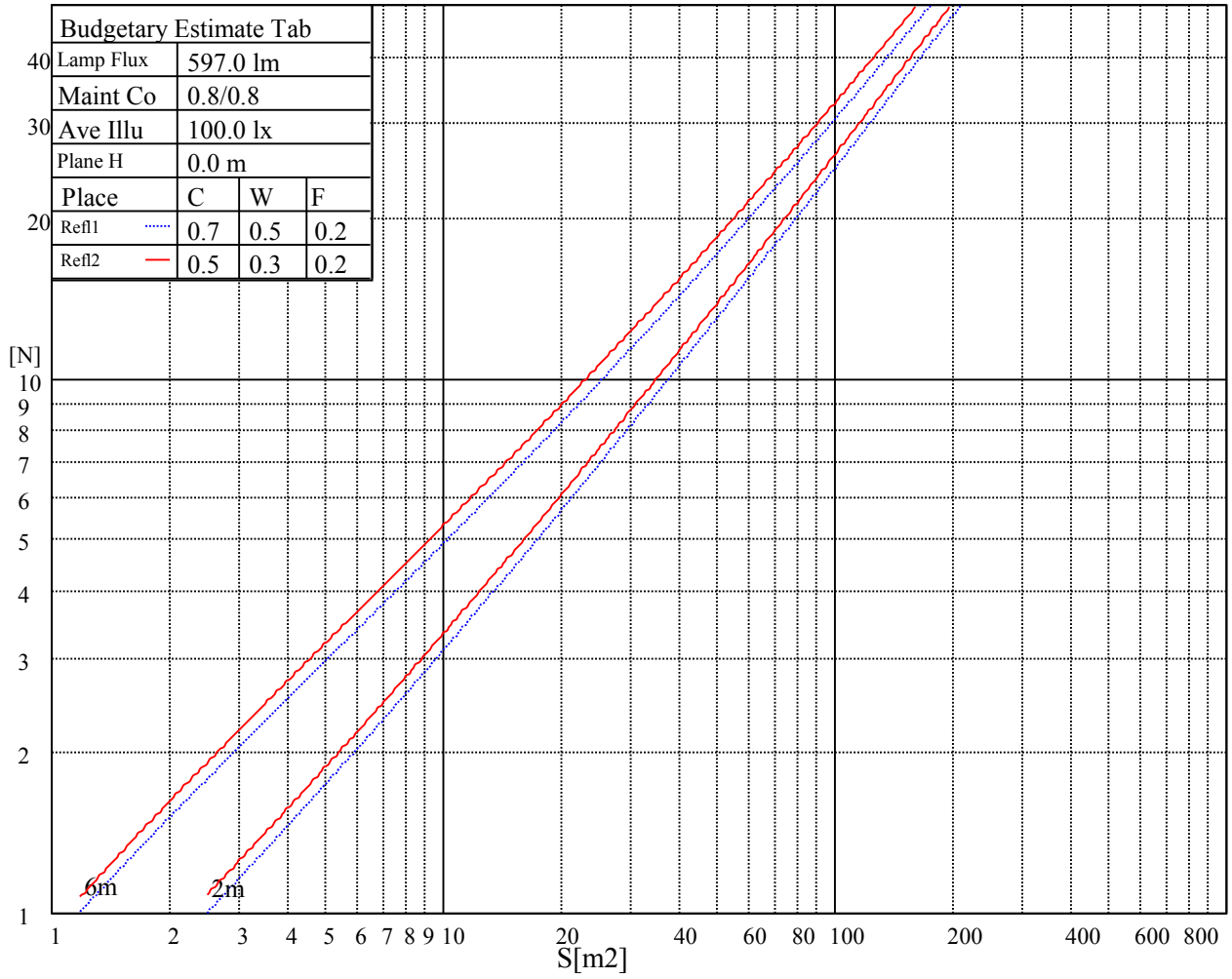


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/27
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Budgetary Estimate Table

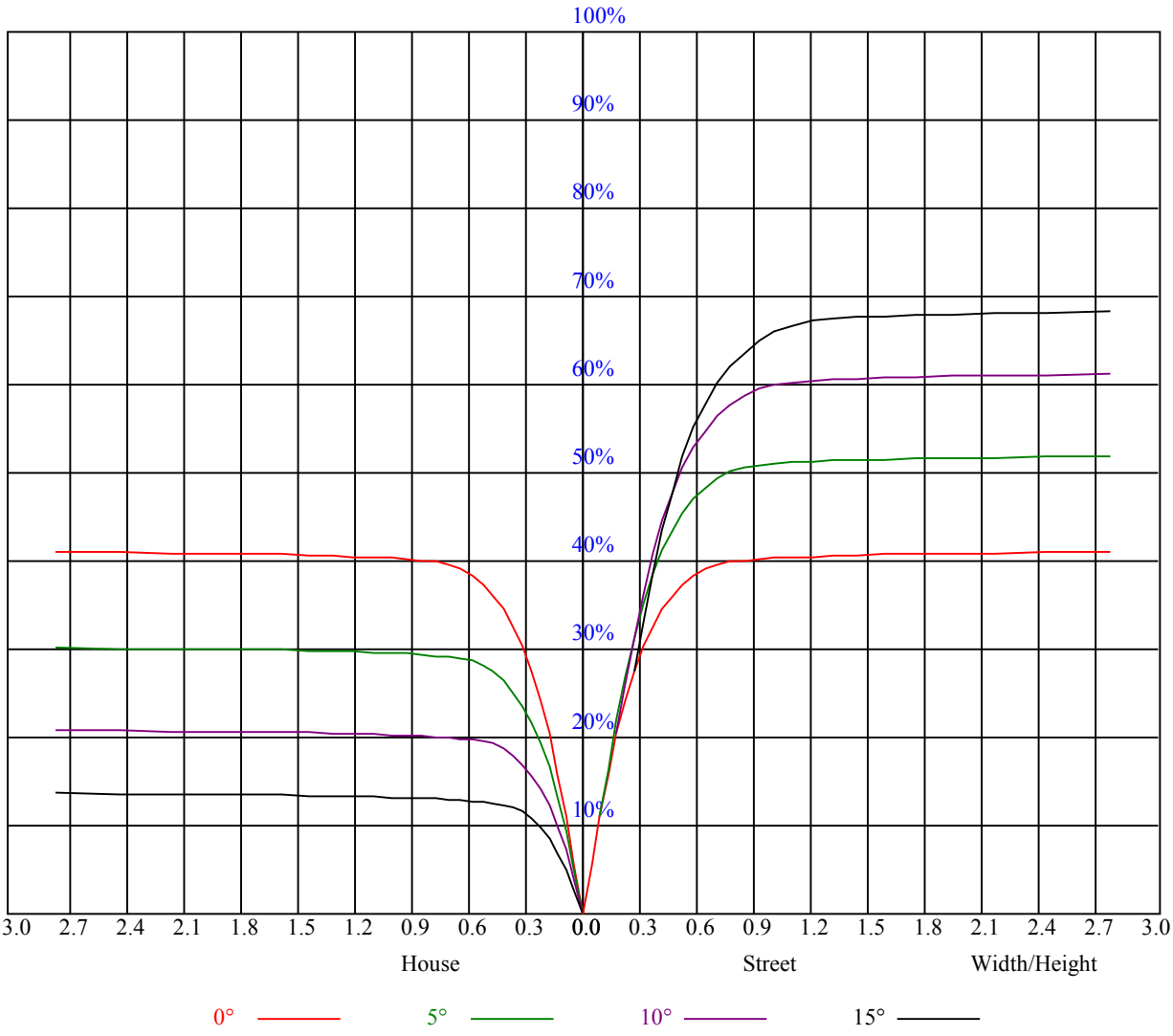


Equipment: GMS1980 Date: 2019/11/27 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

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	0.98	0.98	0.98	0.96	0.96	0.96	0.92	0.92	0.92	0.88	0.88	0.88	0.84	0.84	0.84	0.83
1	0.92	0.90	0.88	0.90	0.89	0.87	0.87	0.86	0.84	0.84	0.83	0.82	0.81	0.80	0.79	0.78
2	0.87	0.84	0.81	0.85	0.82	0.80	0.82	0.80	0.78	0.80	0.78	0.77	0.78	0.76	0.75	0.74
3	0.82	0.78	0.75	0.81	0.77	0.75	0.78	0.76	0.73	0.77	0.74	0.72	0.75	0.73	0.71	0.70
4	0.77	0.73	0.70	0.77	0.73	0.70	0.75	0.72	0.69	0.73	0.71	0.68	0.72	0.69	0.68	0.66
5	0.74	0.69	0.66	0.73	0.69	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.69	0.66	0.64	0.63
6	0.70	0.66	0.63	0.70	0.66	0.63	0.68	0.65	0.62	0.67	0.64	0.62	0.66	0.64	0.61	0.60
7	0.67	0.63	0.60	0.66	0.62	0.60	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.58
8	0.64	0.60	0.57	0.64	0.60	0.57	0.63	0.59	0.57	0.62	0.59	0.56	0.61	0.58	0.56	0.55
9	0.62	0.57	0.55	0.61	0.57	0.54	0.60	0.57	0.54	0.60	0.56	0.54	0.59	0.56	0.54	0.53
10	0.59	0.55	0.52	0.59	0.55	0.52	0.58	0.55	0.52	0.58	0.54	0.52	0.57	0.54	0.52	0.51

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2019/11/27	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	1407.38	1397.81	1370.81	1332.56	1279.69	1227.94	1168.88	1112.63	1056.38
45.0	1402.88	1397.25	1366.88	1326.38	1289.25	1217.25	1168.31	1120.50	1047.94
90.0	1402.31	1389.94	1368.00	1326.94	1282.50	1239.75	1119.09	1112.46	1052.83
135.0	1402.88	1405.13	1393.31	1373.63	1343.25	1303.31	1256.06	1192.50	1137.94
180.0	1406.25	1410.75	1400.06	1369.13	1336.50	1292.63	1233.00	1170.56	1119.38
225.0	1402.88	1406.81	1397.25	1374.19	1341.00	1289.25	1237.50	1121.23	1096.65
270.0	1402.31	1401.19	1392.19	1374.75	1343.81	1299.94	1248.75	1189.13	1130.63
315.0	1402.88	1384.88	1361.81	1323.56	1285.88	1244.81	1193.63	1118.36	1078.71
360.0	1407.38	1397.81	1370.81	1332.56	1279.69	1227.94	1168.88	1112.63	1056.38

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	994.50	939.94	896.06	857.25	799.88	750.94	707.06	637.88	574.31
45.0	987.75	932.63	858.94	807.19	753.75	690.19	641.25	587.25	524.25
90.0	979.71	915.81	858.04	795.54	729.96	677.31	618.08	564.64	508.73
135.0	1074.38	1005.19	945.00	889.88	816.75	758.25	696.38	618.75	566.44
180.0	1060.26	981.96	915.36	849.09	770.74	704.19	639.51	574.54	517.33
225.0	1027.80	953.72	890.94	816.08	754.09	685.52	614.19	559.24	505.24
270.0	1060.31	987.75	927.00	864.00	789.19	727.31	667.13	595.69	532.13
315.0	1019.25	960.69	914.40	859.11	800.33	736.09	669.83	610.48	552.15
360.0	994.50	939.94	896.06	857.25	799.88	750.94	707.06	637.88	574.31

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	529.88	473.06	427.50	395.44	352.13	326.81	303.75	284.06	259.26
45.0	474.19	431.44	390.94	362.25	338.06	308.81	286.31	254.70	228.60
90.0	458.38	418.44	384.36	346.67	322.88	300.32	275.74	260.21	246.71
135.0	513.56	463.50	423.56	389.81	354.94	326.81	300.38	284.06	257.18
180.0	469.46	421.82	387.34	354.71	326.81	304.82	281.76	260.16	243.62
225.0	449.55	406.01	365.68	327.09	300.04	280.01	254.31	235.86	223.26
270.0	483.75	435.38	389.81	355.50	322.31	297.56	285.75	254.08	234.79
315.0	492.81	447.47	411.02	367.09	335.76	308.03	282.77	258.19	242.55
360.0	529.88	473.06	427.50	395.44	352.13	326.81	303.75	284.06	259.26

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	243.45	227.70	217.97	210.26	197.78	177.81	153.68	122.23	91.07
45.0	203.40	184.39	164.70	149.91	136.91	123.58	110.64	93.43	75.60
90.0	227.42	212.63	202.28	191.19	178.09	156.04	128.19	109.24	85.56
135.0	240.13	226.52	216.96	210.38	199.63	179.38	154.18	120.26	93.66
180.0	231.02	219.71	213.64	208.29	196.37	171.68	145.13	113.57	82.01
225.0	209.59	201.04	193.78	187.65	178.59	158.85	132.81	107.55	82.63
270.0	222.58	214.09	208.01	205.14	200.42	180.28	156.43	129.21	94.39
315.0	228.54	216.11	207.45	202.11	187.48	162.45	136.01	104.68	76.95
360.0	243.45	227.70	217.97	210.26	197.78	177.81	153.68	122.23	91.07

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	63.73	38.64	23.40	16.88	15.53	14.57	13.39	12.09	10.80
45.0	58.44	43.99	30.66	25.26	22.16	19.58	17.61	16.03	14.34
90.0	59.51	43.54	31.44	24.58	22.05	19.63	17.38	15.24	13.61
135.0	66.26	43.71	25.09	18.17	16.82	15.53	14.23	12.88	11.42
180.0	57.09	34.82	23.91	18.96	17.44	16.20	14.79	12.99	11.87
225.0	54.34	36.51	25.76	20.36	18.79	17.44	15.92	14.18	12.94
270.0	67.73	44.66	26.61	19.24	17.83	16.48	15.08	13.56	11.98
315.0	49.05	27.62	18.06	15.36	14.18	13.22	12.15	10.69	9.73
360.0	63.73	38.64	23.40	16.88	15.53	14.57	13.39	12.09	10.80

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	10.01	9.34	8.89	8.44	7.93	7.54	7.14	6.81	6.47
45.0	13.05	12.15	11.25	10.52	9.84	9.17	8.61	8.04	7.54
90.0	12.38	11.42	10.69	9.90	9.39	8.72	8.10	7.65	7.26
135.0	10.58	10.01	9.34	8.78	8.27	7.76	7.26	6.92	6.53
180.0	11.14	10.41	9.79	9.11	8.55	7.99	7.54	7.09	6.75
225.0	12.04	11.36	10.58	9.96	9.45	8.83	8.33	7.88	7.43
270.0	11.08	10.35	9.73	9.23	8.72	8.10	7.59	7.26	6.86
315.0	9.17	8.61	8.16	7.82	7.43	6.98	6.69	6.36	6.08
360.0	10.01	9.34	8.89	8.44	7.93	7.54	7.14	6.81	6.47

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	6.19	5.91	5.68	5.40	5.18	5.01	4.78	4.67	4.50
45.0	7.14	6.75	6.30	6.02	5.79	5.51	5.29	5.06	4.89
90.0	6.81	6.47	6.19	5.79	5.51	5.29	5.12	4.84	4.61
135.0	6.19	5.96	5.57	5.34	5.12	4.95	4.73	4.50	4.39
180.0	6.36	5.96	5.63	5.40	5.12	4.89	4.73	4.44	4.33
225.0	6.92	6.58	6.30	5.96	5.63	5.40	5.18	4.89	4.67
270.0	6.47	6.19	5.85	5.57	5.40	5.18	4.95	4.78	4.61
315.0	5.79	5.51	5.34	5.12	4.89	4.67	4.56	4.39	4.28
360.0	6.19	5.91	5.68	5.40	5.18	5.01	4.78	4.67	4.50

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	4.39	4.22	4.16	4.05	3.88	3.83	3.71	3.60	3.54
45.0	4.73	4.56	4.39	4.22	4.11	3.94	3.83	3.77	3.66
90.0	4.44	4.33	4.16	3.99	3.88	3.77	3.66	3.54	3.49
135.0	4.22	4.05	3.88	3.83	3.66	3.54	3.49	3.43	3.26
180.0	4.22	4.05	3.94	3.77	3.66	3.54	3.43	3.38	3.32
225.0	4.50	4.33	4.28	4.11	3.94	3.83	3.66	3.60	3.49
270.0	4.39	4.28	4.16	4.05	3.94	3.83	3.71	3.66	3.49
315.0	4.16	4.05	3.88	3.83	3.66	3.60	3.54	3.43	3.38
360.0	4.39	4.22	4.16	4.05	3.88	3.83	3.71	3.60	3.54

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	3.49	3.38	3.32	3.21	3.15	3.09	3.04	2.98	2.93
45.0	3.60	3.49	3.38	3.32	3.26	3.15	3.09	3.04	2.98
90.0	3.38	3.32	3.21	3.15	3.04	3.04	2.93	2.81	2.81
135.0	3.21	3.15	2.98	2.98	2.93	2.87	2.81	2.76	2.70
180.0	3.21	3.15	3.04	2.98	2.87	2.81	2.81	2.76	2.64
225.0	3.38	3.26	3.21	3.09	3.04	2.98	2.93	2.87	2.81
270.0	3.38	3.38	3.26	3.15	3.15	3.04	2.93	2.87	2.81
315.0	3.26	3.21	3.15	3.09	3.04	2.93	2.93	2.87	2.81
360.0	3.49	3.38	3.32	3.21	3.15	3.09	3.04	2.98	2.93

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	2.93	2.81	2.81	2.76	2.70	2.64	2.64	2.59	2.53
45.0	2.87	2.87	2.76	2.70	2.70	2.64	2.59	2.48	2.42
90.0	2.70	2.70	2.64	2.59	2.59	2.53	2.48	2.42	2.36
135.0	2.64	2.59	2.53	2.53	2.48	2.48	2.42	2.42	2.36
180.0	2.64	2.53	2.53	2.48	2.48	2.42	2.42	2.36	2.36
225.0	2.76	2.70	2.64	2.59	2.59	2.48	2.48	2.42	2.31
270.0	2.81	2.70	2.70	2.64	2.64	2.59	2.53	2.42	2.36
315.0	2.76	2.70	2.64	2.64	2.64	2.59	2.53	2.53	2.36
360.0	2.93	2.81	2.81	2.76	2.70	2.64	2.64	2.59	2.53

Intensity data(cd)

C/γ(°)	90.0
0.0	2.42
45.0	2.31
90.0	2.31
135.0	2.36
180.0	2.31
225.0	2.36
270.0	2.31
315.0	2.36
360.0	2.42