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: 1405-N
Luminaire:92.70.043.00

Report No: NATA0100	Voltage(V): 8.9900
Test No: GC20190308	Current(A): 0.2990
LampCAT: EDISON 2PHM10WW38P55020 LES 3MM	Power (W): 2.6900
Lamp flux(lm): 324.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 0	Width(mm): 0
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 282.30
Efficiency(%): 87.13%
Lumens(lm)/Power(W): 104.95
Central intensity(cd): 1095.483
Maximum intensity(cd): 1095.483
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=16.0
[C90/270]Total=16.0
Field angle(10%Imax): [C0/180]Total=54.1
[C90/270]Total=54.1
Maximum s/h(1/2): C0_180=0.28 C90_270=0.28
Maximum s/h(1/4): C0_180=0.31 C90_270=0.31
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 87.13%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 95.033%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	1095.483	0.000	0	.000%	.000%
1.0	1083.762	1.043	1.043	.322%	.369%
2.0	1042.179	3.051	4.094	.942%	1.450%
3.0	977.393	4.830	8.924	1.491%	3.161%
4.0	903.839	6.297	15.221	1.944%	5.392%
5.0	811.343	7.379	22.6	2.277%	8.006%
6.0	719.381	8.044	30.644	2.483%	10.855%
7.0	631.969	8.388	39.032	2.589%	13.826%
8.0	549.366	8.455	47.487	2.609%	16.821%
9.0	471.987	8.278	55.764	2.555%	19.753%
10.0	407.925	7.963	63.727	2.458%	22.574%
11.0	354.713	7.620	71.347	2.352%	25.273%
12.0	309.094	7.256	78.604	2.240%	27.844%
13.0	271.350	6.888	85.492	2.126%	30.284%
14.0	241.109	6.559	92.052	2.025%	32.607%
15.0	217.870	6.301	98.353	1.945%	34.839%
16.0	197.719	6.090	104.442	1.879%	36.996%
17.0	181.723	5.909	110.351	1.824%	39.090%
18.0	168.652	5.777	116.128	1.783%	41.136%
19.0	158.491	5.692	121.82	1.757%	43.152%
20.0	149.182	5.631	127.451	1.738%	45.147%
21.0	141.180	5.576	133.026	1.721%	47.122%
22.0	134.831	5.547	138.573	1.712%	49.087%
23.0	128.953	5.535	144.108	1.708%	51.047%
24.0	123.307	5.515	149.623	1.702%	53.001%
25.0	118.455	5.497	155.12	1.697%	54.948%
26.0	114.223	5.492	160.613	1.695%	56.894%
27.0	109.688	5.478	166.091	1.691%	58.834%
28.0	105.841	5.457	171.548	1.684%	60.767%
29.0	102.094	5.440	176.988	1.679%	62.694%
30.0	98.360	5.412	182.4	1.670%	64.611%
31.0	94.507	5.367	187.767	1.657%	66.513%
32.0	90.773	5.308	193.075	1.638%	68.393%
33.0	87.026	5.238	198.313	1.617%	70.248%
34.0	83.095	5.148	203.462	1.589%	72.072%
35.0	78.989	5.034	208.495	1.554%	73.855%
36.0	74.313	4.881	213.377	1.507%	75.584%
37.0	69.898	4.703	218.08	1.452%	77.250%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	65.074	4.505	222.585	1.390%	78.846%
39.0	59.857	4.264	226.849	1.316%	80.357%
40.0	54.935	4.004	230.853	1.236%	81.775%
41.0	50.147	3.742	234.595	1.155%	83.100%
42.0	45.162	3.463	238.058	1.069%	84.327%
43.0	40.409	3.170	241.227	.978%	85.450%
44.0	36.394	2.899	244.126	.895%	86.477%
45.0	32.505	2.648	246.774	.817%	87.414%
46.0	28.983	2.405	249.179	.742%	88.266%
47.0	25.966	2.185	251.364	.675%	89.040%
48.0	23.379	1.995	253.359	.616%	89.747%
49.0	20.946	1.820	255.179	.562%	90.392%
50.0	18.851	1.659	256.838	.512%	90.980%
51.0	17.184	1.525	258.363	.471%	91.520%
52.0	15.729	1.412	259.775	.436%	92.020%
53.0	14.365	1.309	261.084	.404%	92.484%
54.0	13.212	1.215	262.3	.375%	92.914%
55.0	12.298	1.139	263.438	.351%	93.318%
56.0	11.447	1.073	264.511	.331%	93.698%
57.0	10.737	1.014	265.526	.313%	94.057%
58.0	10.062	0.962	266.488	.297%	94.398%
59.0	9.534	0.916	267.404	.283%	94.722%
60.0	9.028	0.877	268.281	.271%	95.033%
61.0	8.536	0.838	269.119	.259%	95.330%
62.0	8.121	0.803	269.921	.248%	95.614%
63.0	7.777	0.773	270.695	.239%	95.888%
64.0	7.383	0.744	271.438	.230%	96.151%
65.0	7.038	0.714	272.152	.220%	96.404%
66.0	6.764	0.689	272.841	.213%	96.648%
67.0	6.462	0.665	273.506	.205%	96.884%
68.0	6.180	0.640	274.146	.198%	97.111%
69.0	5.906	0.617	274.763	.190%	97.329%
70.0	5.660	0.594	275.357	.183%	97.539%
71.0	5.393	0.571	275.928	.176%	97.742%
72.0	5.147	0.548	276.476	.169%	97.936%
73.0	4.894	0.525	277.001	.162%	98.122%
74.0	4.662	0.502	277.504	.155%	98.300%
75.0	4.409	0.479	277.983	.148%	98.470%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	4.163	0.455	278.438	.140%	98.631%
77.0	3.945	0.432	278.87	.133%	98.784%
78.0	3.684	0.408	279.278	.126%	98.929%
79.0	3.452	0.383	279.662	.118%	99.064%
80.0	3.206	0.359	280.021	.111%	99.192%
81.0	2.981	0.335	280.356	.103%	99.310%
82.0	2.763	0.312	280.667	.096%	99.420%
83.0	2.538	0.288	280.955	.089%	99.522%
84.0	2.292	0.263	281.218	.081%	99.616%
85.0	2.067	0.238	281.456	.073%	99.700%
86.0	1.842	0.214	281.67	.066%	99.776%
87.0	1.610	0.189	281.859	.058%	99.843%
88.0	1.406	0.165	282.024	.051%	99.901%
89.0	1.252	0.146	282.17	.045%	99.953%
90.0	1.181	0.133	282.303	.041%	100.000%

Zonal flux distribution table

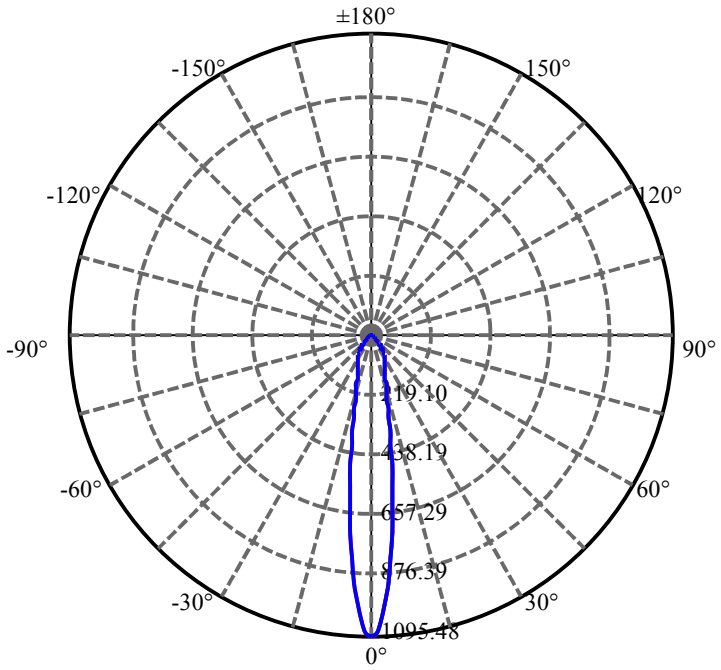
ZONAL LUMEN SUMMARY

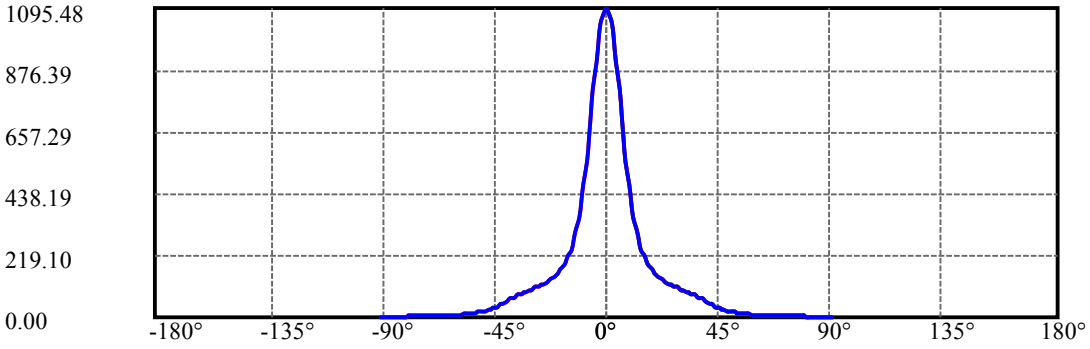
Zone	Lumens	%Lamp	%Fixt
0-30	182.40	56.30%	64.61%
0-40	230.85	71.25%	81.77%
0-60	268.28	82.80%	95.03%
0-90	282.17	87.09%	99.95%
0-120	282.17	87.09%	99.95%
0-180	282.30	87.13%	100.00%
60-90	14.77	4.56%	5.23%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-38.76	225.84	69.70%	80.00%

ZONAL LUMEN SUMMARY

0-10	63.73
10-20	63.72
20-30	54.95
30-40	48.45
40-50	25.99
50-60	11.44
60-70	7.08
70-80	4.66
80-90	2.15
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:

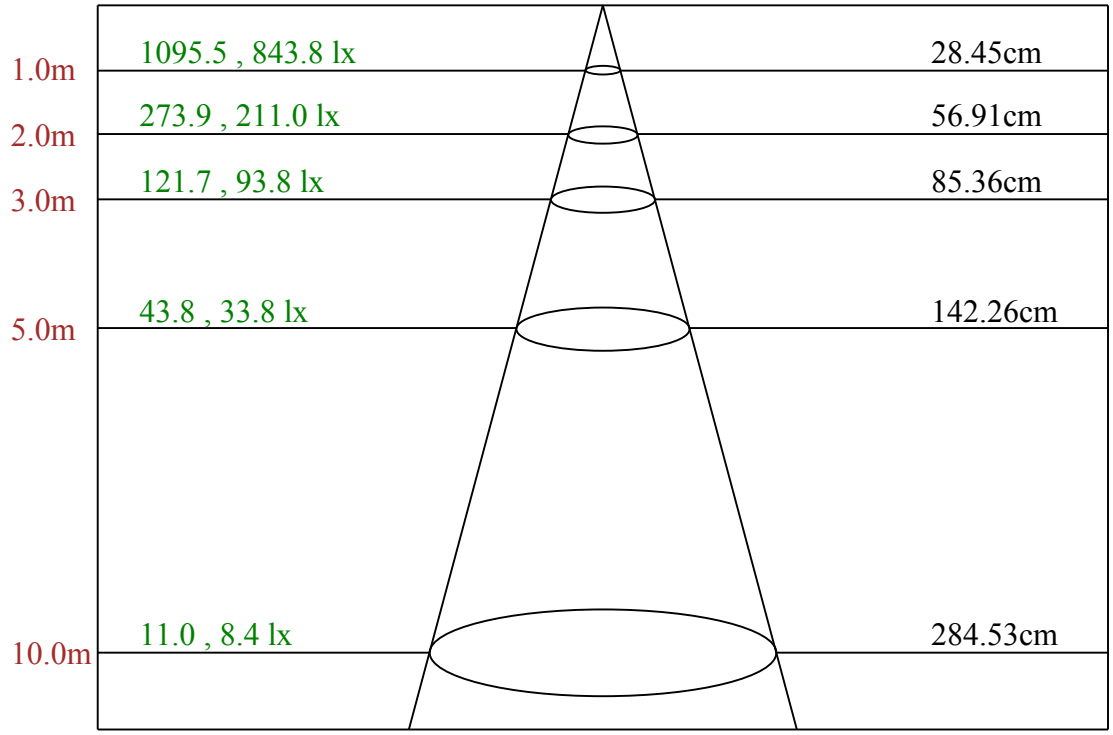
C90/C270:

Field angle(10%Imax):C0/180Left:27.0 Right:27.0
:C90/270Left:27.0 Right:27.0

Beam Angle(50%Imax):C0/180Left:8.0 Right:8.0
:C90/270Left:8.0 Right:8.0

Equipment: GMS1980 Date: 2019/9/3 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

Lux distance Curve



Max , Ave

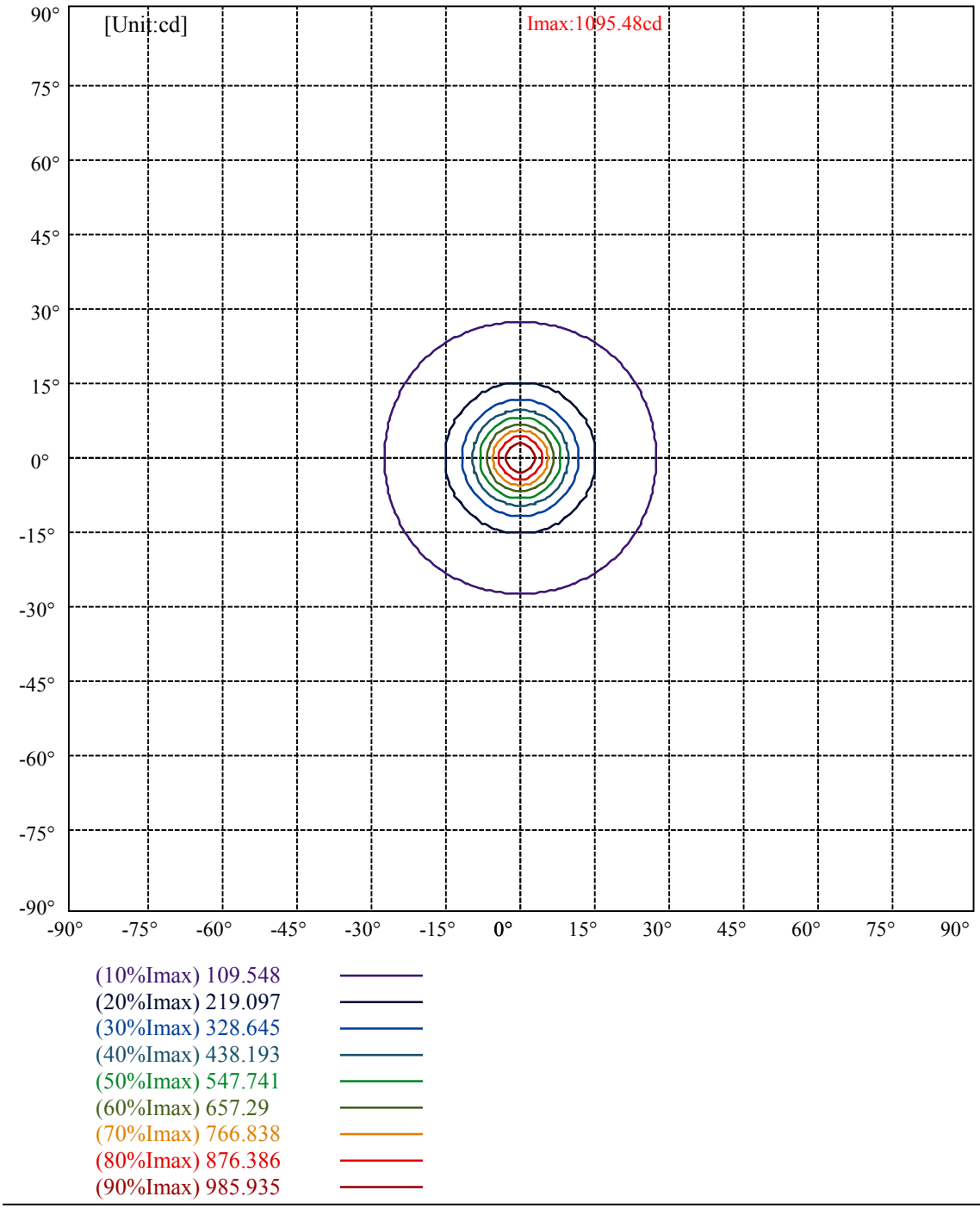
Beam angle of C0 plane 16.19

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/3
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO-Intensity(V-H)



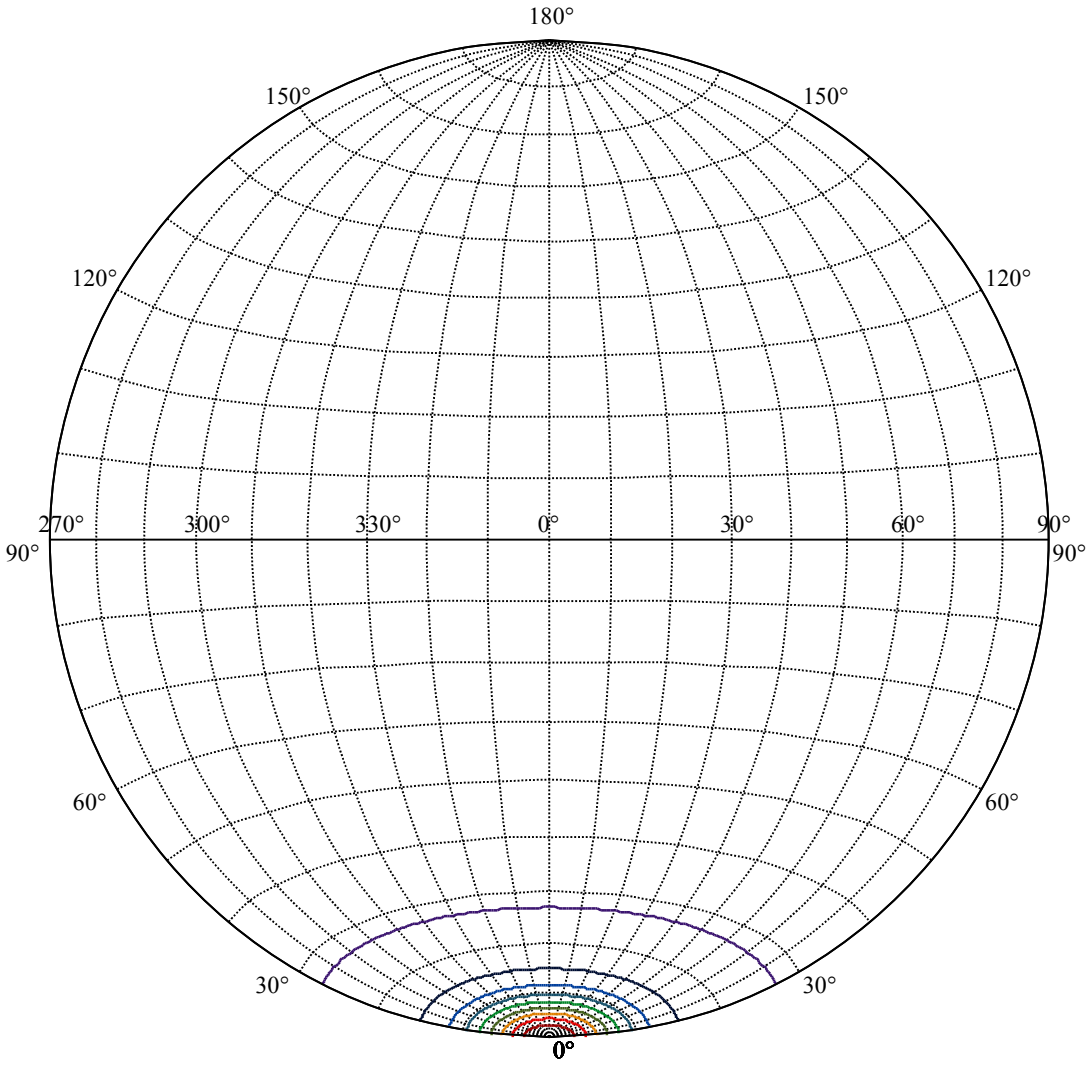
(10%Imax) 109.548
(20%Imax) 219.097
(30%Imax) 328.645
(40%Imax) 438.193
(50%Imax) 547.741
(60%Imax) 657.29
(70%Imax) 766.838
(80%Imax) 876.386
(90%Imax) 985.935

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/3
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:1095.48

(10%Imax) 109.548
(20%Imax) 219.097
(30%Imax) 328.645
(40%Imax) 438.193
(50%Imax) 547.741
(60%Imax) 657.29
(70%Imax) 766.838
(80%Imax) 876.386
(90%Imax) 985.935

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/3
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

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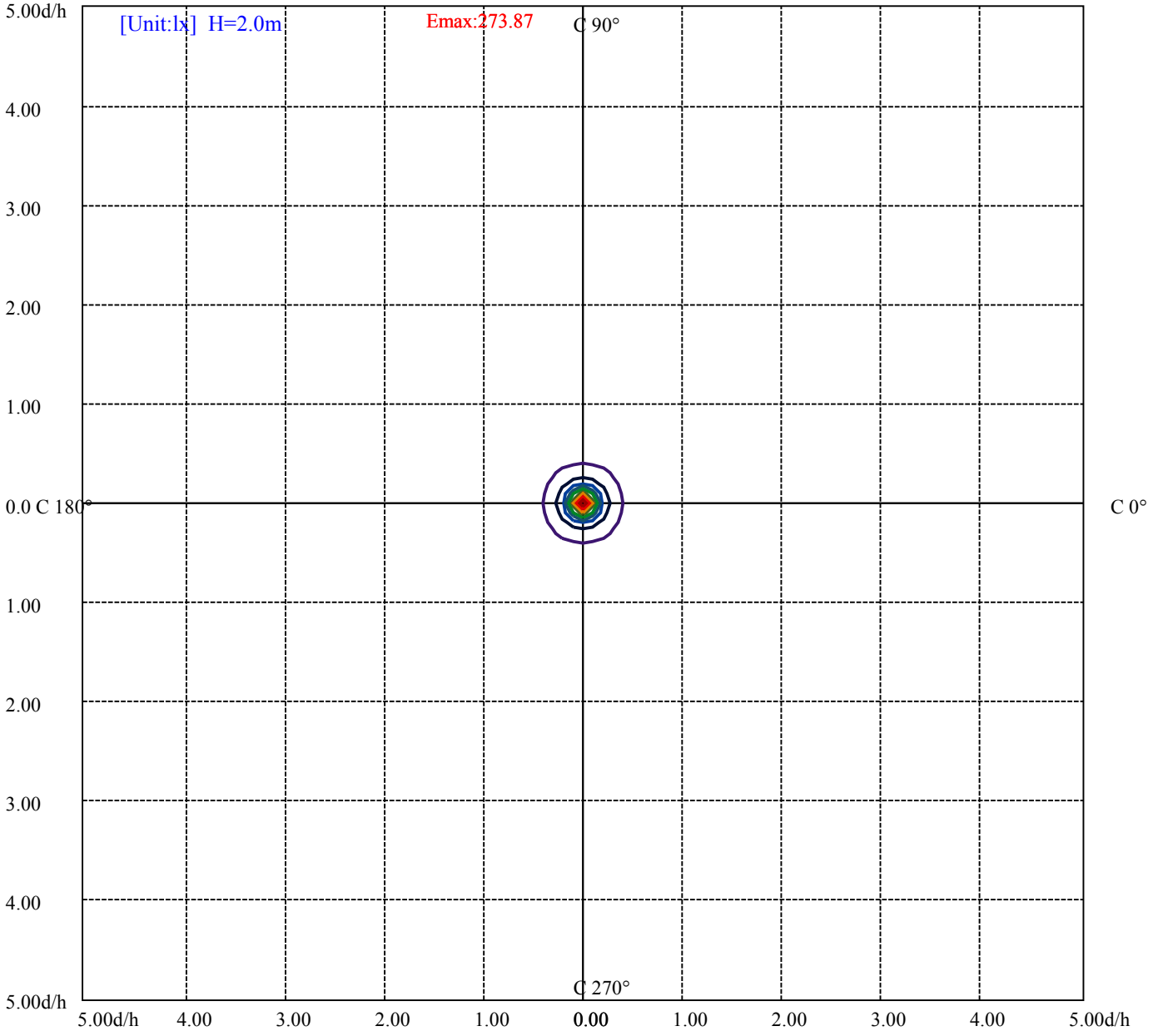
ISO illuminance diagram

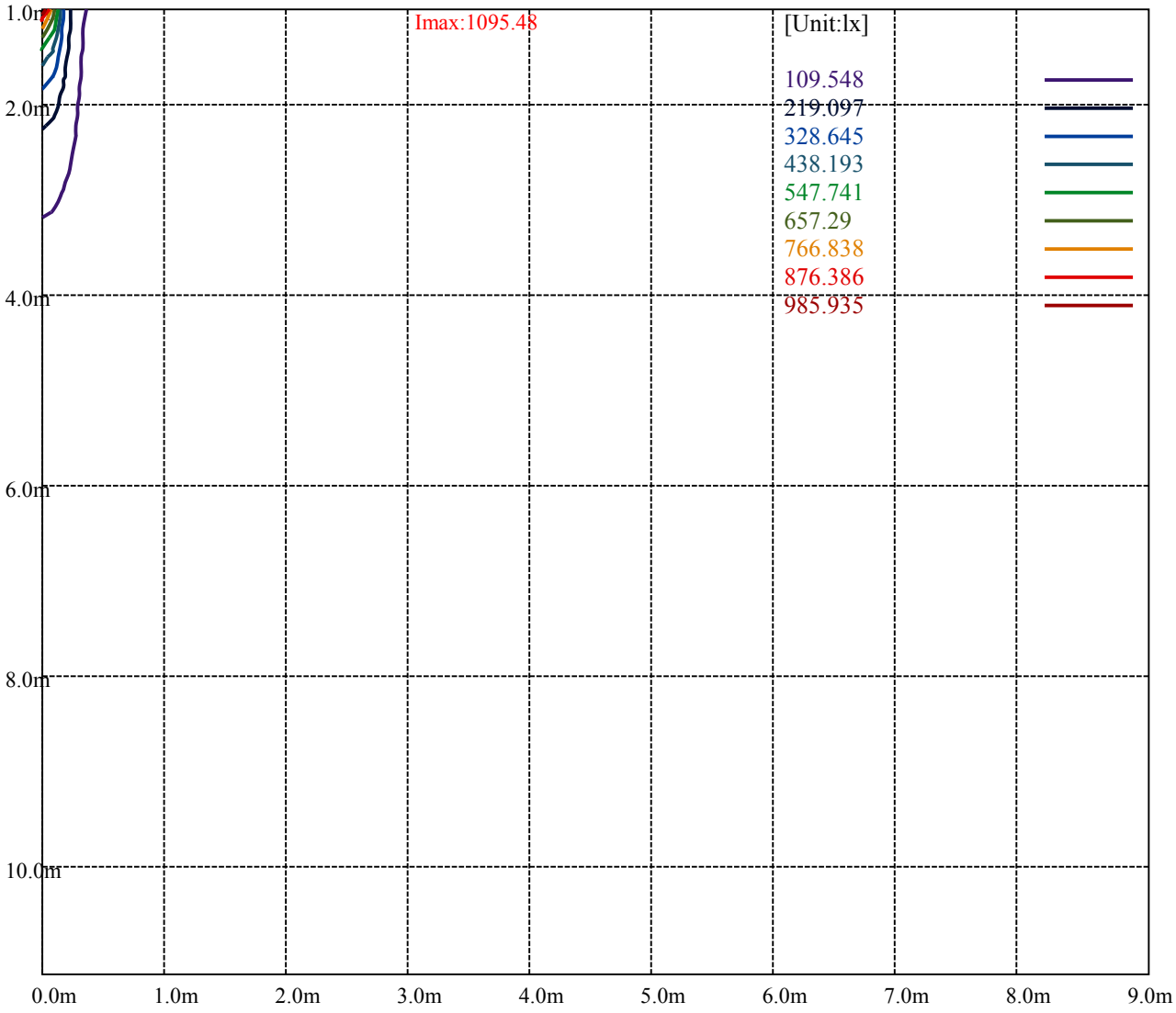


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/3
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/3
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Nata 1405-N

Luminance Limitting Curve(no luminous side)

Luminance Table

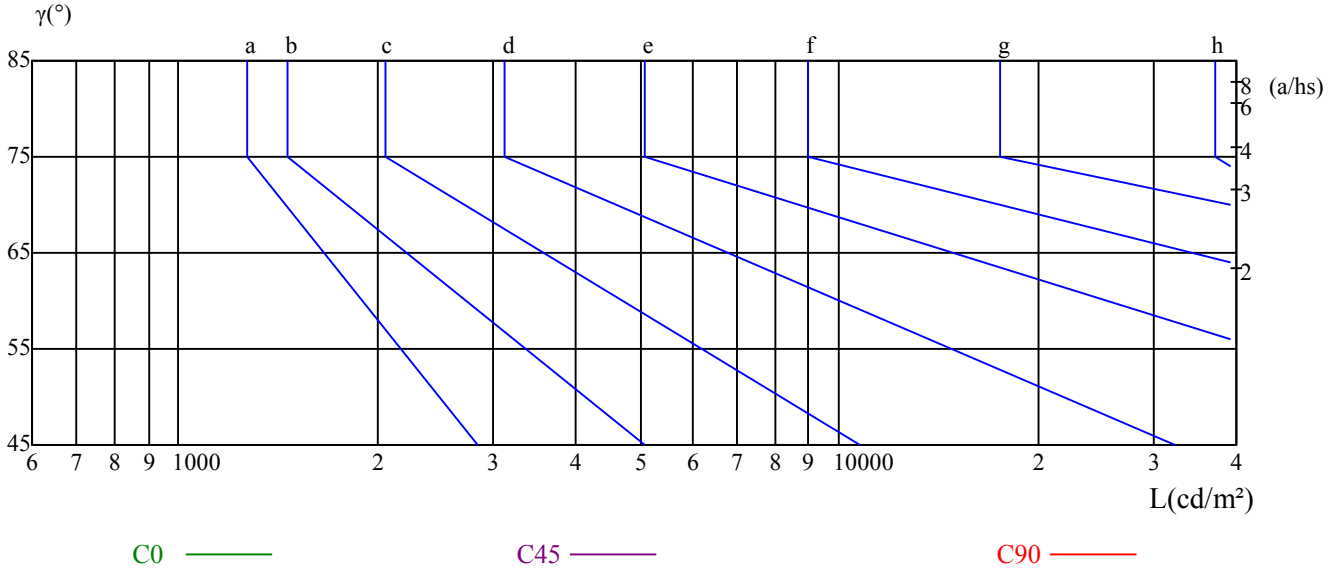
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

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

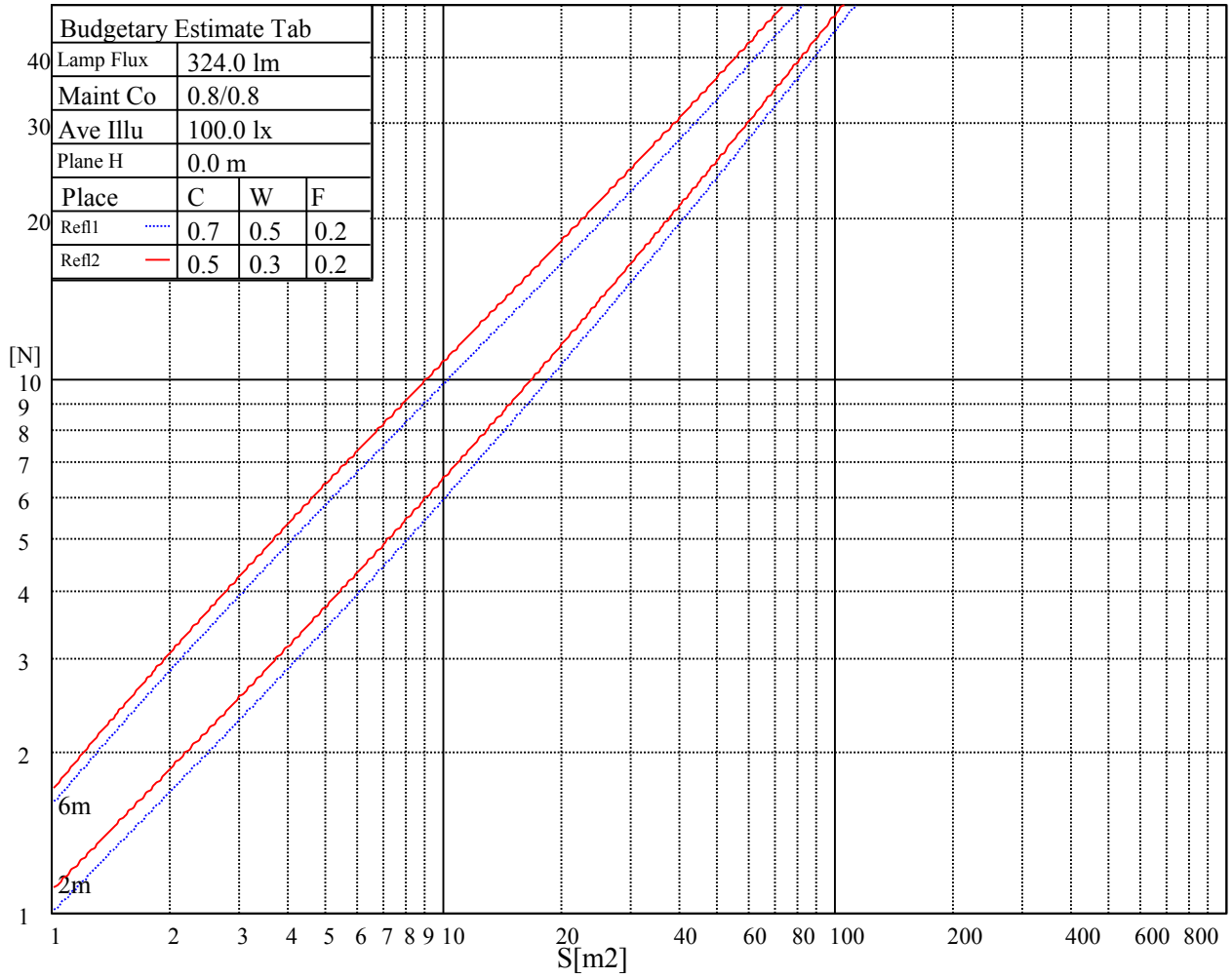
Glare Table

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

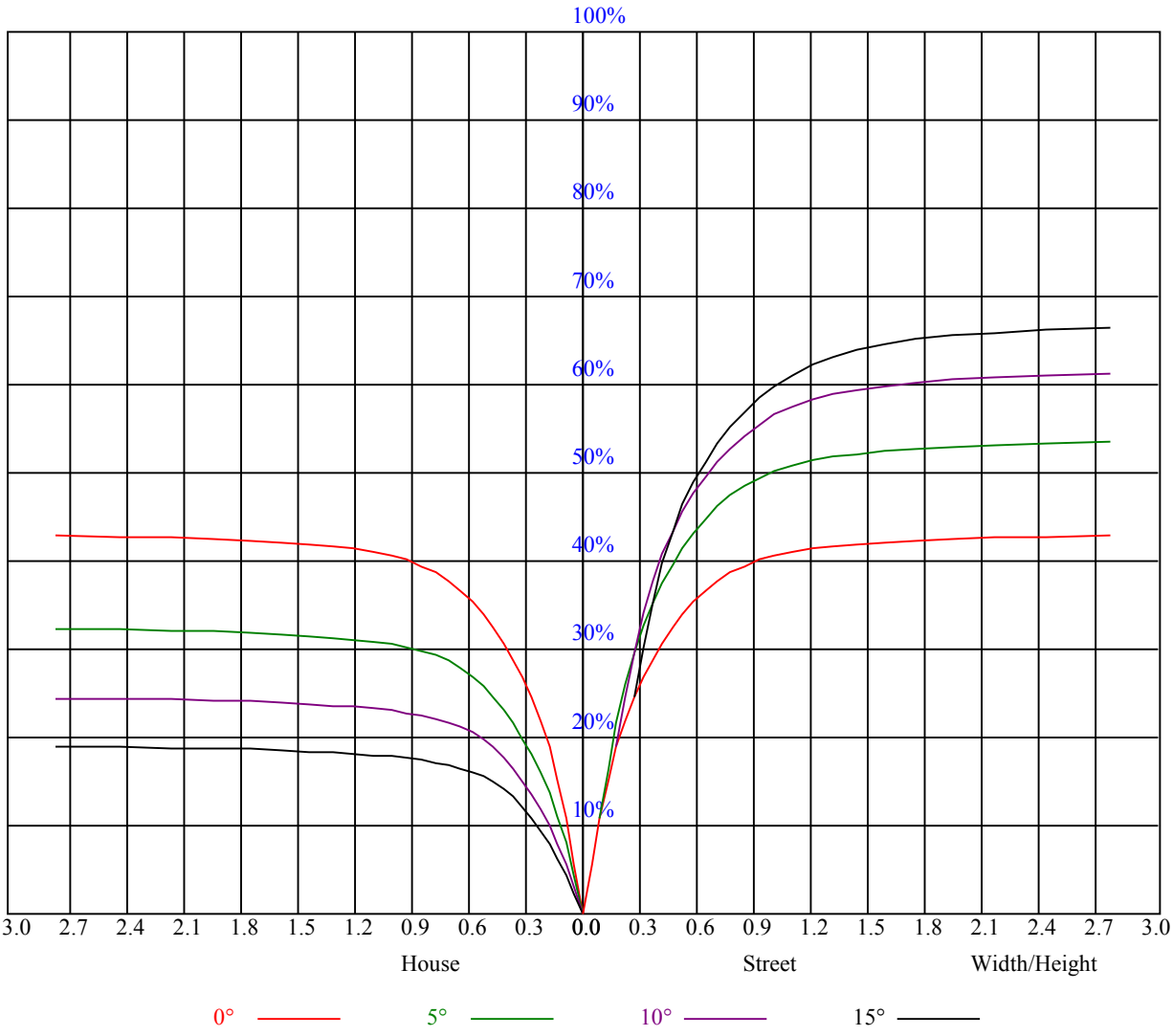


Equipment: GMS1980	Date: 2019/9/3	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

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	1.04	1.04	1.04	1.01	1.01	1.01	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.87
1	0.96	0.93	0.91	0.94	0.92	0.90	0.90	0.88	0.87	0.87	0.86	0.84	0.84	0.83	0.82	0.80
2	0.89	0.85	0.82	0.87	0.84	0.81	0.84	0.81	0.79	0.82	0.79	0.77	0.79	0.77	0.76	0.74
3	0.82	0.78	0.74	0.81	0.77	0.74	0.79	0.75	0.72	0.77	0.74	0.71	0.75	0.72	0.70	0.69
4	0.77	0.72	0.68	0.76	0.71	0.68	0.74	0.70	0.67	0.72	0.69	0.66	0.71	0.68	0.65	0.64
5	0.72	0.67	0.63	0.71	0.67	0.63	0.70	0.66	0.62	0.68	0.65	0.62	0.67	0.64	0.61	0.60
6	0.68	0.63	0.59	0.67	0.62	0.59	0.66	0.62	0.58	0.65	0.61	0.58	0.64	0.60	0.58	0.56
7	0.64	0.59	0.56	0.64	0.59	0.55	0.63	0.58	0.55	0.62	0.58	0.55	0.61	0.57	0.55	0.53
8	0.61	0.56	0.53	0.61	0.56	0.52	0.60	0.55	0.52	0.59	0.55	0.52	0.58	0.54	0.52	0.51
9	0.58	0.53	0.50	0.58	0.53	0.50	0.57	0.53	0.50	0.56	0.52	0.49	0.56	0.52	0.49	0.48
10	0.56	0.51	0.48	0.55	0.51	0.47	0.55	0.50	0.47	0.54	0.50	0.47	0.53	0.50	0.47	0.46

Coefficient Utilization Curve



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/3
Humidity(%): 65.0%

Operator: NT07
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	1091.70	1103.85	1086.47	1045.74	979.54	895.61	813.66	720.00	639.79
45.0	1094.23	1101.54	1081.58	1032.13	971.55	884.08	788.06	696.43	610.31
90.0	1097.66	1084.33	1038.83	968.29	888.24	788.85	696.71	594.34	501.64
135.0	1098.34	1089.79	1032.75	969.47	900.79	793.80	690.98	613.41	513.17
180.0	1091.70	1054.86	998.61	908.16	826.26	739.41	632.03	551.98	478.58
225.0	1094.23	1060.48	1006.48	931.95	844.99	760.89	677.98	580.05	509.23
270.0	1097.66	1087.54	1047.49	983.36	910.74	810.00	728.04	649.52	574.71
315.0	1098.34	1087.71	1045.24	980.04	908.61	818.10	727.59	650.03	567.51
360.0	1091.70	1103.85	1086.47	1045.74	979.54	895.61	813.66	720.00	639.79

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	555.98	478.91	419.74	368.78	314.49	279.00	249.64	219.99	201.09
45.0	512.38	442.58	381.94	320.46	281.76	250.20	224.66	199.80	183.54
90.0	430.26	363.21	310.22	272.81	243.39	214.26	196.43	182.19	169.14
135.0	436.44	383.91	321.64	282.43	247.84	219.83	200.70	185.40	169.43
180.0	401.23	349.37	307.41	268.54	240.69	215.33	194.85	180.84	168.75
225.0	444.99	376.82	330.24	292.33	256.95	228.88	208.41	189.56	174.38
270.0	492.58	433.01	381.54	331.99	291.15	260.94	232.93	209.76	192.88
315.0	502.03	435.60	384.98	335.42	294.53	260.44	235.35	214.20	194.57
360.0	555.98	478.91	419.74	368.78	314.49	279.00	249.64	219.99	201.09

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	185.57	171.90	160.65	152.38	144.28	138.21	131.63	126.06	121.16
45.0	170.16	160.37	150.58	142.76	136.97	131.68	125.38	120.88	116.89
90.0	158.40	149.91	140.91	134.27	128.31	122.29	117.56	112.95	108.79
135.0	159.41	151.26	141.64	135.23	130.05	124.03	119.03	114.81	110.64
180.0	156.43	148.33	141.69	134.04	128.48	123.41	118.35	113.74	109.97
225.0	163.46	153.17	145.69	137.87	131.79	126.28	121.61	116.44	112.61
270.0	177.36	166.05	155.31	145.97	138.94	132.30	126.45	121.50	117.23
315.0	178.43	166.95	156.99	146.93	139.84	133.43	126.45	121.28	116.49
360.0	185.57	171.90	160.65	152.38	144.28	138.21	131.63	126.06	121.16

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	115.99	111.43	107.55	103.67	99.00	95.23	91.46	86.68	82.69
45.0	112.16	108.51	105.02	101.48	96.81	93.60	90.11	85.28	81.17
90.0	105.13	101.81	97.76	94.84	91.86	88.14	84.94	81.73	77.74
135.0	106.93	103.05	99.11	96.08	92.64	88.93	85.89	82.58	78.24
180.0	105.36	102.49	98.66	94.44	91.46	87.81	83.70	80.66	76.89
225.0	108.73	104.96	101.14	97.82	93.83	90.06	86.34	81.96	77.91
270.0	111.38	107.33	104.18	99.51	95.29	92.14	87.41	83.48	79.48
315.0	111.83	107.16	103.33	99.06	95.18	90.28	86.34	82.41	77.79
360.0	115.99	111.43	107.55	103.67	99.00	95.23	91.46	86.68	82.69

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	78.53	73.80	68.63	63.96	58.89	54.45	49.61	44.83	40.84
45.0	76.56	72.11	67.11	62.49	57.21	52.48	47.42	42.47	38.48
90.0	73.41	69.36	64.18	59.06	54.39	49.05	44.38	39.38	34.93
135.0	74.19	69.86	64.52	59.01	54.00	48.26	42.75	38.08	33.47
180.0	71.33	67.50	62.94	57.60	52.14	47.36	42.19	37.24	33.41
225.0	73.07	67.84	63.34	57.94	52.76	48.15	43.59	38.42	34.71
270.0	74.25	69.75	65.31	59.68	55.18	50.79	45.51	41.46	37.69
315.0	73.18	68.96	64.58	59.12	54.90	50.63	45.84	41.40	37.63
360.0	78.53	73.80	68.63	63.96	58.89	54.45	49.61	44.83	40.84

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	37.13	32.91	29.87	27.00	23.85	21.66	19.74	18.11	16.31
45.0	34.26	30.49	27.56	25.20	21.99	19.97	18.39	16.48	14.96
90.0	31.22	27.96	24.41	21.94	19.80	17.61	16.03	14.74	13.44
135.0	29.76	26.10	23.12	20.76	18.79	16.71	15.30	14.06	12.77
180.0	29.53	26.49	23.51	20.93	18.96	16.99	15.47	14.23	13.11
225.0	31.11	27.62	24.58	22.22	19.91	17.94	16.43	14.96	13.84
270.0	33.30	30.09	27.28	24.41	21.88	19.80	17.94	16.48	15.08
315.0	33.75	30.21	27.39	24.58	22.39	20.14	18.17	16.76	15.41
360.0	37.13	32.91	29.87	27.00	23.85	21.66	19.74	18.11	16.31

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	15.08	13.89	12.83	11.98	11.19	10.52	9.90	9.39	8.83
45.0	13.78	12.71	11.81	11.14	10.29	9.79	9.28	8.66	8.33
90.0	12.38	11.59	10.74	10.18	9.56	9.00	8.61	8.21	7.76
135.0	11.93	11.19	10.46	9.84	9.34	8.89	8.55	8.10	7.71
180.0	11.98	11.25	10.58	10.01	9.39	8.94	8.49	8.04	7.71
225.0	12.77	11.81	11.08	10.41	9.73	9.23	8.78	8.27	7.88
270.0	13.78	12.88	11.93	11.08	10.41	9.90	9.23	8.72	8.33
315.0	14.01	13.05	12.15	11.25	10.58	10.01	9.39	8.89	8.44
360.0	15.08	13.89	12.83	11.98	11.19	10.52	9.90	9.39	8.83

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	8.44	7.99	7.59	7.31	6.98	6.64	6.36	6.13	5.79
45.0	7.88	7.48	7.14	6.86	6.53	6.24	5.96	5.74	5.46
90.0	7.48	7.14	6.81	6.53	6.24	6.02	5.74	5.51	5.23
135.0	7.43	7.09	6.75	6.53	6.24	5.96	5.74	5.51	5.23
180.0	7.43	7.03	6.69	6.47	6.19	5.91	5.68	5.40	5.18
225.0	7.59	7.20	6.86	6.58	6.30	6.08	5.74	5.46	5.29
270.0	7.93	7.48	7.14	6.86	6.53	6.24	5.96	5.68	5.40
315.0	8.04	7.65	7.31	6.98	6.69	6.36	6.08	5.85	5.57
360.0	8.44	7.99	7.59	7.31	6.98	6.64	6.36	6.13	5.79

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	5.51	5.29	5.01	4.73	4.56	4.22	3.99	3.71	3.49
45.0	5.23	4.95	4.73	4.50	4.22	4.05	3.71	3.54	3.32
90.0	5.01	4.78	4.56	4.33	4.05	3.83	3.60	3.38	3.09
135.0	5.01	4.78	4.56	4.28	4.05	3.83	3.54	3.32	3.04
180.0	4.95	4.67	4.44	4.22	3.94	3.71	3.49	3.21	2.98
225.0	5.01	4.73	4.50	4.28	3.99	3.83	3.60	3.38	3.09
270.0	5.18	4.89	4.67	4.39	4.16	3.99	3.71	3.49	3.26
315.0	5.29	5.06	4.84	4.56	4.33	4.11	3.83	3.60	3.38
360.0	5.51	5.29	5.01	4.73	4.56	4.22	3.99	3.71	3.49

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	3.26	3.04	2.81	2.59	2.31	2.08	1.86	1.63	1.41
45.0	3.04	2.81	2.59	2.36	2.19	1.97	1.69	1.46	1.29
90.0	2.87	2.70	2.48	2.19	1.97	1.74	1.52	1.35	1.18
135.0	2.81	2.64	2.42	2.14	1.91	1.69	1.46	1.24	1.13
180.0	2.76	2.53	2.31	2.03	1.80	1.58	1.35	1.18	1.13
225.0	2.93	2.64	2.42	2.19	1.97	1.74	1.52	1.35	1.18
270.0	3.04	2.81	2.59	2.36	2.14	1.91	1.69	1.46	1.35
315.0	3.15	2.93	2.70	2.48	2.25	2.03	1.80	1.58	1.35
360.0	3.26	3.04	2.81	2.59	2.31	2.08	1.86	1.63	1.41

Intensity data(cd)

C/γ(°)	90.0
0.0	1.24
45.0	1.13
90.0	1.24
135.0	1.18
180.0	1.18
225.0	1.13
270.0	1.18
315.0	1.18
360.0	1.24