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Nata

LumCAT: 3-2438-A
Luminaire: 92.70.153.00

Report No: NATA0100	Voltage(V): 34.2700
Test No: GC2019111403	Current(A): 0.3220
LampCAT: PHILIPS SLM92757 TWL112024 CT	Power (W): 11.0300
Lamp flux(lm): 1022.0	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): 848.18
Efficiency(%): 82.99%
Lumens(lm)/Power(W): 76.90
Central intensity(cd): 2988.000
Maximum intensity(cd): 2988.000
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=59.3
[C90/270]Total=59.3
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(%): 82.99%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.940%

Equipment: GMS1980	Date: 2019/11/14	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	2988.000	0.000	0	.000%	.000%
1.0	2974.641	2.853	2.853	.279%	.336%
2.0	2937.727	8.486	11.339	.830%	1.337%
3.0	2870.578	13.892	25.231	1.359%	2.975%
4.0	2785.078	18.931	44.162	1.852%	5.207%
5.0	2680.102	23.511	67.673	2.300%	7.979%
6.0	2535.961	27.412	95.085	2.682%	11.210%
7.0	2388.375	30.565	125.65	2.991%	14.814%
8.0	2238.328	33.112	158.762	3.240%	18.718%
9.0	2056.359	34.806	193.568	3.406%	22.822%
10.0	1872.070	35.551	229.119	3.479%	27.013%
11.0	1704.656	35.739	264.858	3.497%	31.227%
12.0	1529.719	35.356	300.214	3.460%	35.395%
13.0	1327.191	33.904	334.119	3.317%	39.392%
14.0	1177.868	32.065	366.183	3.137%	43.173%
15.0	1051.882	30.611	396.794	2.995%	46.782%
16.0	916.657	28.845	425.639	2.822%	50.182%
17.0	801.309	26.753	452.392	2.618%	53.337%
18.0	703.491	24.811	477.203	2.428%	56.262%
19.0	620.473	23.034	500.237	2.254%	58.978%
20.0	555.321	21.520	521.758	2.106%	61.515%
21.0	499.718	20.259	542.017	1.982%	63.903%
22.0	456.244	19.210	561.227	1.880%	66.168%
23.0	422.557	18.440	579.667	1.804%	68.342%
24.0	391.584	17.800	597.467	1.742%	70.441%
25.0	367.439	17.259	614.725	1.689%	72.476%
26.0	349.383	16.921	631.646	1.656%	74.471%
27.0	333.359	16.703	648.349	1.634%	76.440%
28.0	317.749	16.485	664.834	1.613%	78.383%
29.0	306.548	16.333	681.167	1.598%	80.309%
30.0	294.799	16.236	697.404	1.589%	82.223%
31.0	281.363	16.034	713.437	1.569%	84.114%
32.0	263.081	15.598	729.035	1.526%	85.953%
33.0	241.509	14.865	743.9	1.455%	87.705%
34.0	214.945	13.814	757.714	1.352%	89.334%
35.0	185.358	12.432	770.146	1.216%	90.800%
36.0	157.535	10.918	781.064	1.068%	92.087%
37.0	127.962	9.311	790.375	.911%	93.185%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	102.319	7.686	798.062	.752%	94.091%
39.0	78.659	6.177	804.239	.604%	94.819%
40.0	59.217	4.809	809.047	.471%	95.386%
41.0	45.394	3.725	812.773	.364%	95.825%
42.0	34.959	2.919	815.692	.286%	96.169%
43.0	26.445	2.275	817.967	.223%	96.438%
44.0	20.820	1.784	819.75	.175%	96.648%
45.0	16.439	1.432	821.182	.140%	96.817%
46.0	12.396	1.128	822.31	.110%	96.950%
47.0	9.780	0.882	823.192	.086%	97.054%
48.0	8.107	0.723	823.915	.071%	97.139%
49.0	7.066	0.623	824.538	.061%	97.212%
50.0	6.602	0.570	825.108	.056%	97.280%
51.0	6.427	0.551	825.659	.054%	97.345%
52.0	6.349	0.548	826.208	.054%	97.409%
53.0	6.321	0.551	826.759	.054%	97.474%
54.0	6.265	0.555	827.313	.054%	97.540%
55.0	6.223	0.557	827.871	.055%	97.605%
56.0	6.180	0.560	828.431	.055%	97.671%
57.0	6.152	0.564	828.995	.055%	97.738%
58.0	6.124	0.568	829.563	.056%	97.805%
59.0	6.096	0.571	830.134	.056%	97.872%
60.0	6.089	0.576	830.71	.056%	97.940%
61.0	6.047	0.579	831.289	.057%	98.008%
62.0	6.012	0.581	831.87	.057%	98.077%
63.0	6.005	0.584	832.455	.057%	98.146%
64.0	5.991	0.589	833.043	.058%	98.215%
65.0	5.970	0.592	833.635	.058%	98.285%
66.0	5.927	0.594	834.229	.058%	98.355%
67.0	5.920	0.596	834.824	.058%	98.425%
68.0	5.871	0.597	835.422	.058%	98.496%
69.0	5.857	0.598	836.02	.059%	98.566%
70.0	5.843	0.601	836.621	.059%	98.637%
71.0	5.801	0.602	837.223	.059%	98.708%
72.0	5.794	0.603	837.826	.059%	98.779%
73.0	5.745	0.603	838.429	.059%	98.850%
74.0	5.709	0.602	839.031	.059%	98.921%
75.0	5.681	0.602	839.633	.059%	98.992%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	5.639	0.601	840.234	.059%	99.063%
77.0	5.590	0.599	840.833	.059%	99.134%
78.0	5.562	0.597	841.43	.058%	99.204%
79.0	5.520	0.595	842.025	.058%	99.274%
80.0	5.477	0.593	842.618	.058%	99.344%
81.0	5.421	0.589	843.207	.058%	99.413%
82.0	5.358	0.585	843.792	.057%	99.482%
83.0	5.302	0.579	844.371	.057%	99.551%
84.0	5.203	0.572	844.943	.056%	99.618%
85.0	5.048	0.560	845.503	.055%	99.684%
86.0	4.781	0.537	846.04	.053%	99.747%
87.0	4.739	0.521	846.561	.051%	99.809%
88.0	5.034	0.535	847.097	.052%	99.872%
89.0	4.929	0.546	847.643	.053%	99.936%
90.0	4.908	0.539	848.182	.053%	100.000%

Zonal flux distribution table

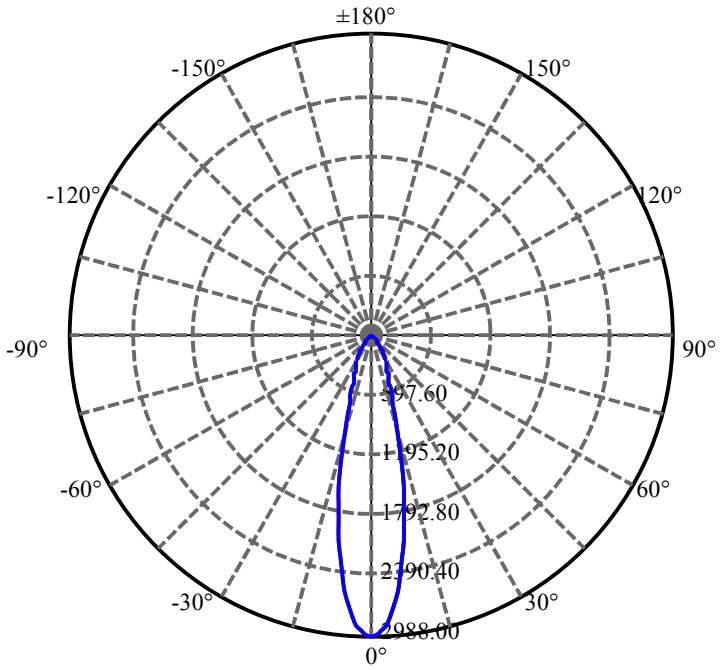
ZONAL LUMEN SUMMARY

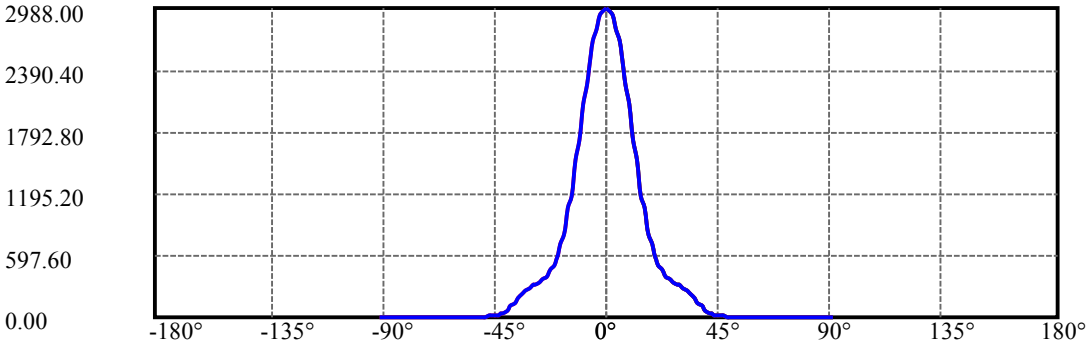
Zone	Lumens	%Lamp	%Fixt
0-30	697.40	68.24%	82.22%
0-40	809.05	79.16%	95.39%
0-60	830.71	81.28%	97.94%
0-90	847.64	82.94%	99.94%
0-120	847.64	82.94%	99.94%
0-180	848.18	82.99%	100.00%
60-90	17.51	1.71%	2.06%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-28.84	678.55	66.39%	80.00%

ZONAL LUMEN SUMMARY

0-10	229.12
10-20	292.64
20-30	175.65
30-40	111.64
40-50	16.06
50-60	5.60
60-70	5.91
70-80	6.00
80-90	5.02
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:29.7 Right:29.7
:C90/270Left:29.7 Right:29.7

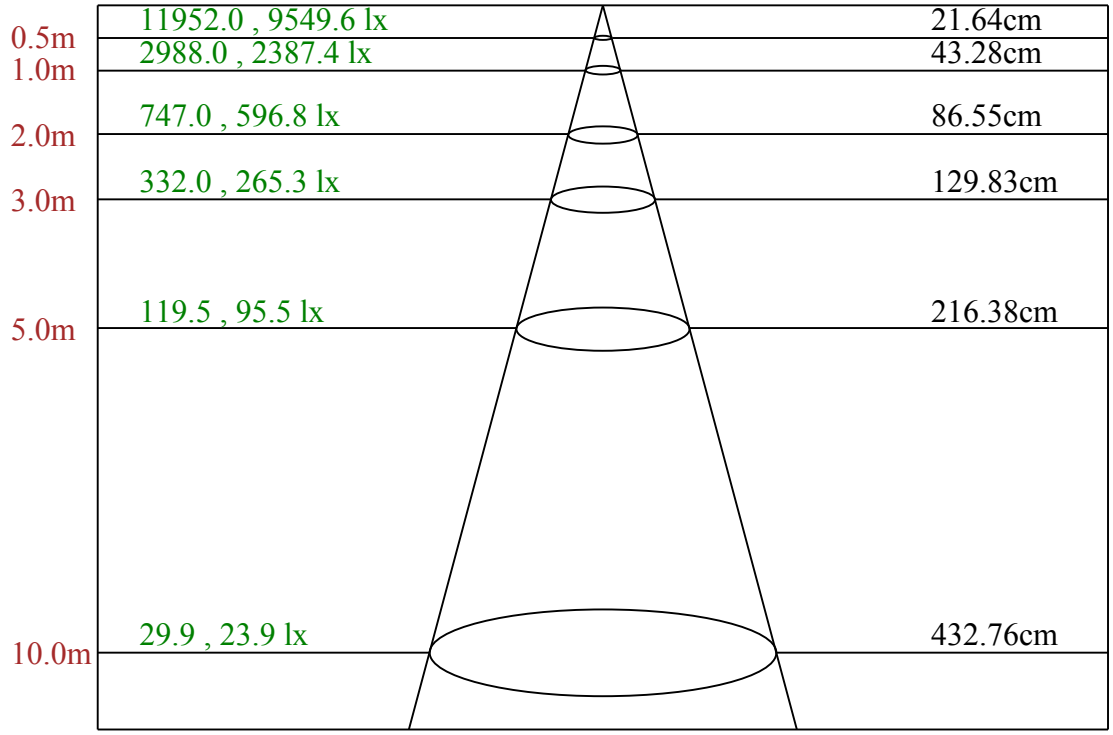
Beam Angle(50%Imax):C0/180Left:12.2 Right:12.2
:C90/270Left:12.2 Right:12.2

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

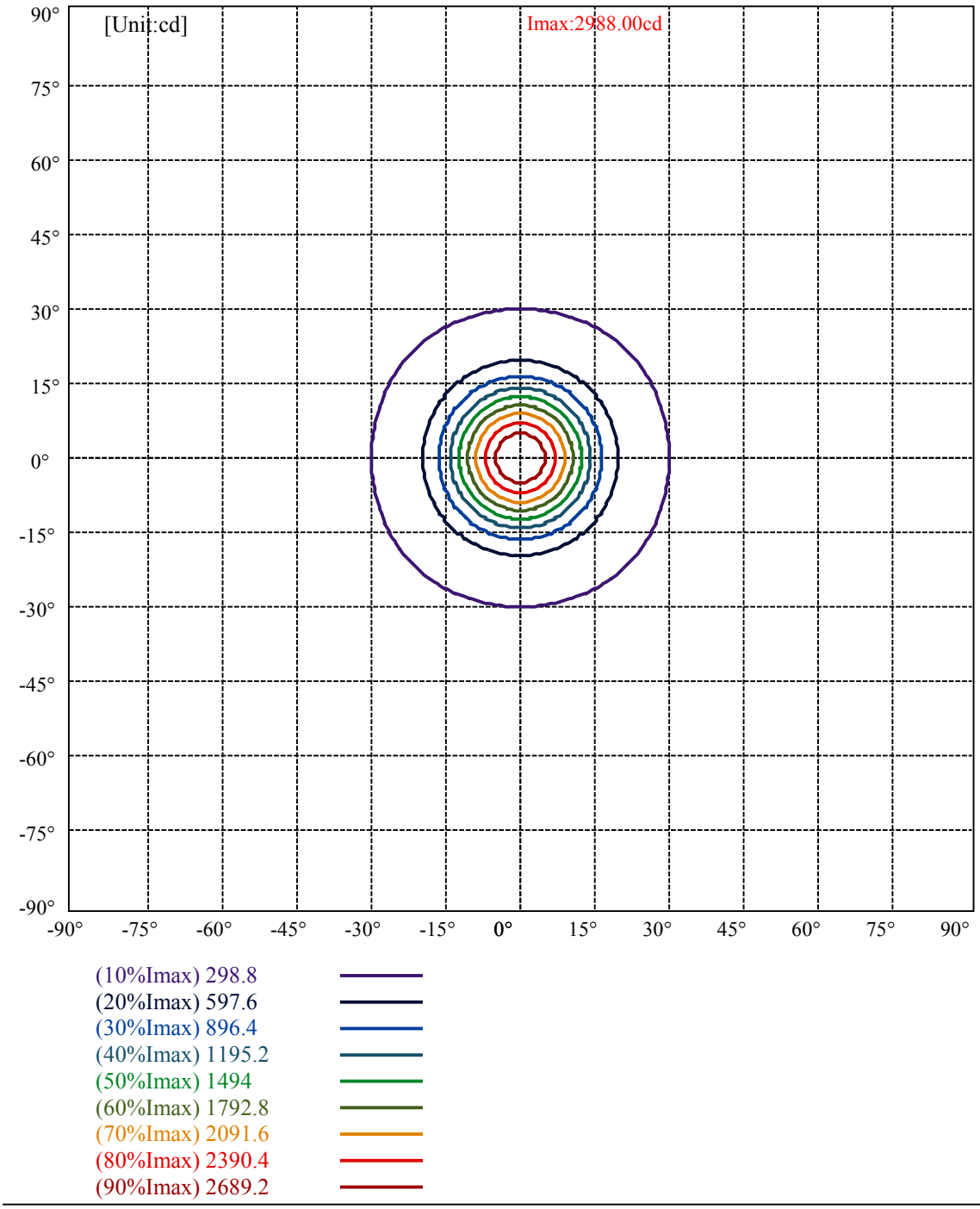
Lux distance Curve



Max , Ave

Beam angle of C0 plane 24.42

ISO-Intensity(V-H)

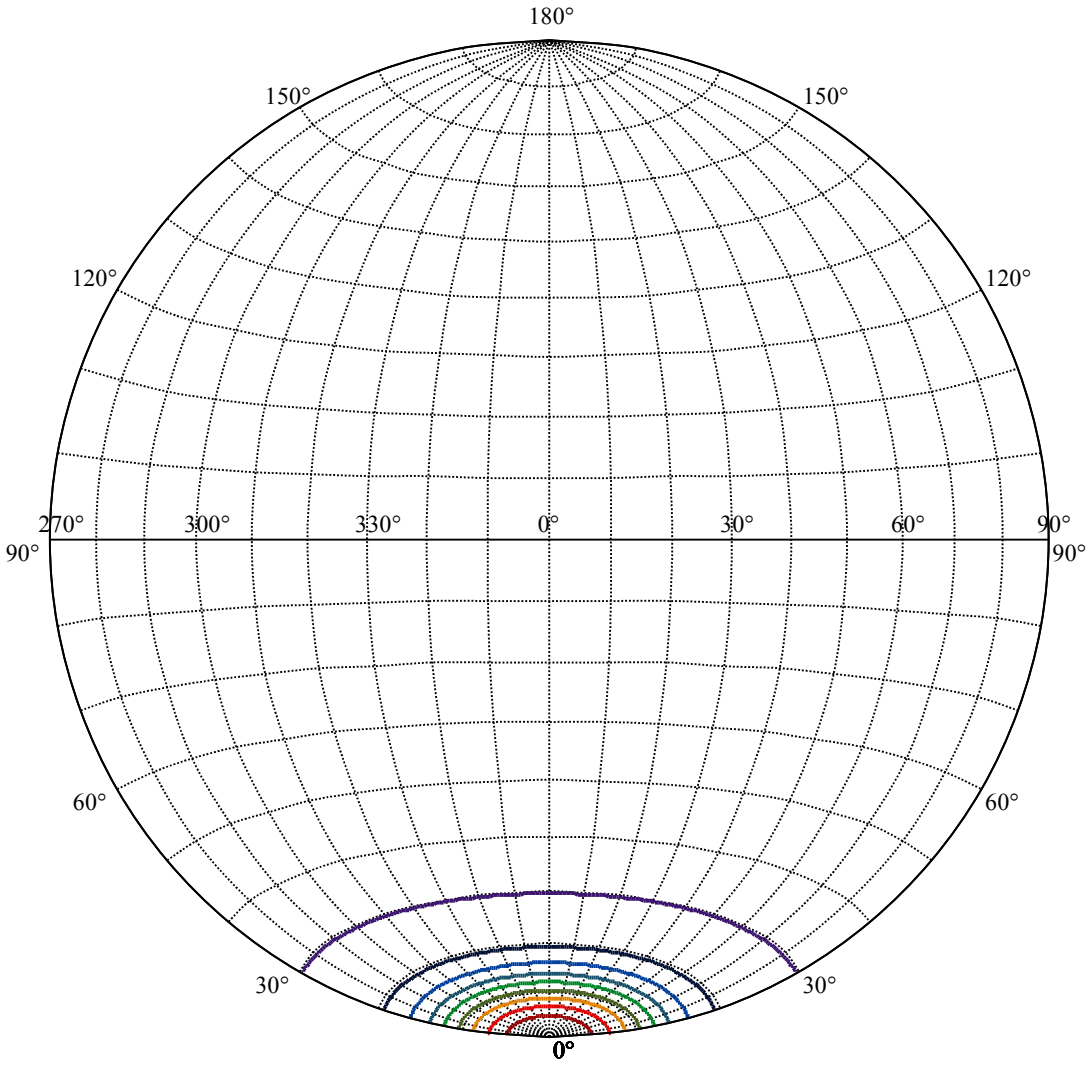


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:2988.00

(10%Imax) 298.8
(20%Imax) 597.6
(30%Imax) 896.4
(40%Imax) 1195.2
(50%Imax) 1494
(60%Imax) 1792.8
(70%Imax) 2091.6
(80%Imax) 2390.4
(90%Imax) 2689.2

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

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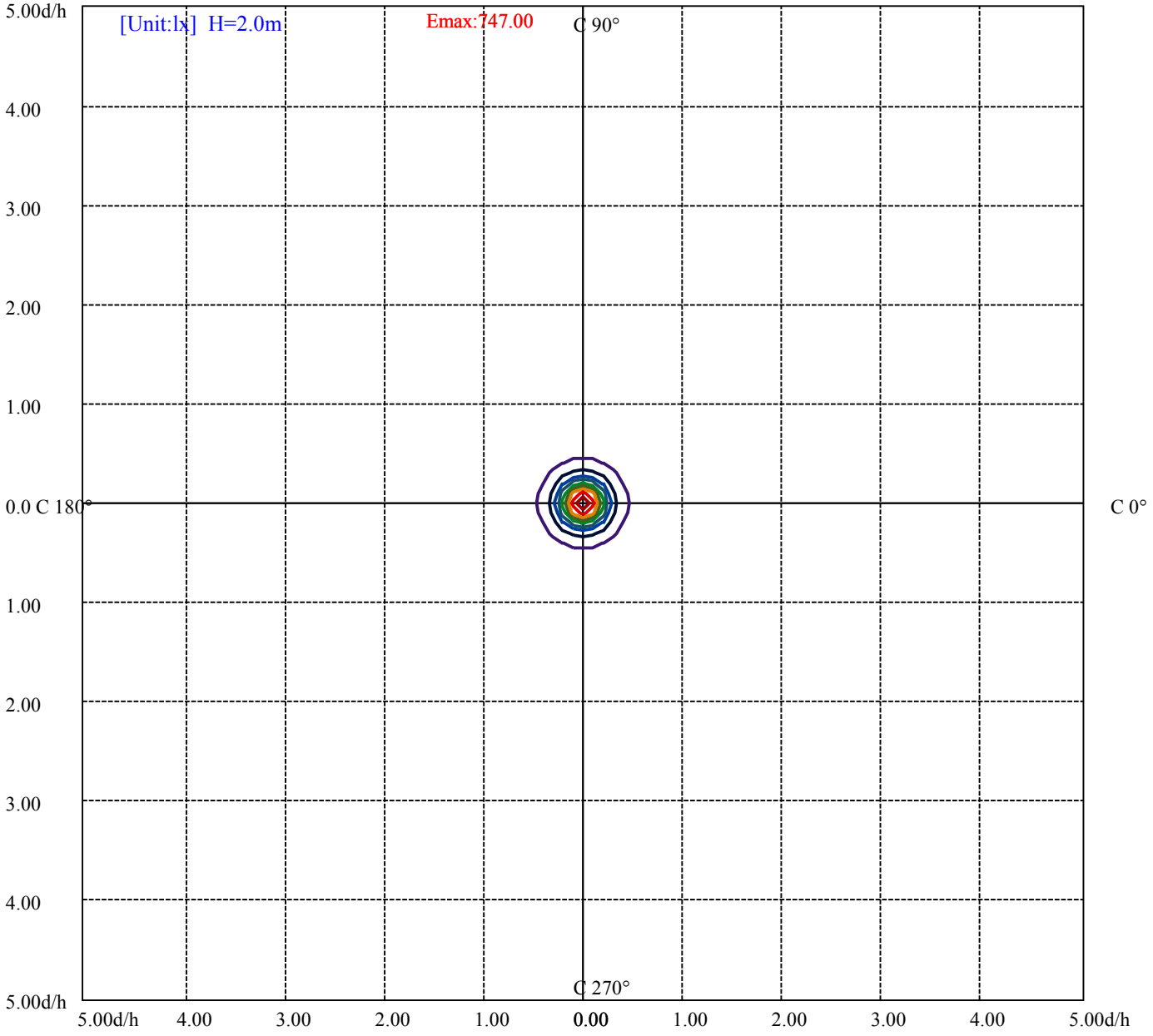
ISO illuminance diagram

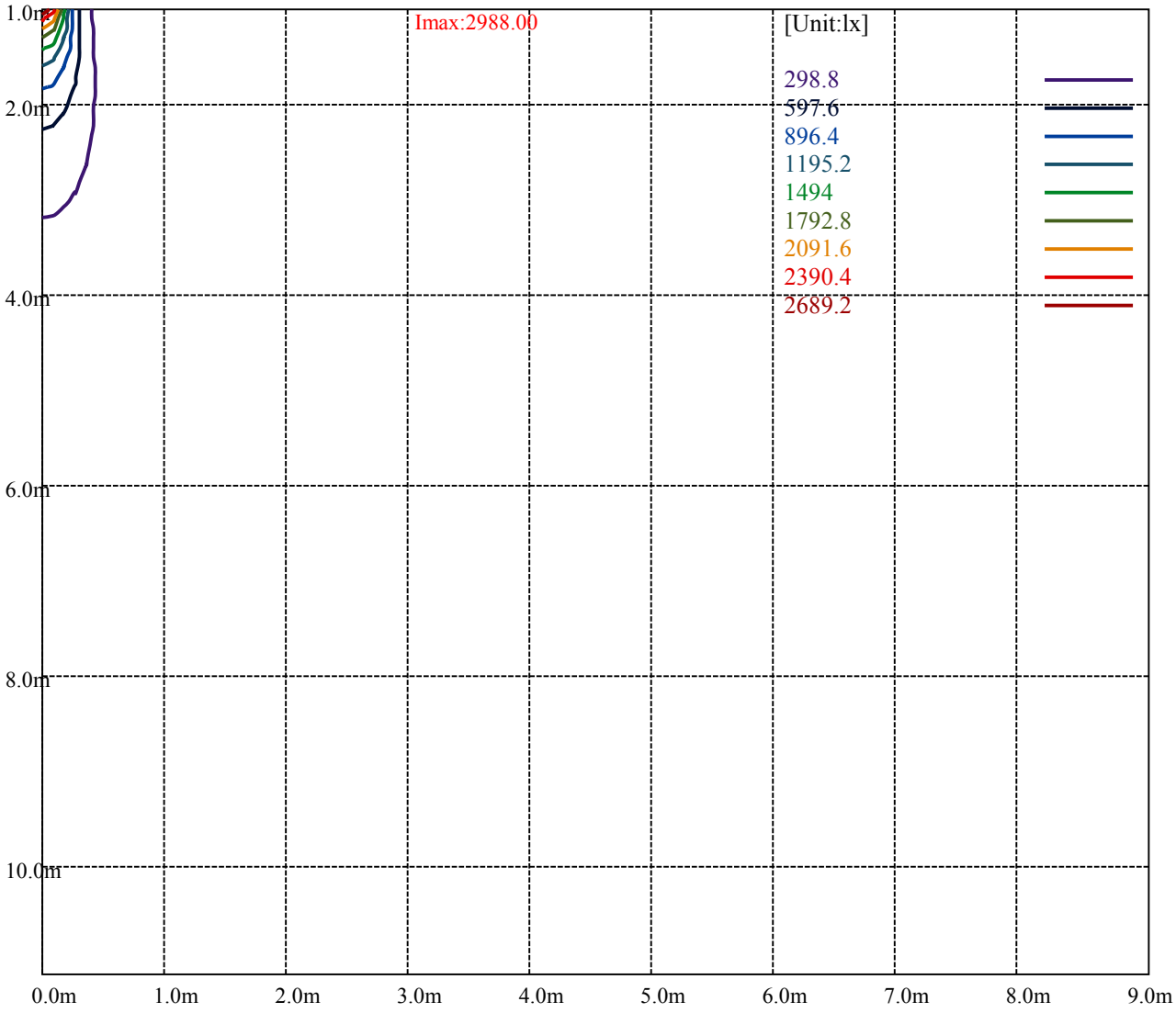


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/14
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

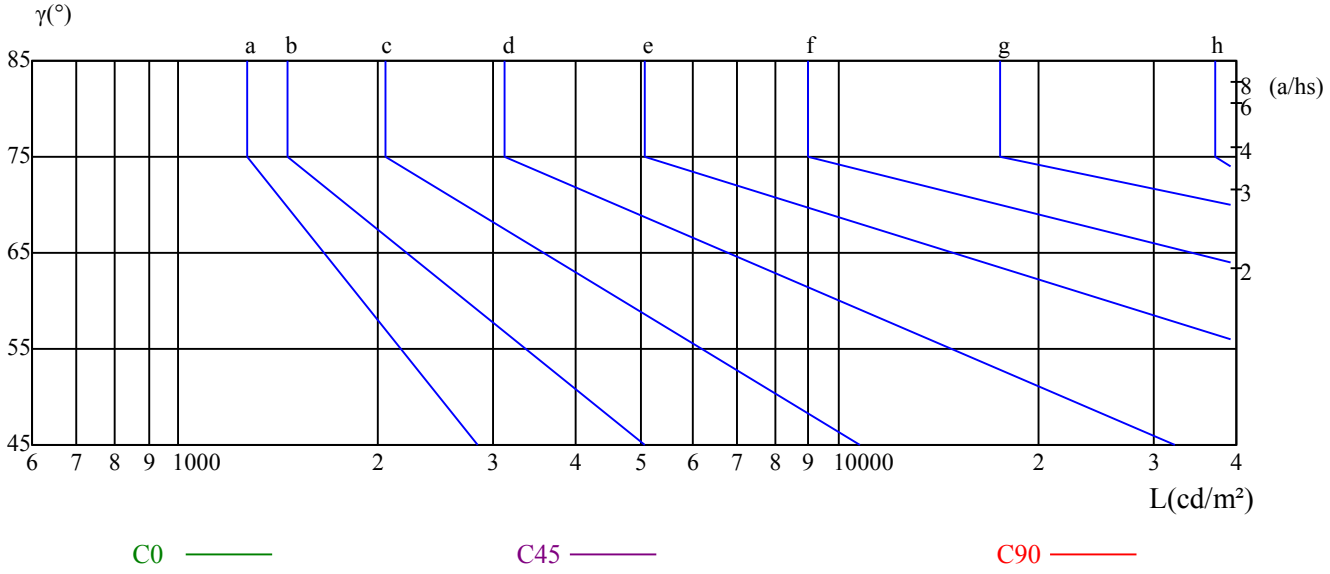
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

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

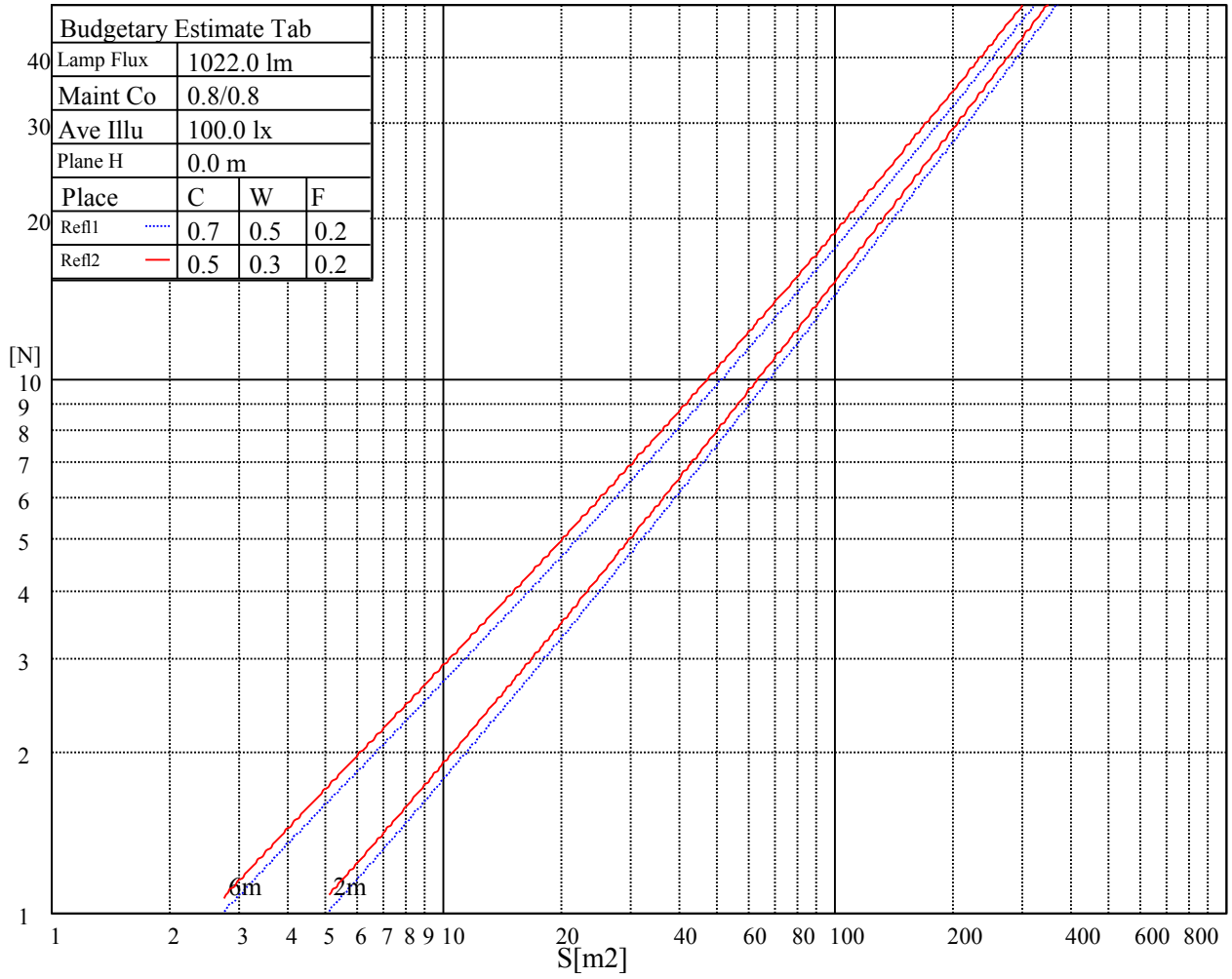
Glare Table

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

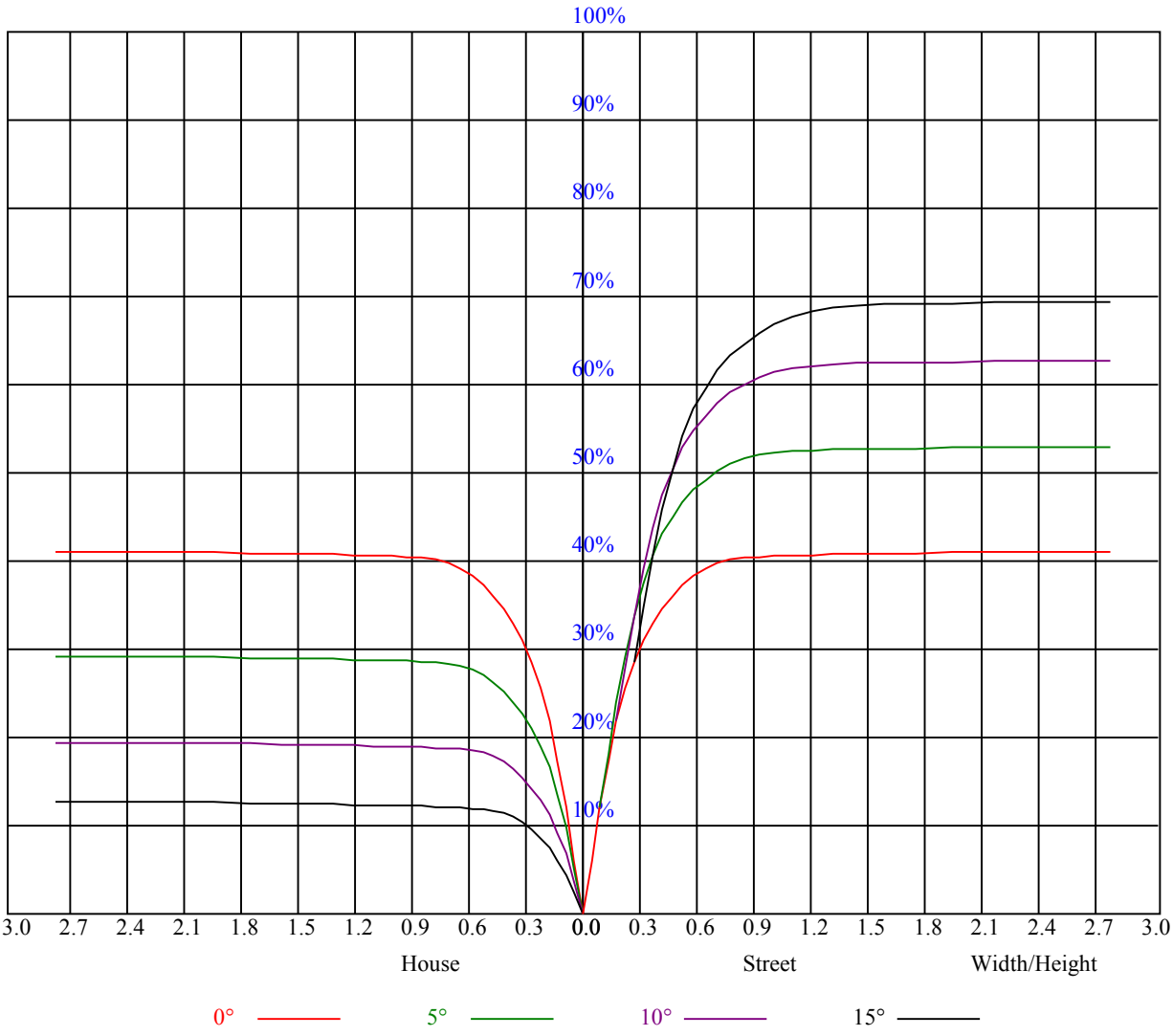


Equipment: GMS1980 Date: 2019/11/14 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

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	0.99	0.99	0.99	0.97	0.97	0.97	0.92	0.92	0.92	0.88	0.88	0.88	0.85	0.85	0.85	0.83
1	0.92	0.91	0.89	0.91	0.89	0.87	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.81	0.80	0.78
2	0.87	0.84	0.82	0.86	0.83	0.81	0.83	0.81	0.79	0.81	0.79	0.77	0.78	0.77	0.76	0.74
3	0.82	0.79	0.76	0.81	0.78	0.75	0.79	0.76	0.74	0.77	0.75	0.73	0.75	0.74	0.72	0.71
4	0.78	0.74	0.71	0.77	0.74	0.71	0.76	0.73	0.70	0.74	0.71	0.69	0.73	0.70	0.69	0.67
5	0.75	0.71	0.68	0.74	0.70	0.67	0.72	0.69	0.67	0.71	0.68	0.66	0.70	0.67	0.66	0.64
6	0.71	0.67	0.64	0.71	0.67	0.64	0.70	0.66	0.64	0.68	0.65	0.63	0.67	0.65	0.63	0.62
7	0.68	0.64	0.61	0.68	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.60	0.65	0.62	0.60	0.59
8	0.66	0.61	0.59	0.65	0.61	0.58	0.64	0.61	0.58	0.64	0.60	0.58	0.63	0.60	0.58	0.57
9	0.63	0.59	0.56	0.63	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.56	0.61	0.58	0.56	0.55
10	0.61	0.57	0.54	0.60	0.57	0.54	0.60	0.56	0.54	0.59	0.56	0.54	0.59	0.56	0.54	0.53

Coefficient Utilization Curve



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/11/14
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	2983.50	2994.75	2979.56	2935.69	2874.38	2790.56	2657.81	2535.19	2397.38
45.0	2986.88	2992.50	2967.75	2922.75	2847.94	2756.81	2629.69	2480.63	2334.38
90.0	2989.69	2971.13	2931.19	2849.63	2757.94	2646.56	2481.75	2334.94	2178.00
135.0	2991.94	2975.06	2931.19	2861.44	2776.50	2671.31	2512.13	2366.44	2214.00
180.0	2983.50	2945.25	2890.13	2805.19	2694.38	2575.69	2422.13	2252.81	2092.50
225.0	2986.88	2957.63	2908.69	2819.81	2725.88	2612.81	2450.25	2305.69	2151.00
270.0	2989.69	2979.56	2946.38	2892.94	2805.75	2689.31	2568.38	2417.06	2271.94
315.0	2991.94	2981.25	2946.94	2877.19	2797.88	2697.75	2565.56	2414.25	2267.44
360.0	2983.50	2994.75	2979.56	2935.69	2874.38	2790.56	2657.81	2535.19	2397.38

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2210.63	2051.44	1886.06	1697.63	1513.13	1353.94	1186.88	1050.19	912.38
45.0	2159.44	1973.25	1803.94	1635.75	1431.00	1276.31	1136.25	992.25	864.56
90.0	1969.31	1799.44	1632.38	1430.44	1295.44	1115.38	1002.38	871.31	769.05
135.0	2009.81	1839.94	1670.63	1503.56	1303.88	1157.06	1025.44	893.25	777.38
180.0	1924.88	1713.38	1548.00	1388.81	1111.84	1062.51	938.98	803.70	710.10
225.0	1968.19	1780.31	1613.25	1429.88	1210.50	1113.30	954.28	854.66	742.61
270.0	2098.13	1914.75	1748.81	1583.44	1383.19	1231.88	1091.81	930.94	820.69
315.0	2110.50	1904.06	1734.19	1568.25	1368.56	1112.57	1079.04	936.96	813.71
360.0	2210.63	2051.44	1886.06	1697.63	1513.13	1353.94	1186.88	1050.19	912.38

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	794.25	703.69	618.75	550.69	500.63	459.56	417.38	390.94	368.44
45.0	762.19	667.13	590.06	532.69	486.00	447.19	414.00	388.13	367.88
90.0	670.50	591.75	535.50	484.26	443.19	413.16	387.90	361.63	344.36
135.0	685.69	604.13	539.44	490.50	449.44	416.81	388.13	364.50	346.50
180.0	629.66	549.62	504.00	455.68	413.72	390.21	364.44	342.34	329.34
225.0	641.19	582.58	526.95	466.43	434.98	405.06	372.54	355.95	339.75
270.0	723.94	633.38	560.81	509.63	461.81	423.56	395.44	368.44	349.31
315.0	720.51	631.52	567.06	507.88	460.18	424.91	392.85	367.59	349.48
360.0	794.25	703.69	618.75	550.69	500.63	459.56	417.38	390.94	368.44

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	347.63	331.31	319.50	307.13	294.19	285.19	266.40	241.20	213.24
45.0	350.44	333.00	321.19	309.38	295.31	284.63	258.58	235.91	203.34
90.0	329.96	316.13	303.64	293.23	276.64	257.91	237.15	209.19	182.03
135.0	333.56	316.13	304.88	293.63	284.06	256.22	235.01	208.86	177.08
180.0	316.58	300.88	291.09	279.06	262.86	241.54	218.31	189.73	160.09
225.0	324.06	310.61	300.15	286.43	272.31	252.56	227.42	201.38	170.16
270.0	330.75	316.13	305.44	294.75	284.63	262.80	244.69	215.94	190.07
315.0	333.90	317.81	306.51	294.81	280.91	263.81	244.52	217.35	186.86
360.0	347.63	331.31	319.50	307.13	294.19	285.19	266.40	241.20	213.24

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	189.39	154.69	127.18	101.76	74.87	58.16	45.28	33.47	26.55
45.0	174.83	146.31	116.27	90.00	72.28	51.98	39.09	30.60	23.12
90.0	151.09	121.50	97.71	76.73	55.35	42.64	33.19	24.41	19.07
135.0	150.47	121.16	97.43	74.19	55.52	42.69	32.34	24.75	19.58
180.0	133.71	105.69	83.64	62.94	46.97	36.56	28.86	21.60	17.21
225.0	138.77	113.01	89.16	64.29	49.67	38.64	29.59	22.84	18.23
270.0	163.01	132.69	103.67	80.83	60.13	46.58	35.38	27.11	21.54
315.0	159.02	128.64	103.50	78.53	58.95	45.90	35.94	26.78	21.26
360.0	189.39	154.69	127.18	101.76	74.87	58.16	45.28	33.47	26.55

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	21.04	15.69	12.26	9.68	7.88	7.03	6.64	6.53	6.47
45.0	18.17	13.84	10.58	8.44	7.31	6.58	6.36	6.30	6.24
90.0	14.96	11.42	8.78	7.43	6.64	6.24	6.19	6.13	6.13
135.0	15.53	11.48	9.11	7.65	6.75	6.41	6.30	6.24	6.24
180.0	13.61	10.18	8.33	7.31	6.75	6.53	6.47	6.36	6.36
225.0	14.51	10.86	8.72	7.59	6.86	6.53	6.41	6.36	6.36
270.0	16.76	13.05	10.41	8.49	7.20	6.75	6.53	6.41	6.36
315.0	16.93	12.66	10.07	8.27	7.14	6.75	6.53	6.47	6.41
360.0	21.04	15.69	12.26	9.68	7.88	7.03	6.64	6.53	6.47

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	6.41	6.36	6.30	6.24	6.24	6.19	6.19	6.13	6.08
45.0	6.19	6.13	6.13	6.08	6.08	6.02	6.02	5.96	5.91
90.0	6.08	6.02	5.96	5.96	5.91	5.91	5.91	5.85	5.79
135.0	6.19	6.19	6.13	6.08	6.08	6.02	6.02	5.96	5.96
180.0	6.30	6.24	6.24	6.19	6.13	6.13	6.13	6.08	6.08
225.0	6.30	6.19	6.19	6.19	6.19	6.13	6.13	6.08	6.08
270.0	6.30	6.30	6.24	6.24	6.19	6.19	6.13	6.13	6.08
315.0	6.36	6.36	6.24	6.24	6.19	6.19	6.19	6.19	6.13
360.0	6.41	6.36	6.30	6.24	6.24	6.19	6.19	6.13	6.08

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	6.08	6.08	6.02	6.02	6.02	5.96	5.96	5.96	5.91
45.0	5.91	5.91	5.91	5.85	5.85	5.79	5.79	5.74	5.68
90.0	5.85	5.79	5.79	5.74	5.74	5.68	5.63	5.63	5.63
135.0	5.91	5.96	5.91	5.85	5.85	5.85	5.79	5.79	5.74
180.0	6.08	6.02	6.02	5.96	5.96	5.91	5.91	5.91	5.85
225.0	6.02	6.02	6.02	5.96	5.96	5.91	5.91	5.91	5.85
270.0	6.08	6.02	6.02	6.02	5.96	5.91	5.91	5.85	5.85
315.0	6.13	6.13	6.08	6.02	6.02	5.96	5.96	5.96	5.91
360.0	6.08	6.08	6.02	6.02	6.02	5.96	5.96	5.96	5.91

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	5.91	5.85	5.85	5.79	5.74	5.74	5.68	5.68	5.63
45.0	5.74	5.68	5.63	5.63	5.57	5.51	5.51	5.40	5.40
90.0	5.57	5.51	5.51	5.46	5.40	5.34	5.29	5.29	5.23
135.0	5.74	5.68	5.63	5.63	5.57	5.51	5.51	5.46	5.40
180.0	5.85	5.79	5.79	5.79	5.74	5.68	5.63	5.63	5.57
225.0	5.85	5.79	5.74	5.74	5.74	5.68	5.63	5.57	5.57
270.0	5.79	5.79	5.74	5.68	5.63	5.57	5.57	5.51	5.46
315.0	5.91	5.85	5.79	5.74	5.74	5.68	5.68	5.63	5.57
360.0	5.91	5.85	5.85	5.79	5.74	5.74	5.68	5.68	5.63

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	5.57	5.51	5.46	5.40	5.23	5.12	9.06	13.44	13.22
45.0	5.34	5.29	5.23	5.18	5.06	4.84	4.56	3.94	3.77
90.0	5.18	5.12	5.06	4.95	4.89	4.73	4.11	3.83	3.77
135.0	5.34	5.29	5.23	5.18	5.06	4.73	4.22	3.88	3.77
180.0	5.51	5.46	5.34	5.18	4.95	4.50	3.88	3.77	3.71
225.0	5.51	5.46	5.40	5.23	5.01	4.67	3.94	3.77	3.71
270.0	5.40	5.29	5.29	5.18	5.01	4.84	4.05	3.83	3.77
315.0	5.51	5.46	5.40	5.34	5.18	4.84	4.11	3.83	3.71
360.0	5.57	5.51	5.46	5.40	5.23	5.12	9.06	13.44	13.22

Intensity data(cd)

C/γ(°)	90.0
0.0	13.11
45.0	3.77
90.0	3.77
135.0	3.71
180.0	3.71
225.0	3.71
270.0	3.77
315.0	3.71
360.0	13.11