NATA LIGHTING CO.,LTD.
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Nata

LumCAT: CT01D03624AH
Luminaire:

Report No: NATA0100	Voltage(V): 33.7200
Test No: GC20190504	Current(A): 0.2970
LampCAT: XICATO XOB LES 9.8MM	Power (W): 10.0000
Lamp flux(lm): 1033.1	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 35.8	Width(mm): 35.8
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 842.23
Efficiency(%): 81.53%
Lumens(lm)/Power(W): 84.22
Central intensity(cd): 2994.750
Maximum intensity(cd): 2994.750
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=23.5
[C90/270]Total=23.5
Field angle(10%Imax): [C0/180]Total=43.9
[C90/270]Total=43.9
Maximum s/h(1/2): C0_180=0.40 C90_270=0.40
Maximum s/h(1/4): C0_180=0.39 C90_270=0.39
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 81.53%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 89.772%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	2994.750	0.000	0	.000%	.000%
1.0	2985.961	2.862	2.862	.277%	.340%
2.0	2953.688	8.525	11.387	.825%	1.352%
3.0	2907.141	14.017	25.404	1.357%	3.016%
4.0	2838.797	19.233	44.637	1.862%	5.300%
5.0	2740.711	24.003	68.64	2.323%	8.150%
6.0	2624.133	28.194	96.834	2.729%	11.497%
7.0	2471.063	31.626	128.46	3.061%	15.252%
8.0	2298.375	34.134	162.594	3.304%	19.305%
9.0	2105.859	35.694	198.288	3.455%	23.543%
10.0	1892.180	36.181	234.468	3.502%	27.839%
11.0	1668.164	35.575	270.044	3.444%	32.063%
12.0	1442.250	34.001	304.045	3.291%	36.100%
13.0	1234.835	31.770	335.815	3.075%	39.872%
14.0	1016.873	28.822	364.637	2.790%	43.294%
15.0	871.432	25.924	390.56	2.509%	46.372%
16.0	724.711	23.388	413.948	2.264%	49.149%
17.0	607.043	20.739	434.687	2.008%	51.612%
18.0	513.809	18.480	453.168	1.789%	53.806%
19.0	441.380	16.618	469.786	1.609%	55.779%
20.0	387.809	15.176	484.962	1.469%	57.581%
21.0	335.138	13.882	498.844	1.344%	59.229%
22.0	298.427	12.732	511.576	1.232%	60.741%
23.0	268.270	11.891	523.467	1.151%	62.153%
24.0	244.146	11.203	534.67	1.084%	63.483%
25.0	218.756	10.525	545.196	1.019%	64.733%
26.0	198.837	9.857	555.053	.954%	65.903%
27.0	181.631	9.308	564.361	.901%	67.008%
28.0	166.577	8.816	573.177	.853%	68.055%
29.0	154.013	8.388	581.565	.812%	69.051%
30.0	143.719	8.039	589.603	.778%	70.005%
31.0	133.467	7.714	597.317	.747%	70.921%
32.0	124.643	7.395	604.712	.716%	71.799%
33.0	117.450	7.132	611.844	.690%	72.646%
34.0	110.152	6.888	618.732	.667%	73.464%
35.0	104.098	6.654	625.385	.644%	74.254%
36.0	98.248	6.443	631.828	.624%	75.019%
37.0	93.227	6.245	638.073	.605%	75.760%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	88.889	6.079	644.152	.588%	76.482%
39.0	85.163	5.941	650.093	.575%	77.187%
40.0	81.816	5.824	655.916	.564%	77.879%
41.0	79.151	5.732	661.648	.555%	78.559%
42.0	76.880	5.669	667.317	.549%	79.232%
43.0	74.602	5.611	672.928	.543%	79.899%
44.0	72.752	5.562	678.49	.538%	80.559%
45.0	70.966	5.523	684.013	.535%	81.215%
46.0	69.124	5.479	689.492	.530%	81.865%
47.0	67.226	5.423	694.915	.525%	82.509%
48.0	65.384	5.361	700.276	.519%	83.146%
49.0	63.380	5.288	705.563	.512%	83.774%
50.0	61.425	5.204	710.767	.504%	84.391%
51.0	59.407	5.112	715.879	.495%	84.998%
52.0	57.255	5.006	720.885	.485%	85.593%
53.0	54.914	4.879	725.764	.472%	86.172%
54.0	52.467	4.733	730.497	.458%	86.734%
55.0	50.330	4.589	735.086	.444%	87.279%
56.0	48.305	4.457	739.543	.431%	87.808%
57.0	46.308	4.326	743.869	.419%	88.322%
58.0	44.374	4.193	748.062	.406%	88.820%
59.0	42.687	4.070	752.133	.394%	89.303%
60.0	40.985	3.953	756.086	.383%	89.772%
61.0	39.340	3.833	759.919	.371%	90.227%
62.0	38.032	3.728	763.647	.361%	90.670%
63.0	36.766	3.638	767.285	.352%	91.102%
64.0	35.529	3.548	770.832	.343%	91.523%
65.0	34.383	3.460	774.292	.335%	91.934%
66.0	33.223	3.373	777.665	.327%	92.334%
67.0	32.175	3.288	780.954	.318%	92.725%
68.0	31.226	3.212	784.165	.311%	93.106%
69.0	30.424	3.145	787.31	.304%	93.480%
70.0	29.742	3.090	790.401	.299%	93.846%
71.0	28.898	3.031	793.431	.293%	94.206%
72.0	27.900	2.953	796.385	.286%	94.557%
73.0	27.042	2.873	799.258	.278%	94.898%
74.0	26.276	2.803	802.061	.271%	95.231%
75.0	25.580	2.740	804.801	.265%	95.556%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	24.996	2.685	807.485	.260%	95.875%
77.0	24.785	2.654	810.14	.257%	96.190%
78.0	24.750	2.652	812.791	.257%	96.505%
79.0	24.905	2.668	815.459	.258%	96.822%
80.0	25.221	2.702	818.162	.262%	97.143%
81.0	25.474	2.742	820.903	.265%	97.468%
82.0	25.763	2.778	823.682	.269%	97.798%
83.0	26.002	2.814	826.496	.272%	98.132%
84.0	25.453	2.803	829.299	.271%	98.465%
85.0	24.996	2.753	832.052	.267%	98.792%
86.0	22.859	2.616	834.668	.253%	99.102%
87.0	19.962	2.343	837.011	.227%	99.381%
88.0	17.655	2.061	839.072	.199%	99.625%
89.0	14.688	1.773	840.845	.172%	99.836%
90.0	10.526	1.382	842.227	.134%	100.000%

Zonal flux distribution table

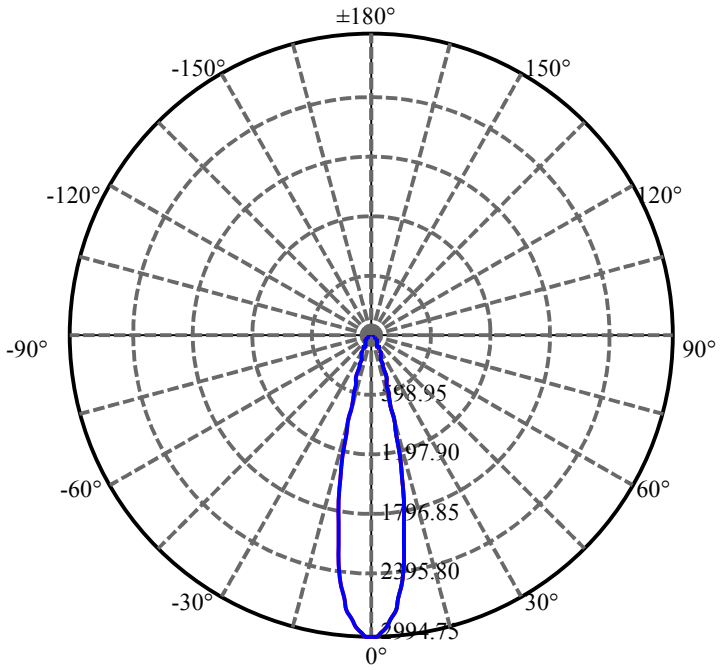
ZONAL LUMEN SUMMARY

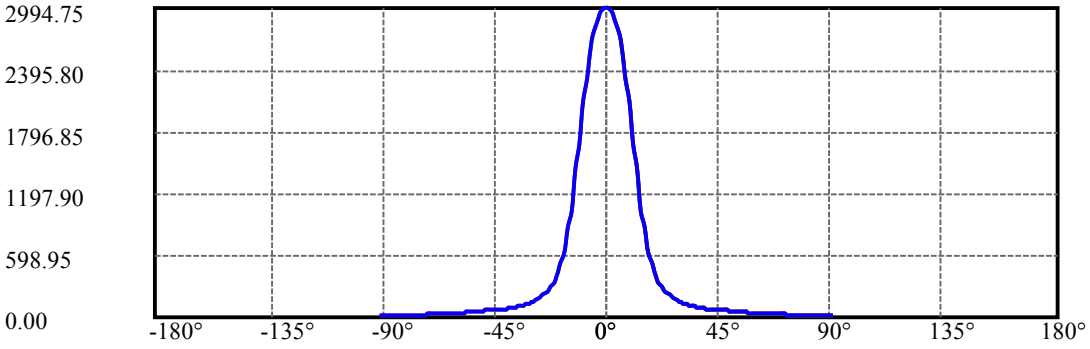
Zone	Lumens	%Lamp	%Fixt
0-30	589.60	57.07%	70.01%
0-40	655.92	63.49%	77.88%
0-60	756.09	73.19%	89.77%
0-90	840.84	81.39%	99.84%
0-120	840.84	81.39%	99.84%
0-180	842.23	81.53%	100.00%
60-90	88.71	8.59%	10.53%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-43.15	673.78	65.22%	80.00%

ZONAL LUMEN SUMMARY

0-10	234.47
10-20	250.49
20-30	104.64
30-40	66.31
40-50	54.85
50-60	45.32
60-70	34.31
70-80	27.76
80-90	22.68
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:22.0 Right:22.0
:C90/270Left:22.0 Right:22.0

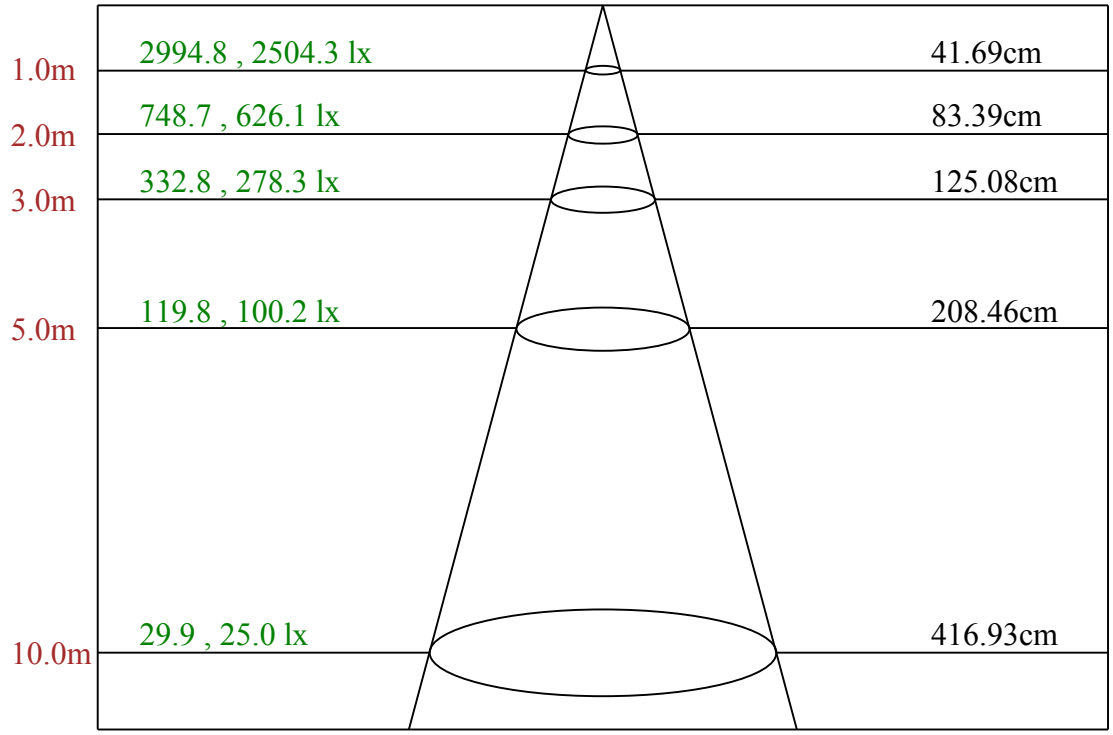
Beam Angle(50%Imax):C0/180Left:11.8 Right:11.8
:C90/270Left:11.8 Right:11.8

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Lux distance Curve

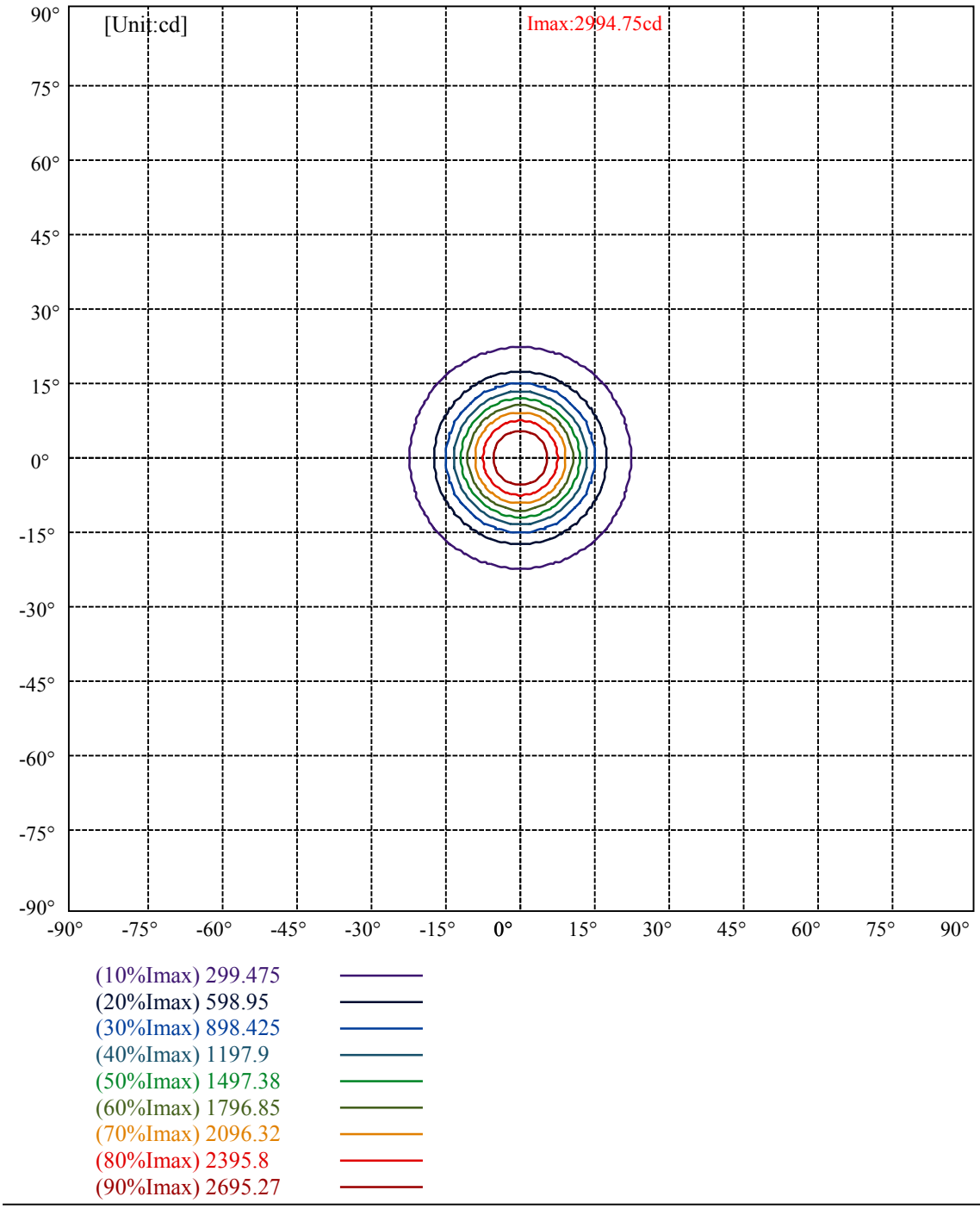


Max , Ave

Beam angle of C0 plane 23.55

Equipment: GMS1980	Date: 2019/9/5	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

ISO-Intensity(V-H)

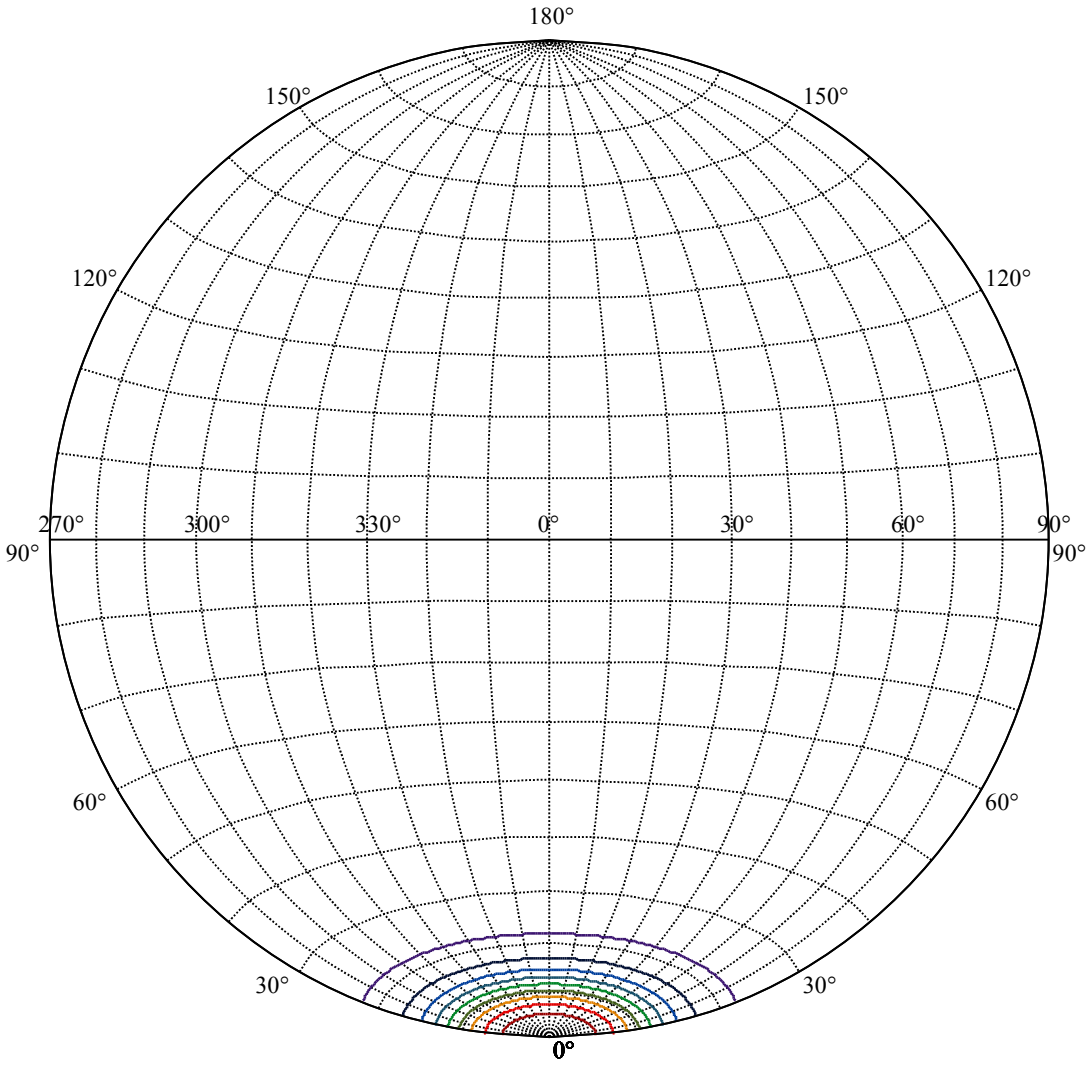


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web

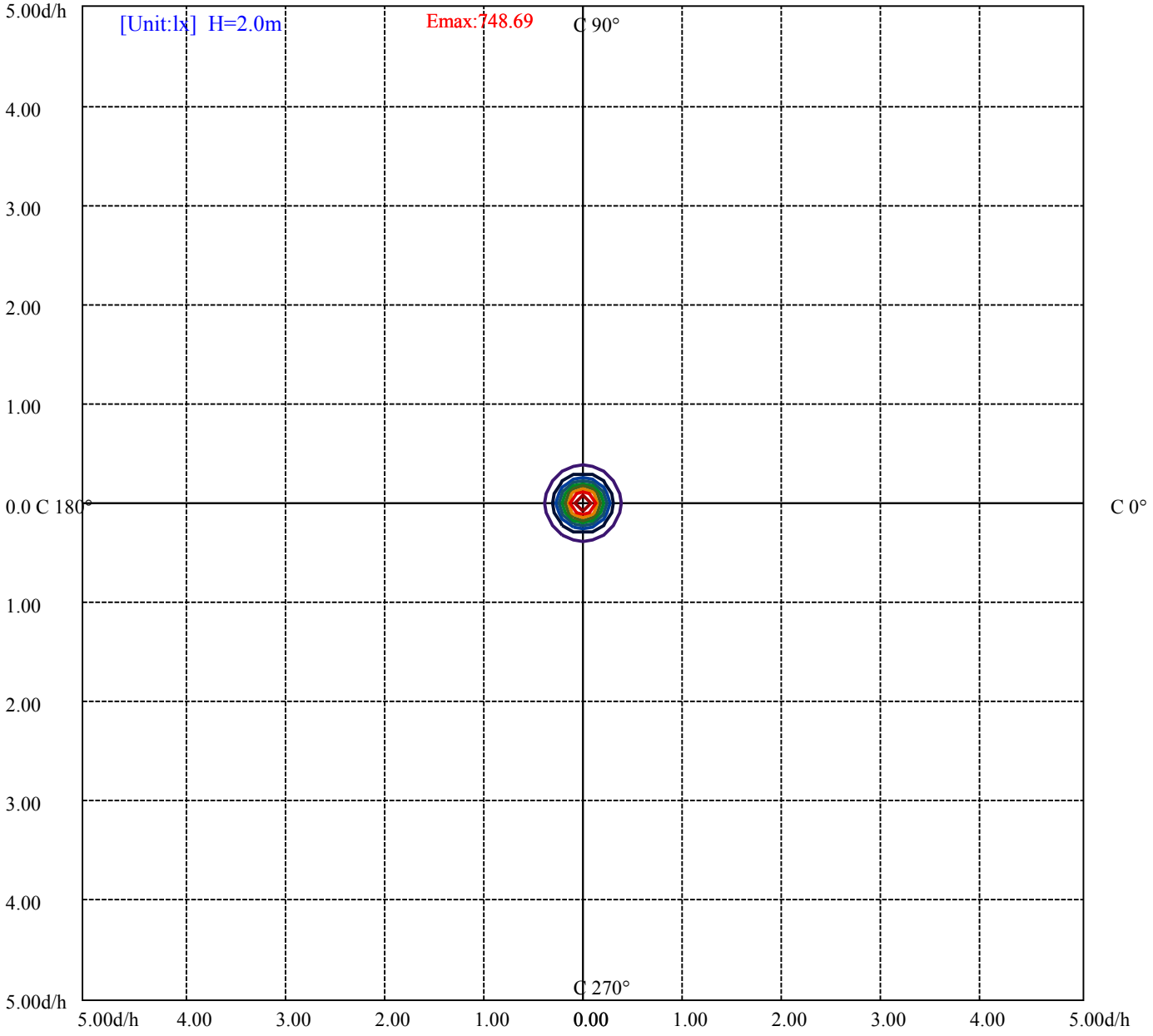


[Unit:cd]

Imax:2994.75

(10%Imax) 299.475
(20%Imax) 598.95
(30%Imax) 898.425
(40%Imax) 1197.9
(50%Imax) 1497.38
(60%Imax) 1796.85
(70%Imax) 2096.32
(80%Imax) 2395.8
(90%Imax) 2695.27

ISO illuminance diagram

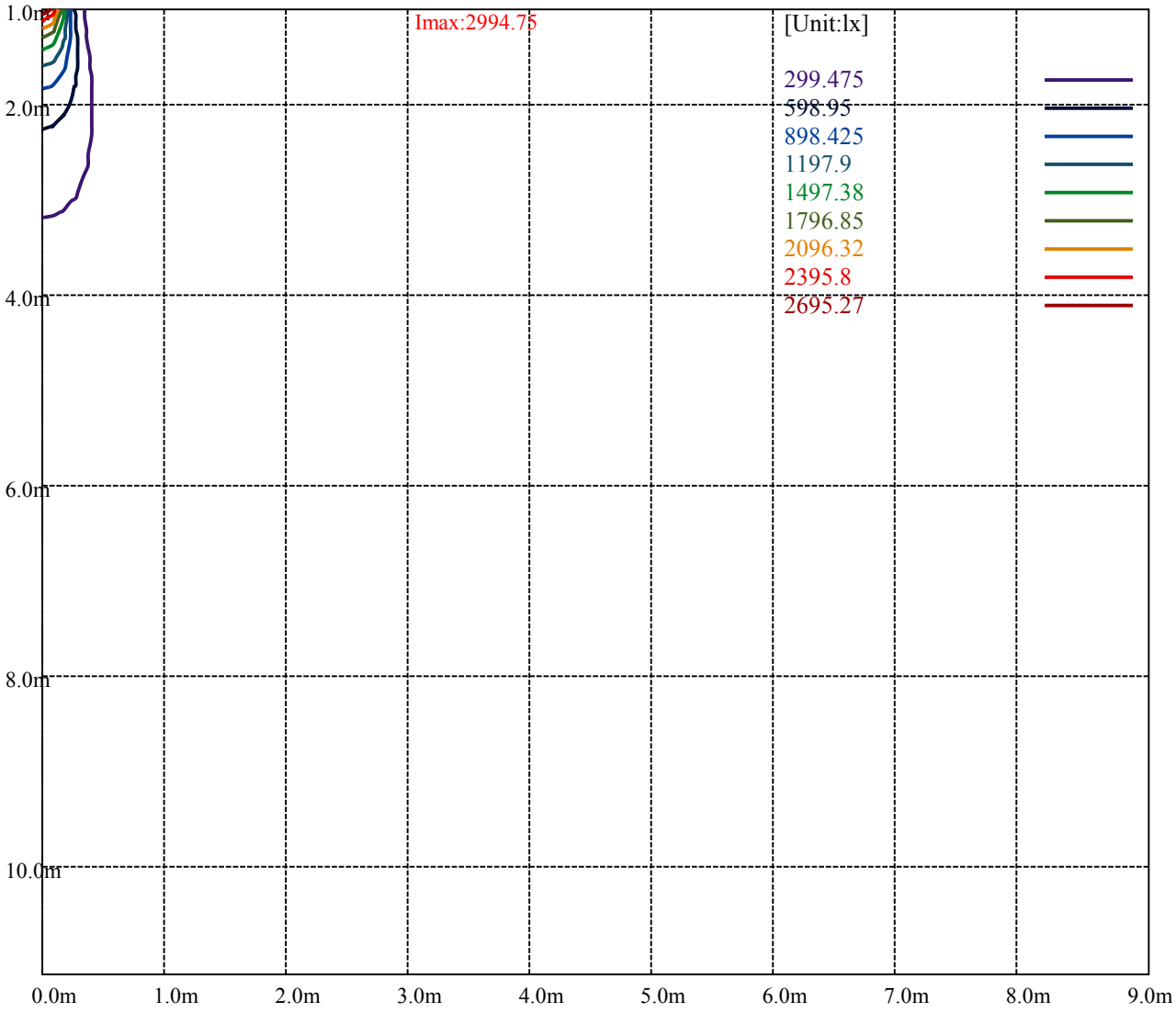


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/5
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Luminance Limitting Curve(no luminous side)

Luminance Table

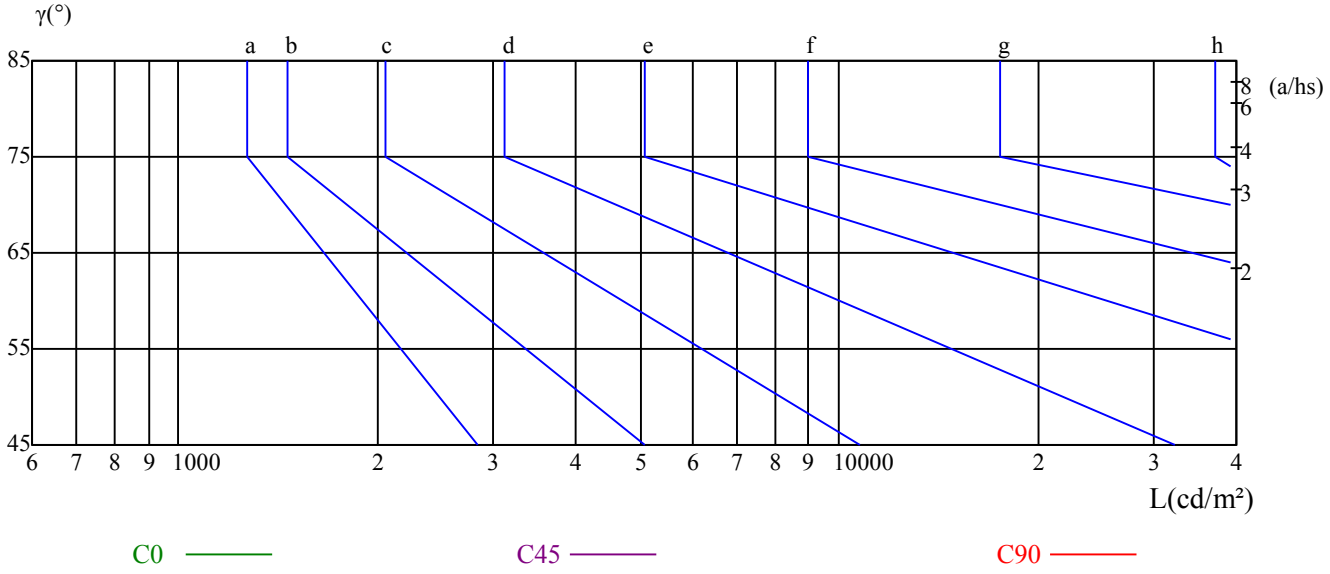
γ	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

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

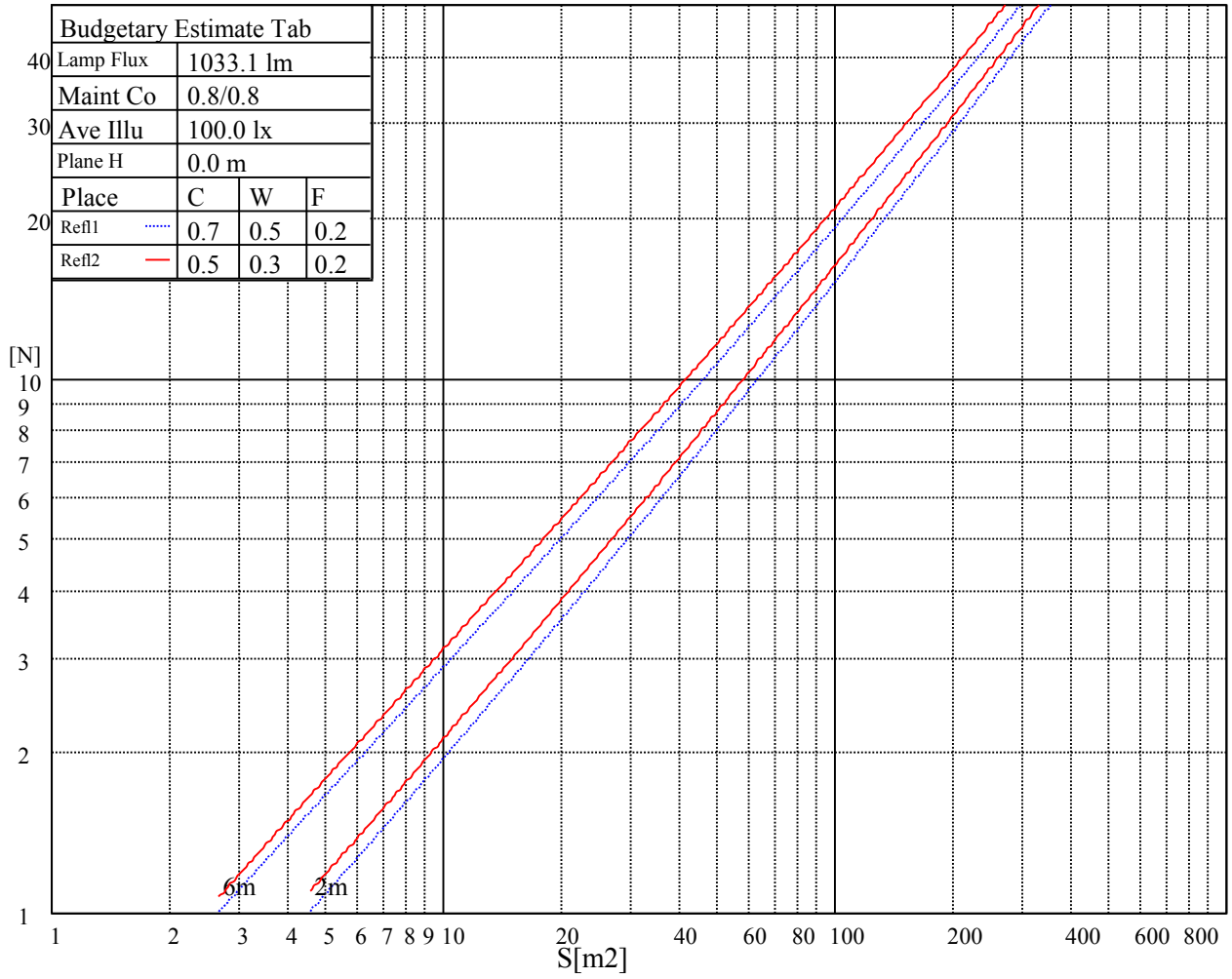
Glare Table

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

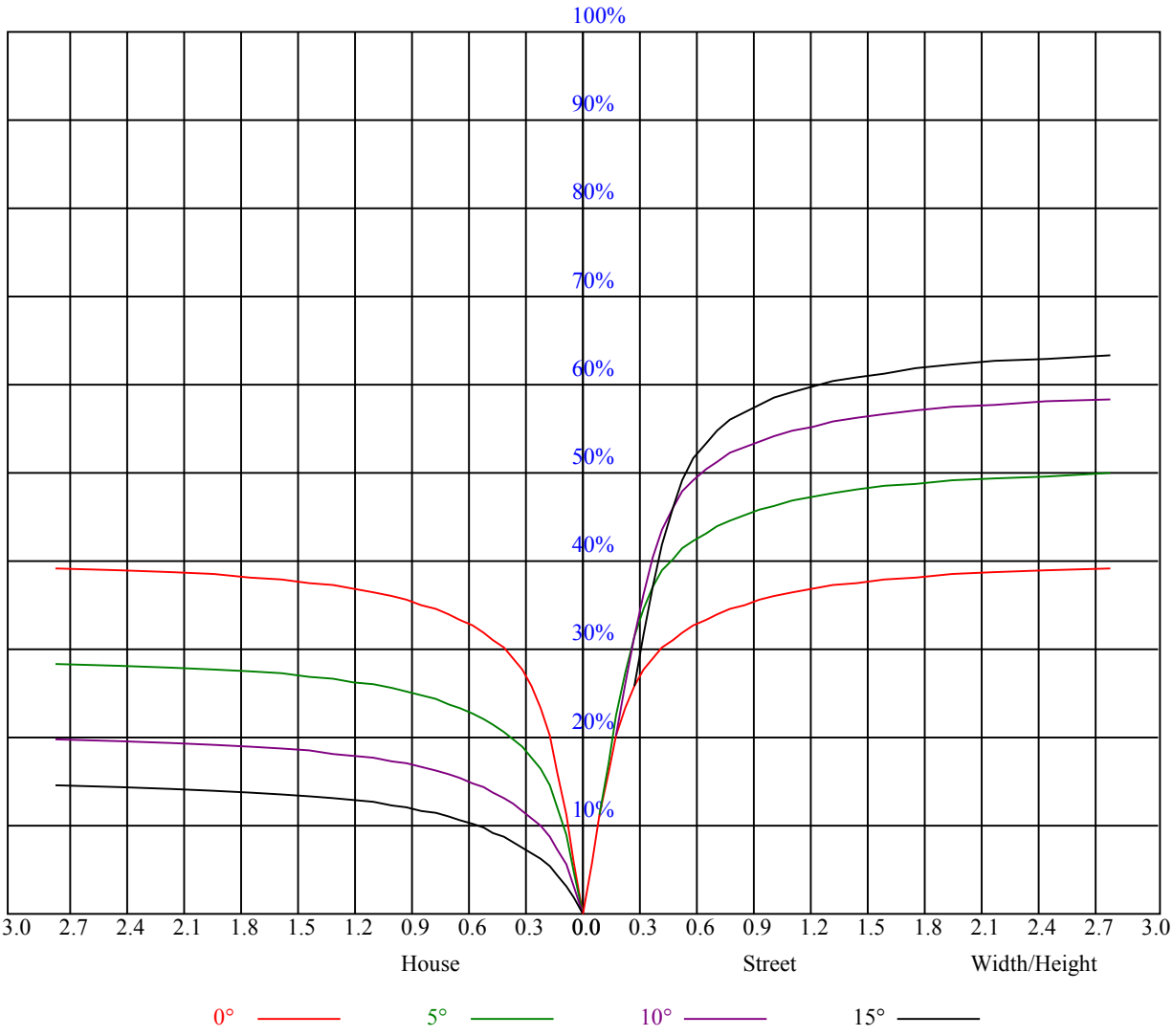


Equipment: GMS1980 Date: 2019/9/5 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

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	0.97	0.97	0.97	0.95	0.95	0.95	0.91	0.91	0.91	0.87	0.87	0.87	0.83	0.83	0.83	0.82
1	0.88	0.86	0.84	0.87	0.84	0.82	0.83	0.81	0.80	0.80	0.79	0.77	0.77	0.76	0.75	0.74
2	0.82	0.78	0.75	0.80	0.77	0.74	0.78	0.75	0.72	0.75	0.73	0.71	0.73	0.71	0.69	0.68
3	0.76	0.72	0.68	0.75	0.71	0.68	0.73	0.70	0.67	0.71	0.68	0.66	0.69	0.67	0.65	0.63
4	0.72	0.67	0.64	0.71	0.67	0.63	0.69	0.65	0.62	0.68	0.64	0.62	0.66	0.63	0.61	0.60
5	0.68	0.63	0.60	0.67	0.63	0.59	0.66	0.62	0.59	0.64	0.61	0.58	0.63	0.60	0.58	0.57
6	0.65	0.60	0.56	0.64	0.60	0.56	0.63	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.55	0.54
7	0.62	0.57	0.54	0.61	0.57	0.54	0.60	0.56	0.53	0.59	0.56	0.53	0.58	0.55	0.53	0.52
8	0.59	0.55	0.51	0.59	0.54	0.51	0.58	0.54	0.51	0.57	0.54	0.51	0.56	0.53	0.51	0.50
9	0.57	0.53	0.50	0.57	0.52	0.49	0.56	0.52	0.49	0.55	0.52	0.49	0.55	0.51	0.49	0.48
10	0.55	0.51	0.48	0.55	0.50	0.48	0.54	0.50	0.48	0.53	0.50	0.47	0.53	0.50	0.47	0.46

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2019/9/5	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	3001.50	2973.38	2912.63	2845.69	2751.75	2601.00	2448.56	2278.13	2050.88
45.0	3002.63	2980.69	2934.00	2874.38	2780.44	2657.25	2518.88	2323.69	2126.25
90.0	2988.56	2973.94	2941.31	2885.63	2805.19	2713.50	2590.31	2401.31	2219.06
135.0	2986.31	2995.88	2990.81	2962.69	2925.00	2865.38	2777.06	2674.69	2534.06
180.0	3001.50	3011.06	2999.25	2967.19	2919.38	2856.38	2778.75	2669.63	2533.50
225.0	3002.63	3010.50	2991.94	2969.44	2917.69	2829.94	2724.75	2566.69	2426.06
270.0	2988.56	2983.50	2962.13	2917.13	2862.56	2779.31	2686.50	2552.63	2409.19
315.0	2986.31	2958.75	2897.44	2835.00	2748.38	2622.94	2468.25	2301.75	2088.00
360.0	3001.50	2973.38	2912.63	2845.69	2751.75	2601.00	2448.56	2278.13	2050.88

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	1811.81	1590.19	1347.19	1144.13	933.19	750.38	617.06	498.94	410.63
45.0	1882.13	1630.69	1405.13	1215.56	948.38	783.56	657.56	507.94	428.06
90.0	2019.94	1742.06	1523.81	1243.13	1071.79	899.33	751.61	604.52	524.31
135.0	2381.63	2181.94	1952.44	1742.06	1532.81	1302.75	1096.31	933.19	760.50
180.0	2393.44	2222.44	1985.63	1779.19	1574.44	1326.38	1121.34	977.46	816.47
225.0	2306.81	2122.31	1930.50	1724.06	1494.56	1118.87	1097.44	917.61	780.86
270.0	2198.25	2011.50	1806.19	1575.56	1344.94	1153.13	960.19	794.81	673.31
315.0	1852.88	1636.31	1394.44	1114.31	978.58	800.61	669.94	563.23	462.21
360.0	1811.81	1590.19	1347.19	1144.13	933.19	750.38	617.06	498.94	410.63

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	351.00	305.44	286.88	234.45	213.08	195.41	177.08	163.86	152.10
45.0	366.19	312.19	286.88	242.61	217.97	198.23	182.36	166.56	154.86
90.0	443.14	375.30	339.41	300.66	266.01	245.08	222.81	196.82	181.86
135.0	644.63	552.94	475.88	406.69	360.56	322.88	289.13	269.44	236.70
180.0	680.06	580.44	492.19	422.94	372.54	327.09	293.96	262.52	236.03
225.0	656.16	555.69	484.99	420.19	366.81	328.39	295.93	261.73	239.18
270.0	567.56	495.00	429.19	376.88	339.75	304.31	289.69	244.58	222.02
315.0	401.74	354.04	307.07	276.69	250.71	224.78	202.22	184.56	167.96
360.0	351.00	305.44	286.88	234.45	213.08	195.41	177.08	163.86	152.10

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	138.94	129.88	122.12	114.36	107.38	101.81	96.02	90.68	86.46
45.0	145.01	133.09	124.76	117.51	108.96	103.39	98.33	92.81	88.48
90.0	167.06	153.79	142.65	133.59	124.54	116.38	109.52	102.77	97.59
135.0	212.96	192.15	176.74	162.62	151.82	141.53	132.47	124.54	117.17
180.0	215.83	198.00	179.04	165.83	153.90	141.41	133.03	125.44	118.58
225.0	218.93	199.13	182.08	168.47	155.14	143.44	134.61	126.06	119.03
270.0	199.41	181.52	169.43	160.43	147.21	138.04	131.01	119.93	112.61
315.0	154.91	145.07	135.28	126.96	118.80	111.15	104.63	99.00	92.87
360.0	138.94	129.88	122.12	114.36	107.38	101.81	96.02	90.68	86.46

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	82.13	78.75	75.43	72.73	70.48	68.74	66.88	65.81	64.80
45.0	84.94	80.94	77.68	75.43	73.29	72.17	71.61	70.88	70.31
90.0	92.42	88.31	84.77	81.62	78.47	76.11	74.14	72.06	70.65
135.0	108.56	102.60	97.65	92.08	88.48	85.33	82.07	79.14	77.01
180.0	110.81	105.19	100.07	94.39	90.39	86.40	83.36	80.04	77.23
225.0	111.94	105.58	100.46	96.02	91.01	87.64	84.60	81.23	78.69
270.0	106.43	99.28	93.66	89.89	85.22	82.07	79.03	75.94	73.63
315.0	88.76	85.16	81.39	79.14	77.18	74.76	73.35	71.72	69.69
360.0	82.13	78.75	75.43	72.73	70.48	68.74	66.88	65.81	64.80

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	63.23	61.93	60.53	58.56	56.70	55.35	53.27	51.47	49.61
45.0	68.96	67.50	65.70	64.13	62.21	60.81	59.23	57.32	54.96
90.0	69.30	67.67	65.70	63.90	61.88	59.51	57.09	54.90	52.37
135.0	74.81	73.01	71.33	69.30	67.28	64.91	62.44	60.41	58.11
180.0	74.98	72.96	70.82	68.63	66.94	65.31	63.11	60.86	58.67
225.0	76.50	74.59	72.84	71.04	68.96	66.77	64.91	62.49	60.19
270.0	71.61	69.19	67.61	66.21	64.35	62.72	61.09	58.67	56.36
315.0	68.34	66.15	63.28	61.31	58.73	56.03	54.11	51.92	49.05
360.0	63.23	61.93	60.53	58.56	56.70	55.35	53.27	51.47	49.61

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	47.36	45.56	43.82	41.91	40.33	38.87	37.07	35.83	34.88
45.0	52.43	50.01	47.81	45.79	43.26	41.23	39.21	37.52	36.28
90.0	49.84	47.70	45.51	43.71	41.85	40.16	38.76	37.13	35.83
135.0	54.79	52.54	50.51	48.04	46.24	44.55	42.81	41.06	39.60
180.0	56.03	53.94	52.03	50.12	48.26	46.69	45.00	43.31	41.74
225.0	57.66	55.13	52.99	50.96	48.60	46.91	45.51	43.54	42.19
270.0	54.34	52.37	50.34	48.32	46.41	44.66	42.75	40.78	39.38
315.0	47.31	45.39	43.43	41.63	40.05	38.42	36.79	35.55	34.37
360.0	47.36	45.56	43.82	41.91	40.33	38.87	37.07	35.83	34.88

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	33.64	32.34	31.39	30.38	29.81	29.08	28.24	27.68	26.94
45.0	35.21	33.86	32.91	32.06	31.33	30.88	30.21	29.59	29.03
90.0	34.88	33.98	32.68	31.73	30.88	30.21	29.76	28.80	28.13
135.0	38.08	36.96	35.78	34.54	33.47	32.18	31.05	30.43	29.53
180.0	39.94	38.53	37.24	35.72	34.26	32.91	31.61	31.11	30.09
225.0	40.84	39.54	38.36	36.84	35.10	33.98	33.08	32.29	31.05
270.0	38.19	36.96	35.61	34.37	32.91	31.84	31.44	30.66	29.70
315.0	33.36	32.06	31.11	30.15	29.64	28.74	28.01	27.39	26.72
360.0	33.64	32.34	31.39	30.38	29.81	29.08	28.24	27.68	26.94

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	26.16	25.48	24.81	24.75	24.98	25.37	25.31	25.20	25.43
45.0	28.24	27.23	26.49	25.93	25.71	25.93	25.82	25.48	25.48
90.0	27.28	26.38	25.48	24.64	24.08	23.96	24.02	23.91	23.74
135.0	28.01	26.94	26.10	25.14	24.08	23.29	23.06	23.40	23.79
180.0	28.69	27.90	27.51	26.89	25.93	25.09	24.69	24.75	24.81
225.0	29.81	28.86	28.24	27.23	25.88	25.26	25.09	25.37	25.76
270.0	29.19	28.46	27.39	26.21	25.37	25.26	25.71	26.72	27.62
315.0	25.82	25.09	24.19	23.85	23.96	24.13	24.30	24.41	25.14
360.0	26.16	25.48	24.81	24.75	24.98	25.37	25.31	25.20	25.43

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	25.54	25.59	25.59	25.26	24.75	23.91	23.40	21.43	19.35
45.0	25.71	25.76	25.54	25.59	25.48	24.86	23.34	20.81	18.90
90.0	24.19	24.81	25.37	25.31	24.02	21.99	18.34	16.88	14.51
135.0	23.79	23.96	24.58	25.14	24.19	20.93	18.06	15.64	13.67
180.0	24.30	23.51	23.23	22.22	21.60	18.51	16.03	13.78	6.81
225.0	25.59	25.54	25.71	25.03	23.63	20.93	17.94	15.58	10.69
270.0	28.86	30.26	30.99	31.44	30.54	27.84	21.15	19.01	16.76
315.0	25.82	26.66	27.00	23.63	25.76	23.91	21.43	18.11	16.82
360.0	25.54	25.59	25.59	25.26	24.75	23.91	23.40	21.43	19.35

Intensity data(cd)

C/γ(°)	90.0
0.0	17.27
45.0	16.31
90.0	9.11
135.0	5.57
180.0	4.11
225.0	4.84
270.0	11.81
315.0	15.19
360.0	17.27