NATA LIGHTING CO.,LTD.
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Nata

LumCAT: LM01D03024AE
Luminaire:

Report No: NATA0100	Voltage(V): 35.7500
Test No: GC2019092612	Current(A): 0.1550
LampCAT: CITIZEN CLU7A2	Power (W): 5.5400
Lamp flux(lm): 543.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 30	Width(mm): 30
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 491.14
Efficiency(%): 90.45%
Lumens(lm)/Power(W): 88.65
Central intensity(cd): 3240.703
Maximum intensity(cd): 3240.703
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=17.8
[C90/270]Total=17.8
Field angle(10%Imax): [C0/180]Total=35.9
[C90/270]Total=35.9
Maximum s/h(1/2): C0_180=0.31 C90_270=0.31
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(%): 90.45%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 95.019%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	3240.703	0.000	0	.000%	.000%
1.0	3215.883	3.089	3.089	.569%	.629%
2.0	3144.586	9.129	12.219	1.681%	2.488%
3.0	3024.984	14.756	26.974	2.717%	5.492%
4.0	2871.352	19.737	46.711	3.635%	9.511%
5.0	2668.500	23.832	70.543	4.389%	14.363%
6.0	2415.727	26.719	97.262	4.921%	19.803%
7.0	2156.344	28.379	125.641	5.226%	25.582%
8.0	1884.164	28.917	154.558	5.325%	31.469%
9.0	1582.924	28.099	182.657	5.175%	37.191%
10.0	1315.849	26.233	208.89	4.831%	42.532%
11.0	1091.967	24.059	232.949	4.431%	47.430%
12.0	923.203	22.029	254.977	4.057%	51.916%
13.0	758.517	19.958	274.935	3.675%	55.979%
14.0	629.093	17.761	292.697	3.271%	59.596%
15.0	527.295	15.875	308.572	2.924%	62.828%
16.0	448.277	14.295	322.867	2.633%	65.739%
17.0	374.625	12.815	335.682	2.360%	68.348%
18.0	321.701	11.481	347.163	2.114%	70.685%
19.0	277.875	10.431	357.594	1.921%	72.809%
20.0	236.032	9.406	367	1.732%	74.724%
21.0	206.501	8.498	375.497	1.565%	76.455%
22.0	179.283	7.752	383.25	1.428%	78.033%
23.0	152.318	6.958	390.208	1.281%	79.450%
24.0	129.846	6.169	396.377	1.136%	80.706%
25.0	112.999	5.522	401.899	1.017%	81.830%
26.0	96.961	4.956	406.855	.913%	82.839%
27.0	84.009	4.427	411.282	.815%	83.741%
28.0	72.710	3.968	415.25	.731%	84.549%
29.0	63.260	3.557	418.807	.655%	85.273%
30.0	55.343	3.202	422.01	.590%	85.925%
31.0	48.586	2.892	424.902	.533%	86.514%
32.0	42.827	2.619	427.521	.482%	87.047%
33.0	38.138	2.385	429.906	.439%	87.533%
34.0	34.207	2.189	432.095	.403%	87.978%
35.0	30.600	2.013	434.108	.371%	88.388%
36.0	27.872	1.862	435.97	.343%	88.767%
37.0	25.847	1.752	437.722	.323%	89.124%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	23.927	1.661	439.383	.306%	89.462%
39.0	22.261	1.577	440.96	.290%	89.783%
40.0	20.988	1.508	442.468	.278%	90.090%
41.0	19.849	1.454	443.922	.268%	90.387%
42.0	18.823	1.405	445.327	.259%	90.673%
43.0	18.070	1.367	446.694	.252%	90.951%
44.0	17.452	1.341	448.035	.247%	91.224%
45.0	16.861	1.319	449.353	.243%	91.492%
46.0	16.390	1.300	450.654	.239%	91.757%
47.0	15.905	1.284	451.938	.237%	92.019%
48.0	15.391	1.265	453.203	.233%	92.276%
49.0	14.955	1.246	454.449	.230%	92.530%
50.0	14.442	1.226	455.675	.226%	92.780%
51.0	13.908	1.199	456.875	.221%	93.024%
52.0	13.472	1.175	458.049	.216%	93.263%
53.0	13.078	1.155	459.204	.213%	93.498%
54.0	12.642	1.134	460.338	.209%	93.729%
55.0	12.255	1.111	461.449	.205%	93.955%
56.0	11.883	1.091	462.54	.201%	94.177%
57.0	11.412	1.065	463.605	.196%	94.394%
58.0	11.109	1.041	464.647	.192%	94.606%
59.0	10.772	1.023	465.67	.188%	94.815%
60.0	10.477	1.004	466.674	.185%	95.019%
61.0	10.181	0.986	467.659	.182%	95.220%
62.0	9.872	0.966	468.626	.178%	95.416%
63.0	9.633	0.949	469.574	.175%	95.610%
64.0	9.415	0.935	470.509	.172%	95.800%
65.0	9.162	0.919	471.428	.169%	95.987%
66.0	8.916	0.902	472.33	.166%	96.171%
67.0	8.684	0.885	473.215	.163%	96.351%
68.0	8.423	0.867	474.082	.160%	96.527%
69.0	8.184	0.847	474.929	.156%	96.700%
70.0	7.973	0.830	475.759	.153%	96.869%
71.0	7.791	0.815	476.574	.150%	97.035%
72.0	7.580	0.799	477.373	.147%	97.197%
73.0	7.376	0.782	478.155	.144%	97.357%
74.0	7.193	0.766	478.921	.141%	97.513%
75.0	7.024	0.751	479.672	.138%	97.665%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	6.919	0.740	480.412	.136%	97.816%
77.0	6.870	0.735	481.147	.135%	97.966%
78.0	6.841	0.734	481.881	.135%	98.115%
79.0	6.926	0.740	482.621	.136%	98.266%
80.0	7.066	0.754	483.375	.139%	98.420%
81.0	7.305	0.777	484.152	.143%	98.578%
82.0	7.552	0.806	484.958	.148%	98.742%
83.0	7.784	0.834	485.792	.154%	98.912%
84.0	7.903	0.855	486.646	.157%	99.086%
85.0	7.763	0.855	487.501	.157%	99.260%
86.0	7.481	0.833	488.335	.153%	99.429%
87.0	7.200	0.803	489.138	.148%	99.593%
88.0	6.806	0.767	489.905	.141%	99.749%
89.0	5.498	0.674	490.58	.124%	99.886%
90.0	4.676	0.558	491.138	.103%	100.000%

Zonal flux distribution table

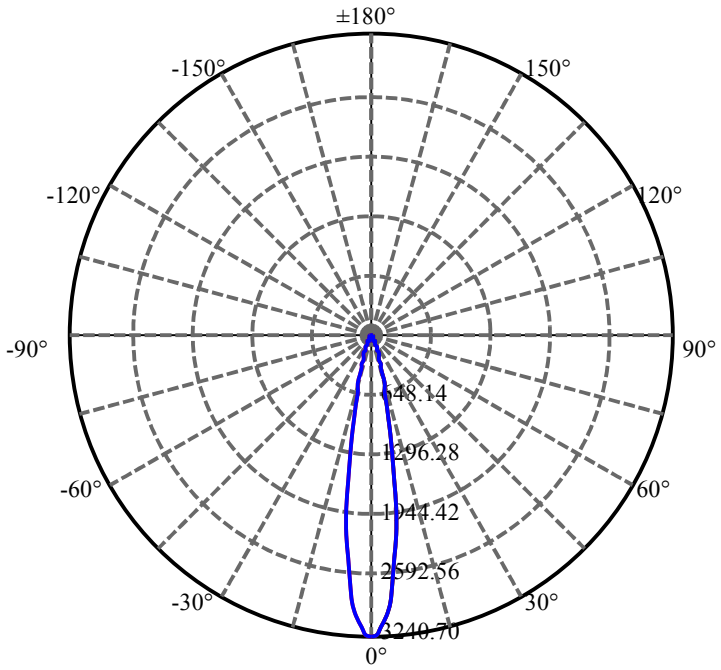
ZONAL LUMEN SUMMARY

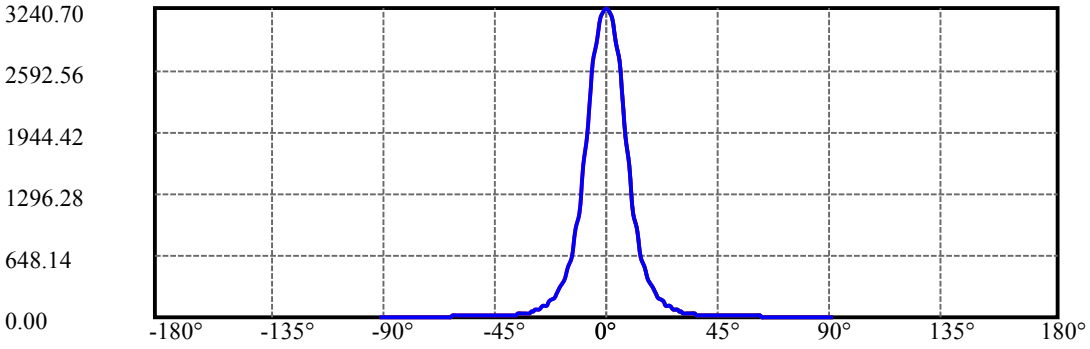
Zone	Lumens	%Lamp	%Fixt
0-30	422.01	77.72%	85.92%
0-40	442.47	81.49%	90.09%
0-60	466.67	85.94%	95.02%
0-90	490.58	90.35%	99.89%
0-120	490.58	90.35%	99.89%
0-180	491.14	90.45%	100.00%
60-90	24.91	4.59%	5.07%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-23.44	392.91	72.36%	80.00%

ZONAL LUMEN SUMMARY

0-10	208.89
10-20	158.11
20-30	55.01
30-40	20.46
40-50	13.21
50-60	11.00
60-70	9.09
70-80	7.62
80-90	7.20
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):

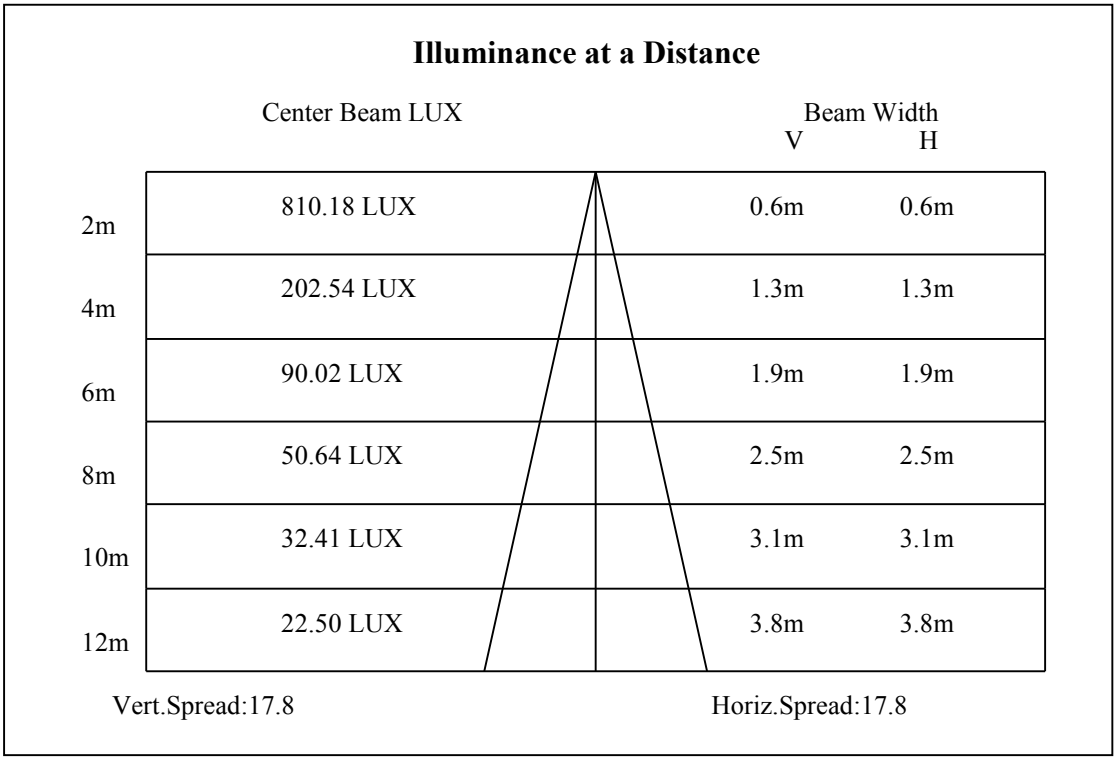
C0/C180:

C90/C270:

Field angle(10%Imax):C0/180Left:18.0 Right:18.0
:C90/270Left:18.0 Right:18.0

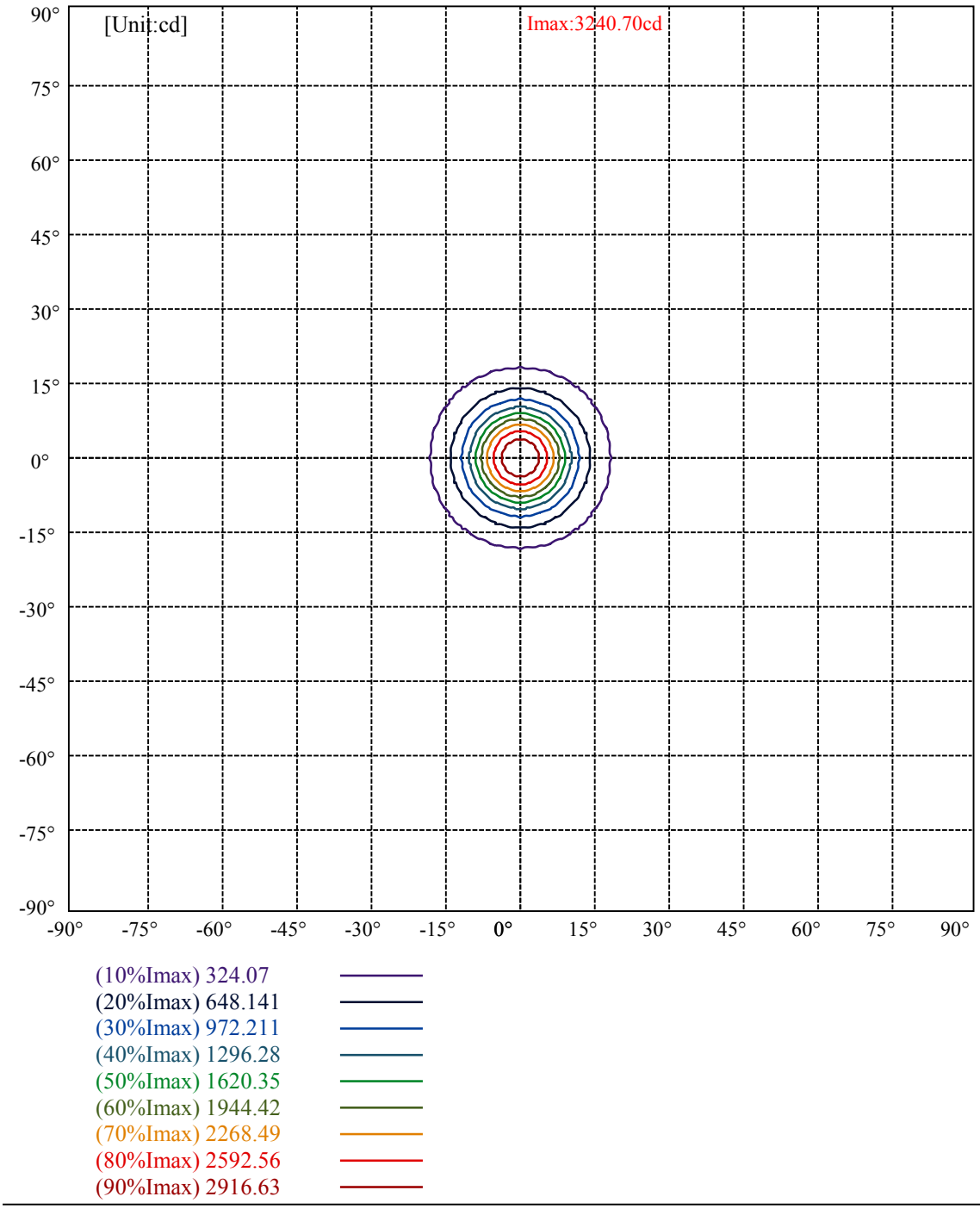
Beam Angle(50%Imax):C0/180Left:8.9 Right:8.9
:C90/270Left:8.9 Right:8.9

Lux distance Curve



Equipment: GMS1980 Date: 2019/9/26 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 65.0% Distance(m): 7.50

ISO-Intensity(V-H)



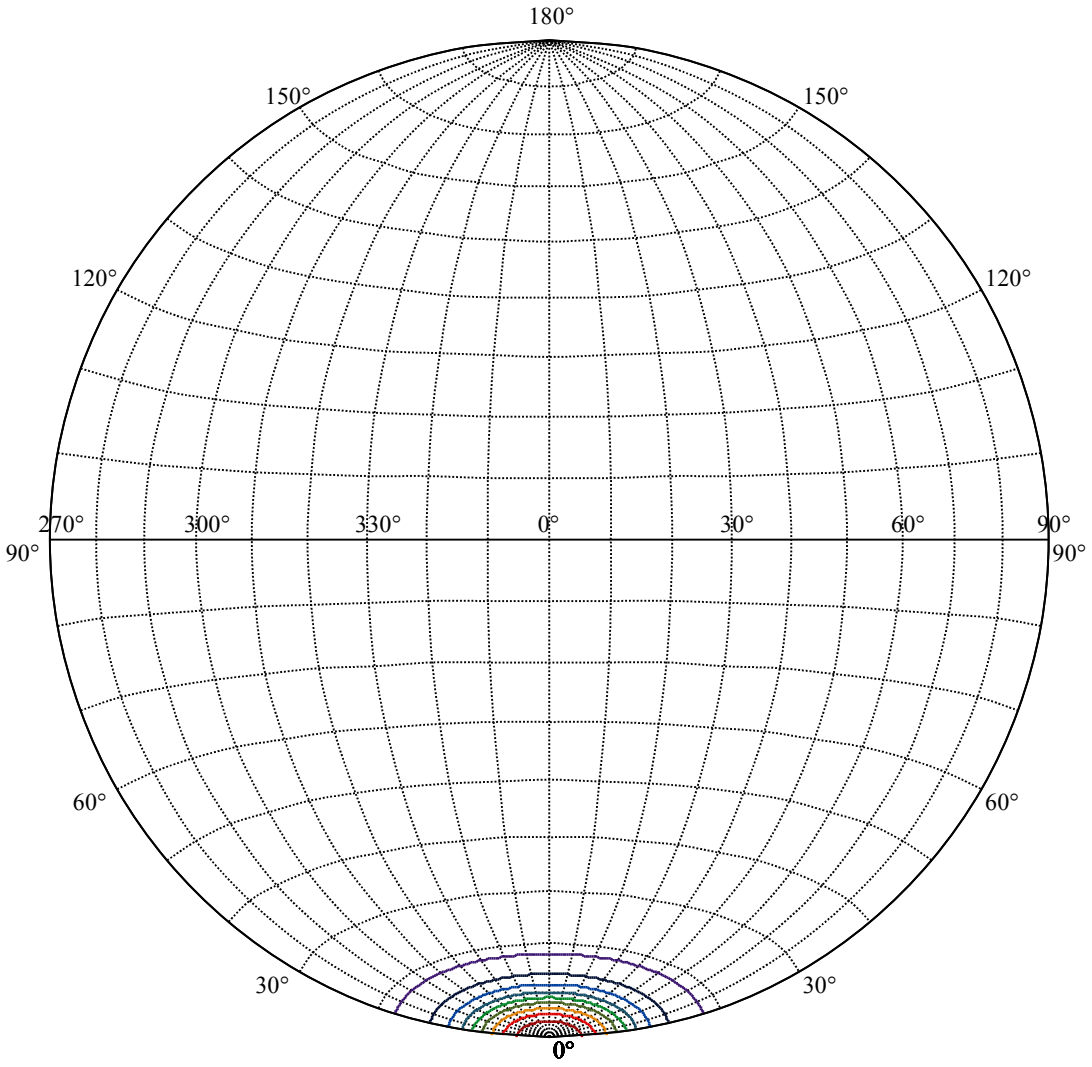
(10%Imax) 324.07
(20%Imax) 648.141
(30%Imax) 972.211
(40%Imax) 1296.28
(50%Imax) 1620.35
(60%Imax) 1944.42
(70%Imax) 2268.49
(80%Imax) 2592.56
(90%Imax) 2916.63

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/26
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

ISO candela diagram on circular web



House [Unit:cd] Road

Imax:3240.70

(10%Imax) 324.07
(20%Imax) 648.141
(30%Imax) 972.211
(40%Imax) 1296.28
(50%Imax) 1620.35
(60%Imax) 1944.42
(70%Imax) 2268.49
(80%Imax) 2592.56
(90%Imax) 2916.63

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/26
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

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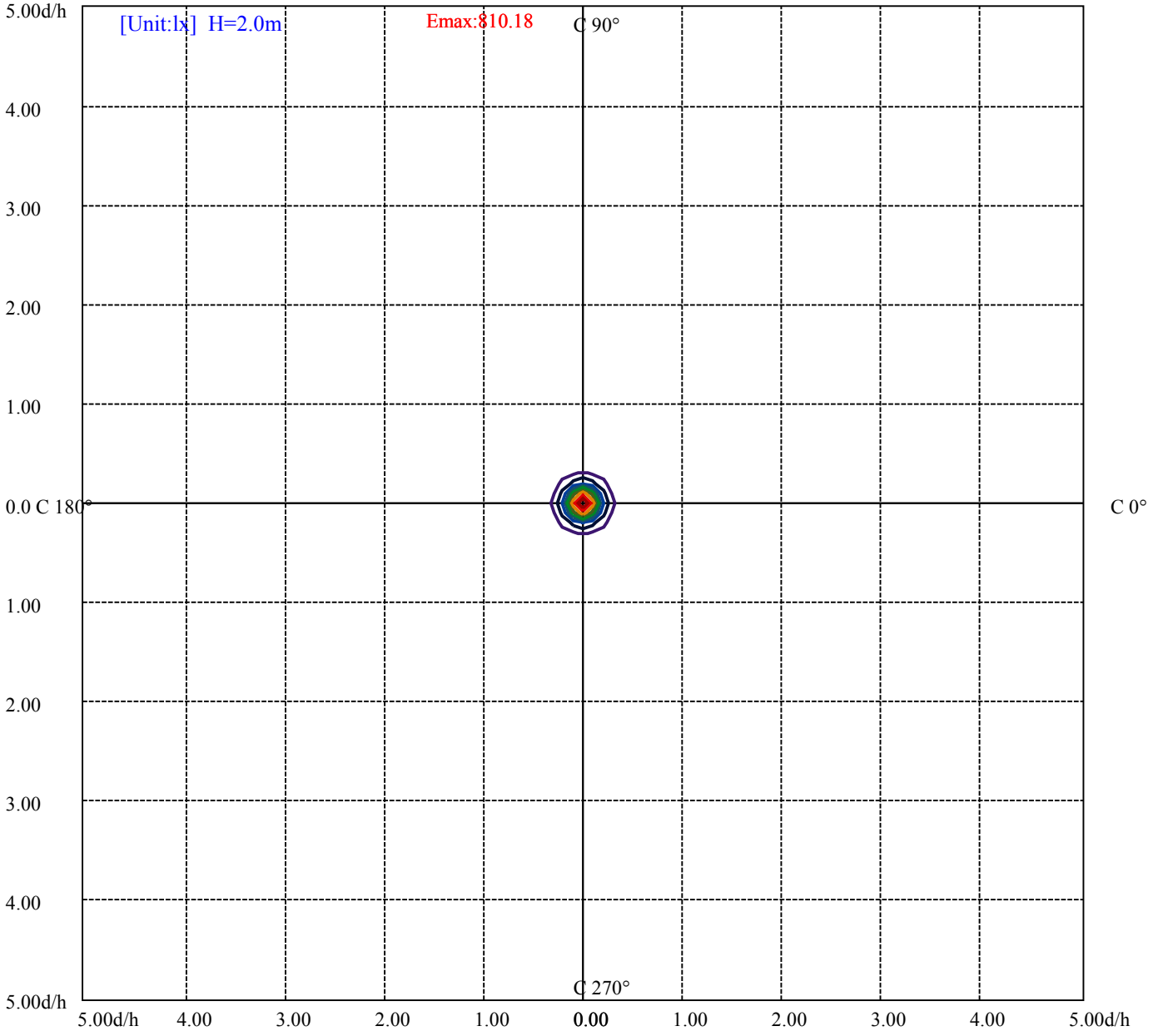
ISO illuminance diagram

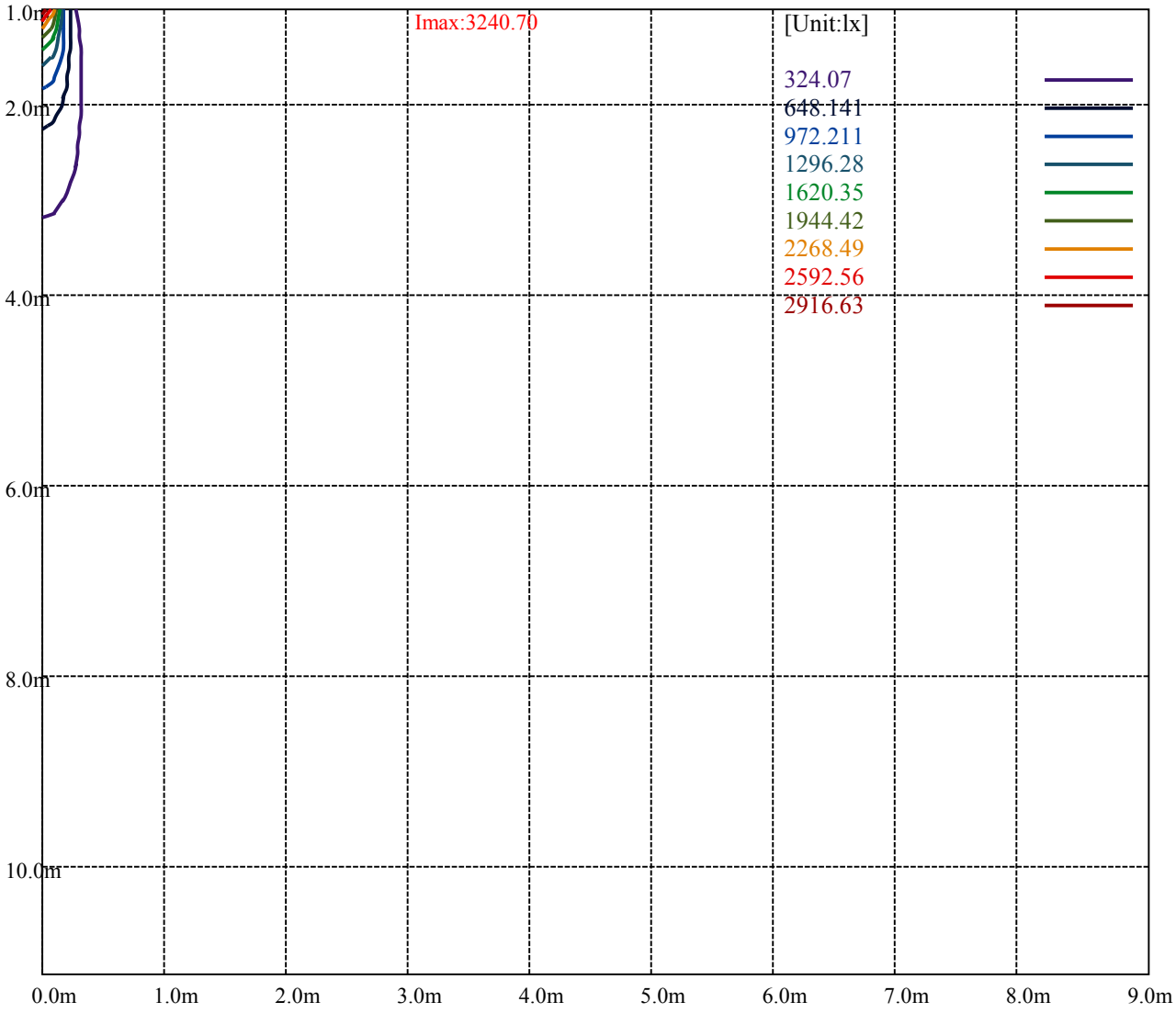


Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/26
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

Space ISO Lux diagram



Equipment: GMS1980
Temperature(°C): 25.0

Date: 2019/9/26
Humidity(%): 65.0%

Operator: NT07
Distance(m): 7.50

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Luminance Limitting Curve(no luminous side)

Luminance Table

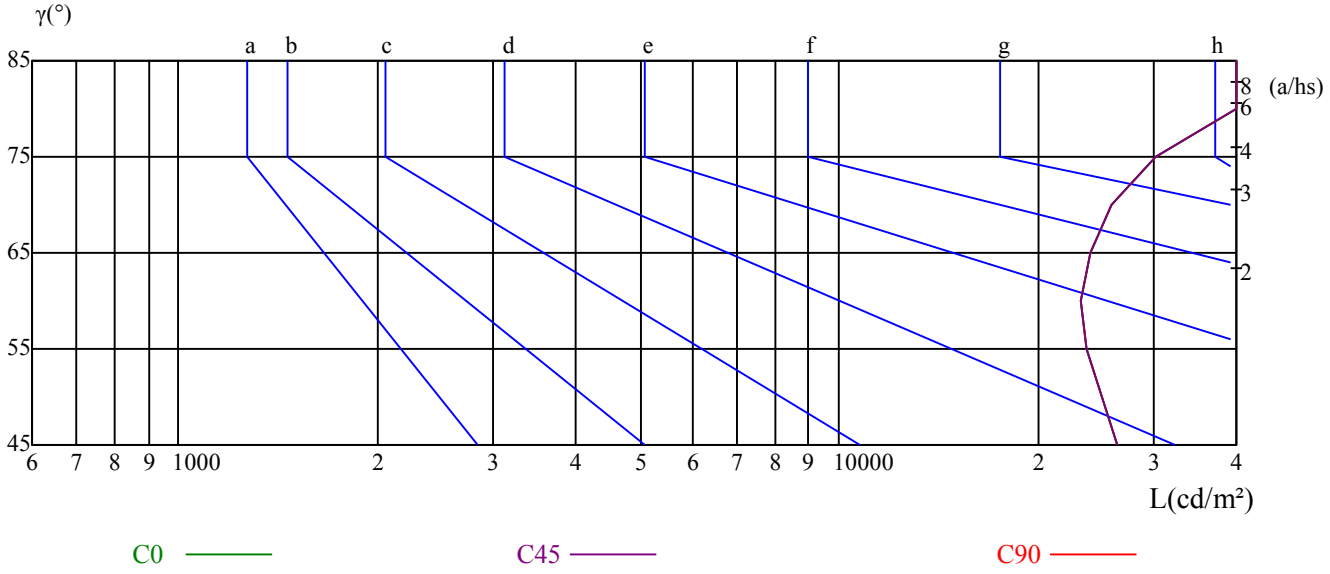
γ	45	50	55	60	65	70	75	80	85
C0	26494	24965	23741	23281	24087	25903	30155	45215	98961
C45	26494	24965	23741	23281	24087	25903	30155	45215	98961
C90	26494	24965	23741	23281	24087	25903	30155	45215	98961

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
24087	24087	24087	30155	30155	30155	98961	98961	98961

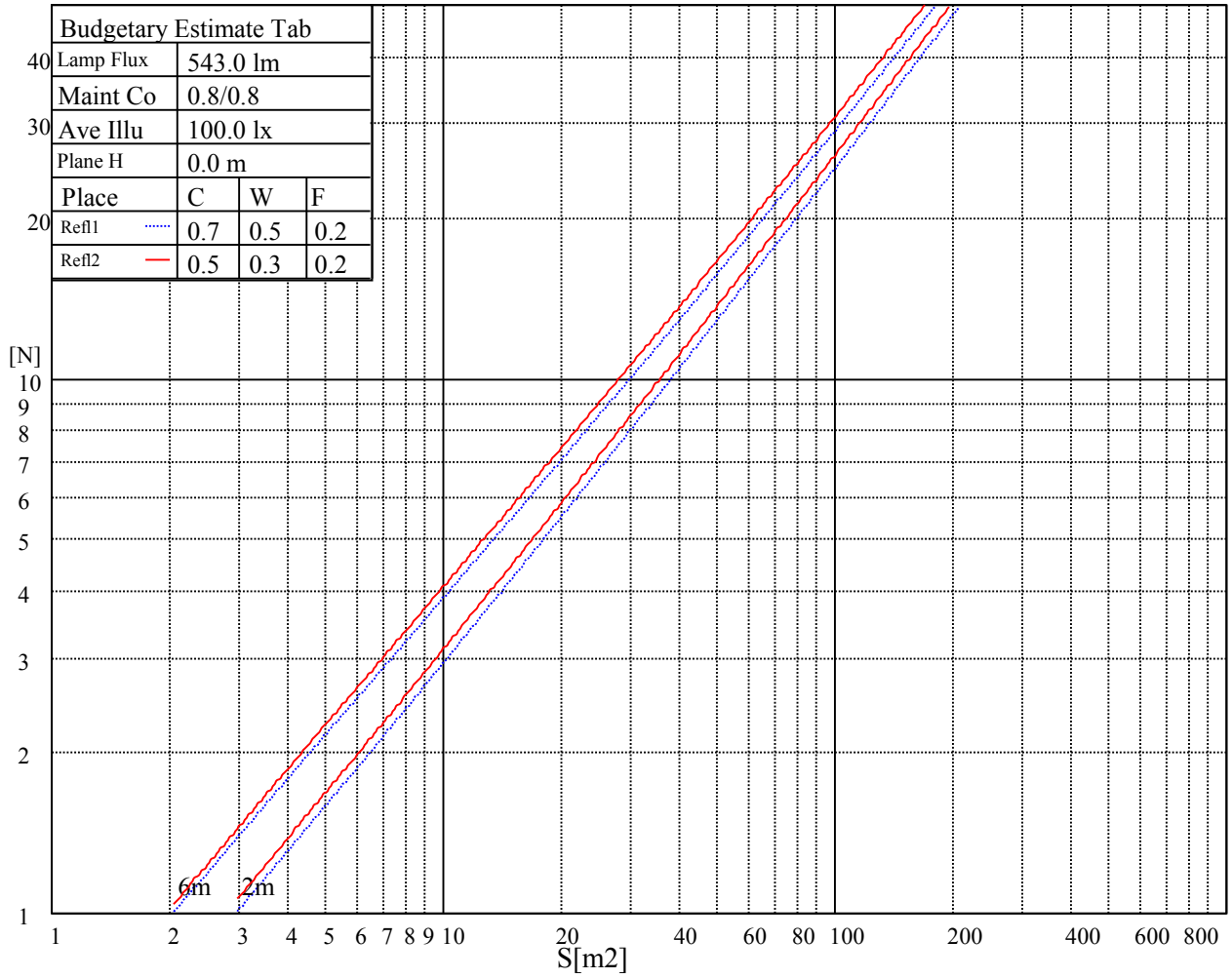
Glare Table

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

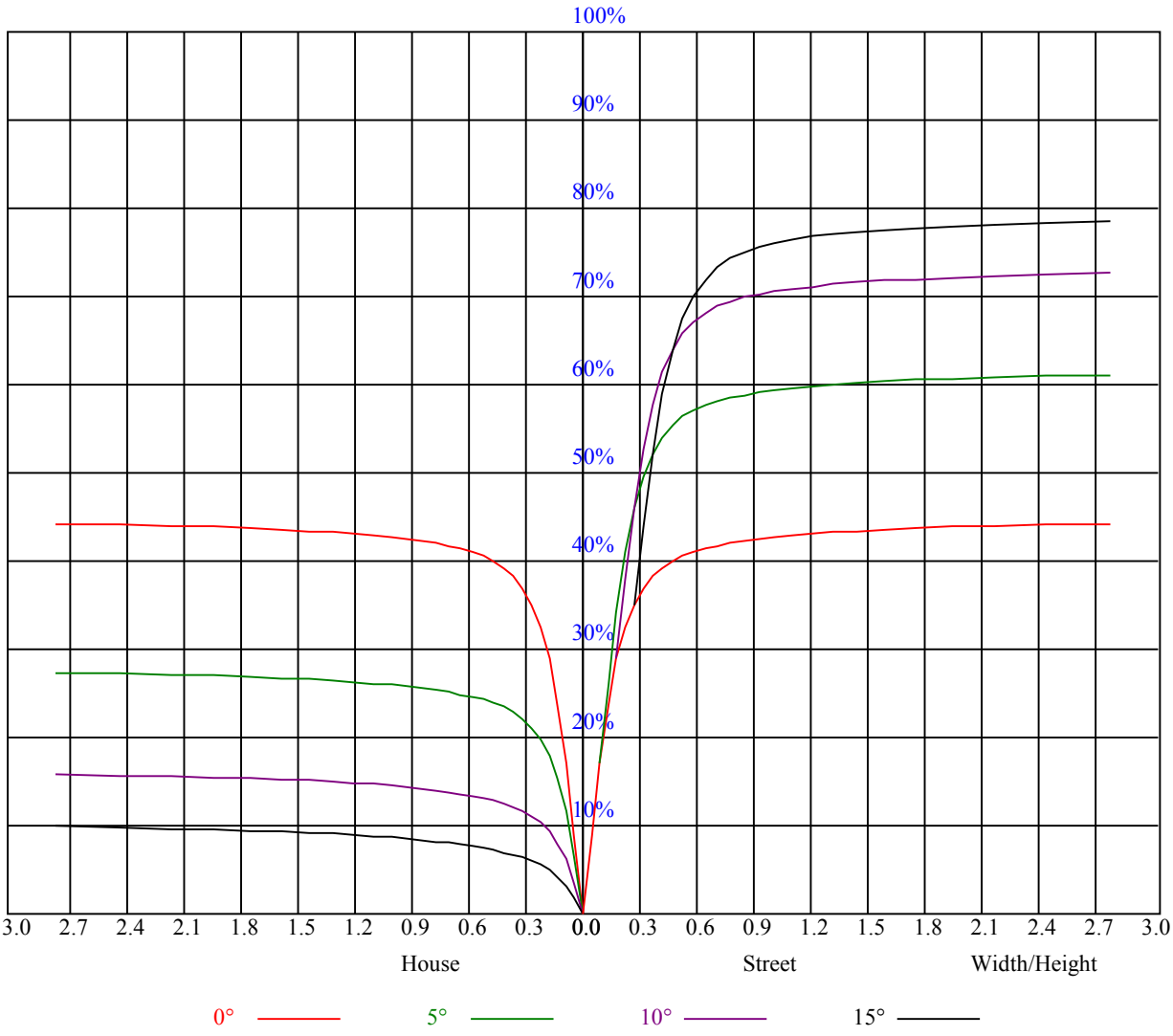


Equipment: GMS1980	Date: 2019/9/26	Operator: NT07
Temperature(°C): 25.0	Humidity(%): 65.0%	Distance(m): 7.50

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	1.08	1.08	1.08	1.05	1.05	1.05	1.00	1.00	1.00	0.96	0.96	0.96	0.92	0.92	0.92	0.90
1	1.01	0.98	0.97	0.99	0.97	0.95	0.95	0.94	0.92	0.92	0.90	0.89	0.89	0.88	0.87	0.85
2	0.95	0.92	0.89	0.94	0.91	0.88	0.91	0.88	0.86	0.88	0.86	0.84	0.86	0.84	0.83	0.81
3	0.91	0.87	0.84	0.89	0.86	0.83	0.87	0.84	0.82	0.85	0.83	0.81	0.83	0.81	0.79	0.78
4	0.87	0.83	0.80	0.86	0.82	0.79	0.84	0.81	0.78	0.82	0.80	0.77	0.81	0.78	0.77	0.75
5	0.83	0.79	0.76	0.83	0.79	0.76	0.81	0.78	0.75	0.80	0.77	0.75	0.79	0.76	0.74	0.73
6	0.81	0.76	0.74	0.80	0.76	0.73	0.79	0.75	0.73	0.78	0.75	0.72	0.77	0.74	0.72	0.71
7	0.78	0.74	0.71	0.78	0.74	0.71	0.77	0.73	0.71	0.76	0.73	0.70	0.75	0.72	0.70	0.69
8	0.76	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.67
9	0.74	0.70	0.67	0.73	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.71	0.69	0.67	0.66
10	0.72	0.68	0.66	0.72	0.68	0.66	0.71	0.68	0.65	0.70	0.67	0.65	0.70	0.67	0.65	0.64

Coefficient Utilization Curve



Equipment: GMS1980	Date: 2019/9/26	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	3252.38	3232.13	3155.63	3047.06	2878.88	2691.00	2442.94	2170.69	1911.94
45.0	3225.94	3257.44	3230.44	3161.81	3057.75	2916.00	2680.88	2455.31	2207.81
90.0	3251.81	3267.56	3233.25	3148.88	3031.31	2849.63	2649.94	2379.94	2082.38
135.0	3232.69	3256.88	3232.69	3169.69	3054.38	2905.88	2692.69	2435.63	2178.56
180.0	3252.38	3221.44	3157.31	3025.69	2876.06	2688.75	2405.81	2147.63	1876.50
225.0	3225.94	3143.25	3034.13	2860.88	2662.31	2397.38	2108.25	1837.13	1539.56
270.0	3251.81	3192.19	3062.25	2918.25	2731.50	2446.31	2194.31	1934.44	1640.81
315.0	3232.69	3156.19	3051.00	2867.63	2678.63	2453.06	2151.00	1890.00	1635.75
360.0	3252.38	3232.13	3155.63	3047.06	2878.88	2691.00	2442.94	2170.69	1911.94

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	1630.13	1369.69	1164.38	988.88	810.00	692.44	597.94	513.00	443.25
45.0	1885.50	1631.81	1363.50	1154.25	955.69	811.69	680.06	585.00	499.50
90.0	1812.38	1523.81	1104.24	1056.49	881.83	705.09	594.34	502.82	411.36
135.0	1911.94	1576.13	1323.00	1098.00	878.63	704.25	580.50	482.63	387.00
180.0	1564.88	1121.63	1041.24	808.71	660.26	543.26	430.14	367.14	301.56
225.0	1122.02	1043.83	838.35	693.45	564.86	464.46	390.43	328.39	268.09
270.0	1364.63	1146.38	938.25	785.81	646.31	534.38	454.50	380.25	318.94
315.0	1371.94	1113.53	962.78	800.04	670.56	577.18	490.44	426.99	367.31
360.0	1630.13	1369.69	1164.38	988.88	810.00	692.44	597.94	513.00	443.25

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	390.94	339.75	295.88	286.88	229.28	198.45	172.18	151.48	130.67
45.0	427.50	375.19	321.75	285.19	263.31	220.05	187.82	163.63	142.76
90.0	351.28	301.78	252.34	218.76	190.35	160.03	141.24	119.42	99.62
135.0	327.38	284.06	225.79	194.12	169.76	141.02	118.41	104.01	85.50
180.0	243.96	210.99	180.34	146.08	127.52	109.41	89.78	79.88	70.09
225.0	229.95	197.78	168.41	142.76	122.96	103.39	87.13	75.15	64.29
270.0	285.75	236.48	201.66	173.42	150.75	128.31	108.96	94.11	81.11
315.0	316.86	276.98	242.10	204.81	180.34	157.89	133.26	116.33	101.64
360.0	390.94	339.75	295.88	286.88	229.28	198.45	172.18	151.48	130.67

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	114.02	96.24	84.60	74.76	64.24	57.32	51.13	45.56	39.71
45.0	122.91	105.81	93.32	79.93	68.46	61.20	52.99	47.03	41.18
90.0	88.26	76.67	62.44	54.96	48.26	40.78	36.90	32.96	29.31
135.0	74.25	65.14	55.69	48.77	43.54	37.97	34.09	30.71	27.56
180.0	61.20	53.44	47.48	41.74	37.46	33.47	30.49	28.18	26.04
225.0	56.36	49.56	44.04	39.88	36.11	31.95	28.91	26.16	23.85
270.0	67.84	59.74	52.82	45.90	40.28	35.89	31.73	28.35	25.93
315.0	87.24	75.09	65.70	56.81	50.34	44.04	38.87	34.71	31.22
360.0	114.02	96.24	84.60	74.76	64.24	57.32	51.13	45.56	39.71

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	35.94	32.91	30.09	27.51	25.71	23.96	22.28	21.04	19.86
45.0	36.68	33.30	30.60	27.73	25.71	24.13	22.56	21.49	20.59
90.0	26.16	23.85	21.83	20.48	19.13	18.23	17.72	16.65	15.75
135.0	25.14	23.29	21.71	20.53	19.29	17.83	16.65	16.09	15.75
180.0	24.30	23.01	21.83	20.64	19.52	18.45	17.55	16.88	16.31
225.0	22.61	21.66	20.36	19.41	18.73	17.94	17.38	16.93	16.65
270.0	23.68	22.33	20.76	19.52	18.73	18.11	17.44	17.16	16.93
315.0	28.46	26.44	24.24	22.28	21.09	20.14	19.01	18.34	17.78
360.0	35.94	32.91	30.09	27.51	25.71	23.96	22.28	21.04	19.86

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	18.84	18.00	17.16	16.59	15.81	15.02	14.40	13.95	13.33
45.0	19.74	19.01	18.45	17.72	17.38	16.99	16.31	15.69	15.02
90.0	15.19	14.96	14.96	14.79	14.40	14.01	13.44	12.99	12.83
135.0	15.47	15.19	14.63	14.29	13.89	13.39	12.99	12.66	12.32
180.0	15.69	15.08	14.40	13.67	13.22	12.71	12.38	12.09	11.81
225.0	16.26	15.86	15.47	15.13	14.85	14.40	14.06	13.73	13.33
270.0	16.59	16.31	15.98	15.41	14.96	14.63	14.06	13.73	13.28
315.0	17.10	16.71	16.20	15.53	15.13	14.40	13.61	12.94	12.71
360.0	18.84	18.00	17.16	16.59	15.81	15.02	14.40	13.95	13.33

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	12.99	12.60	12.15	11.76	11.48	11.14	10.80	10.52	10.13
45.0	14.34	13.73	13.22	12.60	12.21	11.81	11.36	10.97	10.63
90.0	12.43	12.09	11.64	11.19	10.80	10.41	10.18	9.96	9.39
135.0	12.04	11.70	11.53	10.97	10.91	10.63	10.29	10.07	9.84
180.0	11.59	11.36	11.14	10.80	10.58	10.29	10.18	9.96	9.84
225.0	12.94	12.54	12.04	11.70	11.36	10.97	10.74	10.46	10.13
270.0	12.66	12.21	11.87	11.36	11.03	10.74	10.35	10.07	9.84
315.0	12.15	11.81	11.48	10.91	10.52	10.18	9.90	9.45	9.17
360.0	12.99	12.60	12.15	11.76	11.48	11.14	10.80	10.52	10.13

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	9.90	9.68	9.39	9.17	8.94	8.72	8.49	8.27	8.04
45.0	10.24	9.96	9.68	9.28	9.06	8.72	8.49	8.27	7.99
90.0	9.11	9.06	8.89	8.66	8.44	8.16	7.99	7.82	7.71
135.0	9.73	9.51	9.23	9.00	8.78	8.49	8.33	8.10	7.93
180.0	9.68	9.51	9.28	9.11	8.89	8.72	8.55	8.33	8.16
225.0	9.90	9.68	9.39	9.17	8.94	8.61	8.38	8.21	7.99
270.0	9.56	9.28	9.06	8.78	8.49	8.27	8.04	7.82	7.59
315.0	8.94	8.66	8.38	8.16	7.93	7.71	7.20	6.98	6.92
360.0	9.90	9.68	9.39	9.17	8.94	8.72	8.49	8.27	8.04

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	7.82	7.59	7.37	7.26	7.20	7.09	7.03	6.81	6.53
45.0	7.65	7.37	7.09	6.75	6.47	6.30	6.02	5.85	5.74
90.0	7.59	7.43	7.31	7.14	7.03	6.92	6.81	6.75	6.69
135.0	7.71	7.48	7.31	7.09	6.98	6.81	6.75	6.64	6.64
180.0	7.99	7.76	7.65	7.54	7.59	7.88	8.27	9.39	10.80
225.0	7.76	7.65	7.48	7.31	7.20	7.14	7.14	7.14	7.26
270.0	7.37	7.26	7.09	6.92	6.81	6.81	6.75	6.81	6.86
315.0	6.75	6.47	6.24	6.19	6.08	6.02	5.96	6.02	6.02
360.0	7.82	7.59	7.37	7.26	7.20	7.09	7.03	6.81	6.53

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	6.41	6.19	5.96	5.79	5.63	5.51	5.34	5.12	4.11
45.0	5.63	5.57	5.57	5.63	5.51	5.29	5.23	5.01	4.89
90.0	6.81	6.81	6.86	6.98	6.98	6.98	6.86	6.24	5.01
135.0	6.69	6.81	7.09	7.26	7.31	7.20	7.09	6.75	6.58
180.0	12.49	14.40	15.98	16.82	15.86	13.61	11.42	9.90	6.47
225.0	7.37	7.54	7.59	7.59	7.71	7.88	8.16	8.33	6.41
270.0	7.03	7.20	7.37	7.37	7.31	7.54	7.76	7.88	6.19
315.0	6.02	5.91	5.85	5.79	5.79	5.85	5.74	5.23	4.33
360.0	6.41	6.19	5.96	5.79	5.63	5.51	5.34	5.12	4.11

Intensity data(cd)

C/γ(°)	90.0
0.0	3.88
45.0	3.83
90.0	4.05
135.0	5.34
180.0	5.91
225.0	5.34
270.0	4.73
315.0	4.33
360.0	3.88