NATA LIGHTING CO.,LTD.
www.nata.cn
Email:info@nata.com
Tel:+86-750-3770000 Fax:+86 750 3771111
Address:Address:380JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

NT

Client: NT
LumCAT: 61-0208-1
Luminaire: 92.70.427.00
Report No: 20250519-B004
Ballast type: AC
Test No: 20250519-C004
LampCAT: CITIZEN CLU701
Lamp flux(lm): 1347.9
Number of Lamps: 1
Length(mm): 45
Phm Type: C

Voltage(V): 36.800
Current(A): 0.352
Power (W): 12.950
PF: 0.000
Width(mm): 45
Height(mm): 21

Photometric Results

Lumens(lm): 1185.14, Efficiency(%): 87.92% , Luminous Efficacy(lm/W): 91.52
Central intensity(cd): 6236.822, Maximum intensity(cd): 6236.822
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=38.2
[C90/270]Total=38.2
Maximum s/h(1/2): C0_180=0.42 C90_270=0.42
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(%): 87.92%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.493%

Equipment: GMS 1800
Temperature(°C): 25.0
Date: 2025/5/19
Humidity(%): 60.0%
Operator: NT
Distance(m): 7.30

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6236.822	0.000	0	0.00%	0.00%
1.0	6219.902	5.960	5.96	0.44%	0.50%
2.0	6154.622	17.761	23.721	1.32%	2.00%
3.0	6053.304	29.197	52.919	2.17%	4.47%
4.0	5932.669	40.121	93.04	2.98%	7.85%
5.0	5724.705	50.149	143.189	3.72%	12.08%
6.0	5484.167	58.906	202.095	4.37%	17.05%
7.0	5229.974	66.502	268.597	4.93%	22.66%
8.0	4885.254	72.393	340.99	5.37%	28.77%
9.0	4529.876	76.305	417.294	5.66%	35.21%
10.0	4117.345	78.254	495.549	5.81%	41.81%
11.0	3677.836	77.890	573.438	5.78%	48.39%
12.0	3220.275	75.406	648.845	5.59%	54.75%
13.0	2749.857	70.850	719.695	5.26%	60.73%
14.0	2249.944	63.997	783.692	4.75%	66.13%
15.0	1865.730	56.502	840.194	4.19%	70.89%
16.0	1440.369	48.444	888.638	3.59%	74.98%
17.0	1058.226	38.910	927.547	2.89%	78.26%
18.0	876.168	31.894	959.441	2.37%	80.96%
19.0	649.872	26.550	985.991	1.97%	83.20%
20.0	458.107	20.279	1006.27	1.50%	84.91%
21.0	339.211	15.310	1021.58	1.14%	86.20%
22.0	242.783	11.695	1033.276	0.87%	87.19%
23.0	180.347	8.878	1042.154	0.66%	87.94%
24.0	151.983	7.266	1049.42	0.54%	88.55%
25.0	112.455	6.013	1055.433	0.45%	89.06%
26.0	98.034	4.969	1060.402	0.37%	89.48%
27.0	88.468	4.563	1064.964	0.34%	89.86%
28.0	81.021	4.291	1069.255	0.32%	90.22%
29.0	74.679	4.074	1073.329	0.30%	90.57%
30.0	69.730	3.899	1077.228	0.29%	90.89%
31.0	64.594	3.738	1080.966	0.28%	91.21%
32.0	60.071	3.572	1084.538	0.26%	91.51%
33.0	56.567	3.436	1087.974	0.25%	91.80%
34.0	52.551	3.302	1091.276	0.24%	92.08%
35.0	49.107	3.157	1094.433	0.23%	92.35%
36.0	46.103	3.031	1097.465	0.22%	92.60%
37.0	43.325	2.917	1100.381	0.22%	92.85%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	40.654	2.803	1103.184	0.21%	93.08%
39.0	38.415	2.699	1105.883	0.20%	93.31%
40.0	36.277	2.605	1108.488	0.19%	93.53%
41.0	34.545	2.522	1111.01	0.19%	93.75%
42.0	32.967	2.453	1113.463	0.18%	93.95%
43.0	31.787	2.399	1115.862	0.18%	94.15%
44.0	30.568	2.353	1118.215	0.17%	94.35%
45.0	29.683	2.316	1120.531	0.17%	94.55%
46.0	28.850	2.289	1122.82	0.17%	94.74%
47.0	28.230	2.270	1125.09	0.17%	94.93%
48.0	27.751	2.263	1127.353	0.17%	95.12%
49.0	27.484	2.268	1129.621	0.17%	95.32%
50.0	27.364	2.287	1131.908	0.17%	95.51%
51.0	27.291	2.312	1134.22	0.17%	95.70%
52.0	27.271	2.341	1136.562	0.17%	95.90%
53.0	27.171	2.368	1138.93	0.18%	96.10%
54.0	27.045	2.390	1141.32	0.18%	96.30%
55.0	26.785	2.403	1143.723	0.18%	96.51%
56.0	26.399	2.403	1146.126	0.18%	96.71%
57.0	25.866	2.390	1148.515	0.18%	96.91%
58.0	25.113	2.357	1150.873	0.17%	97.11%
59.0	24.240	2.307	1153.18	0.17%	97.30%
60.0	23.248	2.244	1155.424	0.17%	97.49%
61.0	22.069	2.163	1157.586	0.16%	97.68%
62.0	20.956	2.073	1159.659	0.15%	97.85%
63.0	19.691	1.977	1161.636	0.15%	98.02%
64.0	18.578	1.878	1163.514	0.14%	98.18%
65.0	17.193	1.770	1165.284	0.13%	98.32%
66.0	16.040	1.658	1166.942	0.12%	98.46%
67.0	14.961	1.559	1168.501	0.12%	98.60%
68.0	13.829	1.458	1169.96	0.11%	98.72%
69.0	12.810	1.359	1171.319	0.10%	98.83%
70.0	11.844	1.266	1172.585	0.09%	98.94%
71.0	10.924	1.177	1173.762	0.09%	99.04%
72.0	10.058	1.091	1174.853	0.08%	99.13%
73.0	9.252	1.010	1175.862	0.07%	99.22%
74.0	8.433	0.930	1176.792	0.07%	99.30%
75.0	7.660	0.850	1177.643	0.06%	99.37%

Zonal flux distribution table

γ(°)	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	6.874	0.772	1178.414	0.06%	99.43%
77.0	6.282	0.701	1179.116	0.05%	99.49%
78.0	5.789	0.646	1179.762	0.05%	99.55%
79.0	5.302	0.596	1180.358	0.04%	99.60%
80.0	5.023	0.557	1180.914	0.04%	99.64%
81.0	4.763	0.529	1181.443	0.04%	99.69%
82.0	4.516	0.503	1181.947	0.04%	99.73%
83.0	4.270	0.478	1182.424	0.04%	99.77%
84.0	4.050	0.453	1182.877	0.03%	99.81%
85.0	3.817	0.429	1183.307	0.03%	99.85%
86.0	3.604	0.406	1183.712	0.03%	99.88%
87.0	3.397	0.383	1184.096	0.03%	99.91%
88.0	3.217	0.362	1184.458	0.03%	99.94%
89.0	3.097	0.346	1184.804	0.03%	99.97%
90.0	2.978	0.333	1185.137	0.02%	100.00%

Zonal flux distribution table

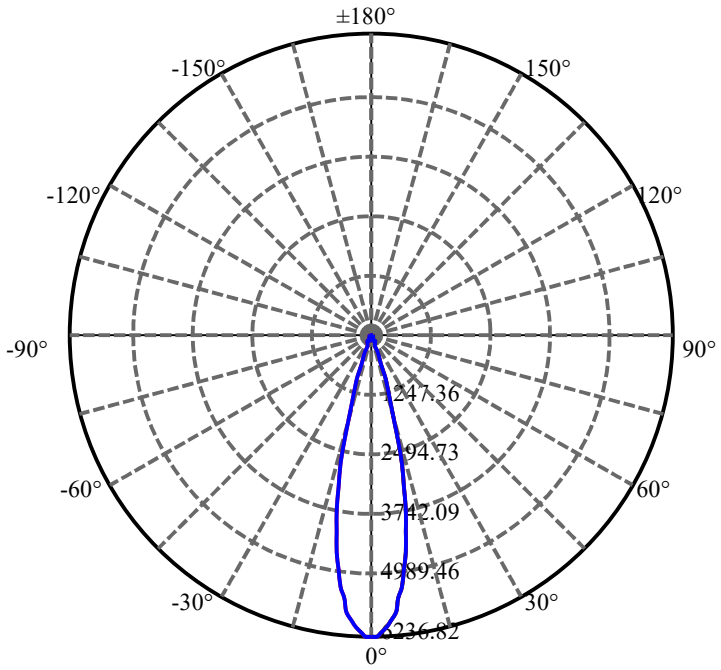
ZONAL LUMEN SUMMARY

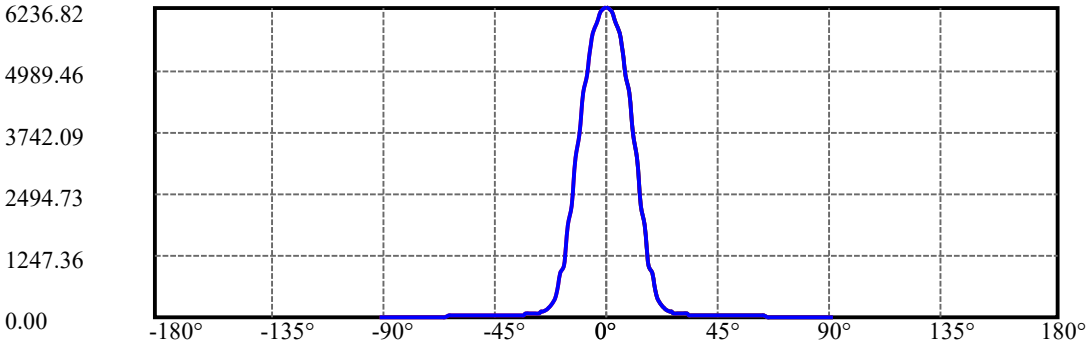
Zone	Lumens	%Lamp	%Fixt
0-30	1077.23	79.92%	90.89%
0-40	1108.49	82.24%	93.53%
0-60	1155.42	85.72%	97.49%
0-90	1184.80	87.90%	99.97%
0-120	1184.80	87.90%	99.97%
0-180	1185.14	87.92%	100.00%
60-90	29.38	2.18%	2.48%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-17.64	948.11	70.34%	80.00%

ZONAL LUMEN SUMMARY

0-10	495.55
10-20	510.72
20-30	70.96
30-40	31.26
40-50	23.42
50-60	23.52
60-70	17.16
70-80	8.33
80-90	3.89
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):

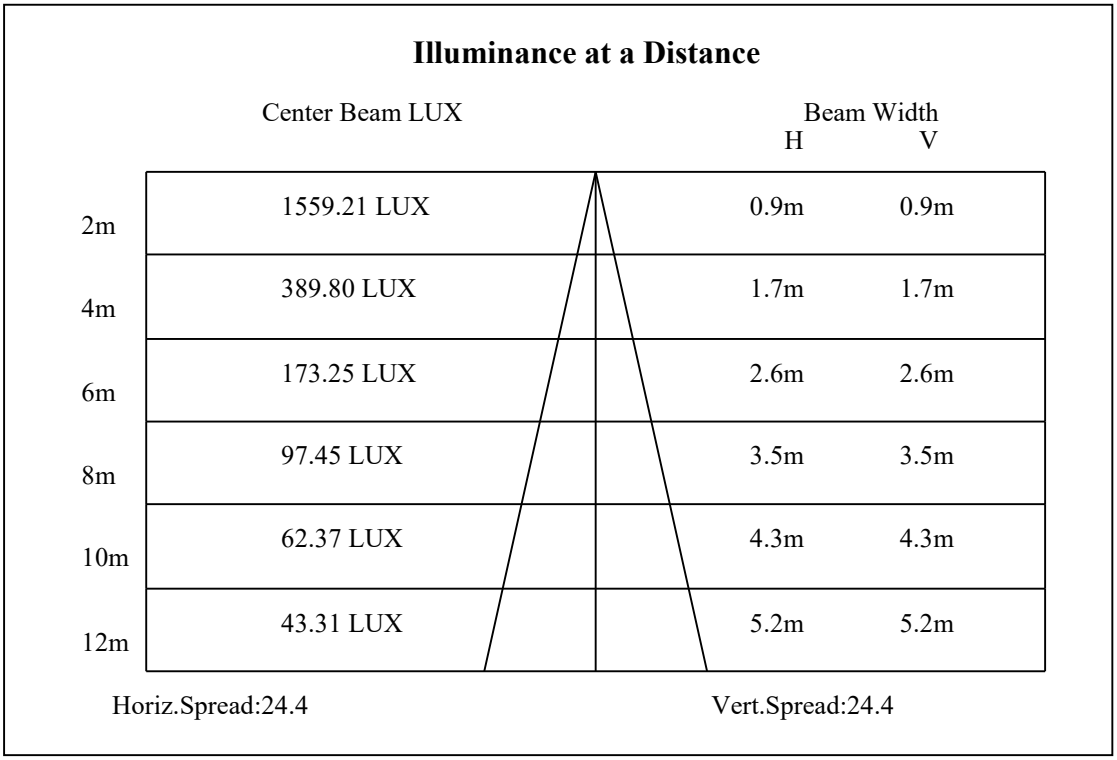
C0/C180:

C90/C270:

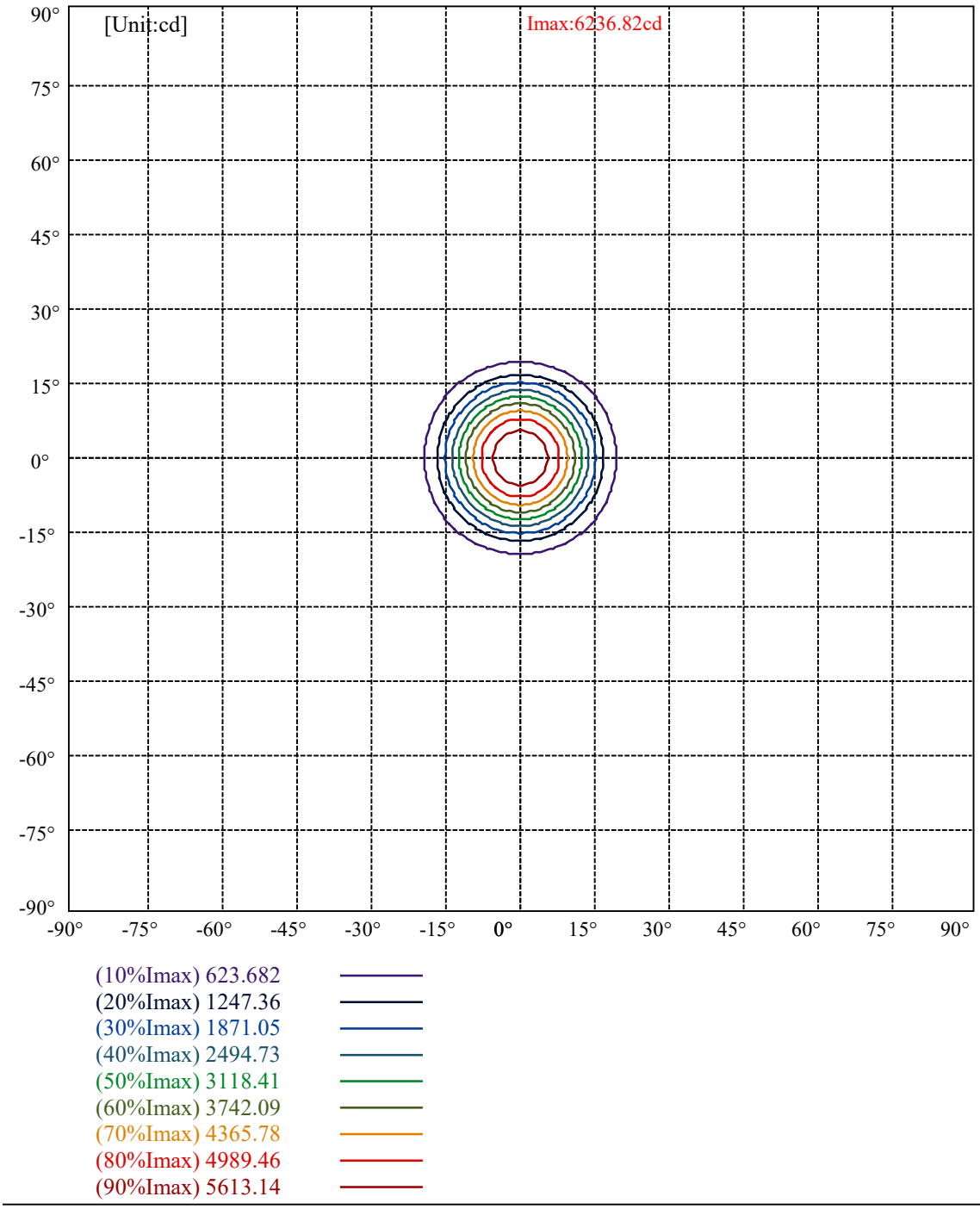
Field angle(10%Imax):C0/180Left:19.1 Right:19.1
:C90/270Left:19.1 Right:19.1

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

Lux distance Curve



ISO-Intensity(V-H)



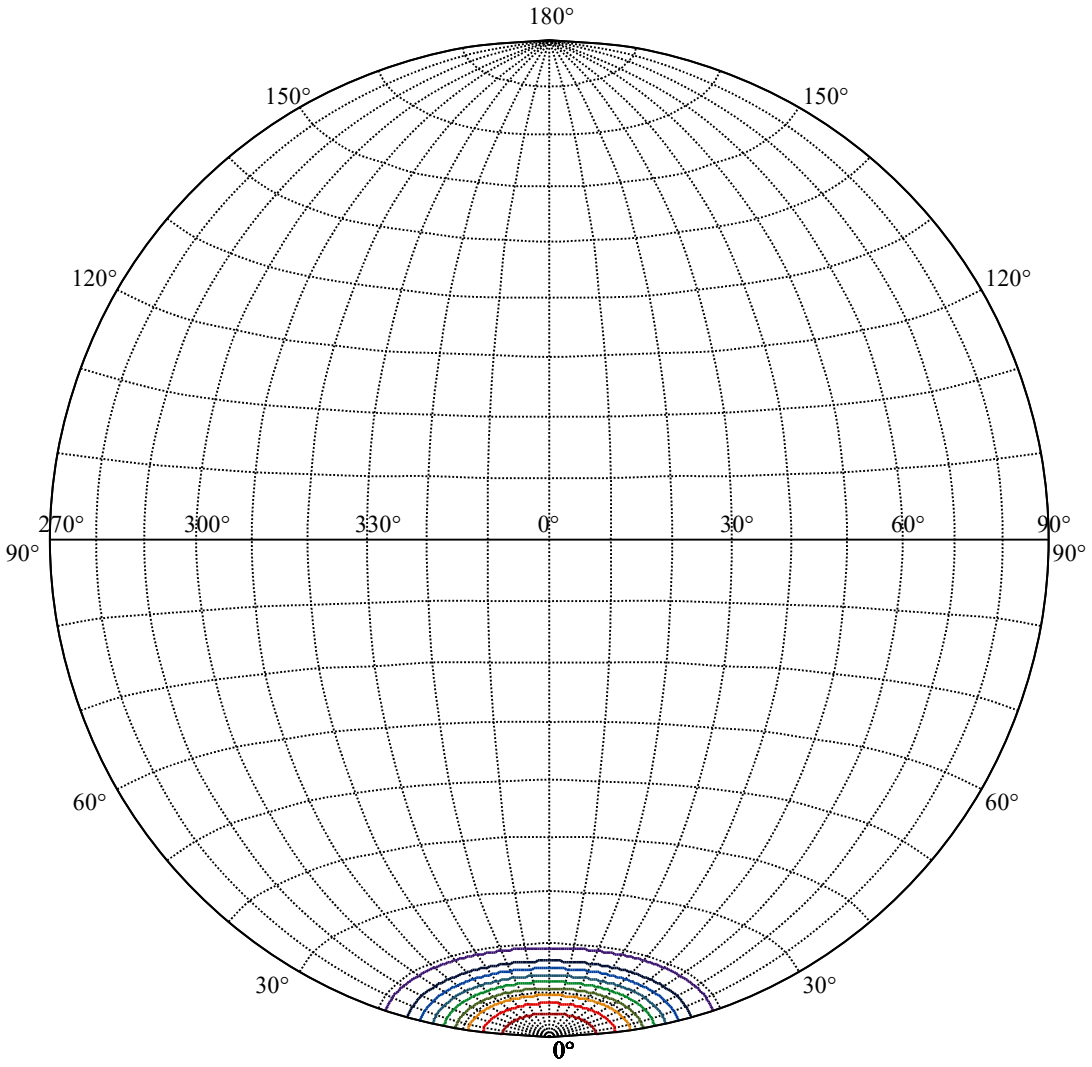
(10%Imax) 623.682
(20%Imax) 1247.36
(30%Imax) 1871.05
(40%Imax) 2494.73
(50%Imax) 3118.41
(60%Imax) 3742.09
(70%Imax) 4365.78
(80%Imax) 4989.46
(90%Imax) 5613.14

Equipment: GMS 1800
Temperature(°C): 25.0

Date: 2025/5/19
Humidity(%): 60.0%

Operator: NT
Distance(m): 7.30

ISO candela diagram on circular web

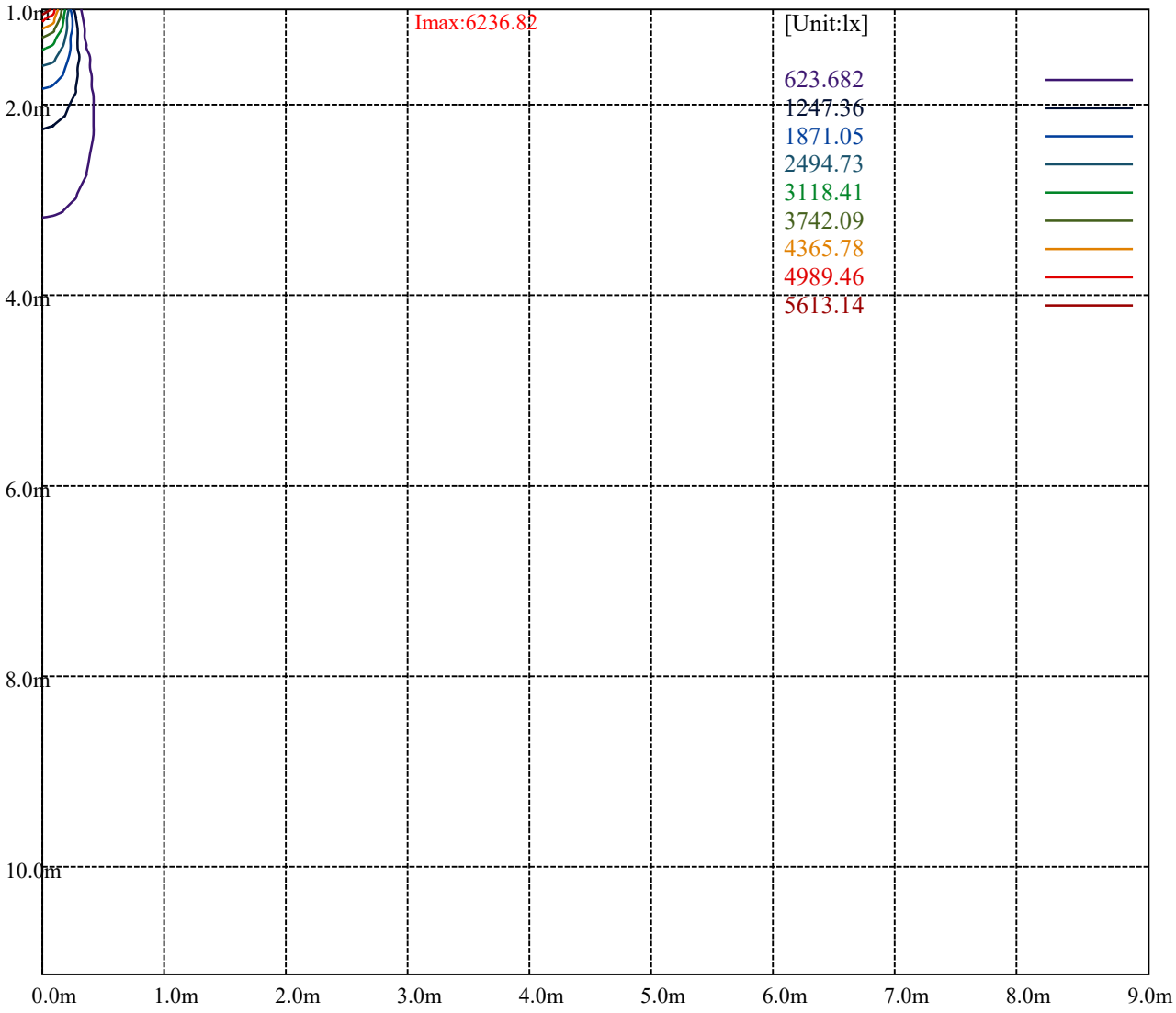


House [Unit:cd] Road

Imax:6236.82

(10%Imax) 623.682
(20%Imax) 1247.36
(30%Imax) 1871.05
(40%Imax) 2494.73
(50%Imax) 3118.41
(60%Imax) 3742.09
(70%Imax) 4365.78
(80%Imax) 4989.46
(90%Imax) 5613.14

Space ISO Lux diagram



Equipment: GMS 1800
Temperature(°C): 25.0

Date: 2025/5/19
Humidity(%): 60.0%

Operator: NT
Distance(m): 7.30

Luminance Limitting Curve(no luminous side)

Luminance Table

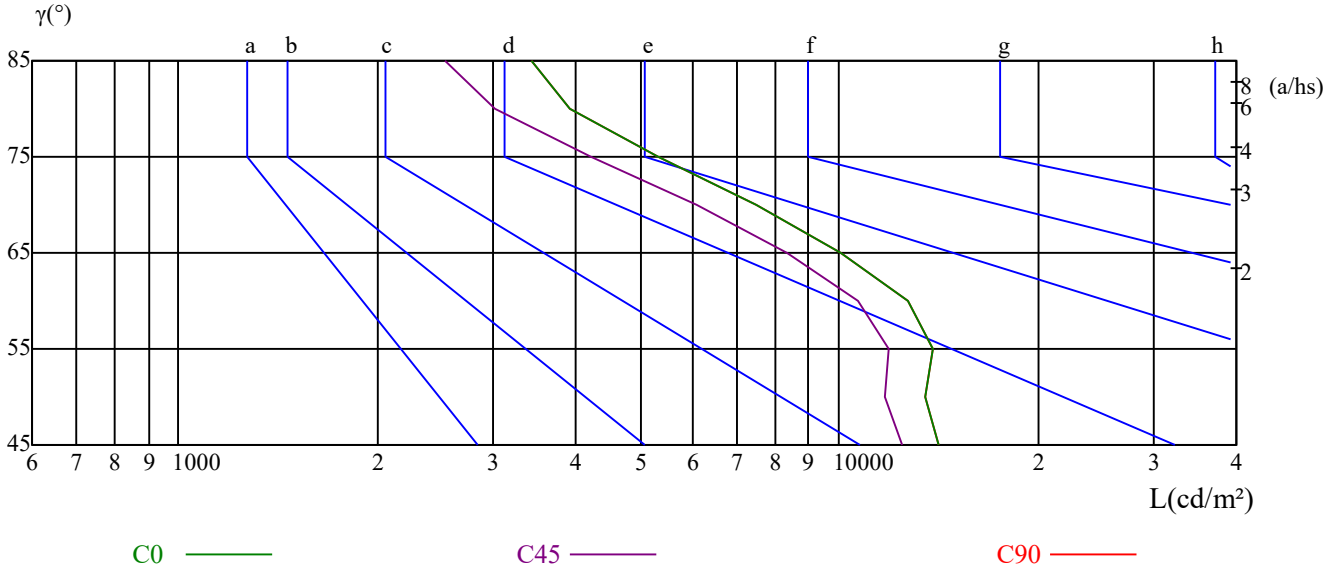
γ	45	50	55	60	65	70	75	80	85
C0	14134	13510	13838	12697	10041	7493	5331	3917	3414
C45	12488	11768	11872	10714	8318	6079	4221	3012	2531
C90	14134	13510	13838	12697	10041	7493	5331	3917	3414

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
20090	20090	20090	14616	14616	14616	21627	21627	21627

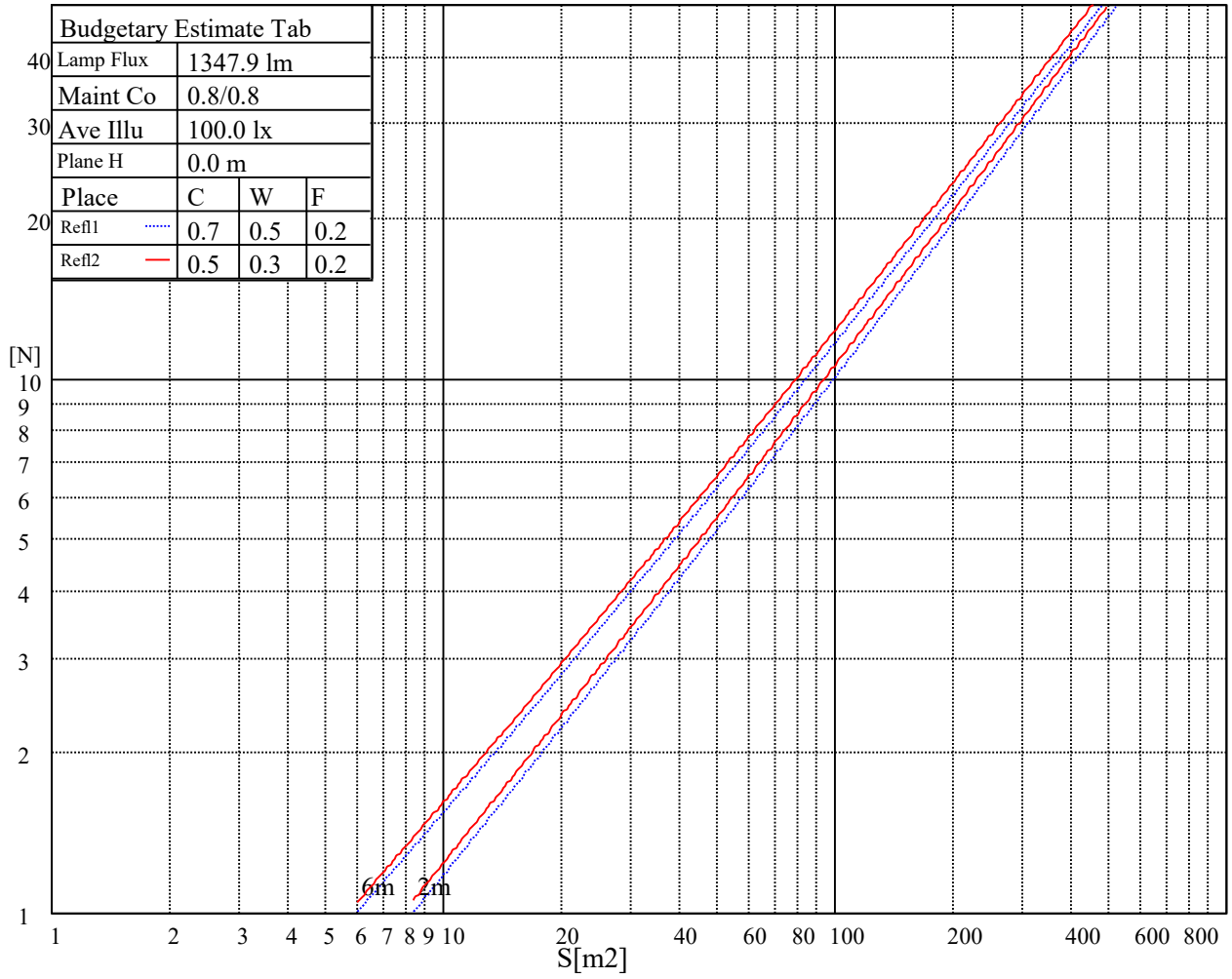
Glare Table

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

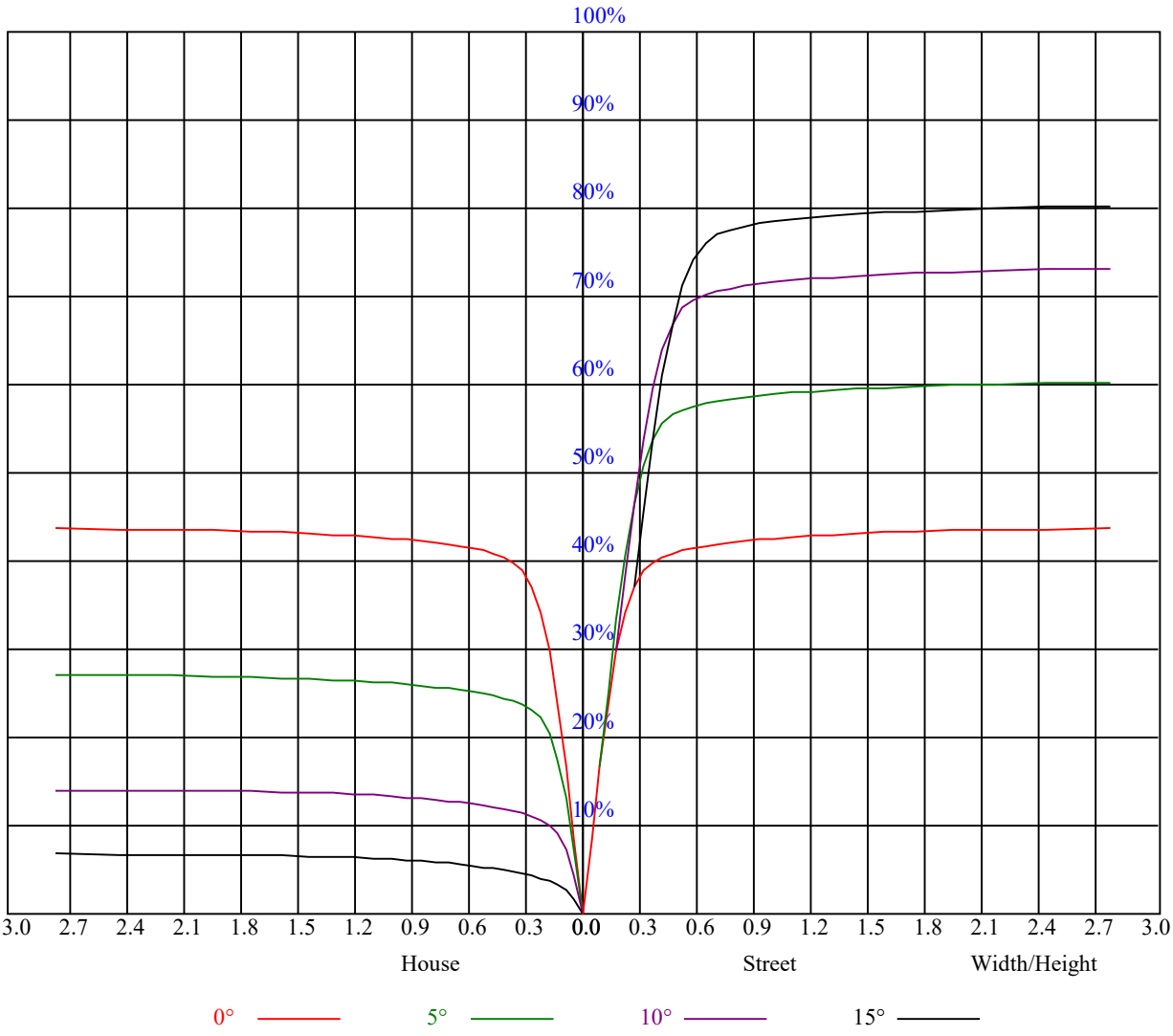


Equipment: GMS 1800 Date: 2025/5/19 Operator: NT
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.30

Utilization factor table for indoor luminaire

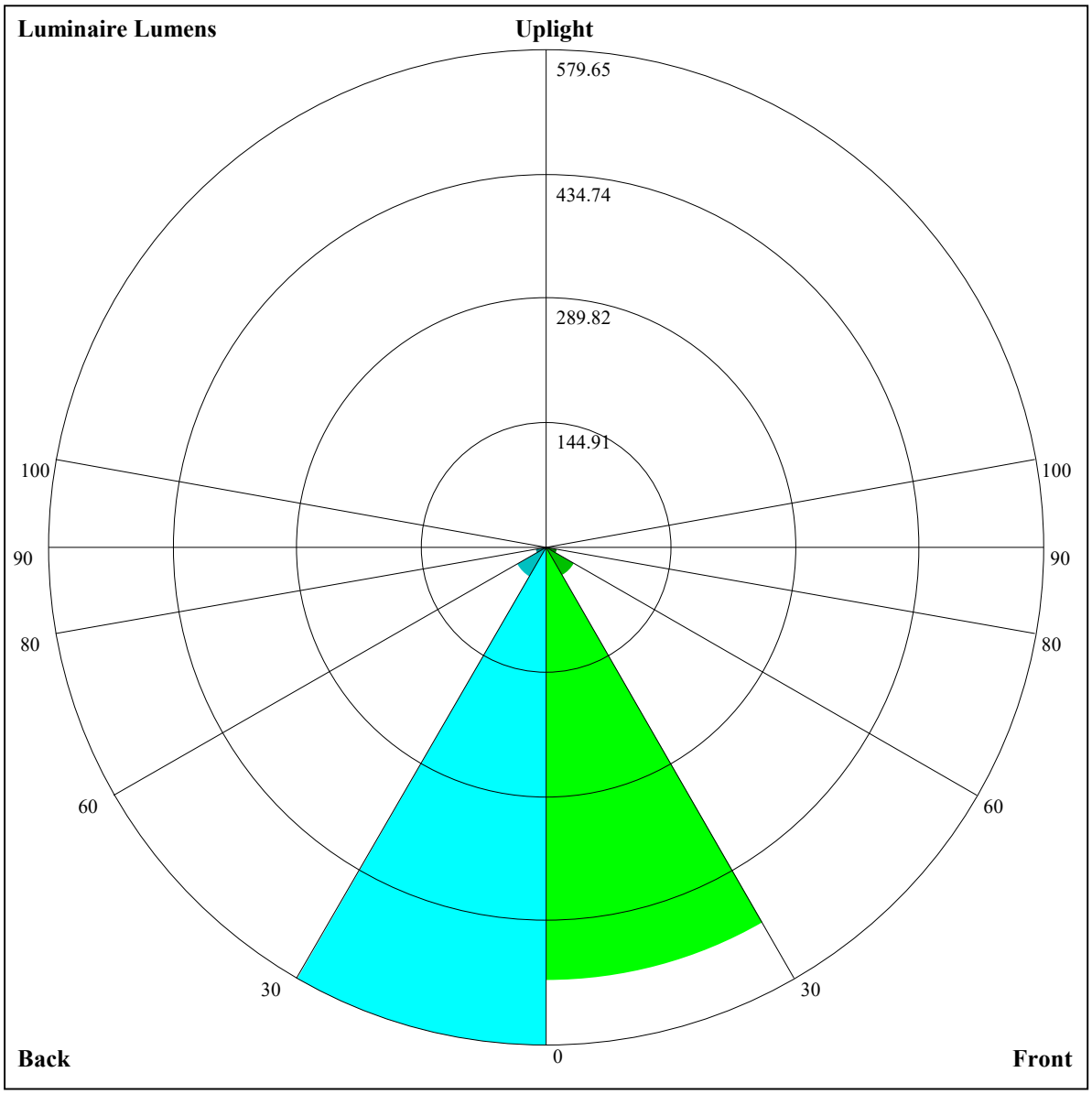
RHOCC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFCIENTS OF UTILIZATION RHOFC=20 CU															
0	1.05	1.05	1.05	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.90	0.90	0.90	0.88
1	0.99	0.97	0.96	0.97	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87	0.87	0.86	0.84
2	0.94	0.91	0.89	0.93	0.90	0.88	0.90	0.88	0.86	0.87	0.86	0.84	0.85	0.84	0.83	0.81
3	0.90	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	0.80	0.79
4	0.87	0.83	0.80	0.86	0.82	0.80	0.84	0.81	0.79	0.82	0.80	0.78	0.81	0.79	0.77	0.76
5	0.84	0.80	0.77	0.83	0.79	0.77	0.81	0.78	0.76	0.80	0.78	0.76	0.79	0.77	0.75	0.74
6	0.81	0.77	0.75	0.80	0.77	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.77	0.75	0.73	0.72
7	0.79	0.75	0.72	0.78	0.75	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.75	0.73	0.71	0.70
8	0.76	0.73	0.70	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.72	0.70	0.74	0.71	0.69	0.69
9	0.74	0.71	0.69	0.74	0.71	0.69	0.73	0.70	0.68	0.73	0.70	0.68	0.72	0.70	0.68	0.67
10	0.73	0.69	0.67	0.72	0.69	0.67	0.72	0.69	0.67	0.71	0.69	0.67	0.71	0.68	0.66	0.66

Coefficient Utilization Curve



Equipment: GMS 1800	Date: 2025/5/19	Operator: NT
Temperature(°C): 25.0	Humidity(%): 60.0%	Distance(m): 7.30

LCS Graph



Luminaire Lumens:

FL=505.61,FM=38.82,FH=12.31,FVH=2.07

BL=579.65,BM=39.49,BH=13.2,BVH=2.15

UL=0,UH=0

BUG Rating:B2-U0-G0

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	6181.80	6085.34	5925.47	5737.36	5603.60	5209.79	4874.60	4651.84	4250.57
45.0	6281.45	6190.86	6049.11	5864.72	5632.91	5356.87	5037.13	4674.76	4274.02
90.0	6178.07	6017.67	5821.03	5569.50	5343.02	5015.81	4558.05	4230.32	3789.08
135.0	6305.97	6275.59	6188.19	6060.30	5887.64	5662.76	5400.57	5088.29	4730.71
180.0	6181.80	6254.27	6278.25	6242.55	6185.00	6081.08	5923.34	5719.78	5458.12
225.0	6281.45	6336.34	6356.06	6343.27	6313.96	6175.41	6085.88	5887.64	5506.08
270.0	6178.07	6285.18	6343.80	6375.78	6372.58	6326.22	6229.76	6086.41	5880.71
315.0	6305.97	6313.96	6275.06	6232.96	6122.65	5969.71	5764.01	5500.75	5192.74
360.0	6181.80	6085.34	5925.47	5737.36	5603.60	5209.79	4874.60	4651.84	4250.57

C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3816.79	3351.57	2890.08	2431.78	1991.61	1366.52	978.14	921.22	666.92
45.0	3838.11	3383.01	2933.77	2492.53	2230.35	1658.01	1302.03	1109.66	830.95
90.0	3330.78	2866.63	2415.26	1988.41	1382.50	1057.01	939.18	688.45	496.34
135.0	4337.43	3905.78	3452.29	2986.00	2521.31	2077.94	1664.41	1290.84	1031.85
180.0	5162.90	4803.72	4392.32	3945.75	3464.01	2968.41	2476.55	2097.12	1578.08
225.0	5308.91	4930.55	4496.77	4017.69	3503.44	2984.40	2469.62	1984.68	1035.69
270.0	5619.59	5297.19	4911.37	4466.39	3979.86	3461.35	3146.40	2418.46	1936.72
315.0	4824.50	4400.32	3930.83	3433.63	2925.78	2425.92	1949.51	1012.51	889.25
360.0	3816.79	3351.57	2890.08	2431.78	1991.61	1366.52	978.14	921.22	666.92

C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	471.40	328.91	230.64	178.95	138.23	113.51	99.76	90.22	82.97
45.0	603.94	431.81	308.71	308.71	158.22	128.16	110.58	99.23	91.23
90.0	357.15	294.43	194.14	152.36	135.14	110.20	103.65	94.32	87.29
135.0	713.18	512.81	390.78	278.87	278.87	151.34	122.99	105.83	94.64
180.0	1271.13	942.33	627.92	471.78	326.29	303.38	203.25	130.72	109.62
225.0	1035.69	793.91	553.31	376.07	256.27	183.42	155.39	124.70	106.15
270.0	1667.60	1265.80	922.08	647.10	442.47	302.31	302.31	154.81	123.37
315.0	889.25	628.98	437.30	299.86	206.77	150.44	117.93	99.81	88.99
360.0	471.40	328.91	230.64	178.95	138.23	113.51	99.76	90.22	82.97

C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	77.38	72.69	68.53	64.53	60.70	56.81	53.02	49.24	45.99
45.0	84.52	79.03	74.02	71.14	66.61	61.07	58.78	55.05	51.37
90.0	81.21	75.51	69.70	64.48	59.63	55.26	51.32	47.64	44.12
135.0	86.06	78.98	73.11	68.10	63.31	58.99	54.68	50.63	46.74
180.0	96.67	87.24	79.08	74.71	67.15	62.94	60.80	55.79	52.44
225.0	94.32	85.37	77.70	71.41	66.13	61.55	57.39	53.66	50.04
270.0	106.10	94.16	85.21	77.70	71.36	65.81	61.92	57.02	54.20
315.0	81.48	75.19	70.08	65.76	61.87	58.14	54.62	51.37	47.96
360.0	77.38	72.69	68.53	64.53	60.70	56.81	53.02	49.24	45.99

C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	43.06	40.34	38.10	36.29	34.59	33.04	31.55	30.85	29.36
45.0	47.96	44.71	41.78	39.11	36.72	34.59	32.72	31.23	30.16
90.0	40.98	38.32	35.92	33.95	32.61	31.07	29.95	29.31	28.46
135.0	43.43	41.62	38.90	36.66	34.69	32.93	31.55	30.38	29.52
180.0	50.57	47.32	44.28	41.51	39.01	36.88	35.01	33.36	31.87
225.0	46.68	43.70	40.98	38.53	36.45	34.69	33.15	32.35	30.91
270.0	50.89	47.80	44.87	42.26	39.86	37.73	35.86	34.32	32.88
315.0	45.24	42.79	40.39	39.01	36.29	35.44	33.95	32.51	31.39
360.0	43.06	40.34	38.10	36.29	34.59	33.04	31.55	30.85	29.36

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	28.94	28.24	27.82	27.60	27.44	27.34	27.12	26.96	26.54
45.0	29.10	28.24	27.60	27.12	27.07	27.02	26.96	26.86	26.70
90.0	27.71	27.12	26.70	26.38	26.33	26.33	26.33	26.22	26.01
135.0	28.56	27.66	26.91	26.38	26.17	26.22	26.27	26.33	26.27
180.0	30.75	29.79	28.99	28.19	27.71	27.39	27.28	27.44	27.55
225.0	30.43	29.58	28.67	28.30	27.98	27.92	28.03	28.19	28.35
270.0	31.71	30.80	30.38	29.79	29.10	28.56	28.14	27.98	27.98
315.0	30.27	29.36	28.78	28.24	28.08	28.14	28.19	28.19	27.98
360.0	28.94	28.24	27.82	27.60	27.44	27.34	27.12	26.96	26.54

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	26.06	25.53	24.89	24.09	23.02	21.85	20.73	19.56	18.39
45.0	26.54	26.17	25.58	24.89	24.09	22.97	21.85	20.78	19.66
90.0	25.74	25.21	24.51	23.61	22.54	21.42	20.14	18.86	17.69
135.0	26.22	26.01	25.69	25.05	24.41	23.77	22.54	21.69	20.46
180.0	27.66	27.71	27.60	27.39	26.91	26.22	25.42	24.30	23.23
225.0	28.40	28.24	28.03	27.55	26.91	26.01	25.05	23.77	22.49
270.0	28.03	27.98	27.87	27.76	27.39	26.91	26.17	25.26	24.09
315.0	27.71	27.44	27.02	26.59	25.63	24.78	24.09	22.33	21.64
360.0	26.06	25.53	24.89	24.09	23.02	21.85	20.73	19.56	18.39

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	17.11	16.47	14.87	14.18	13.22	12.20	11.19	10.34	9.54
45.0	18.44	17.21	16.09	15.03	13.96	12.95	12.04	11.14	10.23
90.0	16.47	15.67	14.07	13.00	12.36	11.40	10.44	9.59	8.85
135.0	19.18	17.96	16.73	15.51	14.34	13.27	12.31	11.35	10.39
180.0	22.06	20.84	19.50	18.23	17.05	15.88	14.71	13.75	12.79
225.0	21.10	19.98	18.44	17.11	16.04	14.65	13.75	12.74	11.67
270.0	22.81	21.53	20.20	18.81	17.48	16.20	15.03	13.86	12.79
315.0	20.36	18.97	17.64	16.47	15.24	14.07	13.00	11.99	11.14
360.0	17.11	16.47	14.87	14.18	13.22	12.20	11.19	10.34	9.54

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	8.79	7.99	7.19	6.39	5.60	5.33	5.17	5.01	4.74
45.0	9.43	8.79	7.94	7.25	6.23	5.60	5.33	5.06	4.85
90.0	8.10	7.30	6.50	5.54	5.17	4.96	4.74	4.48	4.26
135.0	9.54	8.79	7.99	7.19	6.39	5.81	5.22	4.96	4.85
180.0	11.94	10.98	10.13	9.33	8.58	7.78	7.25	6.29	5.76
225.0	10.71	9.91	9.17	8.31	7.57	6.77	5.86	5.44	5.12
270.0	11.78	10.87	9.91	9.43	8.42	7.89	7.19	5.92	5.54
315.0	10.18	9.38	8.63	7.83	7.03	6.13	5.54	5.28	5.06
360.0	8.79	7.99	7.19	6.39	5.60	5.33	5.17	5.01	4.74

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	4.48	4.26	4.00	3.73	3.57	3.36	3.20	2.93	2.88
45.0	4.53	4.32	4.10	3.89	3.68	3.46	3.25	3.09	2.98
90.0	4.10	3.89	3.62	3.46	3.30	3.09	2.93	2.82	2.82
135.0	4.48	4.32	4.10	3.89	3.57	3.41	3.14	2.98	2.88
180.0	5.49	5.06	4.80	4.58	4.26	4.05	3.84	3.62	3.36
225.0	4.96	4.74	4.48	4.21	4.05	3.78	3.57	3.36	3.25
270.0	5.28	4.96	4.74	4.48	4.16	4.00	3.73	3.57	3.41
315.0	4.80	4.58	4.32	4.16	3.94	3.68	3.52	3.36	3.20
360.0	4.48	4.26	4.00	3.73	3.57	3.36	3.20	2.93	2.88

Intensity data(cd)

C/γ(°)	90.0
0.0	2.82
45.0	2.98
90.0	2.82
135.0	2.72
180.0	3.20
225.0	3.09
270.0	3.14
315.0	3.04
360.0	2.82