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Nata

LumCAT: 2-2077-M	
Luminaire: 92.70.131.00	
Report No: NATA0100	Voltage(V): 33.9100
Test No: GC2019091106	Current(A): 0.3970
LampCAT: CITIZEN CLU038	Power (W): 13.4600
Lamp flux(lm): 1918.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 65	Width(mm): 65
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1504.62
Efficiency(%): 78.45%
Lumens(lm)/Power(W): 111.78
Central intensity(cd): 8226.563
Maximum intensity(cd): 8226.563
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=23.3
[C90/270]Total=23.3
Field angle(10%Imax): [C0/180]Total=41.8
[C90/270]Total=41.8
Maximum s/h(1/2): C0_180=0.39 C90_270=0.39
Maximum s/h(1/4): C0_180=0.40 C90_270=0.40
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 78.45%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.452%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	8226.563	0.000	0	.000%	.000%
1.0	8192.039	7.856	7.856	.410%	.522%
2.0	8093.320	23.374	31.23	1.219%	2.076%
3.0	7912.969	38.282	69.512	1.996%	4.620%
4.0	7664.203	52.142	121.654	2.719%	8.085%
5.0	7345.266	64.570	186.224	3.367%	12.377%
6.0	6947.719	75.113	261.337	3.916%	17.369%
7.0	6481.828	83.357	344.694	4.346%	22.909%
8.0	6022.406	89.490	434.185	4.666%	28.857%
9.0	5476.219	93.190	527.375	4.859%	35.050%
10.0	4932.352	94.194	621.568	4.911%	41.311%
11.0	4441.078	93.660	715.228	4.883%	47.536%
12.0	3930.258	91.511	806.739	4.771%	53.618%
13.0	3422.953	87.264	894.003	4.550%	59.417%
14.0	2978.789	81.942	975.945	4.272%	64.863%
15.0	2571.398	76.195	1052.14	3.973%	69.927%
16.0	2182.289	69.655	1121.795	3.632%	74.557%
17.0	1856.813	62.900	1184.695	3.279%	78.737%
18.0	1529.198	55.828	1240.523	2.911%	82.448%
19.0	1272.431	48.743	1289.265	2.541%	85.687%
20.0	997.882	41.553	1330.818	2.166%	88.449%
21.0	801.858	34.559	1365.377	1.802%	90.746%
22.0	611.318	28.398	1393.775	1.481%	92.633%
23.0	446.456	22.195	1415.97	1.157%	94.108%
24.0	294.420	16.198	1432.169	.845%	95.185%
25.0	187.158	10.950	1443.119	.571%	95.913%
26.0	111.495	7.050	1450.168	.368%	96.381%
27.0	49.781	3.946	1454.114	.206%	96.643%
28.0	28.343	1.978	1456.092	.103%	96.775%
29.0	20.770	1.285	1457.377	.067%	96.860%
30.0	18.506	1.060	1458.437	.055%	96.931%
31.0	16.784	0.982	1459.419	.051%	96.996%
32.0	15.525	0.926	1460.345	.048%	97.057%
33.0	14.569	0.887	1461.232	.046%	97.116%
34.0	13.662	0.854	1462.086	.045%	97.173%
35.0	12.952	0.827	1462.912	.043%	97.228%
36.0	12.326	0.805	1463.717	.042%	97.282%
37.0	11.770	0.786	1464.503	.041%	97.334%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	11.285	0.770	1465.273	.040%	97.385%
39.0	10.863	0.756	1466.029	.039%	97.435%
40.0	10.512	0.745	1466.774	.039%	97.485%
41.0	10.209	0.738	1467.512	.038%	97.534%
42.0	9.928	0.732	1468.244	.038%	97.582%
43.0	9.675	0.726	1468.97	.038%	97.631%
44.0	9.471	0.723	1469.692	.038%	97.679%
45.0	9.281	0.721	1470.413	.038%	97.727%
46.0	9.105	0.719	1471.132	.037%	97.774%
47.0	8.944	0.718	1471.85	.037%	97.822%
48.0	8.817	0.718	1472.568	.037%	97.870%
49.0	8.684	0.719	1473.287	.037%	97.918%
50.0	8.571	0.719	1474.006	.038%	97.965%
51.0	8.473	0.721	1474.727	.038%	98.013%
52.0	8.381	0.723	1475.45	.038%	98.061%
53.0	8.283	0.725	1476.175	.038%	98.110%
54.0	8.198	0.726	1476.902	.038%	98.158%
55.0	8.135	0.729	1477.631	.038%	98.206%
56.0	8.079	0.733	1478.363	.038%	98.255%
57.0	8.023	0.736	1479.1	.038%	98.304%
58.0	7.959	0.739	1479.839	.039%	98.353%
59.0	7.903	0.742	1480.58	.039%	98.402%
60.0	7.847	0.744	1481.324	.039%	98.452%
61.0	7.812	0.747	1482.072	.039%	98.501%
62.0	7.763	0.750	1482.822	.039%	98.551%
63.0	7.727	0.753	1483.575	.039%	98.601%
64.0	7.685	0.756	1484.332	.039%	98.652%
65.0	7.650	0.759	1485.091	.040%	98.702%
66.0	7.622	0.762	1485.853	.040%	98.753%
67.0	7.580	0.764	1486.617	.040%	98.804%
68.0	7.566	0.767	1487.384	.040%	98.855%
69.0	7.530	0.770	1488.154	.040%	98.906%
70.0	7.509	0.772	1488.927	.040%	98.957%
71.0	7.495	0.776	1489.702	.040%	99.009%
72.0	7.460	0.778	1490.48	.041%	99.060%
73.0	7.446	0.779	1491.259	.041%	99.112%
74.0	7.425	0.782	1492.041	.041%	99.164%
75.0	7.411	0.784	1492.825	.041%	99.216%

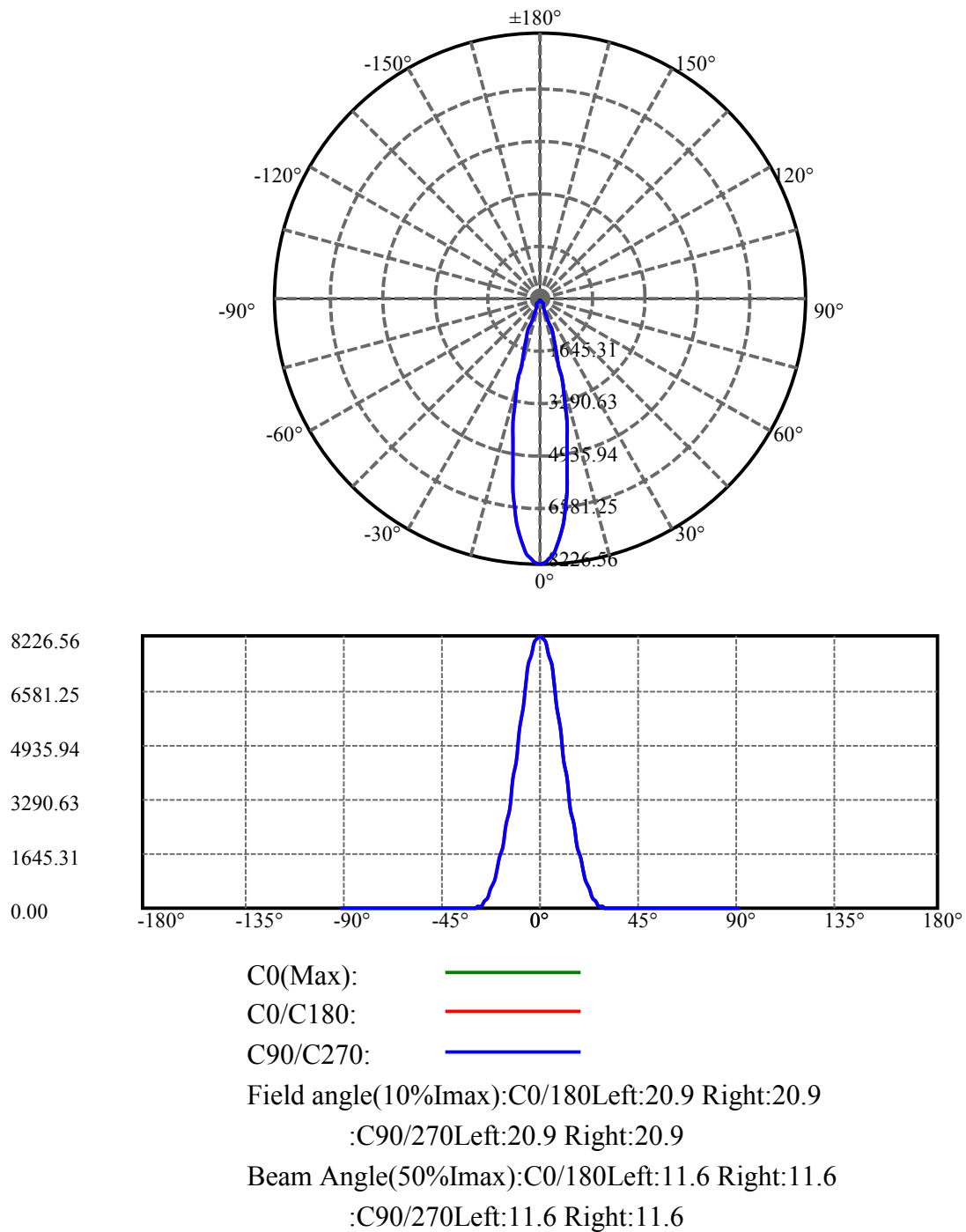
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	7.397	0.786	1493.611	.041%	99.268%
77.0	7.369	0.787	1494.398	.041%	99.321%
78.0	7.362	0.789	1495.187	.041%	99.373%
79.0	7.320	0.789	1495.976	.041%	99.426%
80.0	7.305	0.788	1496.764	.041%	99.478%
81.0	7.284	0.789	1497.553	.041%	99.530%
82.0	7.291	0.790	1498.344	.041%	99.583%
83.0	7.270	0.792	1499.135	.041%	99.636%
84.0	7.256	0.791	1499.927	.041%	99.688%
85.0	7.207	0.789	1500.716	.041%	99.741%
86.0	7.179	0.786	1501.502	.041%	99.793%
87.0	7.151	0.784	1502.287	.041%	99.845%
88.0	7.116	0.781	1503.068	.041%	99.897%
89.0	7.073	0.778	1503.846	.041%	99.949%
90.0	7.024	0.773	1504.619	.040%	100.000%

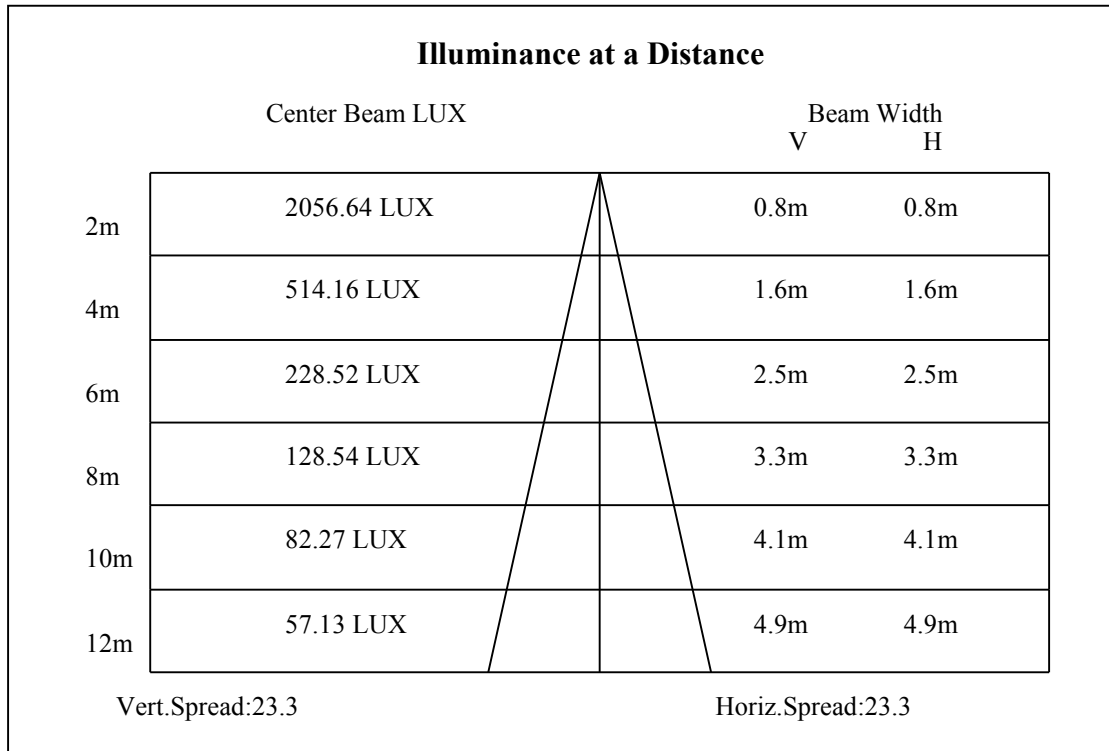
ZONAL LUMEN SUMMARY

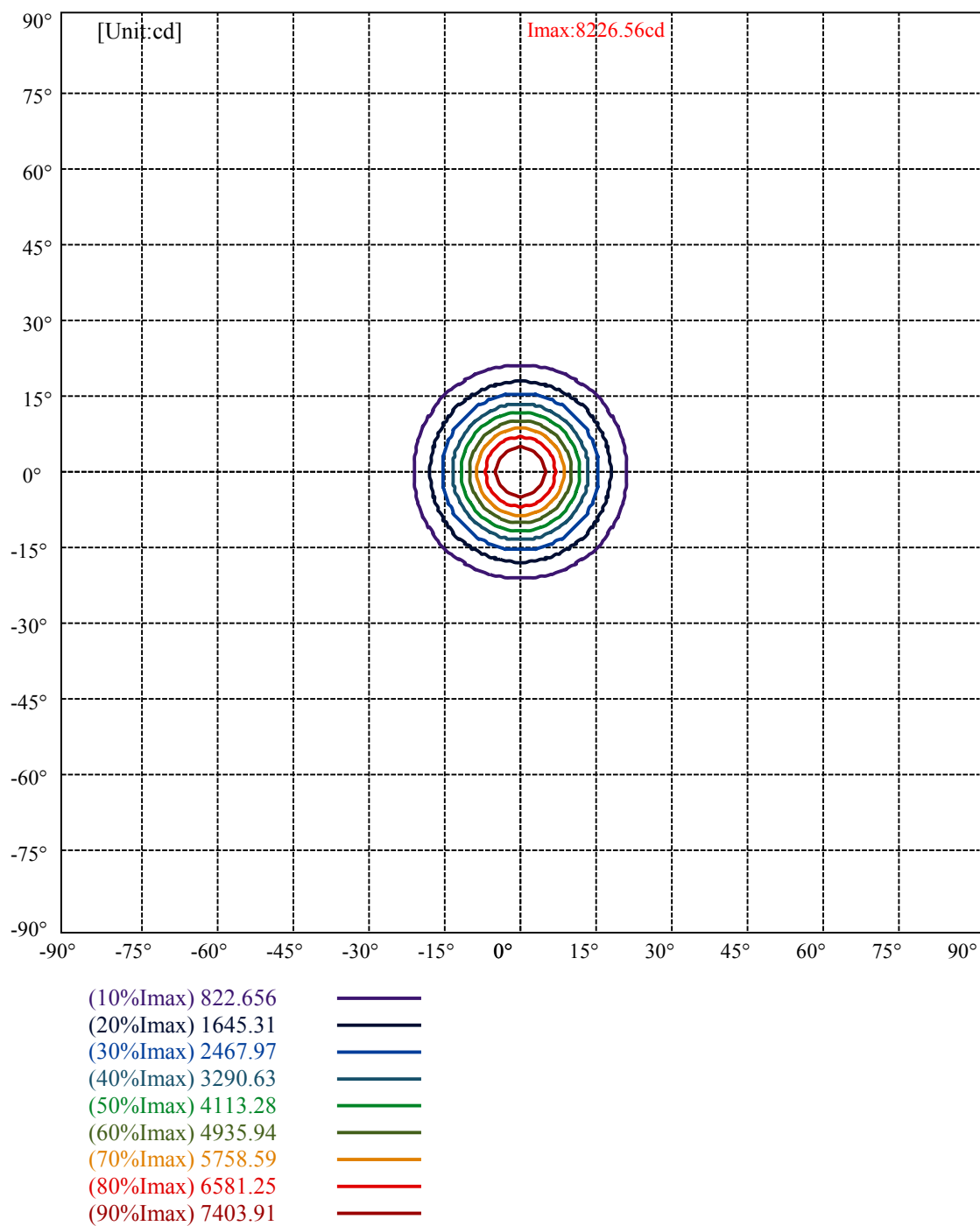
Zone	Lumens	%Lamp	%Fixt
0-30	1458.44	76.04%	96.93%
0-40	1466.77	76.47%	97.48%
0-60	1481.32	77.23%	98.45%
0-90	1503.85	78.41%	99.95%
0-120	1503.85	78.41%	99.95%
0-180	1504.62	78.45%	100.00%
60-90	23.27	1.21%	1.55%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-17.34	1203.70	62.76%	80.00%

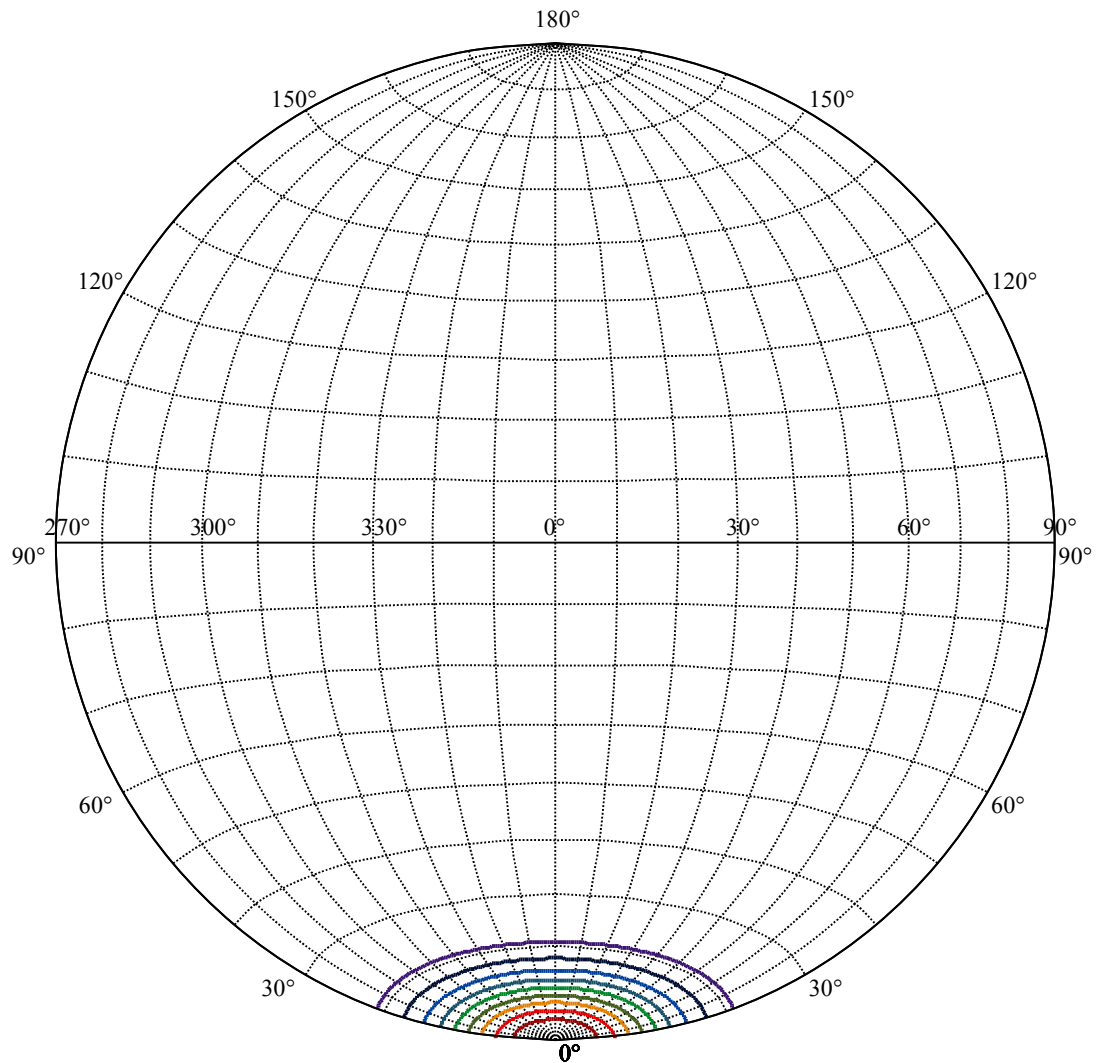
ZONAL LUMEN SUMMARY

0-10	621.57
10-20	709.25
20-30	127.62
30-40	8.34
40-50	7.23
50-60	7.32
60-70	7.60
70-80	7.84
80-90	7.08
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









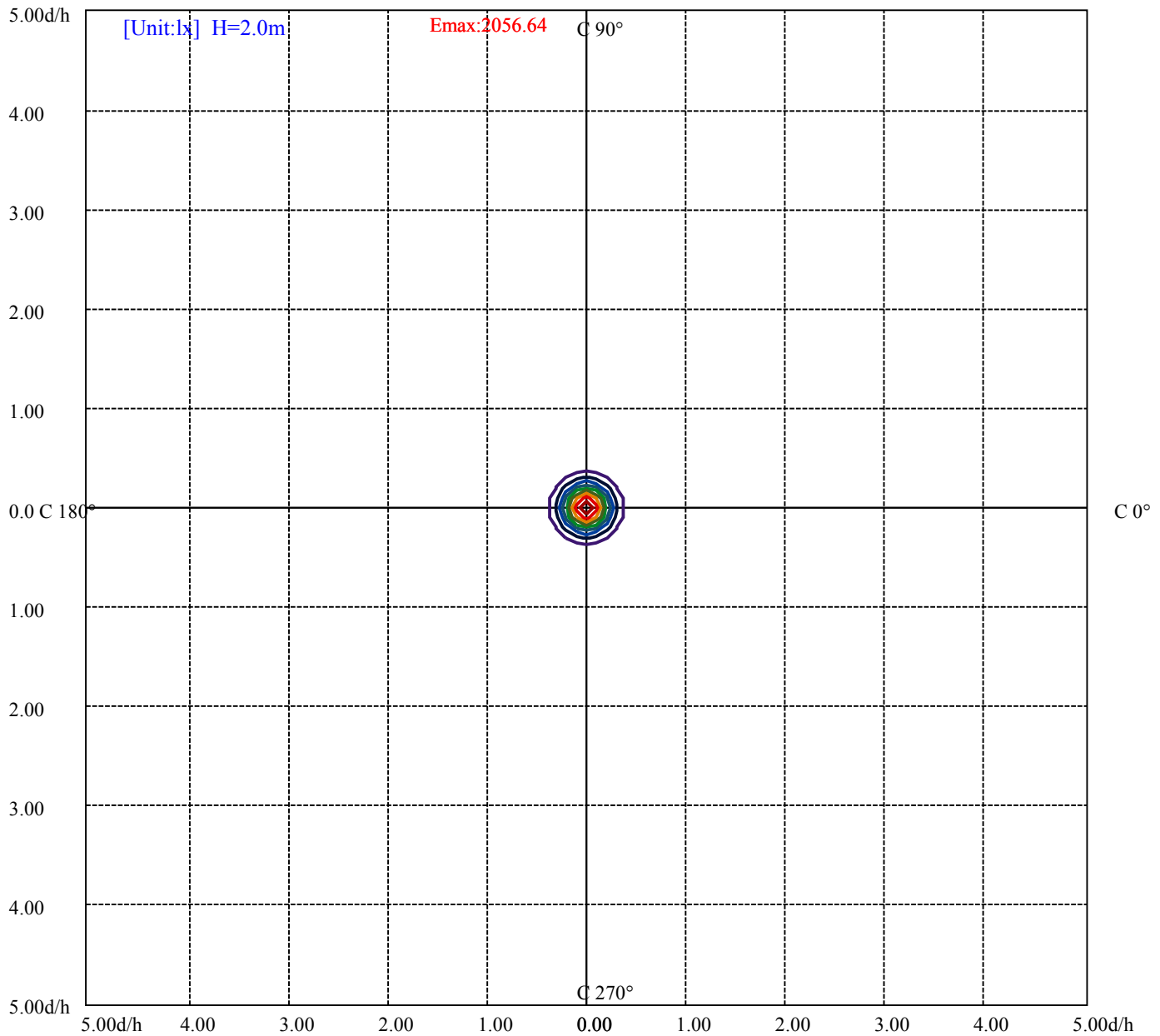
House

[Unit:cd]

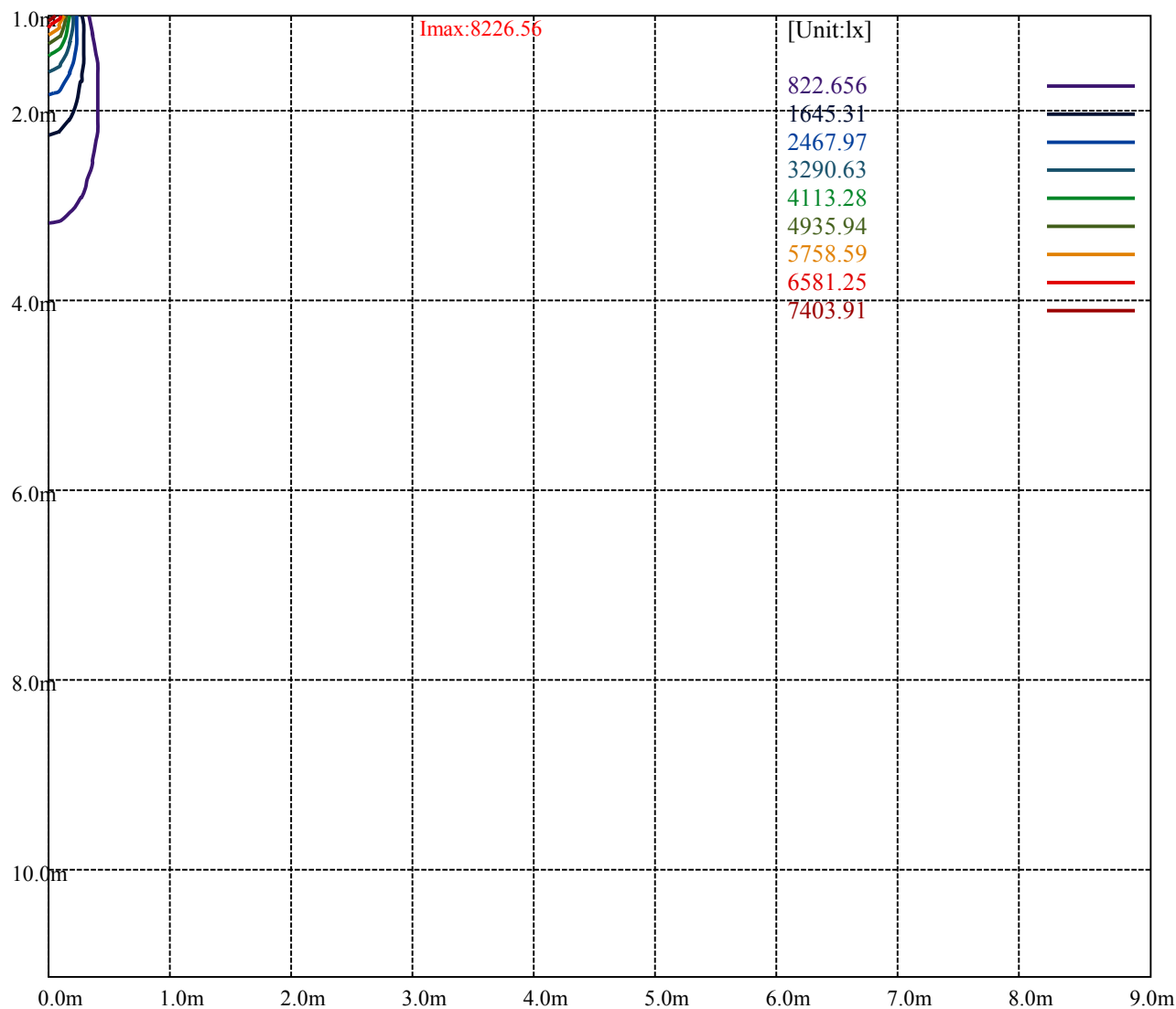
Road

Imax:8226.56

(10%Imax)	822.656	—
(20%Imax)	1645.31	—
(30%Imax)	2467.97	—
(40%Imax)	3290.63	—
(50%Imax)	4113.28	—
(60%Imax)	4935.94	—
(70%Imax)	5758.59	—
(80%Imax)	6581.25	—
(90%Imax)	7403.91	—



(10%Emax)	205.664	—
(20%Emax)	411.3275	—
(30%Emax)	616.9925	—
(40%Emax)	822.655	—
(50%Emax)	1028.32	—
(60%Emax)	1233.983	—
(70%Emax)	1439.647	—
(80%Emax)	1645.313	—
(90%Emax)	1850.975	—



Luminance Table

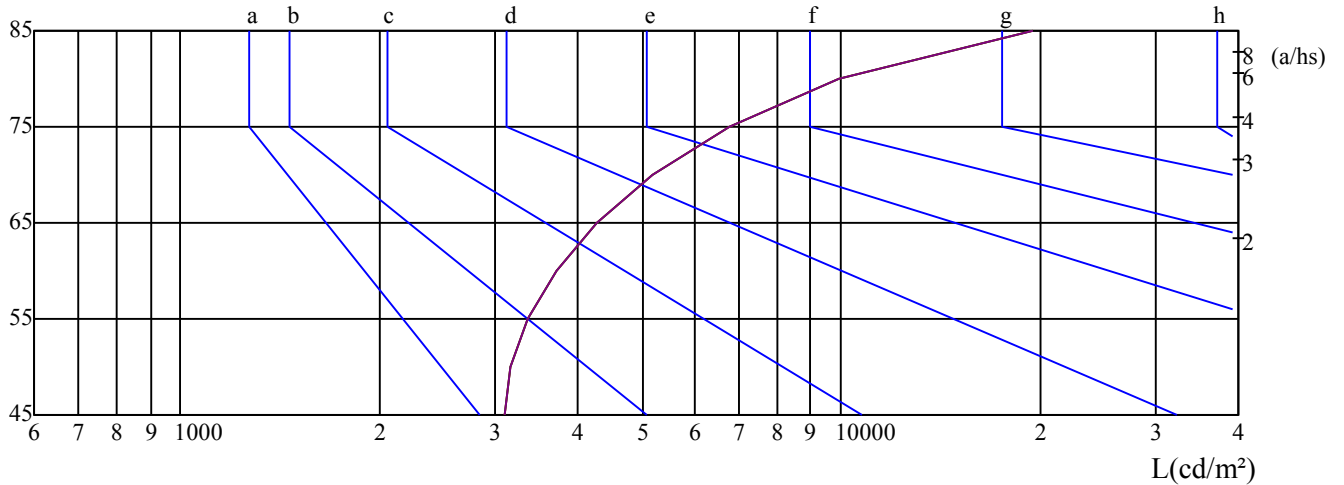
γ	45	50	55	60	65	70	75	80	85
C0	3107	3156	3357	3714	4284	5197	6777	9958	19572
C45	3107	3156	3357	3714	4284	5197	6777	9958	19572
C90	3107	3156	3357	3714	4284	5197	6777	9958	19572

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4284	4284	4284	6777	6777	6777	19572	19572	19572

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

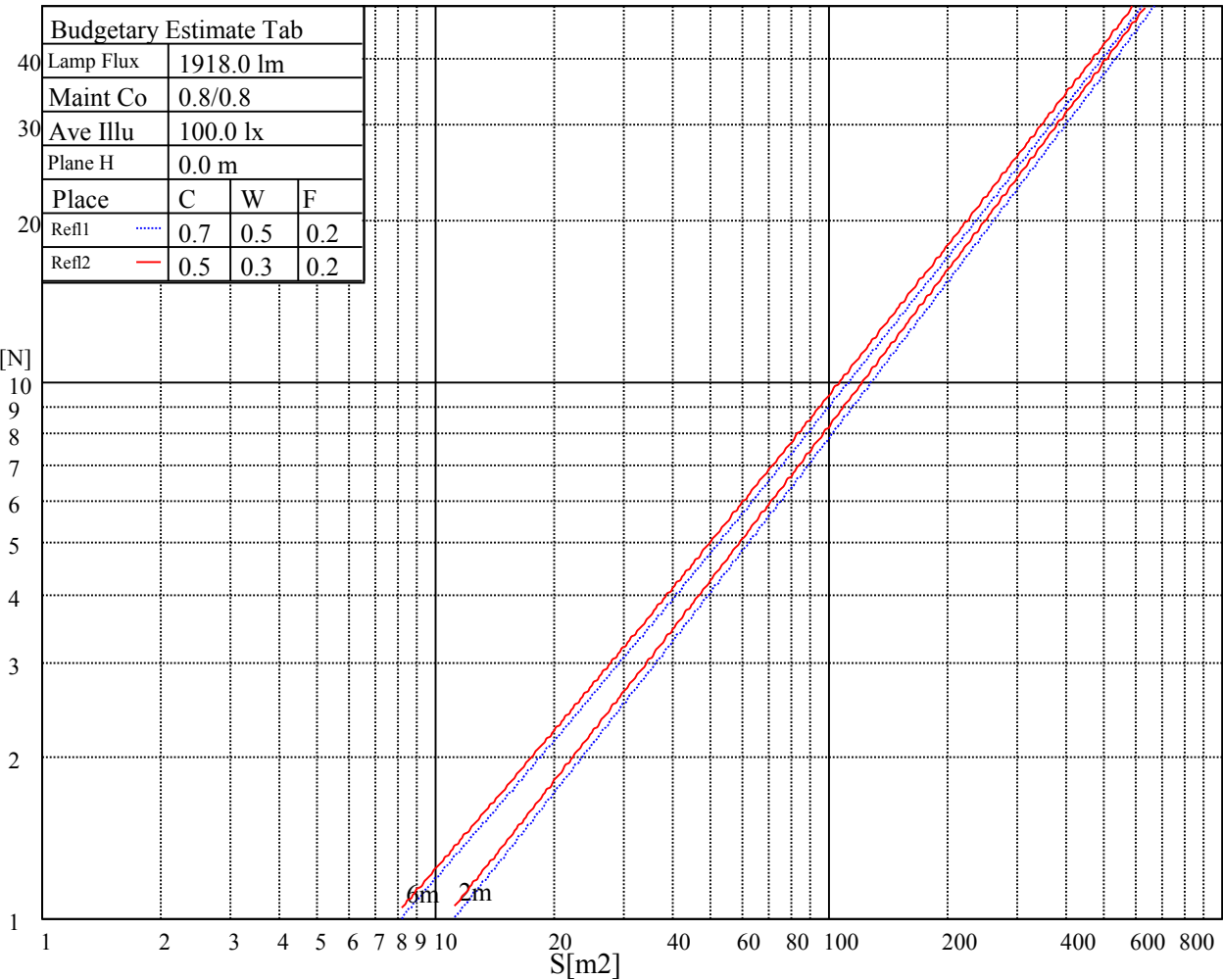
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

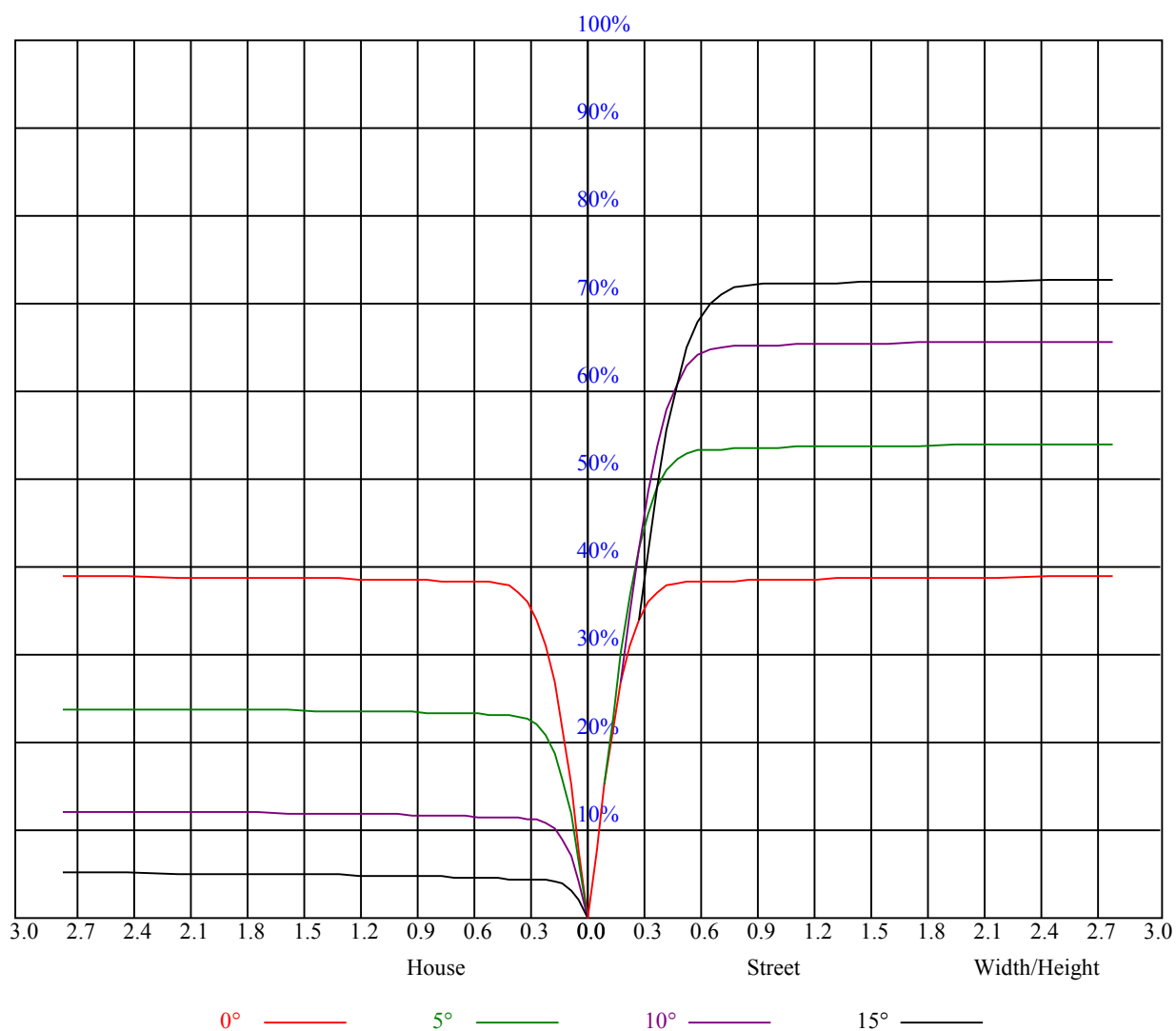
C0 ———

C45 ———

C90 ———



RHOC	80			70			50			30			10			0
RHOW	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	COEFFICIENTS OF UTILIZATION RHOFC=20 CU															
0	0.93	0.93	0.93	0.91	0.91	0.91	0.87	0.87	0.87	0.83	0.83	0.83	0.80	0.80	0.80	0.78
1	0.89	0.87	0.86	0.87	0.85	0.84	0.84	0.83	0.82	0.81	0.80	0.79	0.78	0.78	0.77	0.76
2	0.85	0.82	0.80	0.83	0.81	0.79	0.81	0.79	0.78	0.79	0.77	0.76	0.77	0.75	0.75	0.73
3	0.81	0.79	0.76	0.80	0.78	0.76	0.78	0.76	0.75	0.77	0.75	0.73	0.75	0.74	0.72	0.71
4	0.78	0.75	0.73	0.78	0.75	0.73	0.76	0.74	0.72	0.75	0.73	0.71	0.73	0.72	0.70	0.70
5	0.76	0.73	0.71	0.75	0.72	0.70	0.74	0.72	0.70	0.73	0.71	0.69	0.72	0.70	0.69	0.68
6	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.70	0.68	0.71	0.69	0.67	0.70	0.68	0.67	0.66
7	0.72	0.69	0.67	0.71	0.68	0.66	0.70	0.68	0.66	0.70	0.67	0.66	0.69	0.67	0.65	0.65
8	0.70	0.67	0.65	0.69	0.67	0.65	0.69	0.66	0.64	0.68	0.66	0.64	0.67	0.65	0.64	0.63
9	0.68	0.65	0.63	0.68	0.65	0.63	0.67	0.65	0.63	0.67	0.64	0.63	0.66	0.64	0.63	0.62
10	0.67	0.64	0.62	0.66	0.64	0.62	0.66	0.63	0.62	0.65	0.63	0.61	0.65	0.63	0.61	0.61



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	8235.00	8144.44	7985.81	7702.88	7406.44	7020.56	6492.94	6038.44	5549.63
45.0	8253.56	8165.25	8009.44	7793.44	7476.75	7078.50	6662.81	6160.50	5668.88
90.0	8220.38	8168.63	8052.19	7855.88	7562.81	7250.63	6868.13	6320.81	5859.00
135.0	8197.31	8244.00	8220.38	8123.63	7976.25	7746.19	7414.88	7041.94	6629.06
180.0	8235.00	8263.13	8236.69	8137.13	7952.63	7720.88	7424.44	6942.38	6505.88
225.0	8253.56	8256.38	8211.94	8081.44	7899.75	7635.38	7234.31	6849.56	6406.31
270.0	8220.38	8211.94	8125.88	7969.50	7748.44	7410.94	7009.88	6600.38	6149.25
315.0	8197.31	8082.56	7904.25	7639.88	7290.56	6899.06	6474.38	5900.63	5411.25
360.0	8235.00	8144.44	7985.81	7702.88	7406.44	7020.56	6492.94	6038.44	5549.63
C/ γ (°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4930.31	4436.44	3959.44	3445.31	2964.94	2573.44	2174.63	1811.81	1526.06
45.0	5056.88	4561.88	4070.25	3589.31	3044.81	2641.50	2284.31	1913.06	1591.88
90.0	5371.31	4748.63	4265.44	3796.88	3292.31	2839.50	2468.25	2088.00	1778.06
135.0	6062.06	5587.88	5083.88	4515.19	3978.00	3519.56	3042.00	2607.19	2257.31
180.0	6033.38	5410.13	4916.25	4424.63	3948.75	3393.56	2982.94	2596.50	2201.63
225.0	5883.19	5340.38	4833.56	4272.75	3797.44	3302.44	2845.69	2466.56	2124.00
270.0	5562.00	5078.25	4586.63	4038.75	3519.00	3092.06	2652.75	2243.25	1918.13
315.0	4910.63	4295.25	3813.19	3359.25	2838.38	2468.25	2120.63	1731.94	1457.44
360.0	4930.31	4436.44	3959.44	3445.31	2964.94	2573.44	2174.63	1811.81	1526.06
C/ γ (°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1252.69	1036.13	807.19	597.94	437.63	298.13	156.77	81.06	39.38
45.0	1328.63	1060.88	821.25	613.69	441.00	292.50	159.41	73.01	37.07
90.0	1465.88	1107.00	971.55	746.10	528.02	396.68	267.86	129.99	69.92
135.0	1896.19	1605.94	1313.44	1054.69	860.06	665.44	450.56	309.94	294.75
180.0	1842.75	1554.19	1100.64	1019.31	815.63	606.77	444.60	288.73	166.89
225.0	1743.75	1473.75	1116.96	976.44	747.79	567.79	411.64	247.11	146.87
270.0	1596.94	1342.69	1082.81	842.63	653.63	487.69	312.19	296.44	102.99
315.0	1106.78	998.89	769.22	564.08	406.80	256.67	152.33	70.99	34.09
360.0	1252.69	1036.13	807.19	597.94	437.63	298.13	156.77	81.06	39.38
C/ γ (°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	23.46	20.36	18.45	16.93	15.64	14.68	13.73	12.88	12.26
45.0	24.58	20.14	18.23	16.88	15.47	14.51	13.73	12.94	12.32
90.0	33.92	22.61	19.35	17.55	16.20	15.02	14.18	13.33	12.77
135.0	86.63	42.08	24.75	20.70	18.06	16.65	15.53	14.40	13.61
180.0	88.59	42.64	22.95	19.74	17.78	16.09	15.02	14.18	13.33
225.0	73.13	32.74	22.61	19.97	18.00	16.48	15.41	14.40	13.56
270.0	44.04	25.43	21.49	19.29	17.33	16.14	15.24	14.12	13.39
315.0	23.91	20.76	18.34	16.99	15.81	14.63	13.73	13.05	12.38
360.0	23.46	20.36	18.45	16.93	15.64	14.68	13.73	12.88	12.26
C/ γ (°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	11.70	11.19	10.74	10.35	10.01	9.79	9.51	9.28	9.11
45.0	11.81	11.31	10.91	10.58	10.24	10.01	9.73	9.51	9.34
90.0	12.15	11.64	11.19	10.80	10.46	10.13	9.90	9.62	9.45
135.0	12.99	12.32	11.76	11.31	10.91	10.58	10.24	9.96	9.73
180.0	12.60	12.04	11.53	11.03	10.69	10.35	10.01	9.79	9.51
225.0	12.83	12.21	11.70	11.19	10.80	10.46	10.18	9.90	9.68
270.0	12.77	12.15	11.59	11.19	10.80	10.46	10.18	9.90	9.73
315.0	11.76	11.31	10.86	10.46	10.18	9.90	9.68	9.45	9.23
360.0	11.70	11.19	10.74	10.35	10.01	9.79	9.51	9.28	9.11

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	8.94	8.78	8.66	8.49	8.38	8.27	8.16	8.10	8.04
45.0	9.17	8.94	8.83	8.66	8.55	8.49	8.38	8.33	8.21
90.0	9.28	9.11	8.94	8.83	8.72	8.61	8.55	8.49	8.38
135.0	9.51	9.28	9.17	9.00	8.83	8.78	8.61	8.55	8.44
180.0	9.34	9.17	8.94	8.83	8.66	8.55	8.44	8.33	8.21
225.0	9.45	9.28	9.06	8.94	8.83	8.66	8.61	8.44	8.38
270.0	9.51	9.34	9.17	9.06	8.89	8.78	8.66	8.55	8.44
315.0	9.06	8.94	8.78	8.72	8.61	8.44	8.38	8.27	8.16
360.0	8.94	8.78	8.66	8.49	8.38	8.27	8.16	8.10	8.04
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	7.93	7.88	7.82	7.82	7.76	7.71	7.65	7.65	7.59
45.0	8.16	8.10	8.10	8.04	7.99	7.93	7.93	7.88	7.82
90.0	8.27	8.21	8.16	8.10	8.04	7.99	7.93	7.88	7.88
135.0	8.33	8.21	8.16	8.10	8.04	7.99	7.88	7.88	7.76
180.0	8.16	8.10	7.99	7.93	7.88	7.82	7.76	7.71	7.65
225.0	8.27	8.21	8.16	8.10	7.99	7.93	7.88	7.82	7.76
270.0	8.38	8.33	8.27	8.16	8.10	8.04	7.99	7.93	7.93
315.0	8.10	8.04	7.99	7.93	7.88	7.82	7.76	7.76	7.71
360.0	7.93	7.88	7.82	7.82	7.76	7.71	7.65	7.65	7.59
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	7.59	7.54	7.48	7.43	7.43	7.43	7.37	7.31	7.26
45.0	7.76	7.76	7.71	7.65	7.59	7.59	7.54	7.48	7.48
90.0	7.82	7.76	7.76	7.71	7.65	7.65	7.59	7.59	7.59
135.0	7.76	7.71	7.71	7.65	7.59	7.54	7.54	7.54	7.54
180.0	7.59	7.54	7.54	7.48	7.48	7.43	7.43	7.43	7.43
225.0	7.76	7.71	7.65	7.65	7.59	7.59	7.54	7.54	7.54
270.0	7.88	7.82	7.76	7.76	7.71	7.71	7.71	7.65	7.65
315.0	7.65	7.65	7.59	7.65	7.59	7.59	7.54	7.54	7.48
360.0	7.59	7.54	7.48	7.43	7.43	7.43	7.37	7.31	7.26
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	7.26	7.20	7.20	7.14	7.14	7.09	7.09	7.03	7.03
45.0	7.43	7.43	7.37	7.31	7.31	7.31	7.26	7.20	7.20
90.0	7.54	7.54	7.48	7.48	7.48	7.43	7.43	7.37	7.37
135.0	7.48	7.43	7.43	7.43	7.37	7.37	7.37	7.31	7.26
180.0	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.37	7.31
225.0	7.48	7.48	7.48	7.48	7.48	7.48	7.48	7.48	7.48
270.0	7.65	7.71	7.65	7.71	7.65	7.65	7.65	7.59	7.59
315.0	7.48	7.43	7.43	7.37	7.37	7.26	7.26	7.20	7.20
360.0	7.26	7.20	7.20	7.14	7.14	7.09	7.09	7.03	7.03
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	6.98	6.98	6.98	6.92	6.92	6.92	6.92	6.92	6.86
45.0	7.20	7.20	7.20	7.20	7.14	7.09	7.09	7.09	7.09
90.0	7.37	7.37	7.37	7.37	7.20	7.14	7.14	7.09	7.09
135.0	7.26	7.26	7.20	7.20	7.14	7.14	7.09	7.09	7.03
180.0	7.31	7.31	7.31	7.31	7.31	7.26	7.26	7.20	7.09
225.0	7.48	7.48	7.43	7.43	7.37	7.37	7.37	7.31	7.26
270.0	7.54	7.59	7.54	7.54	7.48	7.43	7.31	7.20	7.14
315.0	7.14	7.14	7.14	7.09	7.09	7.09	7.03	7.03	7.03
360.0	6.98	6.98	6.98	6.92	6.92	6.92	6.92	6.92	6.86

Intensity data(cd)

Appendix Page: 18 Total:18

C/ γ (°)	90.0
0.0	6.86
45.0	7.03
90.0	7.09
135.0	7.03
180.0	6.98
225.0	7.09
270.0	7.09
315.0	7.03
360.0	6.86