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NATA

LumCAT: CT01D03524AF

Luminaire:

Report No: NATA0100

Test No: GC2018112802

LampCAT: CITIZEN CLU710

Lamp flux(lm): 1778.0

Number of Lamps: 1

Length(mm): 33

Phm Type: C

Voltage(V): 35.9000

Current(A): 0.4500

Power (W): 16.1550

PF: 0.0000

Ballast type: DC

Width(mm): 33

Height(mm): 0

Photometric Results

Lumens(lm): 1668.48

Efficiency(%): 93.84%

Lumens(lm)/Power(W): 103.35

Central intensity(cd): 4883.625

Maximum intensity(cd): 4883.625

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=25.6

[C90/270]Total=25.6

Field angle(10%Imax): [C0/180]Total=59.9

[C90/270]Total=59.9

Maximum s/h(1/2): C0_180=0.43 C90_270=0.43

Maximum s/h(1/4): C0_180=0.49 C90_270=0.49

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 93.90%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 93.031%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4883.625	1.168	1.168	.066%	.070%
1.0	4852.336	9.287	10.455	.522%	.627%
2.0	4772.180	18.264	28.719	1.027%	1.721%
3.0	4647.094	26.671	55.389	1.500%	3.320%
4.0	4506.820	34.475	89.864	1.939%	5.386%
5.0	4343.906	41.517	131.382	2.335%	7.874%
6.0	4152.094	47.594	178.976	2.677%	10.727%
7.0	3906.422	52.207	231.182	2.936%	13.856%
8.0	3672.211	56.045	287.227	3.152%	17.215%
9.0	3388.289	58.125	345.352	3.269%	20.699%
10.0	3098.250	58.998	404.35	3.318%	24.235%
11.0	2859.680	59.837	464.187	3.365%	27.821%
12.0	2628.352	59.926	524.113	3.370%	31.413%
13.0	2394.281	59.063	583.176	3.322%	34.953%
14.0	2203.172	58.449	641.625	3.287%	38.456%
15.0	2029.570	57.604	699.229	3.240%	41.908%
16.0	1853.227	56.017	755.245	3.151%	45.266%
17.0	1715.625	55.006	810.251	3.094%	48.562%
18.0	1575.281	53.382	863.633	3.002%	51.762%
19.0	1444.852	51.584	915.217	2.901%	54.853%
20.0	1323.330	49.633	964.85	2.792%	57.828%
21.0	1213.221	47.678	1012.529	2.682%	60.686%
22.0	1103.358	45.326	1057.854	2.549%	63.402%
23.0	1022.787	43.824	1101.679	2.465%	66.029%
24.0	931.163	41.533	1143.211	2.336%	68.518%
25.0	843.356	39.085	1182.296	2.198%	70.861%
26.0	766.884	36.866	1219.162	2.073%	73.070%
27.0	690.293	34.366	1253.528	1.933%	75.130%
28.0	618.265	31.830	1285.358	1.790%	77.038%
29.0	548.170	29.143	1314.502	1.639%	78.785%
30.0	484.959	26.591	1341.092	1.496%	80.378%
31.0	421.418	23.801	1364.894	1.339%	81.805%
32.0	365.217	21.223	1386.117	1.194%	83.077%
33.0	313.130	18.702	1404.819	1.052%	84.198%
34.0	262.484	16.096	1420.915	.905%	85.162%
35.0	222.799	14.014	1434.929	.788%	86.002%
36.0	184.212	11.874	1446.802	.668%	86.714%
37.0	148.830	9.822	1456.624	.552%	87.303%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	121.352	8.193	1464.817	.461%	87.794%
39.0	98.613	6.805	1471.623	.383%	88.202%
40.0	81.703	5.759	1477.382	.324%	88.547%
41.0	69.532	5.002	1482.384	.281%	88.847%
42.0	60.075	4.408	1486.793	.248%	89.111%
43.0	53.571	4.007	1490.799	.225%	89.351%
44.0	49.634	3.781	1494.58	.213%	89.578%
45.0	47.327	3.670	1498.25	.206%	89.798%
46.0	46.188	3.643	1501.893	.205%	90.016%
47.0	45.253	3.629	1505.523	.204%	90.233%
48.0	44.445	3.622	1509.145	.204%	90.451%
49.0	43.812	3.626	1512.771	.204%	90.668%
50.0	43.383	3.644	1516.415	.205%	90.886%
51.0	43.228	3.684	1520.099	.207%	91.107%
52.0	43.235	3.736	1523.835	.210%	91.331%
53.0	43.031	3.769	1527.604	.212%	91.557%
54.0	42.427	3.764	1531.368	.212%	91.782%
55.0	41.639	3.740	1535.108	.210%	92.007%
56.0	40.894	3.718	1538.826	.209%	92.229%
57.0	40.155	3.693	1542.519	.208%	92.451%
58.0	39.066	3.633	1546.152	.204%	92.669%
59.0	38.011	3.573	1549.725	.201%	92.883%
60.0	36.809	3.496	1553.221	.197%	93.092%
61.0	35.599	3.414	1556.635	.192%	93.297%
62.0	34.615	3.352	1559.987	.189%	93.498%
63.0	33.750	3.298	1563.284	.185%	93.695%
64.0	32.745	3.227	1566.512	.182%	93.889%
65.0	31.739	3.154	1569.666	.177%	94.078%
66.0	31.008	3.106	1572.772	.175%	94.264%
67.0	30.255	3.054	1575.827	.172%	94.447%
68.0	29.651	3.015	1578.841	.170%	94.628%
69.0	29.208	2.990	1581.832	.168%	94.807%
70.0	28.793	2.967	1584.799	.167%	94.985%
71.0	28.659	2.972	1587.77	.167%	95.163%
72.0	29.496	3.076	1590.846	.173%	95.347%
73.0	31.563	3.310	1594.156	.186%	95.546%
74.0	33.694	3.552	1597.708	.200%	95.759%
75.0	35.845	3.797	1601.505	.214%	95.986%

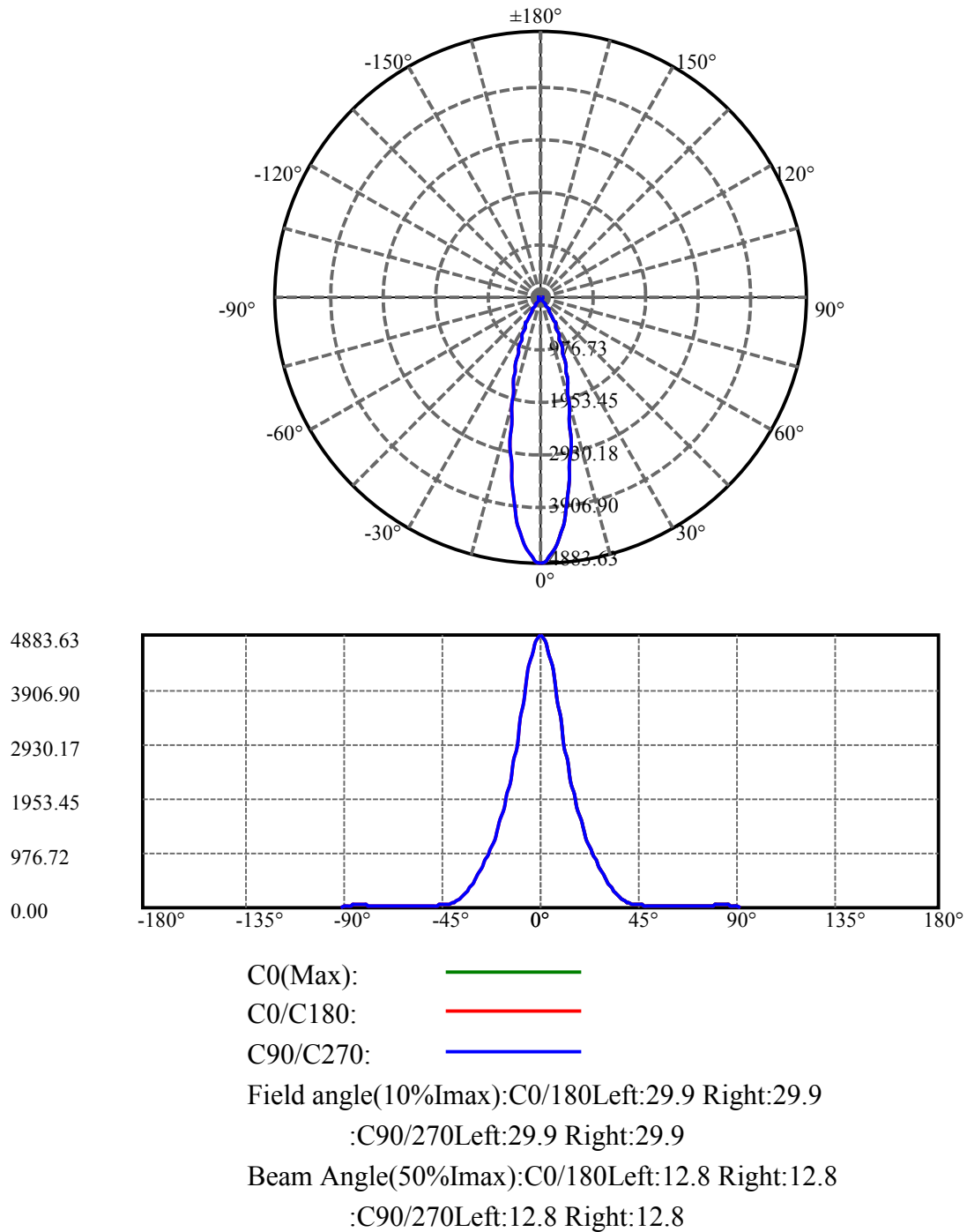
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	38.644	4.112	1605.617	.231%	96.233%
77.0	41.414	4.425	1610.042	.249%	96.498%
78.0	43.910	4.710	1614.752	.265%	96.780%
79.0	46.399	4.995	1619.747	.281%	97.079%
80.0	48.938	5.285	1625.032	.297%	97.396%
81.0	50.330	5.451	1630.483	.307%	97.723%
82.0	51.750	5.620	1636.103	.316%	98.060%
83.0	53.128	5.783	1641.885	.325%	98.406%
84.0	53.494	5.834	1647.719	.328%	98.756%
85.0	51.033	5.575	1653.294	.314%	99.090%
86.0	44.522	4.870	1658.165	.274%	99.382%
87.0	38.813	4.250	1662.415	.239%	99.637%
88.0	28.645	3.139	1665.555	.177%	99.825%
89.0	21.382	2.344	1667.899	.132%	99.965%
90.0	10.519	0.577	1668.476	.032%	100.000%

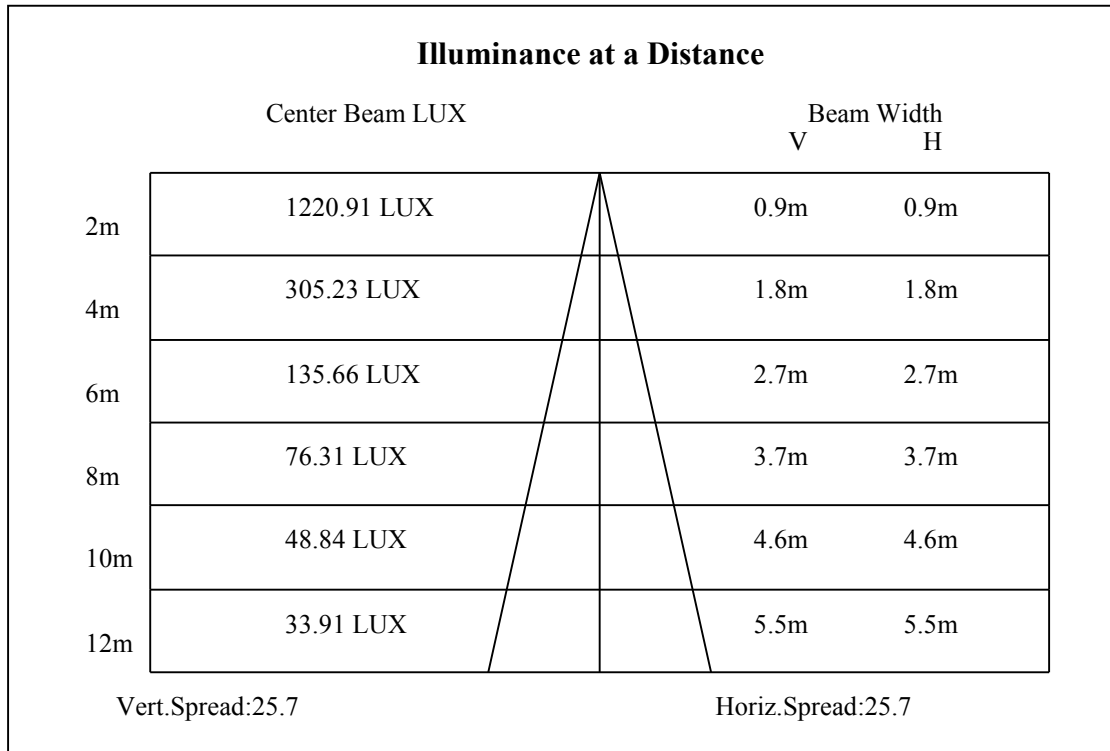
ZONAL LUMEN SUMMARY

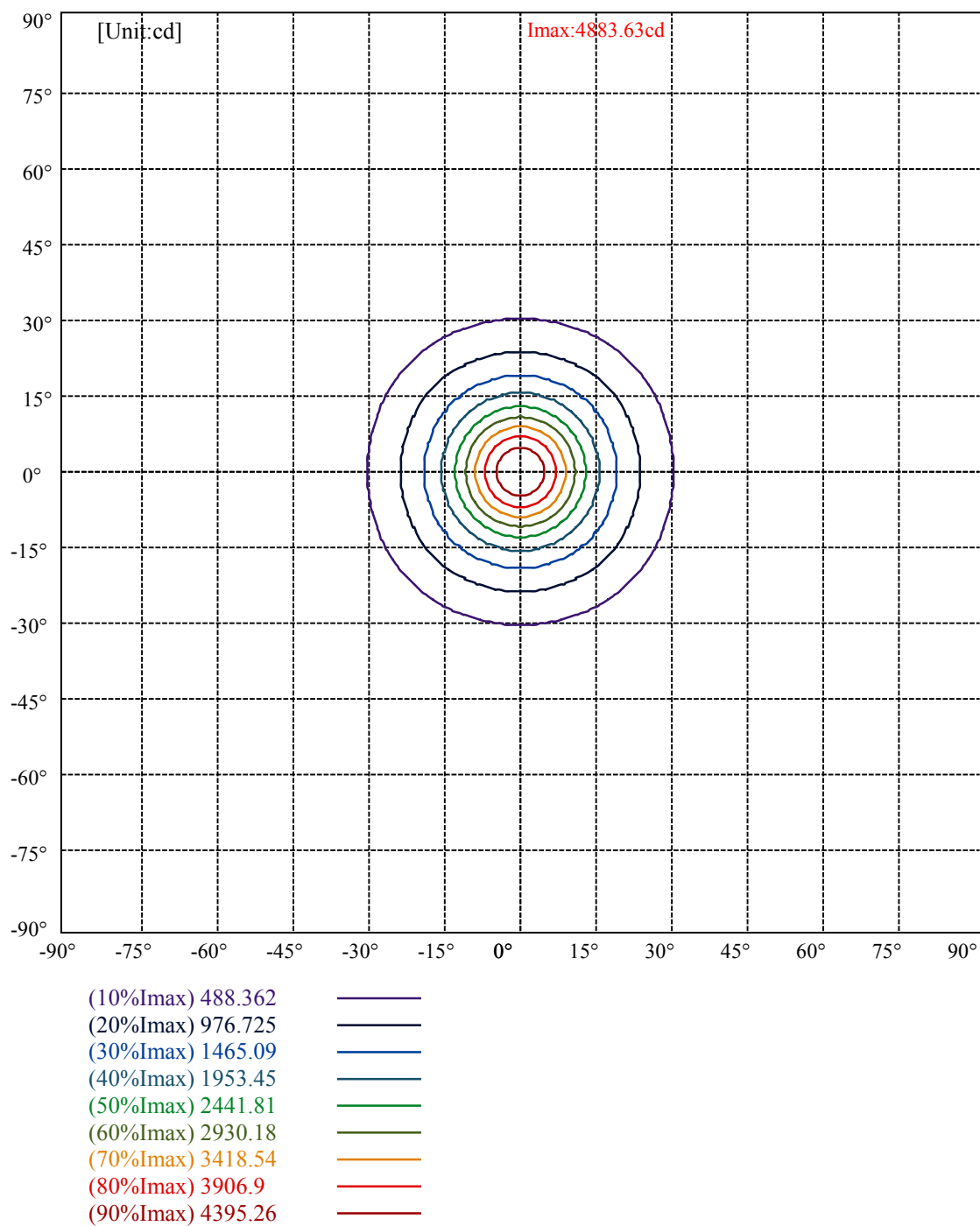
Zone	Lumens	%Lamp	%Fixt
0-30	1341.09	75.43%	80.38%
0-40	1477.38	83.09%	88.55%
0-60	1553.22	87.36%	93.09%
0-90	1667.90	93.81%	99.97%
0-120	1667.90	93.81%	99.97%
0-180	1668.48	93.84%	100.00%
60-90	118.17	6.65%	7.08%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-29.76	1334.78	75.07%	80.00%

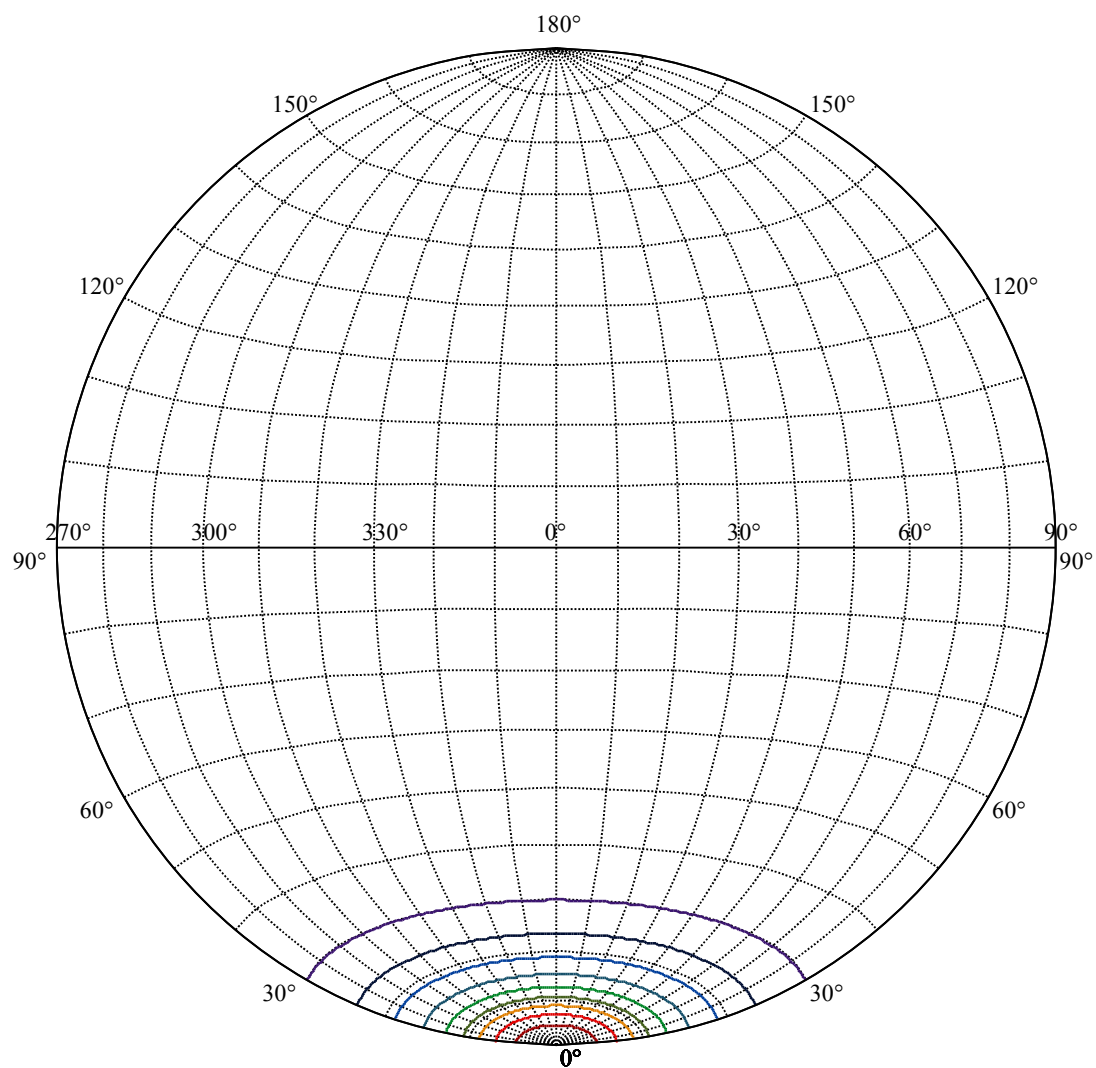
ZONAL LUMEN SUMMARY

0-10	404.35
10-20	560.50
20-30	376.24
30-40	136.29
40-50	39.03
50-60	36.81
60-70	31.58
70-80	40.23
80-90	42.87
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









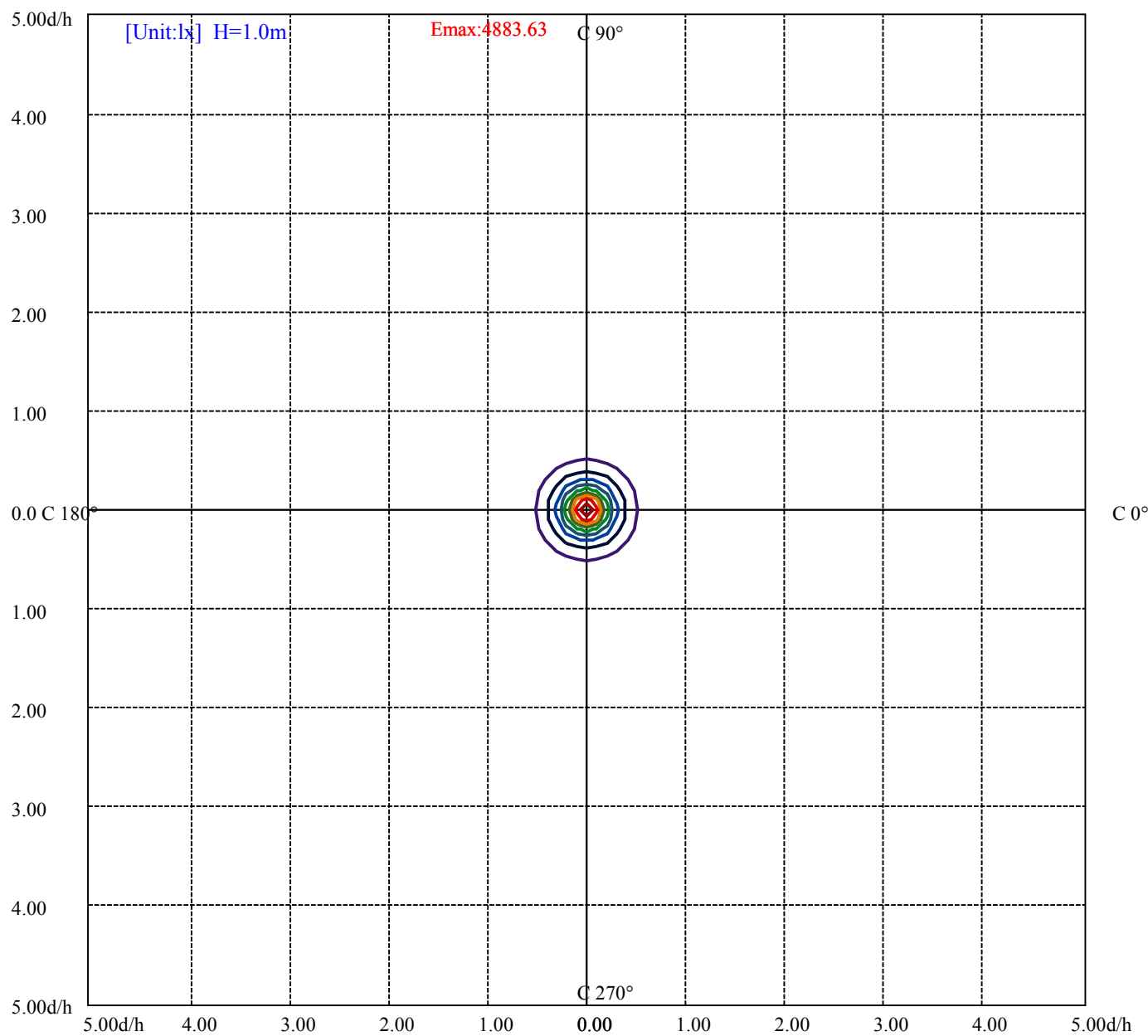
House

[Unit:cd]

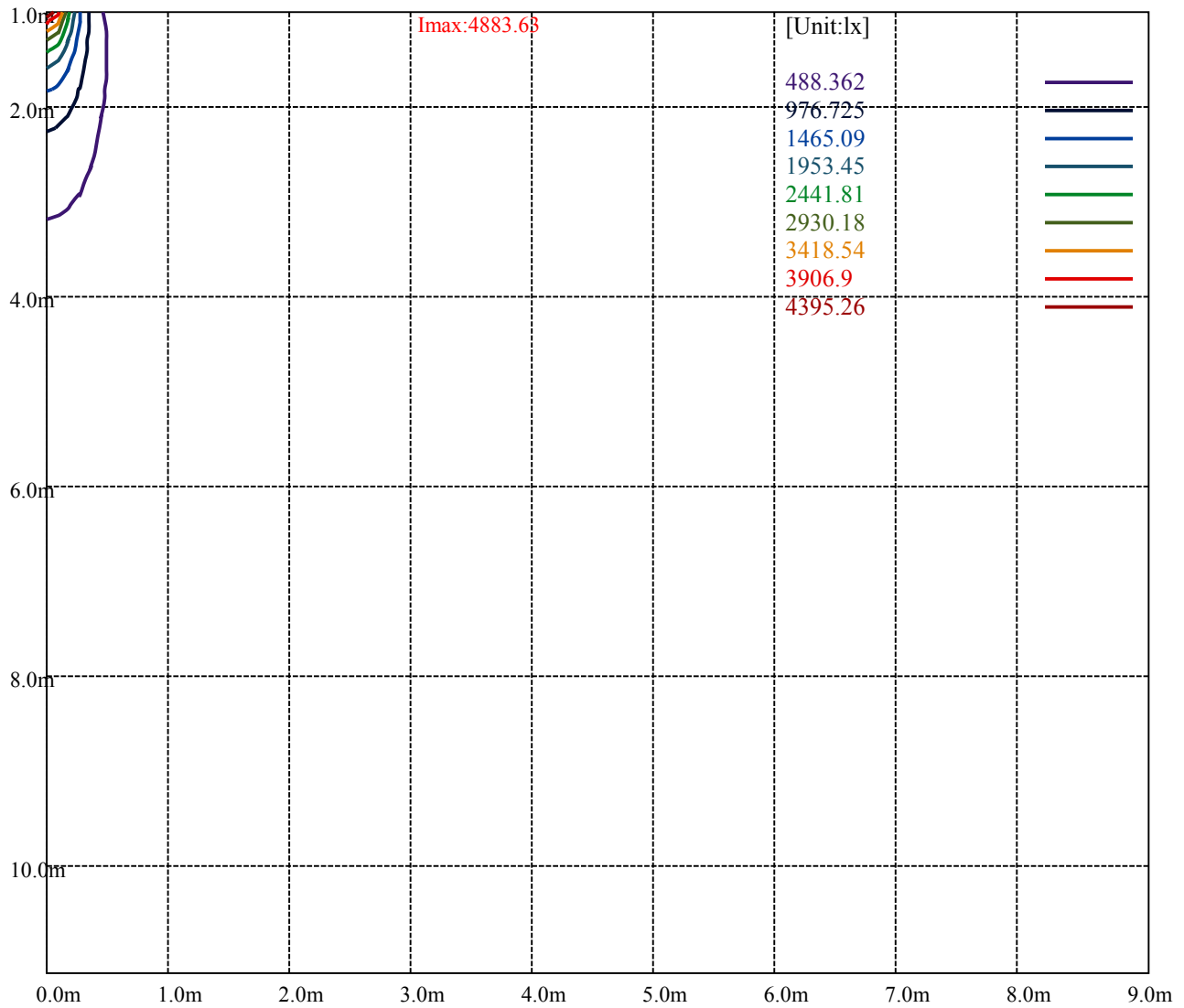
Road

Imax:4883.63

(10%Imax)	488.362	—
(20%Imax)	976.725	—
(30%Imax)	1465.09	—
(40%Imax)	1953.45	—
(50%Imax)	2441.81	—
(60%Imax)	2930.18	—
(70%Imax)	3418.54	—
(80%Imax)	3906.9	—
(90%Imax)	4395.26	—



(10%Emax) 488.362	—
(20%Emax) 976.724	—
(30%Emax) 1465.09	—
(40%Emax) 1953.45	—
(50%Emax) 2441.81	—
(60%Emax) 2930.17	—
(70%Emax) 3418.53	—
(80%Emax) 3906.9	—
(90%Emax) 4395.26	—



Luminance Table

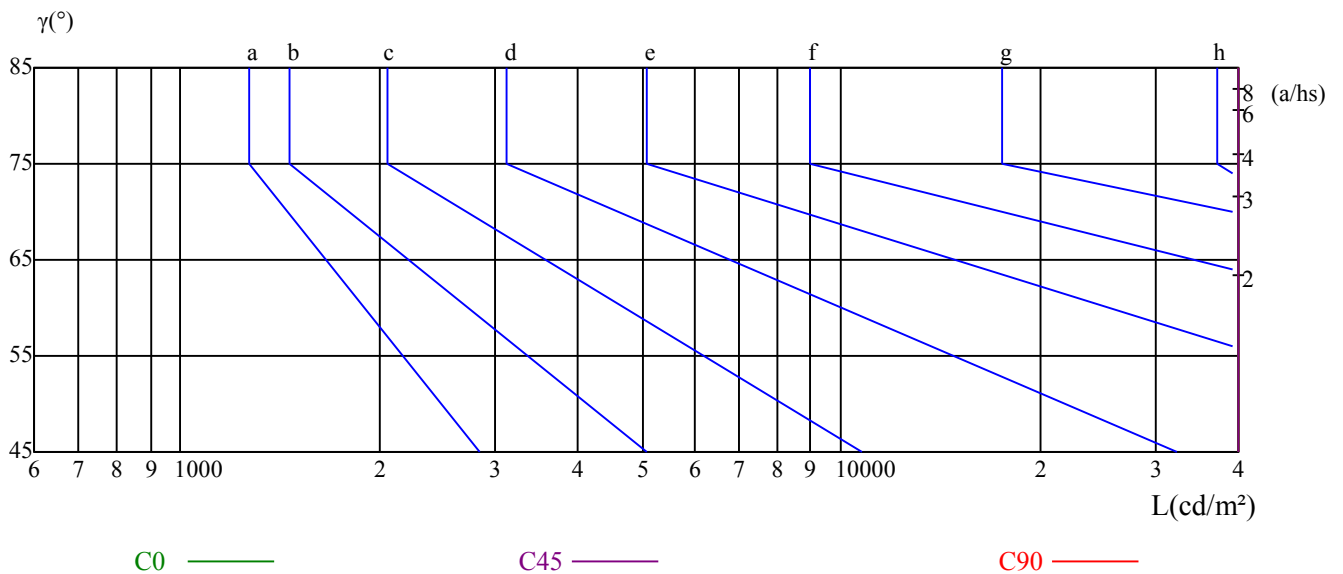
γ	45	50	55	60	65	70	75	80	85
C0	61461	61976	66663	67601	68963	77305	127177	258788	537682
C45	61461	61976	66663	67601	68963	77305	127177	258788	537682
C90	61461	61976	66663	67601	68963	77305	127177	258788	537682

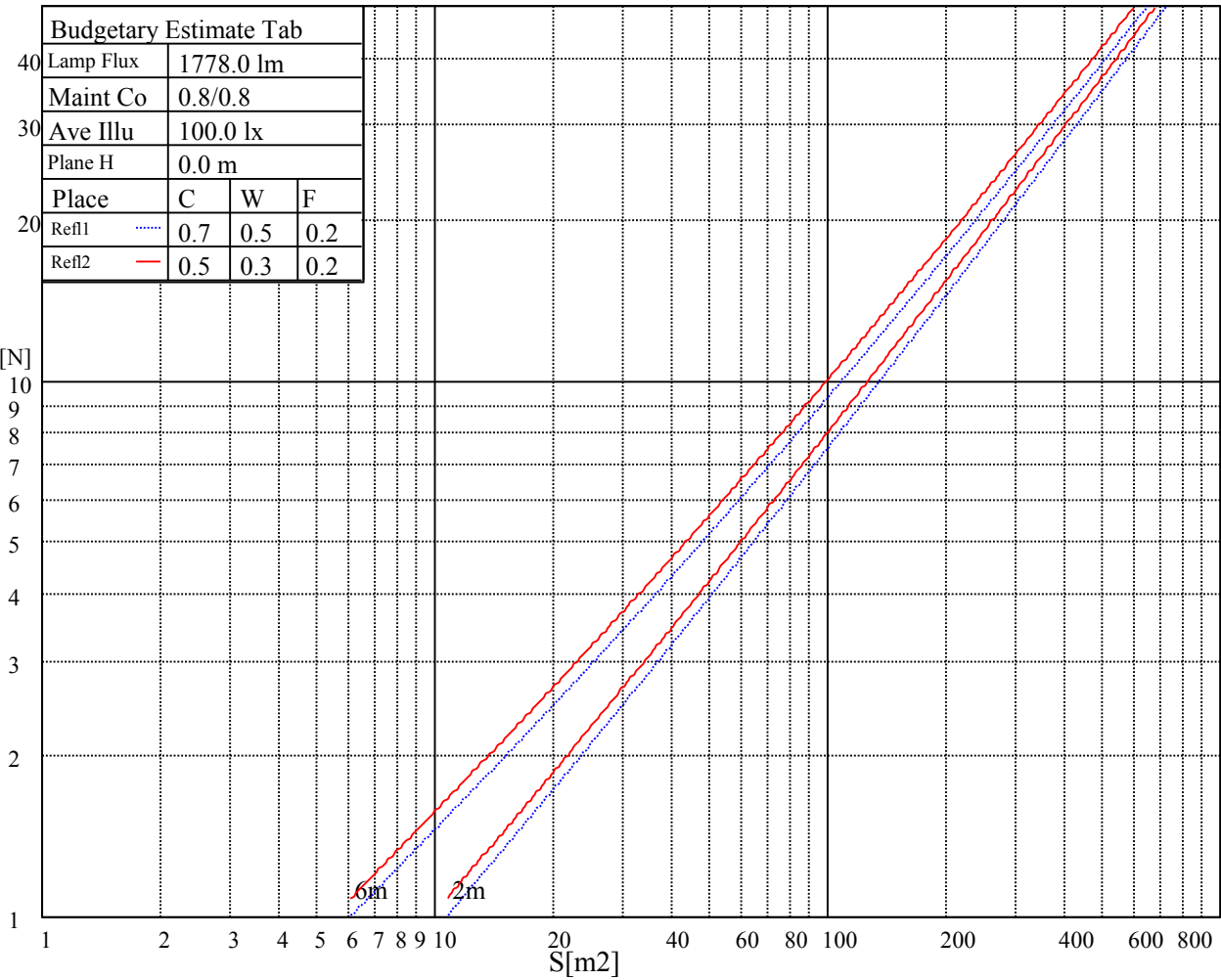
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
68963	68963	68963	127177	127177	127177	537682	537682	537682

Glare Table

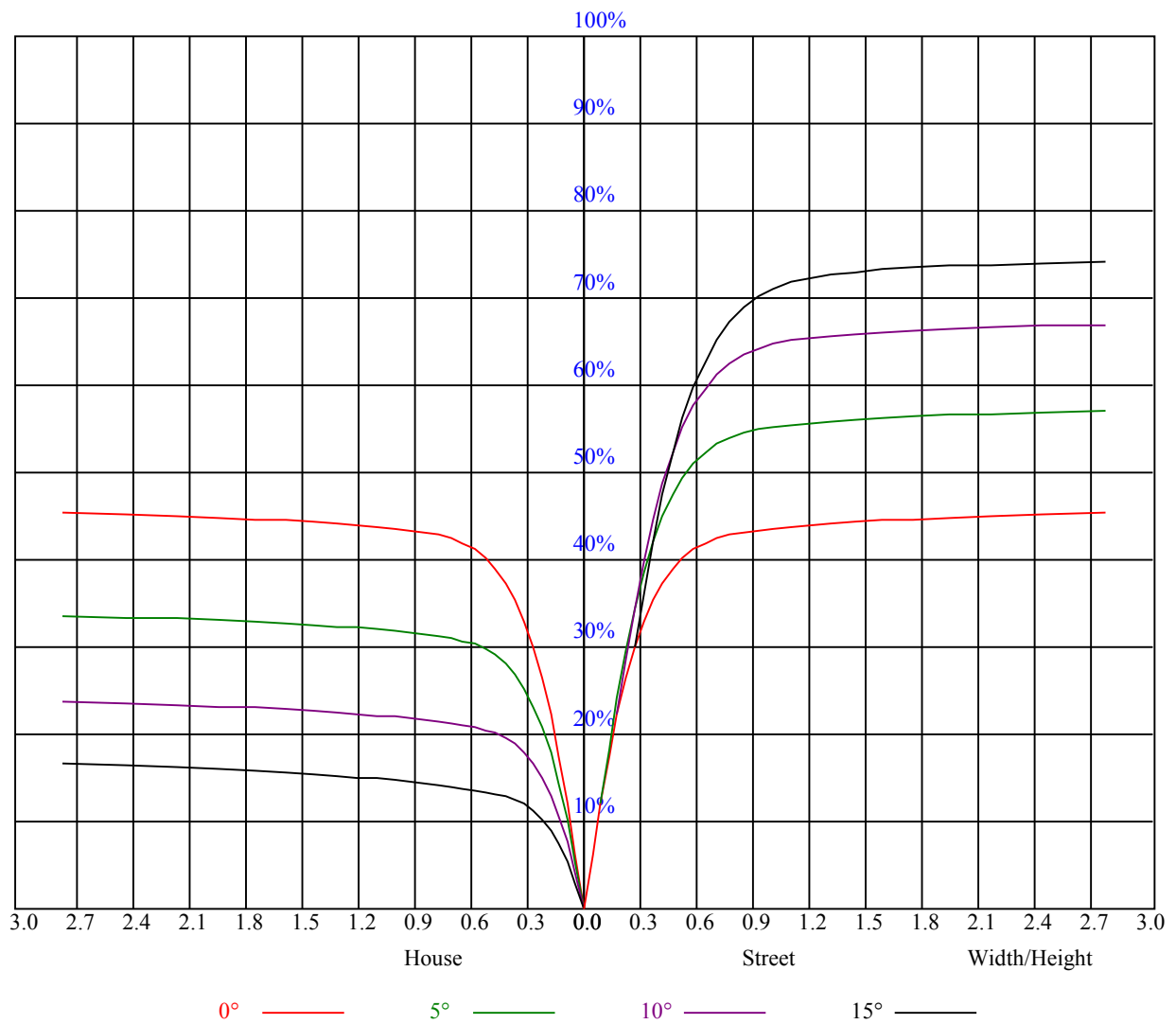
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	≤ 300				
1.5	B		2000	1000	500	≤ 300			
1.85	C			2000	1000	500	≤ 300		
2.2	D				2000	1000	500	≤ 300	
2.55	E					2000	1000	500	≤ 300
		a	b	c	d	e	f	g	h

Luminance Limiting Curve





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 RHOF=20 CU															
0	1.12	1.12	1.12	1.09	1.09	1.09	1.04	1.04	1.04	1.00	1.00	1.00	0.96	0.96	0.96	0.94
1	1.03	1.00	0.98	1.01	0.98	0.96	0.97	0.95	0.93	0.93	0.92	0.90	0.90	0.89	0.88	0.86
2	0.96	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	0.82	0.81
3	0.90	0.86	0.82	0.89	0.85	0.81	0.87	0.83	0.80	0.84	0.81	0.79	0.82	0.80	0.78	0.76
4	0.85	0.80	0.77	0.84	0.80	0.76	0.82	0.78	0.75	0.81	0.77	0.74	0.79	0.76	0.74	0.72
5	0.81	0.76	0.72	0.80	0.76	0.72	0.79	0.75	0.71	0.77	0.74	0.71	0.76	0.73	0.70	0.69
6	0.77	0.72	0.69	0.77	0.72	0.68	0.75	0.71	0.68	0.74	0.70	0.67	0.73	0.70	0.67	0.66
7	0.74	0.69	0.65	0.73	0.69	0.65	0.72	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.64	0.63
8	0.71	0.66	0.63	0.70	0.66	0.62	0.69	0.65	0.62	0.69	0.65	0.62	0.68	0.64	0.62	0.60
9	0.68	0.63	0.60	0.68	0.63	0.60	0.67	0.63	0.60	0.66	0.62	0.59	0.65	0.62	0.59	0.58
10	0.66	0.61	0.58	0.65	0.61	0.58	0.65	0.60	0.57	0.64	0.60	0.57	0.63	0.60	0.57	0.56



NATA CT01D03524AF

Intensity data(cd)

Appendix Page: 16 Total:18

C/γ(°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.0	4895.44	4889.25	4805.44	4683.38	4560.19	4393.69	4198.50	3987.00	3780.56
45.0	4879.13	4782.94	4667.06	4546.69	4358.25	4158.00	3969.00	3655.13	3388.50
90.0	4860.00	4770.56	4664.25	4510.69	4336.88	4159.13	3942.00	3628.69	3360.38
135.0	4899.94	4860.56	4764.38	4646.25	4516.88	4350.38	4142.81	3926.25	3682.69
180.0	4895.44	4836.38	4719.94	4584.38	4436.44	4277.25	4090.50	3822.19	3565.69
225.0	4879.13	4909.50	4887.00	4750.31	4647.38	4519.69	4339.13	4136.06	3934.69
270.0	4860.00	4897.13	4883.06	4793.06	4681.69	4530.38	4345.31	4164.19	3966.75
315.0	4899.94	4872.38	4786.31	4662.00	4516.88	4362.75	4189.50	3931.88	3698.44
360.0	4895.44	4889.25	4805.44	4683.38	4560.19	4393.69	4198.50	3987.00	3780.56
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3421.69	3152.81	2930.63	2636.44	2395.69	2224.69	2004.75	1826.44	1699.88
45.0	3115.69	2812.50	2600.44	2408.06	2199.38	2049.75	1916.44	1764.00	1651.50
90.0	3101.06	2819.25	2621.25	2436.75	2250.56	2084.63	1954.13	1816.88	1702.69
135.0	3350.81	3085.31	2849.63	2610.56	2388.94	2215.13	2040.75	1885.50	1756.13
180.0	3292.88	3003.75	2741.63	2534.06	2333.81	2113.88	1951.31	1803.94	1651.50
225.0	3670.88	3375.00	3106.13	2831.63	2607.75	2372.63	2162.25	1992.94	1833.19
270.0	3713.06	3425.06	3160.69	2940.75	2621.25	2408.06	2237.06	1983.94	1816.31
315.0	3440.25	3112.31	2867.06	2628.56	2356.88	2156.63	1969.88	1752.19	1613.81
360.0	3421.69	3152.81	2930.63	2636.44	2395.69	2224.69	2004.75	1826.44	1699.88
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1535.06	1414.13	1305.56	1180.69	1087.88	1000.69	897.19	819.56	744.19
45.0	1547.44	1442.81	1341.56	1253.25	1157.06	1064.25	986.06	901.13	826.88
90.0	1585.13	1476.56	1383.75	1287.00	1120.11	1109.70	1032.75	938.42	866.14
135.0	1622.81	1524.94	1414.69	1312.88	1221.75	1144.13	1044.56	967.50	897.75
180.0	1513.69	1404.00	1290.94	1118.53	1098.17	1008.79	932.91	850.84	772.26
225.0	1670.06	1518.75	1394.44	1278.00	1116.68	1044.06	954.17	846.84	767.53
270.0	1677.94	1492.31	1339.88	1229.06	1083.38	974.81	851.06	758.81	675.00
315.0	1450.13	1285.31	1115.83	1046.36	941.85	835.88	750.60	663.75	585.34
360.0	1535.06	1414.13	1305.56	1180.69	1087.88	1000.69	897.19	819.56	744.19
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	655.31	586.69	523.69	457.31	394.88	342.56	288.00	236.25	198.06
45.0	747.00	671.06	604.13	537.75	459.56	405.00	351.00	286.88	258.58
90.0	796.61	719.78	645.81	582.75	511.88	444.54	388.24	328.95	280.58
135.0	816.75	750.38	685.13	612.56	542.81	483.19	423.56	364.50	315.56
180.0	705.09	639.39	558.84	497.53	439.65	371.53	320.91	274.73	228.04
225.0	692.94	612.00	537.08	476.33	412.65	353.19	304.43	254.36	214.65
270.0	587.81	507.38	442.13	378.00	320.06	285.19	230.23	189.79	155.25
315.0	520.82	459.45	388.58	337.44	289.86	236.53	198.68	164.42	131.68
360.0	655.31	586.69	523.69	457.31	394.88	342.56	288.00	236.25	198.06
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	160.82	133.14	107.33	86.91	73.41	63.84	55.86	51.98	49.16
45.0	196.20	155.59	123.13	100.46	79.59	66.49	57.43	52.31	49.89
90.0	231.36	187.76	154.46	123.30	98.61	81.96	69.64	58.50	53.21
135.0	288.00	223.59	182.64	148.39	123.53	102.66	82.18	70.37	61.99
180.0	187.65	156.54	127.41	103.56	86.46	71.61	61.93	54.39	49.50
225.0	175.78	143.27	118.74	95.91	78.41	66.99	58.50	51.53	47.76
270.0	128.81	104.18	86.18	70.37	60.02	53.78	48.99	46.01	44.10
315.0	105.08	86.57	70.93	60.02	53.61	48.94	46.07	43.48	41.46
360.0	160.82	133.14	107.33	86.91	73.41	63.84	55.86	51.98	49.16

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	46.63	46.80	45.96	44.89	44.04	43.71	43.26	43.54	43.37
45.0	48.66	47.31	46.58	46.41	46.18	46.24	47.08	46.91	46.07
90.0	50.57	48.94	47.53	46.86	46.91	47.14	47.14	46.91	46.46
135.0	56.70	54.34	52.48	51.13	50.23	49.73	49.56	49.73	49.05
180.0	48.21	47.36	45.84	44.89	44.38	43.71	43.59	43.93	43.31
225.0	45.06	43.43	43.26	42.36	41.01	39.83	39.15	38.87	39.49
270.0	42.75	41.18	41.12	40.50	39.66	39.04	38.59	38.31	38.87
315.0	40.05	40.16	39.26	38.53	38.08	37.69	37.46	37.69	37.63
360.0	46.63	46.80	45.96	44.89	44.04	43.71	43.26	43.54	43.37
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	42.81	42.24	41.57	40.61	39.77	38.87	37.46	36.28	35.21
45.0	45.17	43.93	42.75	41.91	40.56	39.26	37.74	36.34	35.16
90.0	45.39	43.93	43.14	42.08	40.33	38.98	37.63	36.00	34.99
135.0	48.26	46.97	45.68	44.55	43.14	41.91	40.28	38.76	37.58
180.0	42.58	41.96	41.23	40.56	39.60	38.48	37.46	36.34	35.27
225.0	39.38	39.26	38.98	38.70	38.19	37.52	36.73	35.83	35.10
270.0	38.64	38.42	38.08	37.74	36.73	35.83	34.88	33.98	33.13
315.0	37.18	36.39	35.72	35.10	34.20	33.24	32.29	31.28	30.49
360.0	42.81	42.24	41.57	40.61	39.77	38.87	37.46	36.28	35.21
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	34.09	32.96	32.18	31.50	31.05	30.43	29.81	29.31	28.97
45.0	34.03	32.85	32.23	31.44	30.60	29.98	29.48	29.19	29.53
90.0	33.86	32.63	31.56	30.77	29.81	28.97	28.24	27.73	27.90
135.0	36.62	35.38	34.48	33.92	32.85	32.06	31.50	30.66	30.26
180.0	34.48	33.69	32.91	32.40	31.84	31.16	30.60	30.15	29.98
225.0	34.54	33.81	33.08	32.57	31.89	31.56	30.88	30.15	29.64
270.0	32.51	31.56	30.94	30.32	29.76	29.08	28.46	27.84	27.34
315.0	29.87	29.08	26.55	25.14	24.24	23.96	24.69	25.31	25.65
360.0	34.09	32.96	32.18	31.50	31.05	30.43	29.81	29.31	28.97
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	28.86	31.16	33.69	36.56	39.49	43.14	47.31	49.73	52.03
45.0	32.96	34.59	37.52	41.46	45.96	49.56	52.14	53.49	55.13
90.0	29.81	32.96	34.54	35.33	38.48	42.24	44.55	47.64	53.38
135.0	30.54	34.14	36.56	38.48	42.24	46.58	50.51	53.38	55.01
180.0	31.28	34.31	36.34	37.58	40.44	44.33	46.74	49.95	52.03
225.0	29.25	29.70	31.22	33.58	36.06	37.07	39.43	43.99	47.48
270.0	27.11	27.51	29.14	31.22	33.92	35.38	37.91	41.79	43.99
315.0	26.16	28.13	30.54	32.57	32.57	33.02	32.68	31.22	32.46
360.0	28.86	31.16	33.69	36.56	39.49	43.14	47.31	49.73	52.03
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	54.28	55.29	56.87	60.19	60.02	57.54	55.13	48.15	45.45
45.0	57.83	62.27	65.93	64.91	61.14	46.24	42.19	16.65	8.61
90.0	55.63	56.48	55.74	54.90	52.48	37.69	28.07	13.78	7.59
135.0	55.18	53.78	55.69	54.84	48.32	38.93	26.94	23.40	11.53
180.0	51.36	50.79	51.08	49.05	43.14	33.69	24.53	20.25	10.58
225.0	49.78	53.94	56.64	57.54	57.15	55.74	48.99	31.73	24.81
270.0	45.62	47.81	50.12	53.33	54.00	54.34	55.46	49.28	38.76
315.0	32.96	33.64	32.96	33.19	32.01	32.01	29.19	25.93	23.74
360.0	54.28	55.29	56.87	60.19	60.02	57.54	55.13	48.15	45.45

Intensity data(cd)

Appendix Page: 18 Total:18

C/ γ (°)	90.0
0.0	11.19
45.0	7.76
90.0	7.59
135.0	7.65
180.0	7.54
225.0	12.43
270.0	17.83
315.0	12.15
360.0	11.19