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NATA

LumCAT: CR01D06324BG(62.0019.03)

Luminaire: 92.70.185.00

Report No: NATA0100

Voltage(V): 35.2000

Test No: GC2018120607

Current(A): 0.3000

LampCAT: CREE CXB1512

Power (W): 10.5600

Lamp flux(lm): 1526.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 63

Width(mm): 63

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1338.66

Efficiency(%): 87.72%

Lumens(lm)/Power(W): 126.87

Central intensity(cd): 4771.546

Maximum intensity(cd): 4771.546

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=22.7

[C90/270]Total=22.7

Field angle(10%Imax): [C0/180]Total=51.9

[C90/270]Total=51.9

Maximum s/h(1/2): C0_180=0.38 C90_270=0.38

Maximum s/h(1/4): C0_180=0.42 C90_270=0.42

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 87.79%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 94.000%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	4771.547	1.142	1.142	.075%	.085%
1.0	4744.125	9.080	10.221	.595%	.764%
2.0	4661.156	17.839	28.06	1.169%	2.096%
3.0	4514.484	25.910	53.969	1.698%	4.032%
4.0	4331.250	33.132	87.102	2.171%	6.507%
5.0	4111.031	39.291	126.393	2.575%	9.442%
6.0	3859.805	44.244	170.637	2.899%	12.747%
7.0	3575.813	47.788	218.425	3.132%	16.317%
8.0	3315.586	50.602	269.027	3.316%	20.097%
9.0	3020.344	51.813	320.84	3.395%	23.967%
10.0	2725.734	51.905	372.745	3.401%	27.845%
11.0	2474.859	51.785	424.529	3.393%	31.713%
12.0	2232.070	50.891	475.42	3.335%	35.515%
13.0	1989.422	49.076	524.496	3.216%	39.181%
14.0	1790.930	47.512	572.008	3.114%	42.730%
15.0	1619.508	45.965	617.973	3.012%	46.164%
16.0	1452.023	43.890	661.863	2.876%	49.442%
17.0	1305.338	41.851	703.715	2.743%	52.569%
18.0	1171.448	39.697	743.412	2.601%	55.534%
19.0	1061.423	37.895	781.307	2.483%	58.365%
20.0	956.637	35.880	817.186	2.351%	61.045%
21.0	857.081	33.682	850.869	2.207%	63.561%
22.0	761.126	31.267	882.136	2.049%	65.897%
23.0	682.650	29.250	911.386	1.917%	68.082%
24.0	604.181	26.948	938.334	1.766%	70.095%
25.0	530.311	24.577	962.911	1.611%	71.931%
26.0	473.084	22.742	985.653	1.490%	73.630%
27.0	417.101	20.765	1006.419	1.361%	75.181%
28.0	369.485	19.022	1025.441	1.247%	76.602%
29.0	329.295	17.507	1042.948	1.147%	77.910%
30.0	294.884	16.169	1059.116	1.060%	79.118%
31.0	265.690	15.006	1074.122	.983%	80.239%
32.0	235.652	13.694	1087.816	.897%	81.262%
33.0	211.866	12.654	1100.47	.829%	82.207%
34.0	189.548	11.623	1112.094	.762%	83.075%
35.0	172.702	10.863	1122.956	.712%	83.887%
36.0	156.361	10.079	1133.035	.660%	84.639%
37.0	141.771	9.356	1142.391	.613%	85.338%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	128.672	8.687	1151.078	.569%	85.987%
39.0	117.028	8.076	1159.155	.529%	86.591%
40.0	105.919	7.466	1166.621	.489%	87.148%
41.0	96.813	6.965	1173.586	.456%	87.669%
42.0	88.284	6.478	1180.064	.425%	88.153%
43.0	79.945	5.979	1186.043	.392%	88.599%
44.0	73.997	5.637	1191.68	.369%	89.020%
45.0	68.632	5.322	1197.002	.349%	89.418%
46.0	64.090	5.056	1202.057	.331%	89.796%
47.0	60.272	4.834	1206.891	.317%	90.157%
48.0	57.101	4.653	1211.544	.305%	90.504%
49.0	54.098	4.477	1216.022	.293%	90.839%
50.0	51.638	4.338	1220.36	.284%	91.163%
51.0	49.535	4.222	1224.581	.277%	91.478%
52.0	47.714	4.123	1228.704	.270%	91.786%
53.0	46.195	4.046	1232.75	.265%	92.088%
54.0	44.831	3.977	1236.727	.261%	92.385%
55.0	43.580	3.915	1240.642	.257%	92.678%
56.0	42.328	3.848	1244.49	.252%	92.965%
57.0	41.323	3.800	1248.291	.249%	93.249%
58.0	40.205	3.739	1252.03	.245%	93.529%
59.0	39.291	3.693	1255.723	.242%	93.804%
60.0	38.405	3.647	1259.37	.239%	94.077%
61.0	37.505	3.597	1262.967	.236%	94.346%
62.0	36.647	3.548	1266.516	.233%	94.611%
63.0	35.775	3.496	1270.011	.229%	94.872%
64.0	34.720	3.422	1273.433	.224%	95.127%
65.0	33.680	3.347	1276.78	.219%	95.377%
66.0	32.702	3.276	1280.057	.215%	95.622%
67.0	31.627	3.192	1283.249	.209%	95.861%
68.0	30.734	3.125	1286.374	.205%	96.094%
69.0	29.805	3.051	1289.425	.200%	96.322%
70.0	28.948	2.983	1292.408	.195%	96.545%
71.0	28.027	2.906	1295.314	.190%	96.762%
72.0	27.155	2.832	1298.146	.186%	96.974%
73.0	26.220	2.750	1300.896	.180%	97.179%
74.0	25.481	2.686	1303.582	.176%	97.380%
75.0	24.764	2.623	1306.205	.172%	97.576%

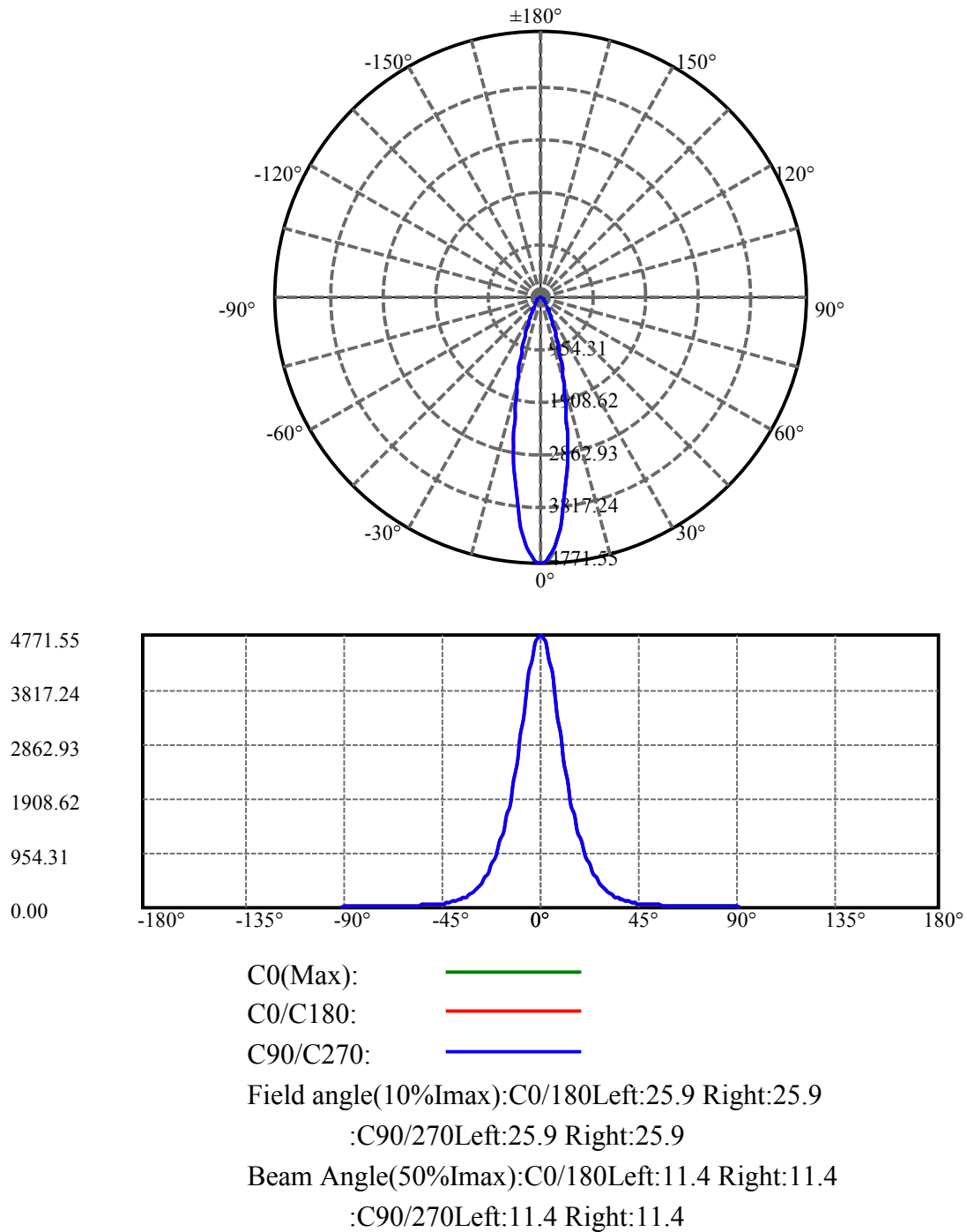
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	24.089	2.563	1308.768	.168%	97.767%
77.0	23.674	2.530	1311.298	.166%	97.956%
78.0	23.133	2.481	1313.779	.163%	98.141%
79.0	22.535	2.426	1316.205	.159%	98.323%
80.0	22.106	2.387	1318.592	.156%	98.501%
81.0	21.987	2.381	1320.974	.156%	98.679%
82.0	21.748	2.362	1323.335	.155%	98.855%
83.0	21.621	2.353	1325.689	.154%	99.031%
84.0	21.572	2.353	1328.041	.154%	99.207%
85.0	21.530	2.352	1330.393	.154%	99.382%
86.0	19.617	2.146	1332.539	.141%	99.543%
87.0	17.198	1.883	1334.423	.123%	99.683%
88.0	16.080	1.762	1336.185	.115%	99.815%
89.0	15.209	1.668	1337.853	.109%	99.940%
90.0	14.738	0.808	1338.661	.053%	100.000%

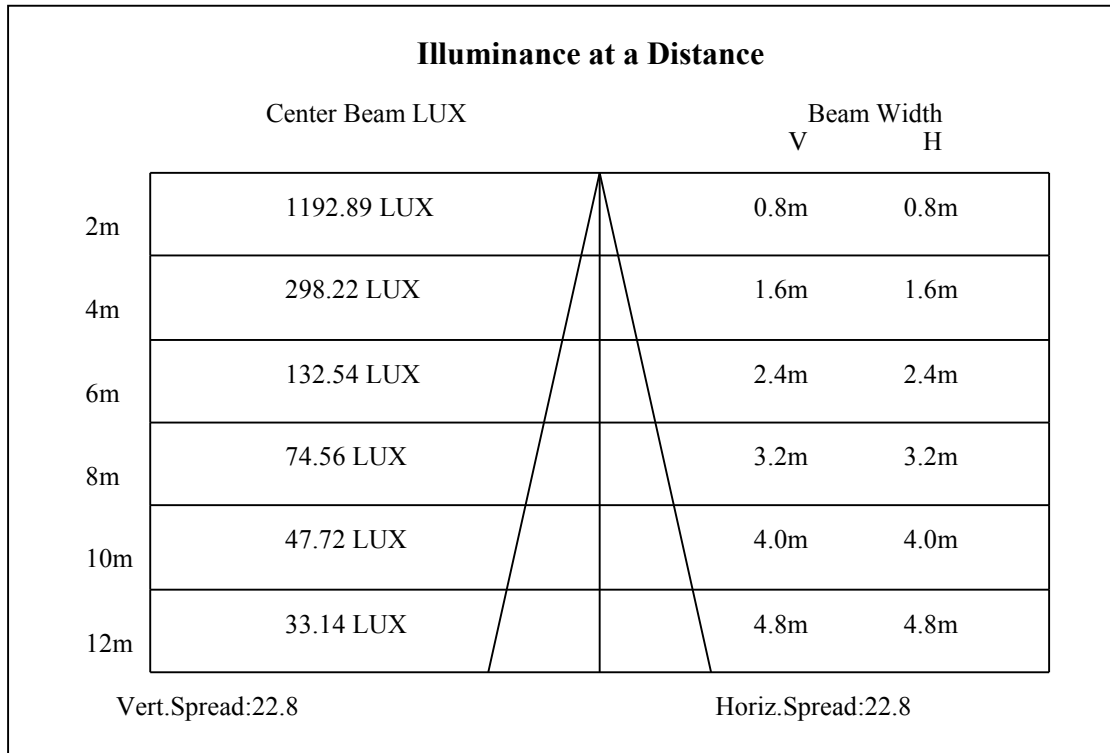
ZONAL LUMEN SUMMARY

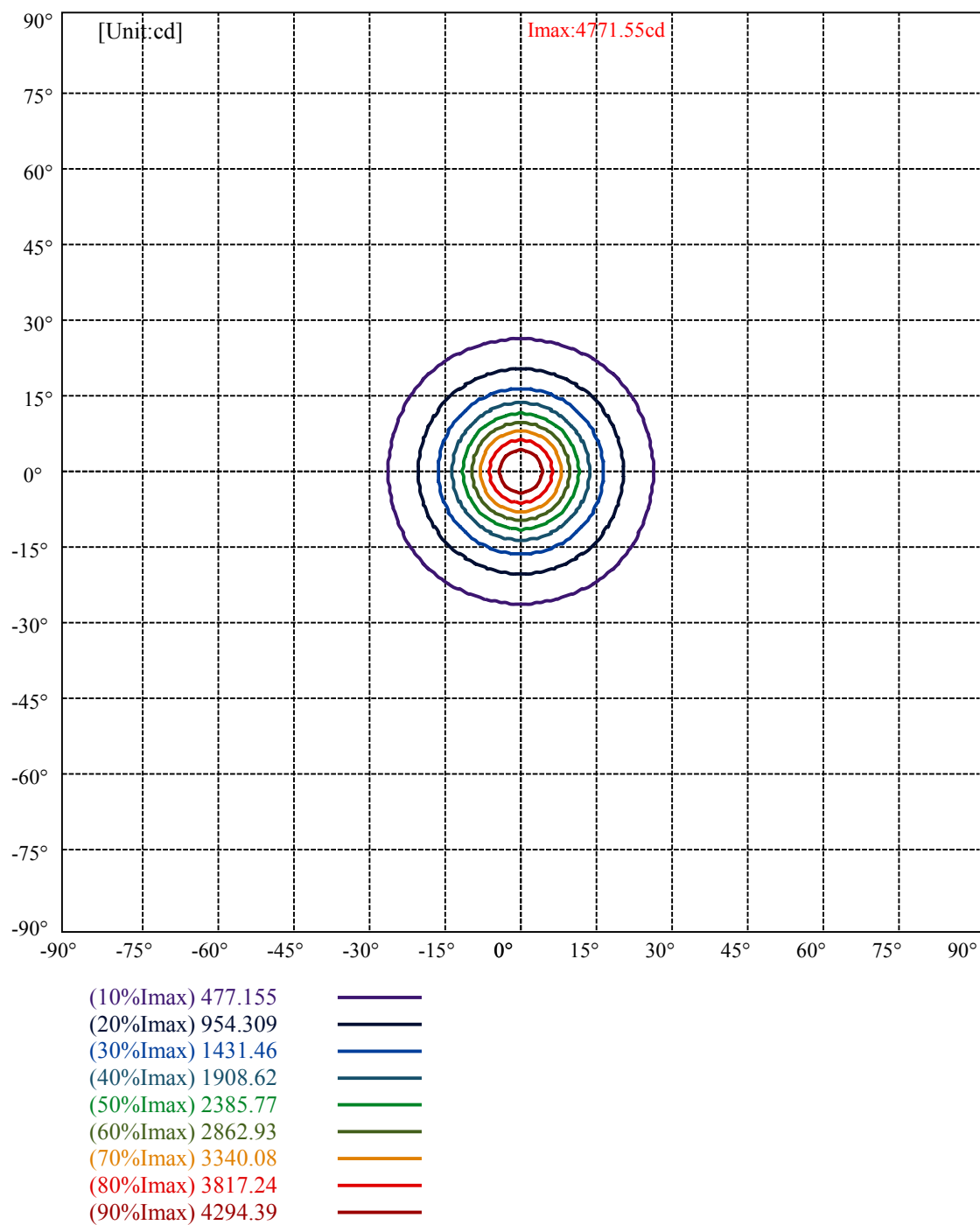
Zone	Lumens	%Lamp	%Fixt
0-30	1059.12	69.40%	79.12%
0-40	1166.62	76.45%	87.15%
0-60	1259.37	82.53%	94.08%
0-90	1337.85	87.67%	99.94%
0-120	1337.85	87.67%	99.94%
0-180	1338.66	87.72%	100.00%
60-90	82.13	5.38%	6.14%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-30.79	1070.93	70.18%	80.00%

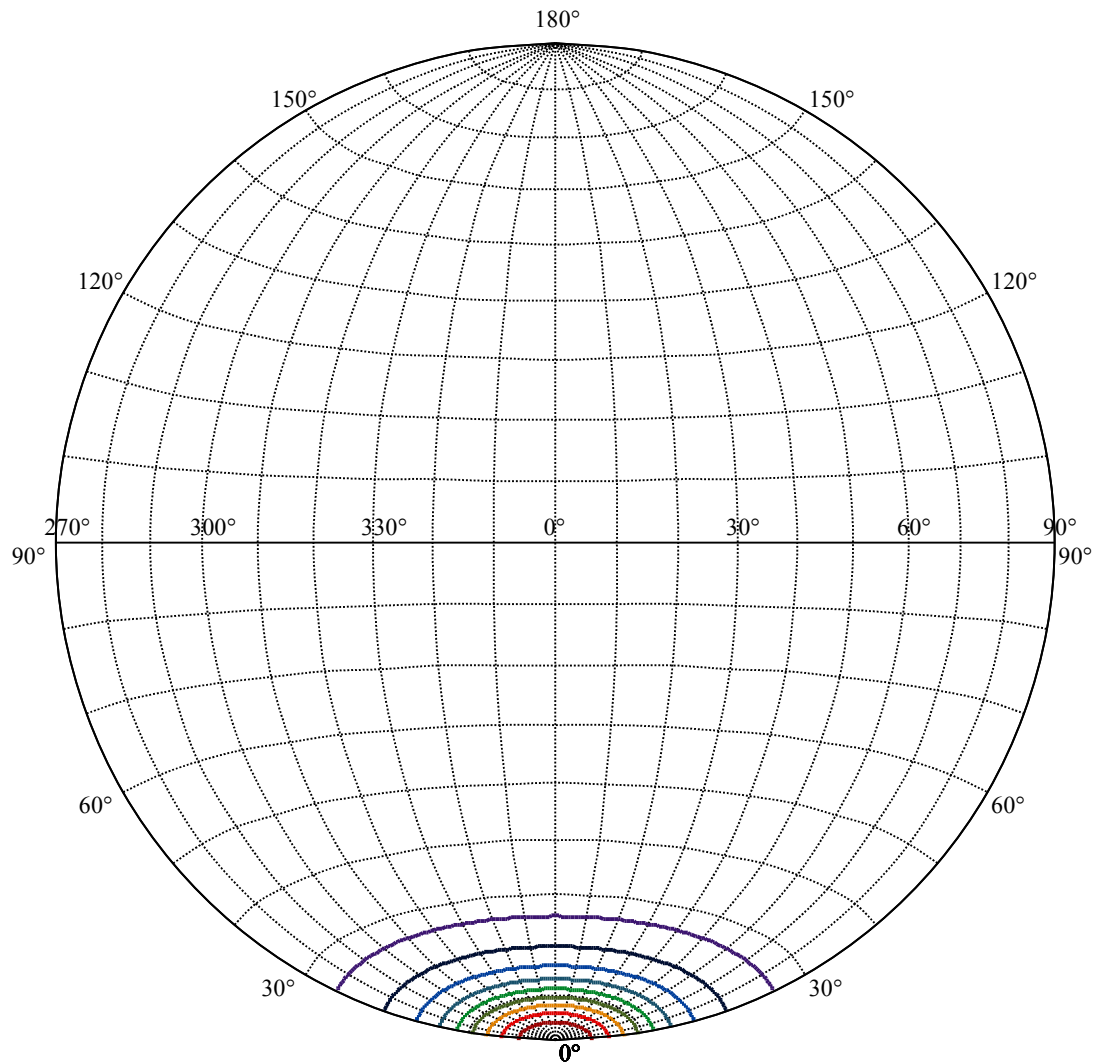
ZONAL LUMEN SUMMARY

0-10	372.74
10-20	444.44
20-30	241.93
30-40	107.50
40-50	53.74
50-60	39.01
60-70	33.04
70-80	26.18
80-90	19.26
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









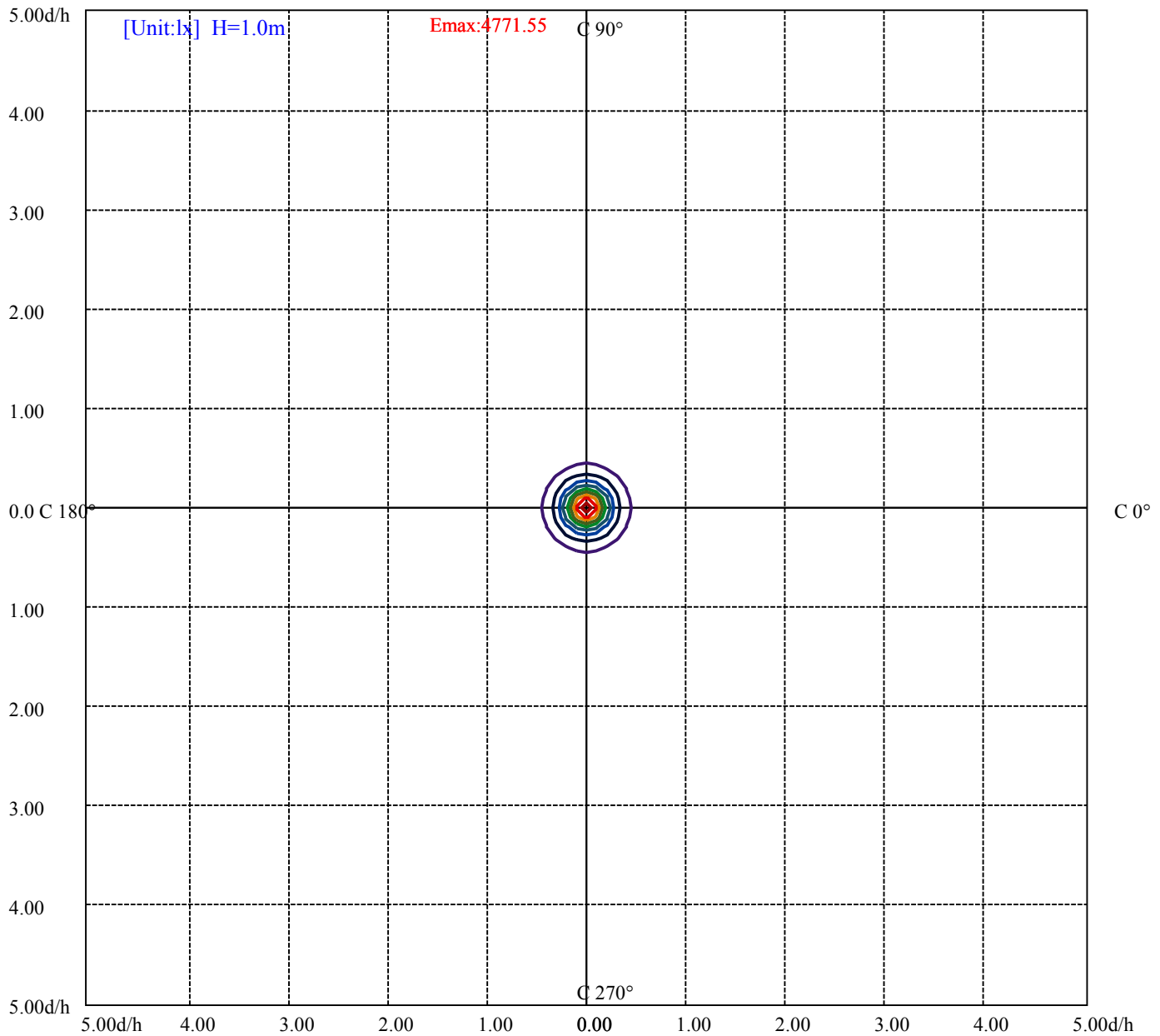
House

[Unit:cd]

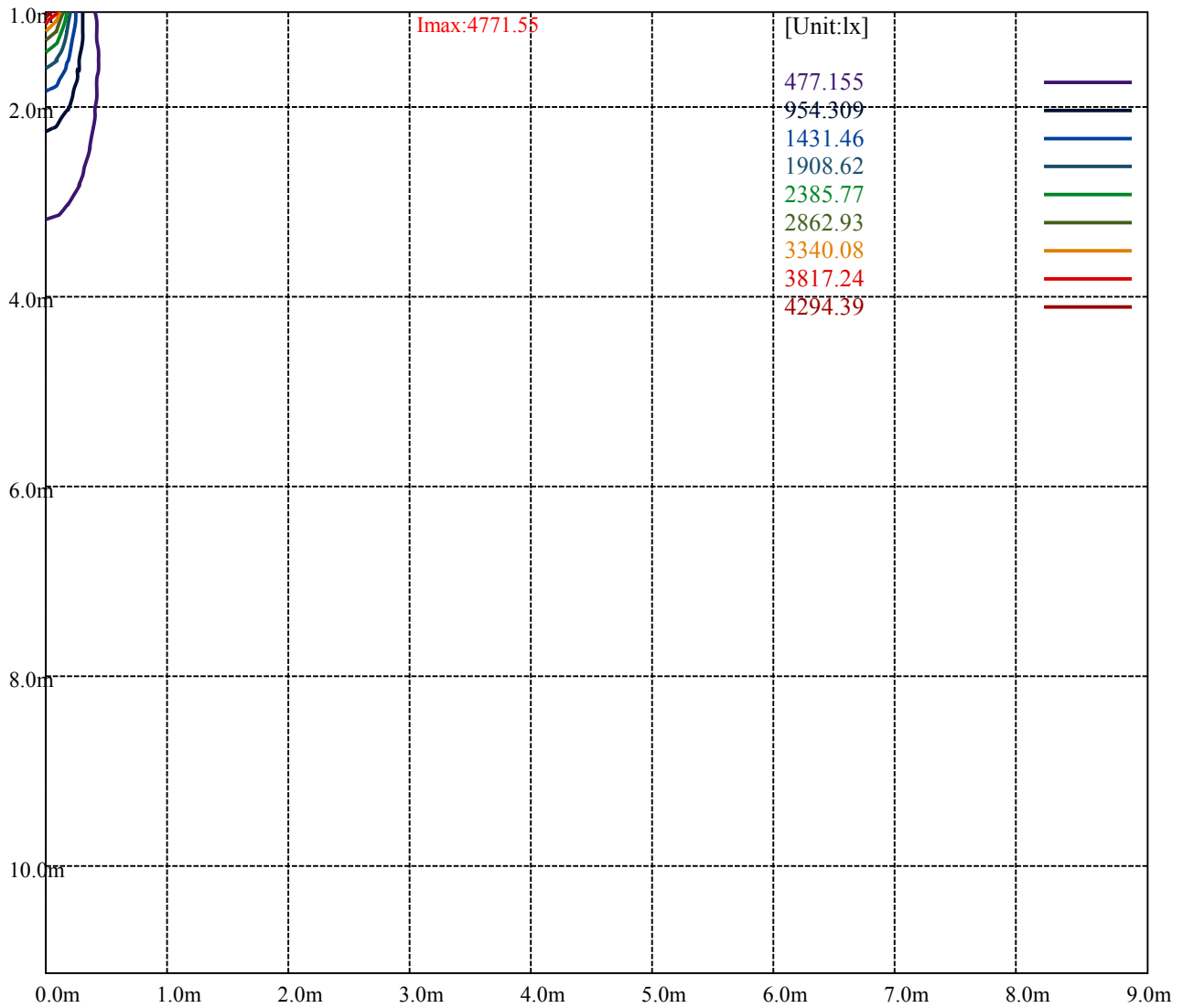
Road

Imax:4771.55

(10%Imax)	477.155	—
(20%Imax)	954.309	—
(30%Imax)	1431.46	—
(40%Imax)	1908.62	—
(50%Imax)	2385.77	—
(60%Imax)	2862.93	—
(70%Imax)	3340.08	—
(80%Imax)	3817.24	—
(90%Imax)	4294.39	—



(10%E _{max}) 477.154	—
(20%E _{max}) 954.308	—
(30%E _{max}) 1431.46	—
(40%E _{max}) 1908.62	—
(50%E _{max}) 2385.77	—
(60%E _{max}) 2862.93	—
(70%E _{max}) 3340.08	—
(80%E _{max}) 3817.23	—
(90%E _{max}) 4294.39	—



Luminance Table

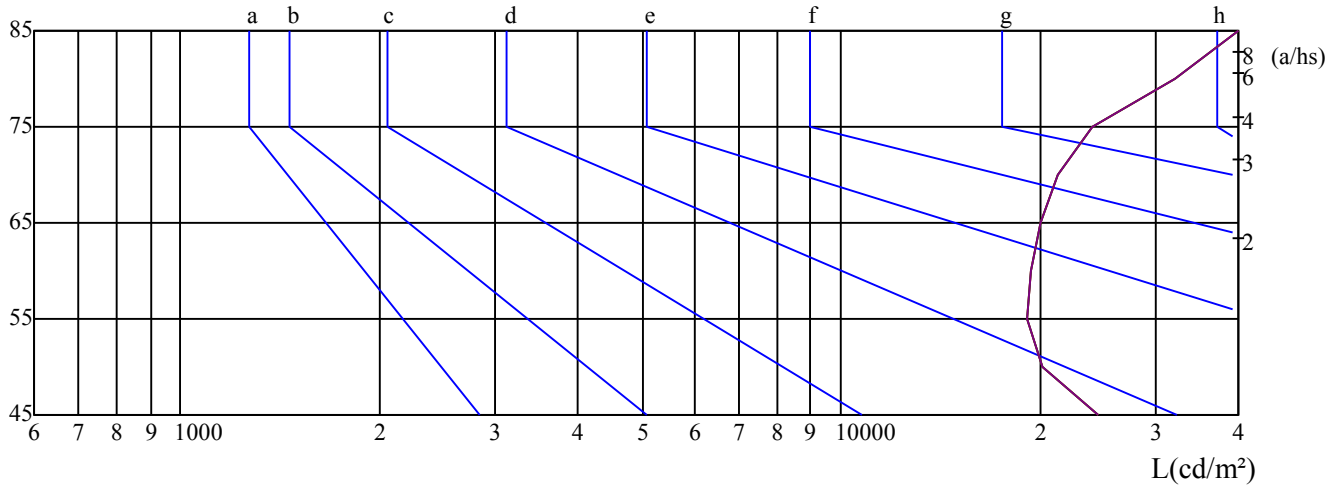
γ	45	50	55	60	65	70	75	80	85
C0	24455	20240	19143	19352	20079	21325	24107	32075	62239
C45	24455	20240	19143	19352	20079	21325	24107	32075	62239
C90	24455	20240	19143	19352	20079	21325	24107	32075	62239

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
20079	20079	20079	24107	24107	24107	62239	62239	62239

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

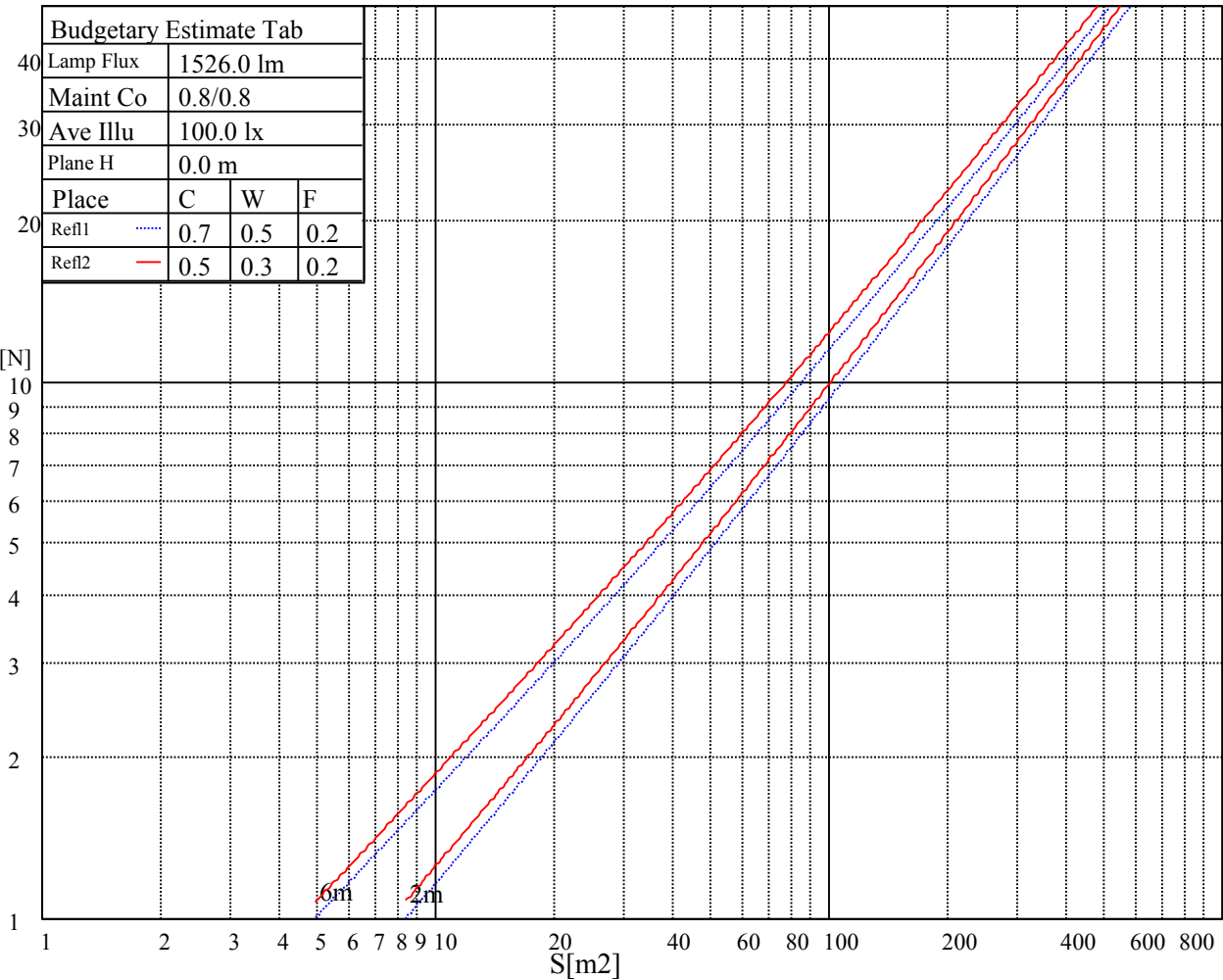
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

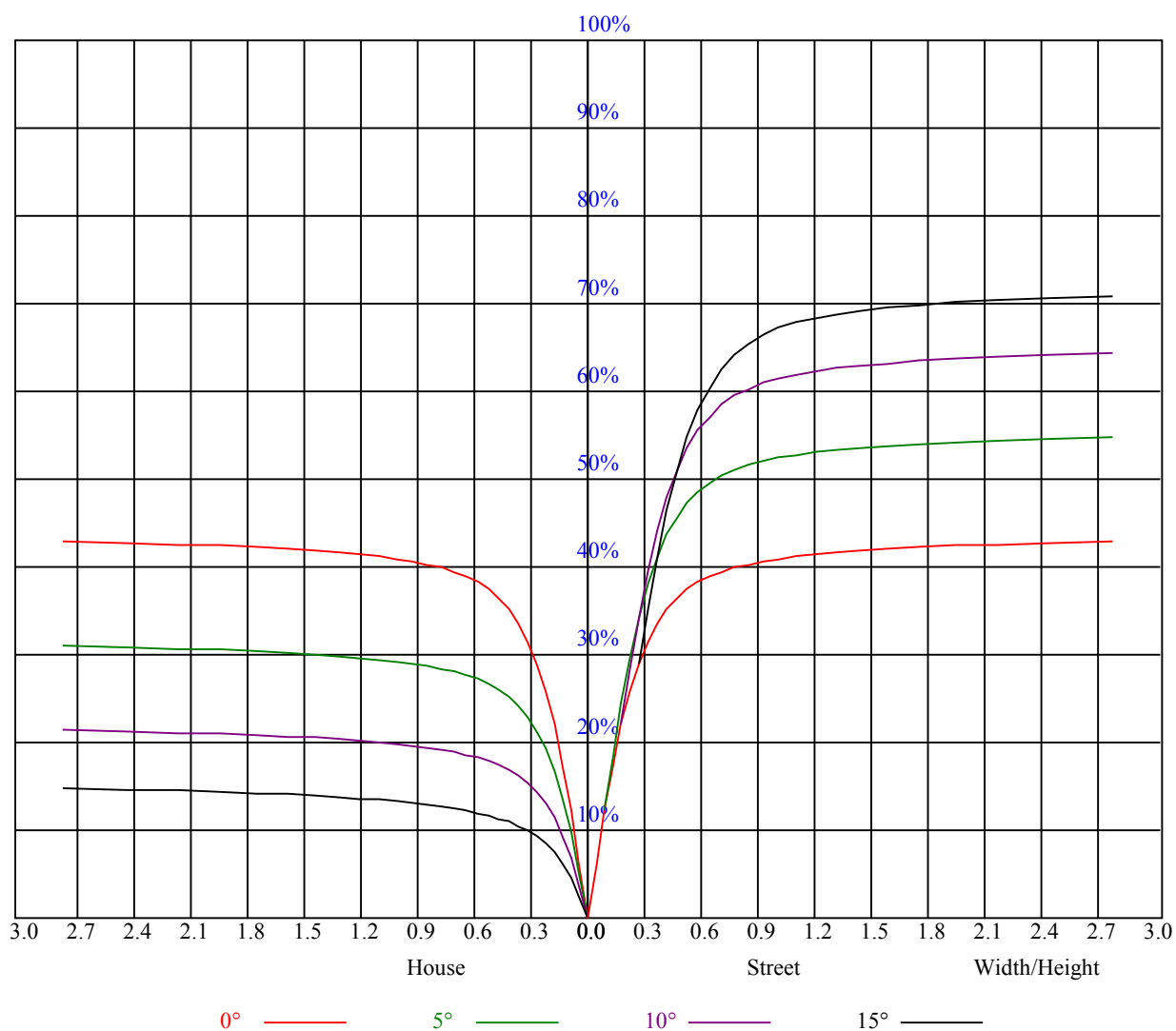
C0 ———

C45 ———

C90 ———



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	COEFFICIENTS OF UTILIZATION RHOFC=20 CU															
0	1.05	1.05	1.05	1.02	1.02	1.02	0.98	0.98	0.98	0.93	0.93	0.93	0.90	0.90	0.90	0.88
1	0.97	0.94	0.92	0.95	0.93	0.91	0.91	0.90	0.88	0.88	0.87	0.85	0.85	0.84	0.83	0.81
2	0.90	0.87	0.84	0.89	0.86	0.83	0.86	0.83	0.81	0.83	0.81	0.79	0.81	0.79	0.78	0.76
3	0.85	0.81	0.78	0.84	0.80	0.77	0.82	0.78	0.76	0.79	0.77	0.75	0.78	0.75	0.73	0.72
4	0.81	0.76	0.73	0.80	0.75	0.72	0.78	0.74	0.71	0.76	0.73	0.70	0.74	0.72	0.70	0.68
5	0.77	0.72	0.68	0.76	0.71	0.68	0.74	0.70	0.68	0.73	0.70	0.67	0.72	0.69	0.66	0.65
6	0.73	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.64	0.70	0.67	0.64	0.69	0.66	0.64	0.62
7	0.70	0.65	0.62	0.69	0.65	0.62	0.68	0.64	0.62	0.67	0.64	0.61	0.66	0.63	0.61	0.60
8	0.67	0.63	0.60	0.67	0.62	0.59	0.66	0.62	0.59	0.65	0.62	0.59	0.64	0.61	0.59	0.58
9	0.65	0.60	0.57	0.64	0.60	0.57	0.64	0.60	0.57	0.63	0.59	0.57	0.62	0.59	0.57	0.56
10	0.62	0.58	0.55	0.62	0.58	0.55	0.61	0.58	0.55	0.61	0.57	0.55	0.60	0.57	0.55	0.54



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	4779.00	4749.19	4658.06	4510.69	4332.94	4095.00	3831.75	3580.88	3321.00
45.0	4777.88	4738.50	4638.94	4498.31	4300.88	4065.75	3828.38	3540.38	3277.13
90.0	4770.56	4730.63	4640.06	4463.44	4278.38	4065.19	3762.00	3501.00	3237.75
135.0	4761.00	4765.50	4708.13	4609.69	4446.56	4239.56	4021.31	3751.88	3502.13
180.0	4779.00	4752.56	4676.06	4539.94	4354.88	4151.81	3924.56	3614.63	3358.69
225.0	4777.88	4759.88	4691.25	4536.56	4366.69	4161.38	3894.19	3611.25	3349.13
270.0	4770.56	4758.19	4683.94	4560.19	4365.56	4129.88	3887.44	3599.44	3334.50
315.0	4756.50	4698.56	4592.81	4397.06	4204.13	3979.69	3728.81	3407.06	3144.38
360.0	4779.00	4749.19	4658.06	4510.69	4332.94	4095.00	3831.75	3580.88	3321.00
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	2997.00	2737.69	2490.75	2229.75	1991.81	1803.94	1613.25	1444.50	1308.38
45.0	2980.13	2683.69	2432.25	2200.50	1940.06	1756.69	1597.50	1419.19	1288.13
90.0	2898.56	2637.56	2391.19	2110.50	1933.88	1730.25	1533.94	1410.19	1278.00
135.0	3218.06	2922.75	2667.94	2456.44	2145.94	1947.38	1792.69	1578.94	1377.19
180.0	3097.69	2775.94	2532.38	2306.25	2072.81	1865.25	1701.00	1535.63	1400.63
225.0	3051.56	2754.56	2494.69	2231.44	2016.56	1800.56	1618.88	1476.56	1346.06
270.0	3040.88	2736.00	2477.25	2237.06	1955.81	1758.38	1590.75	1402.31	1267.88
315.0	2878.88	2557.69	2312.44	2084.63	1858.50	1665.00	1508.06	1348.88	1116.45
360.0	2997.00	2737.69	2490.75	2229.75	1991.81	1803.94	1613.25	1444.50	1308.38
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1169.44	1058.06	943.31	838.13	752.63	674.44	585.56	522.56	464.63
45.0	1161.56	1043.44	929.25	839.81	742.50	663.75	581.63	511.88	456.19
90.0	1110.32	1016.10	916.03	811.13	715.61	639.00	570.66	494.61	441.23
135.0	1316.25	1165.50	1046.81	958.50	837.00	751.50	671.06	581.63	520.31
180.0	1259.44	1115.83	1026.39	919.01	820.29	739.07	664.03	576.96	512.61
225.0	1117.69	1092.88	996.86	885.66	801.73	722.31	631.63	565.59	504.73
270.0	1148.63	1029.38	921.94	832.50	738.56	663.19	585.56	517.50	461.81
315.0	1088.27	970.20	872.49	771.92	680.68	607.95	543.32	471.77	423.17
360.0	1169.44	1058.06	943.31	838.13	752.63	674.44	585.56	522.56	464.63
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	402.19	358.88	321.75	290.81	253.80	230.63	209.93	187.31	171.62
45.0	401.63	355.50	317.81	286.31	267.69	227.31	206.72	186.92	167.29
90.0	394.54	342.34	305.16	271.86	239.51	212.12	190.58	169.31	152.61
135.0	459.56	406.69	364.50	326.81	286.88	267.30	231.81	203.12	185.68
180.0	454.78	398.03	348.24	310.78	271.24	244.52	221.34	195.81	180.45
225.0	436.95	395.16	347.91	302.34	275.12	245.36	217.18	199.80	182.14
270.0	406.69	361.13	326.81	296.44	285.75	236.70	215.55	191.81	174.99
315.0	380.48	338.18	302.18	273.71	245.53	221.29	201.83	182.31	166.84
360.0	402.19	358.88	321.75	290.81	253.80	230.63	209.93	187.31	171.62
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	157.11	142.31	129.04	118.01	106.88	97.93	88.76	80.49	74.36
45.0	153.23	139.89	124.93	114.58	104.68	94.28	85.56	78.81	72.34
90.0	136.35	122.06	110.93	99.79	90.23	82.91	76.67	70.14	65.98
135.0	169.31	152.27	136.97	125.10	113.01	102.04	92.03	83.31	76.61
180.0	162.84	145.29	134.33	121.44	108.23	99.73	90.79	80.27	74.59
225.0	161.04	149.06	136.63	123.69	112.28	102.83	94.28	84.66	77.91
270.0	160.03	146.19	130.84	119.76	108.73	99.96	91.18	83.36	77.34
315.0	150.98	137.08	125.72	113.85	103.33	94.84	87.02	78.53	72.84
360.0	157.11	142.31	129.04	118.01	106.88	97.93	88.76	80.49	74.36

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	68.68	63.96	60.36	57.26	54.06	51.75	49.78	47.98	46.46
45.0	67.16	63.17	59.40	56.36	53.49	50.96	48.83	47.14	45.56
90.0	62.49	59.23	56.36	54.00	51.81	49.78	48.21	46.63	45.39
135.0	70.31	65.42	61.54	58.16	54.56	52.09	49.84	47.53	45.90
180.0	69.24	64.29	60.19	56.87	53.66	50.91	48.66	46.63	45.23
225.0	71.49	66.66	61.99	58.05	55.24	52.43	49.89	48.15	46.63
270.0	71.55	66.43	62.55	59.06	55.46	53.04	50.74	48.94	46.91
315.0	68.12	63.56	59.79	57.04	54.51	52.14	50.34	48.71	47.48
360.0	68.68	63.96	60.36	57.26	54.06	51.75	49.78	47.98	46.46
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	45.28	44.10	42.98	42.08	41.12	40.33	39.43	38.70	38.03
45.0	44.21	43.03	41.57	40.56	39.54	38.64	37.97	37.29	36.39
90.0	44.10	42.86	41.74	40.67	39.38	38.48	37.52	36.39	35.44
135.0	44.55	43.20	41.85	40.84	39.60	38.59	37.58	36.56	35.61
180.0	43.65	42.53	41.29	40.44	39.43	38.70	37.91	37.07	36.34
225.0	45.17	43.82	42.69	41.63	40.44	39.54	38.76	37.86	37.07
270.0	45.51	44.21	42.69	41.57	40.50	39.32	38.19	37.29	36.34
315.0	46.18	44.89	43.82	42.81	41.63	40.73	39.88	38.87	37.97
360.0	45.28	44.10	42.98	42.08	41.12	40.33	39.43	38.70	38.03
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	37.24	36.17	35.33	34.37	33.24	32.40	31.56	30.71	29.70
45.0	35.55	34.48	33.30	32.23	31.11	30.09	29.19	28.35	27.34
90.0	34.43	33.30	32.18	31.22	30.21	29.31	28.29	27.34	26.49
135.0	34.76	33.58	32.51	31.50	30.21	29.25	28.35	27.45	26.44
180.0	35.55	34.88	33.86	33.02	32.34	31.61	30.94	30.38	29.64
225.0	36.17	35.10	34.09	33.13	32.06	31.16	30.04	29.14	28.29
270.0	35.44	34.43	33.41	32.46	31.44	30.49	29.59	28.86	27.73
315.0	37.07	35.83	34.76	33.69	32.40	31.56	30.49	29.36	28.58
360.0	37.24	36.17	35.33	34.37	33.24	32.40	31.56	30.71	29.70
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	28.80	27.79	26.89	25.93	25.31	25.26	24.64	23.63	23.06
45.0	26.49	25.65	24.81	24.08	23.40	22.84	22.33	21.99	21.66
90.0	25.65	24.81	24.30	23.85	23.40	22.89	22.44	21.99	21.66
135.0	25.65	24.69	23.96	23.12	22.33	21.83	21.26	20.81	20.48
180.0	28.80	27.62	27.11	26.44	25.65	25.54	24.64	23.18	21.88
225.0	27.39	26.44	25.65	24.92	24.13	23.63	23.12	22.61	22.22
270.0	26.89	26.21	25.26	24.58	24.08	23.51	23.12	22.89	22.89
315.0	27.56	26.55	25.88	25.20	24.41	23.91	23.51	23.18	23.01
360.0	28.80	27.79	26.89	25.93	25.31	25.26	24.64	23.63	23.06
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	22.73	22.33	21.94	21.54	20.81	19.18	17.27	16.14	15.30
45.0	21.38	21.15	21.04	21.04	20.87	17.89	16.31	15.36	14.63
90.0	21.32	21.04	21.26	21.60	22.16	17.61	16.20	15.53	14.85
135.0	20.14	19.91	19.74	19.91	20.19	18.45	16.43	15.36	14.74
180.0	21.54	21.21	20.70	20.19	19.58	18.06	16.20	15.36	14.63
225.0	22.05	21.77	21.66	21.66	21.71	21.60	18.17	16.71	15.75
270.0	23.74	23.46	23.34	23.40	23.51	23.85	18.96	17.33	16.03
315.0	23.01	23.12	23.29	23.23	23.40	20.31	18.06	16.88	15.75
360.0	22.73	22.33	21.94	21.54	20.81	19.18	17.27	16.14	15.30

Intensity data(cd)

C/ γ (°)	90.0
0.0	14.79
45.0	14.46
90.0	14.34
135.0	14.18
180.0	14.23
225.0	14.96
270.0	15.36
315.0	15.58
360.0	14.79