
Nata

Client:

LumCAT: 1656-S

Luminaire: 92.70.123.00

Report No: nata0100

Test No: GC2018050301

LampCAT: CREE CXA1310

Lamp flux(lm): 632.9

Number of Lamps: 1

Length(mm): 47

Phm Type: C

Voltage(V): 18.1000

Current(A): 0.3500

Power (W): 6.3350

PF: 0.0000

Ballast type: DC

Width(mm): 47

Height(mm): 0

Photometric Results

Lumens(lm): 574.96, Efficiency(%): 90.85% , Luminous Efficacy(lm/W): 90.76

Central intensity(cd): 6945.640, Maximum intensity(cd): 6945.640

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=11.2

[C90/270]Total=11.2

Field angle(10%Imax): [C0/180]Total=23.8

[C90/270]Total=23.8

Maximum s/h(1/2): C0_180=0.19 C90_270=0.19

Maximum s/h(1/4): C0_180=0.21 C90_270=0.21

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.11%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 98.504%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	6945.640	1.662	1.662	.263%	.289%
1.0	6763.541	12.944	14.606	2.045%	2.540%
2.0	6286.271	24.058	38.664	3.802%	6.725%
3.0	5584.508	32.051	70.715	5.064%	12.299%
4.0	4793.417	36.668	107.382	5.794%	18.677%
5.0	3970.874	37.952	145.334	5.997%	25.277%
6.0	3162.921	36.256	181.59	5.729%	31.583%
7.0	2508.714	33.527	215.117	5.298%	37.415%
8.0	1958.336	29.888	245.005	4.723%	42.613%
9.0	1460.089	25.047	270.052	3.958%	46.969%
10.0	1107.976	21.099	291.151	3.334%	50.639%
11.0	866.051	18.121	309.272	2.863%	53.791%
12.0	669.458	15.264	324.536	2.412%	56.445%
13.0	531.666	13.115	337.651	2.072%	58.726%
14.0	434.815	11.535	349.187	1.823%	60.733%
15.0	368.348	10.455	359.641	1.652%	62.551%
16.0	323.505	9.778	369.42	1.545%	64.252%
17.0	288.275	9.243	378.662	1.460%	65.859%
18.0	264.986	8.980	387.642	1.419%	67.421%
19.0	251.718	8.987	396.629	1.420%	68.984%
20.0	239.908	8.998	405.627	1.422%	70.549%
21.0	228.415	8.976	414.603	1.418%	72.110%
22.0	222.215	9.129	423.732	1.442%	73.698%
23.0	217.266	9.309	433.041	1.471%	75.317%
24.0	212.869	9.495	442.536	1.500%	76.969%
25.0	209.428	9.706	452.242	1.534%	78.657%
26.0	206.427	9.923	462.165	1.568%	80.383%
27.0	203.344	10.123	472.289	1.600%	82.143%
28.0	200.281	10.311	482.6	1.629%	83.937%
29.0	197.164	10.482	493.082	1.656%	85.760%
30.0	193.709	10.621	503.703	1.678%	87.607%
31.0	187.701	10.601	514.304	1.675%	89.451%
32.0	175.589	10.204	524.508	1.612%	91.226%
33.0	161.047	9.619	534.126	1.520%	92.899%
34.0	141.316	8.666	542.792	1.369%	94.406%
35.0	112.852	7.098	549.89	1.122%	95.640%
36.0	82.784	5.336	555.226	.843%	96.568%
37.0	56.398	3.722	558.948	.588%	97.216%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	34.665	2.340	561.289	.370%	97.623%
39.0	17.942	1.238	562.527	.196%	97.838%
40.0	9.236	0.651	563.178	.103%	97.951%
41.0	5.733	0.412	563.59	.065%	98.023%
42.0	4.721	0.346	563.937	.055%	98.083%
43.0	3.978	0.297	564.234	.047%	98.135%
44.0	3.448	0.263	564.497	.042%	98.181%
45.0	3.028	0.235	564.732	.037%	98.222%
46.0	2.794	0.220	564.952	.035%	98.260%
47.0	2.705	0.217	565.169	.034%	98.298%
48.0	2.636	0.215	565.384	.034%	98.335%
49.0	2.595	0.215	565.599	.034%	98.372%
50.0	2.533	0.213	565.811	.034%	98.409%
51.0	2.512	0.214	566.026	.034%	98.447%
52.0	2.464	0.213	566.238	.034%	98.484%
53.0	2.436	0.213	566.452	.034%	98.521%
54.0	2.416	0.214	566.666	.034%	98.558%
55.0	2.395	0.215	566.881	.034%	98.596%
56.0	2.367	0.215	567.096	.034%	98.633%
57.0	2.374	0.218	567.315	.035%	98.671%
58.0	2.340	0.218	567.532	.034%	98.709%
59.0	2.326	0.219	567.751	.035%	98.747%
60.0	2.319	0.220	567.971	.035%	98.785%
61.0	2.312	0.222	568.193	.035%	98.824%
62.0	2.305	0.223	568.416	.035%	98.863%
63.0	2.305	0.225	568.642	.036%	98.902%
64.0	2.305	0.227	568.869	.036%	98.941%
65.0	2.278	0.226	569.095	.036%	98.981%
66.0	2.271	0.228	569.323	.036%	99.020%
67.0	2.292	0.231	569.554	.037%	99.060%
68.0	2.278	0.232	569.786	.037%	99.101%
69.0	2.271	0.233	570.018	.037%	99.141%
70.0	2.264	0.233	570.252	.037%	99.182%
71.0	2.264	0.235	570.486	.037%	99.223%
72.0	2.257	0.235	570.722	.037%	99.263%
73.0	2.257	0.237	570.958	.037%	99.305%
74.0	2.257	0.238	571.196	.038%	99.346%
75.0	2.257	0.239	571.436	.038%	99.388%

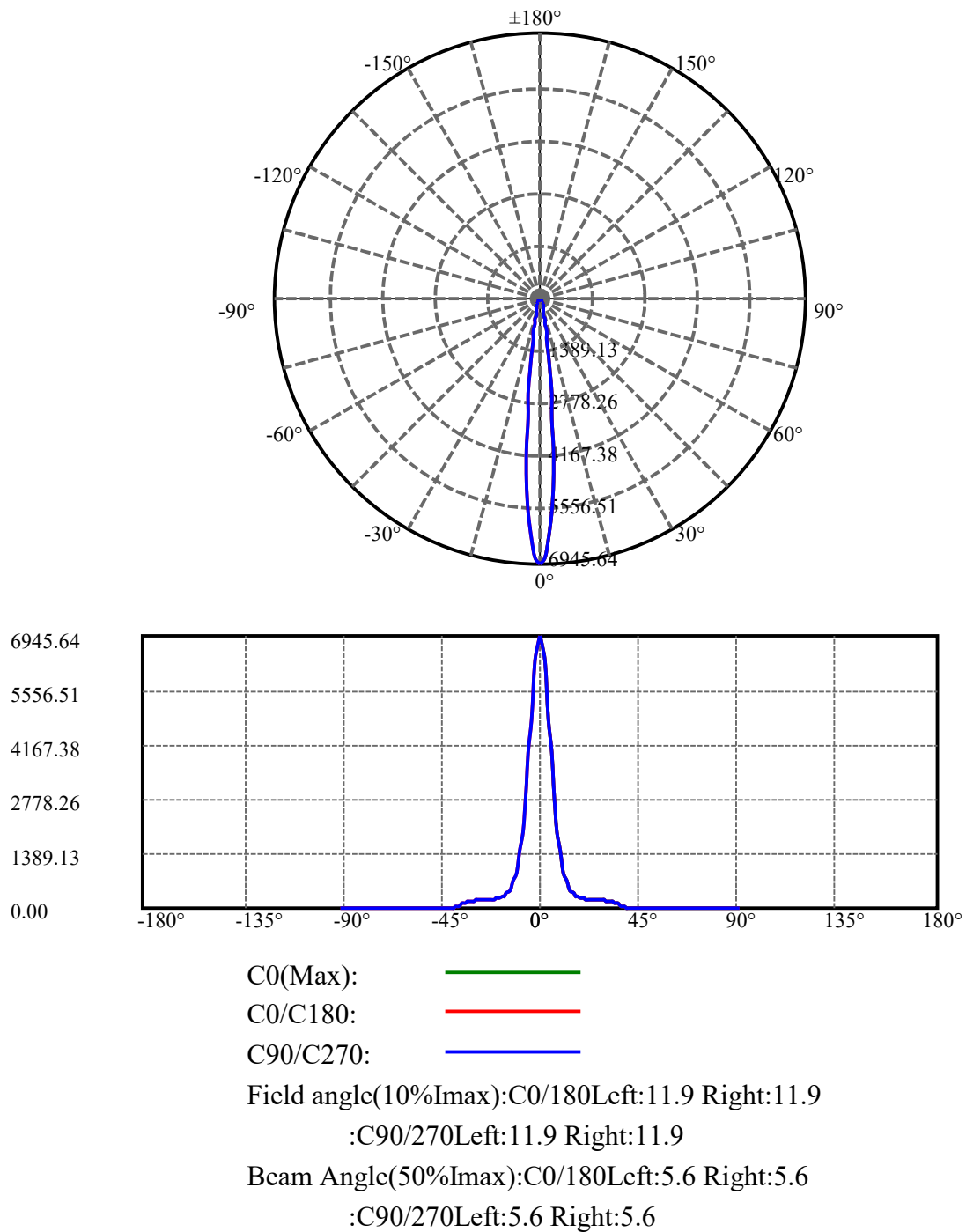
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	2.250	0.239	571.675	.038%	99.429%
77.0	2.244	0.240	571.915	.038%	99.471%
78.0	2.244	0.241	572.155	.038%	99.513%
79.0	2.250	0.242	572.398	.038%	99.555%
80.0	2.244	0.242	572.64	.038%	99.597%
81.0	2.250	0.244	572.884	.039%	99.640%
82.0	2.237	0.243	573.127	.038%	99.682%
83.0	2.237	0.243	573.37	.038%	99.724%
84.0	2.237	0.244	573.614	.039%	99.767%
85.0	2.237	0.244	573.858	.039%	99.809%
86.0	2.237	0.245	574.103	.039%	99.852%
87.0	2.230	0.244	574.347	.039%	99.894%
88.0	2.230	0.244	574.591	.039%	99.937%
89.0	2.223	0.244	574.835	.039%	99.979%
90.0	2.209	0.121	574.956	.019%	100.000%

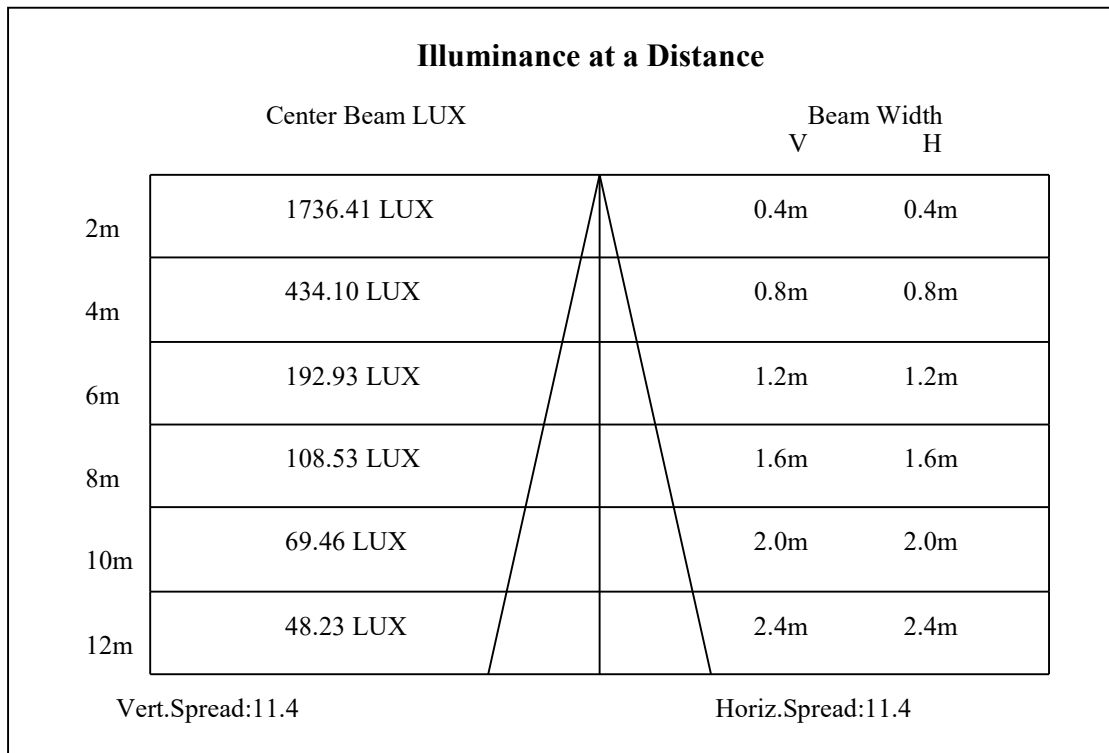
ZONAL LUMEN SUMMARY

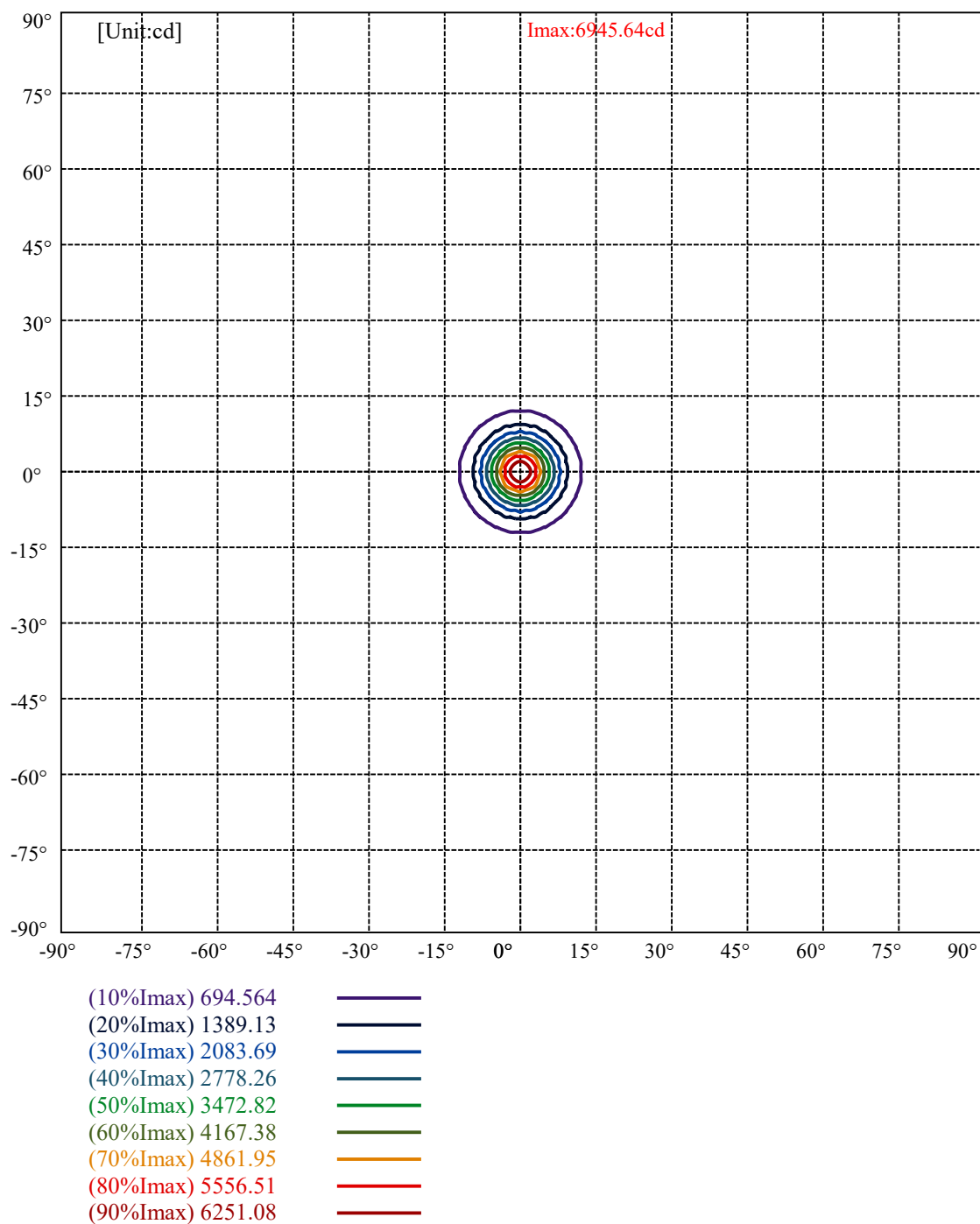
Zone	Lumens	%Lamp	%Fixt
0-30	503.70	79.59%	87.61%
0-40	563.18	88.99%	97.95%
0-60	567.97	89.75%	98.79%
0-90	574.84	90.83%	99.98%
0-120	574.84	90.83%	99.98%
0-180	574.96	90.85%	100.00%
60-90	7.08	1.12%	1.23%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-25.78	459.97	72.68%	80.00%

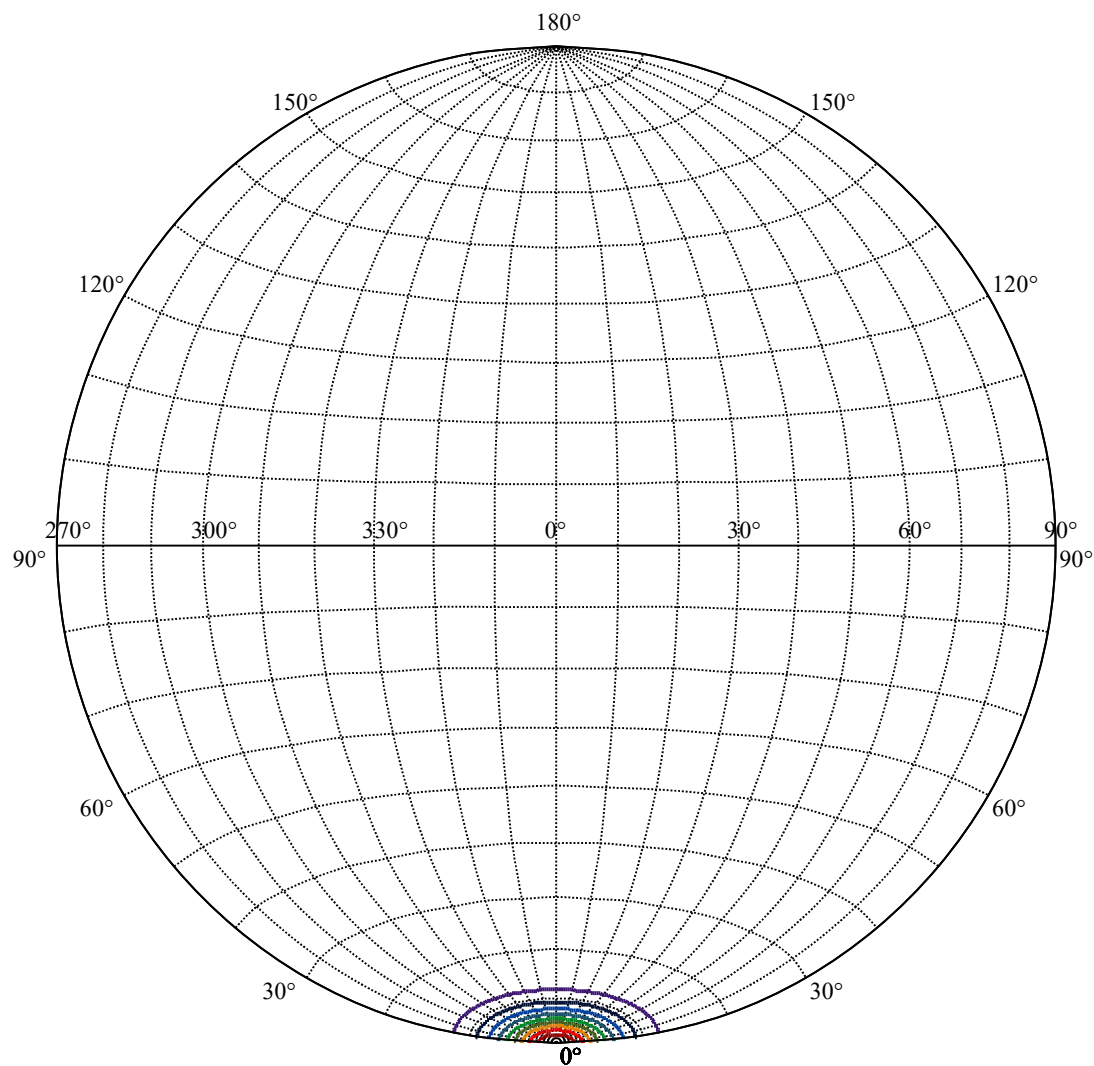
ZONAL LUMEN SUMMARY

0-10	291.15
10-20	114.48
20-30	98.08
30-40	59.48
40-50	2.63
50-60	2.16
60-70	2.28
70-80	2.39
80-90	2.20
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







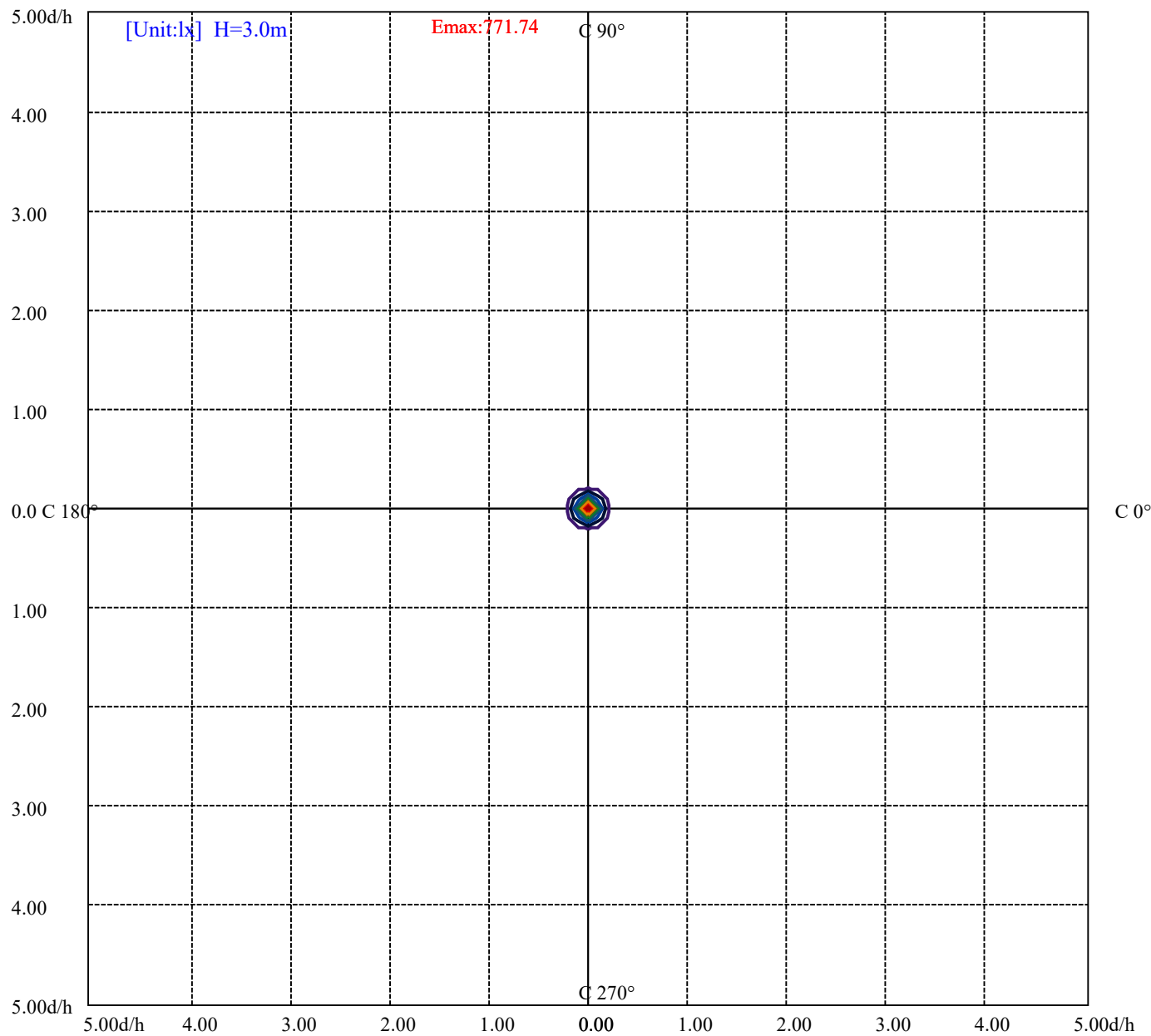


House

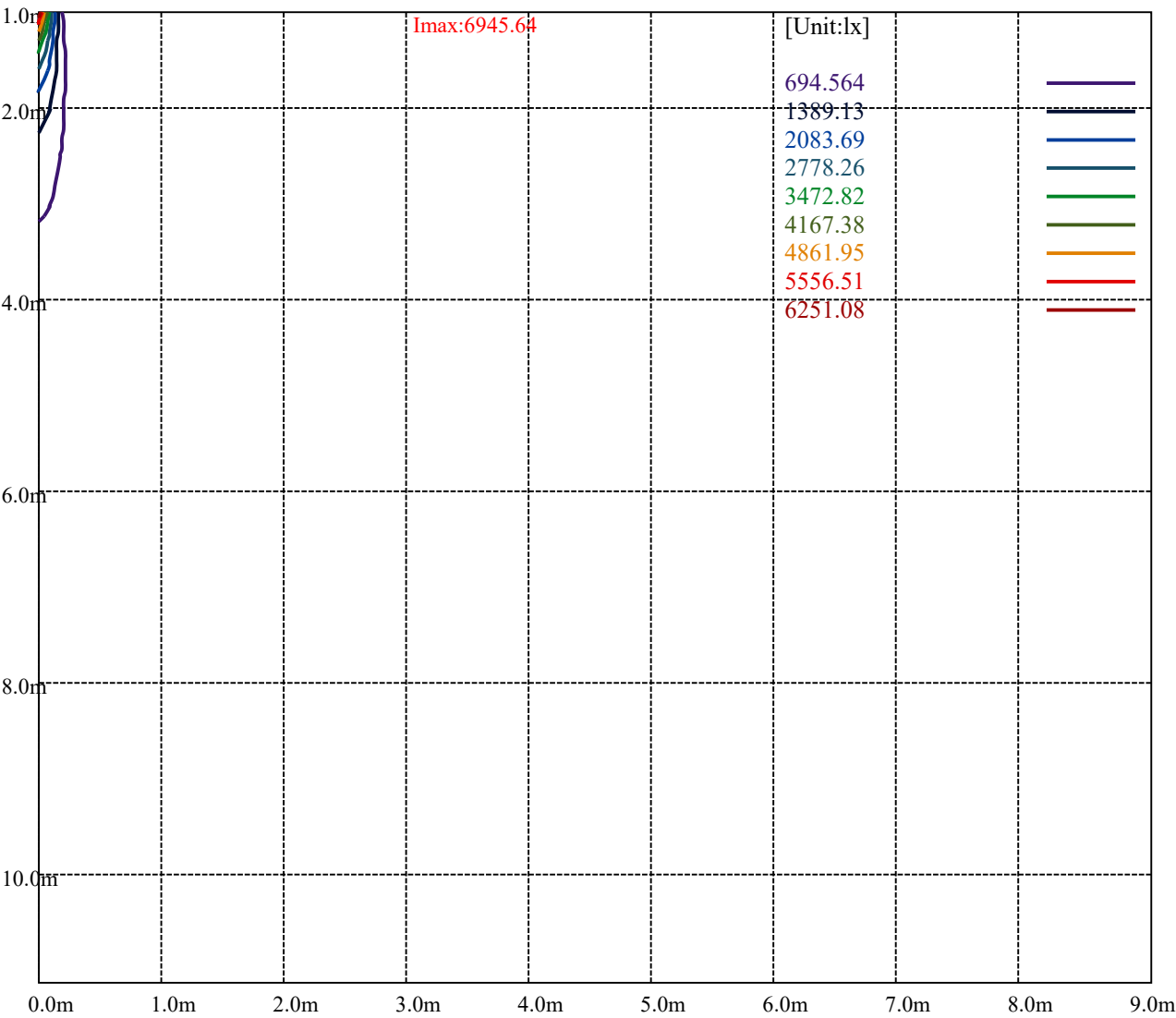
[Unit:cd]

Road

Imax:6945.64	
(10%Imax) 694.564	—
(20%Imax) 1389.13	—
(30%Imax) 2083.69	—
(40%Imax) 2778.26	—
(50%Imax) 3472.82	—
(60%Imax) 4167.38	—
(70%Imax) 4861.95	—
(80%Imax) 5556.51	—
(90%Imax) 6251.08	—



(10%Emax)	77.17344	—
(20%Emax)	154.3467	—
(30%Emax)	231.52	—
(40%Emax)	308.6933	—
(50%Emax)	385.8678	—
(60%Emax)	463.0411	—
(70%Emax)	540.2145	—
(80%Emax)	617.3878	—
(90%Emax)	694.5611	—



Luminance Table

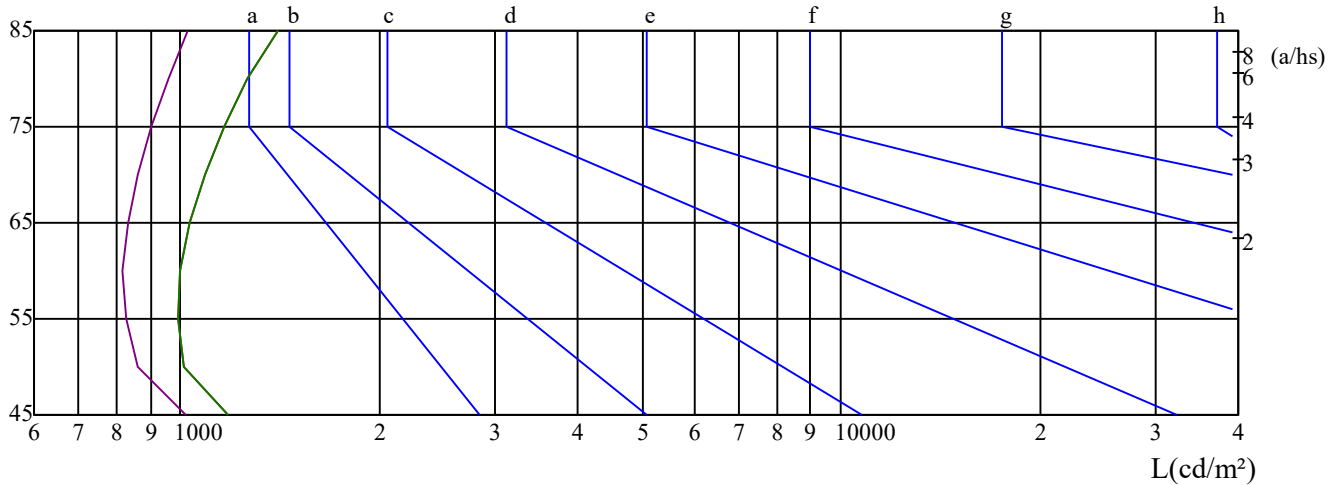
γ	45	50	55	60	65	70	75	80	85
C0	1183	1013	989	997	1030	1088	1167	1266	1400
C45	1019	859	826	819	831	861	904	956	1026
C90	1183	1013	989	997	1030	1088	1167	1266	1400

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
2440	2440	2440	3948	3948	3948	11617	11617	11617

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

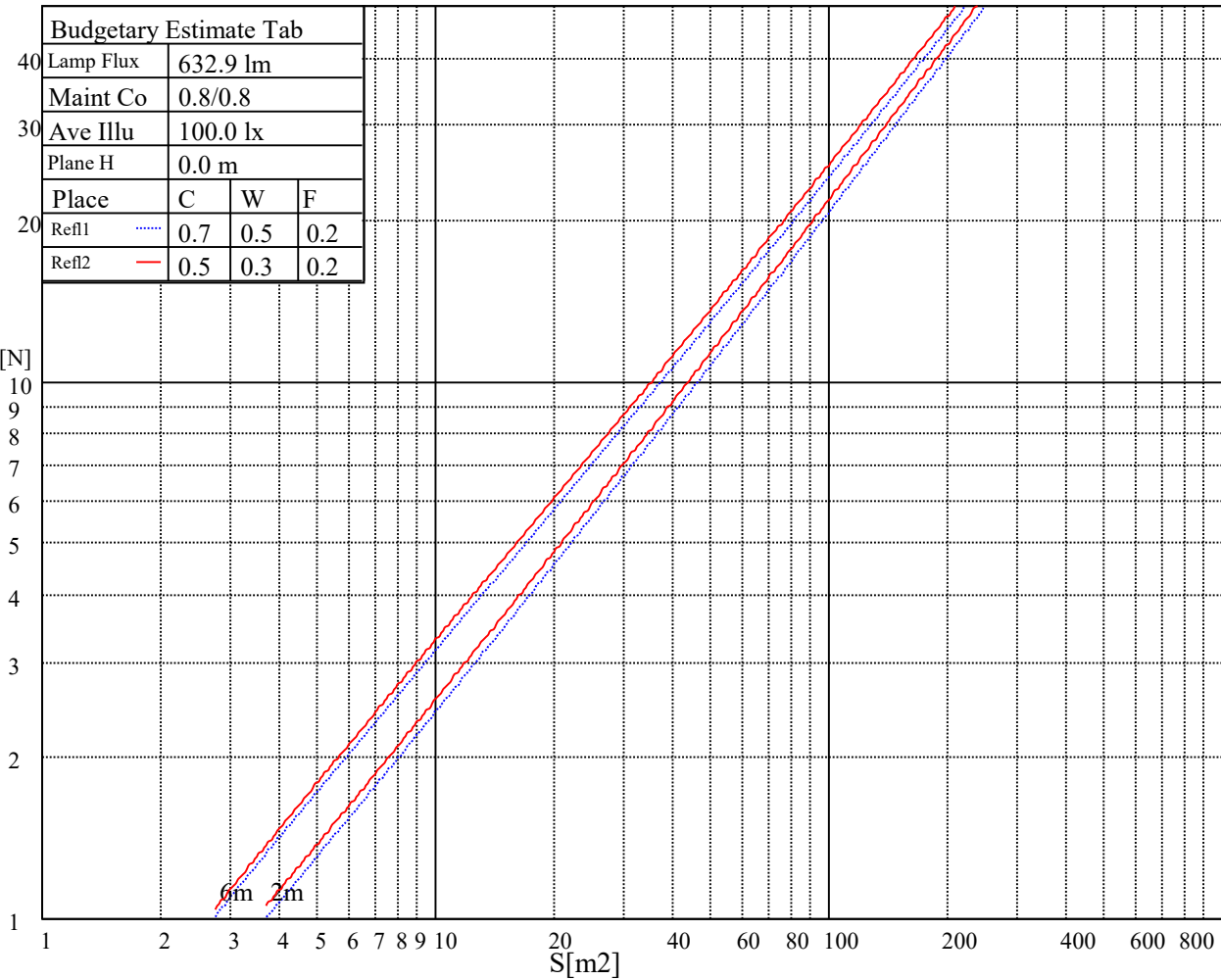
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

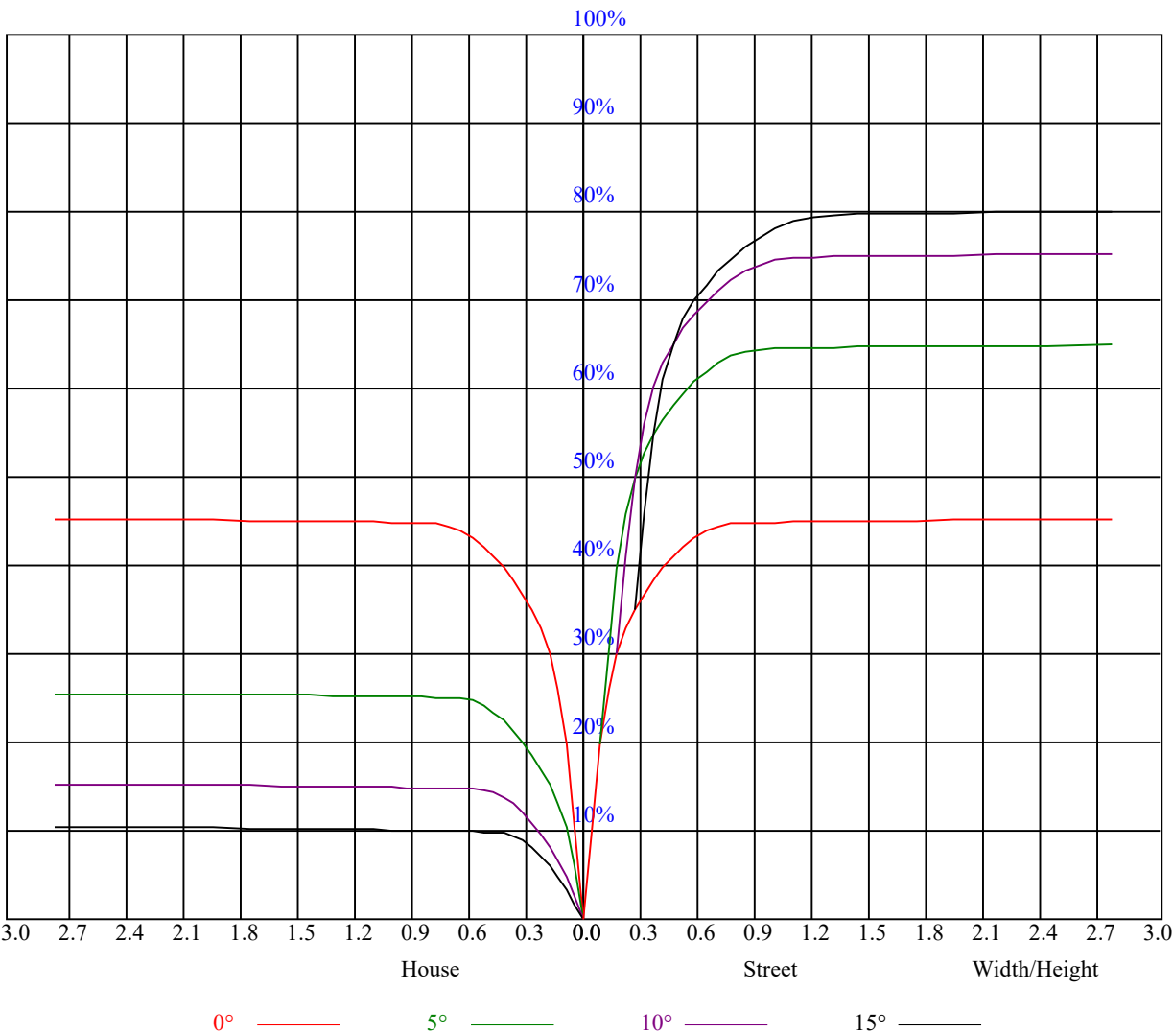
C0 ———

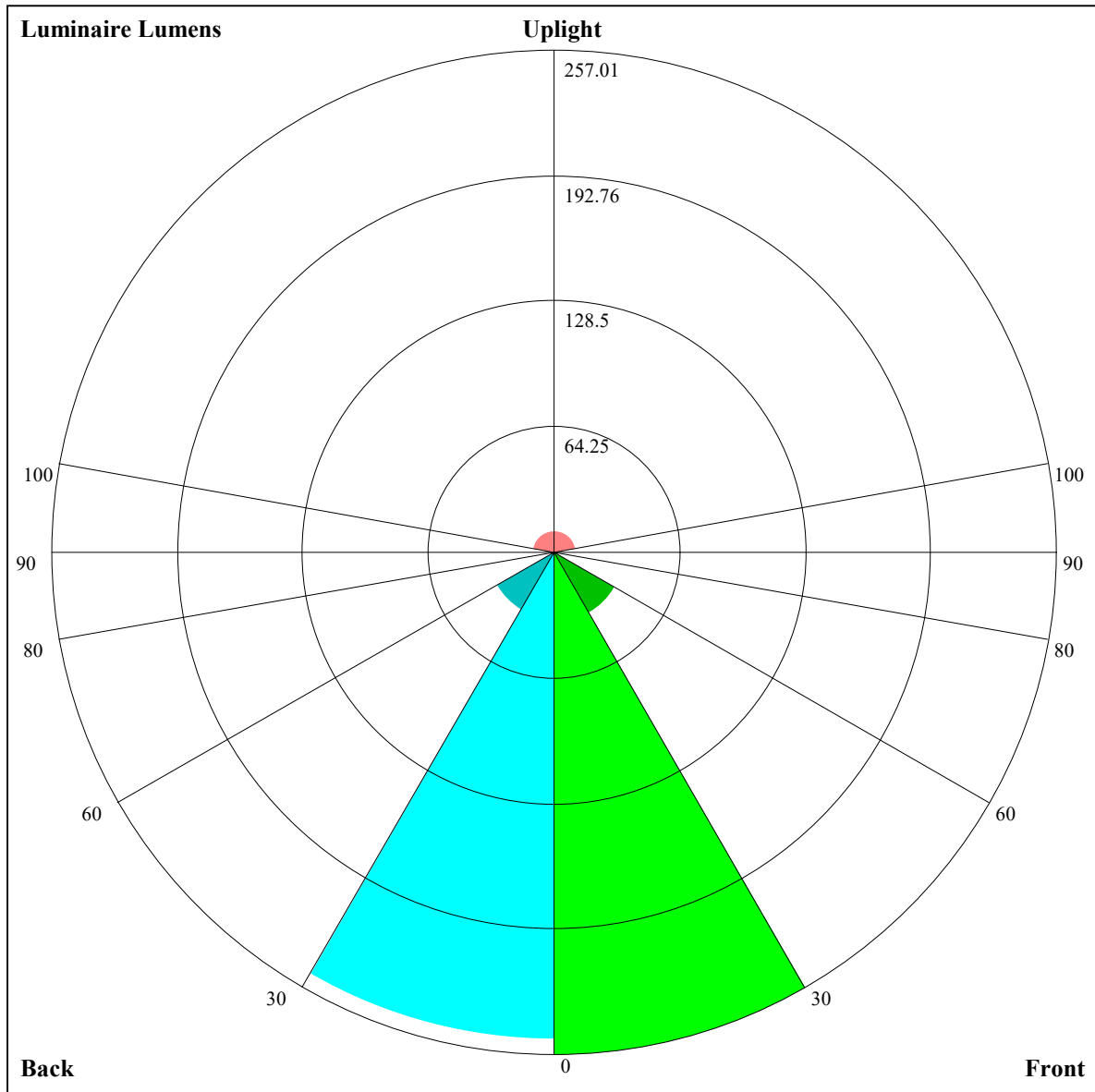
C45 ———

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	1.08	1.08	1.08	1.06	1.06	1.06	1.01	1.01	1.01	0.97	0.97	0.97	0.93	0.93	0.93	0.91
1	1.02	1.00	0.99	1.00	0.99	0.97	0.97	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.89	0.87
2	0.97	0.95	0.92	0.96	0.93	0.91	0.93	0.91	0.89	0.90	0.89	0.87	0.88	0.87	0.86	0.84
3	0.93	0.90	0.87	0.92	0.89	0.87	0.90	0.87	0.85	0.88	0.86	0.84	0.86	0.84	0.83	0.81
4	0.90	0.86	0.83	0.89	0.85	0.83	0.87	0.84	0.82	0.85	0.83	0.81	0.84	0.82	0.80	0.79
5	0.87	0.83	0.80	0.86	0.82	0.80	0.84	0.81	0.79	0.83	0.80	0.78	0.82	0.79	0.78	0.77
6	0.84	0.80	0.77	0.83	0.79	0.77	0.82	0.79	0.76	0.81	0.78	0.76	0.80	0.77	0.75	0.74
7	0.81	0.77	0.75	0.81	0.77	0.75	0.80	0.76	0.74	0.79	0.76	0.74	0.78	0.75	0.73	0.73
8	0.79	0.75	0.73	0.78	0.75	0.72	0.78	0.74	0.72	0.77	0.74	0.72	0.76	0.74	0.72	0.71
9	0.77	0.73	0.71	0.76	0.73	0.71	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.72	0.70	0.69
10	0.75	0.71	0.69	0.75	0.71	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.73	0.70	0.68	0.68





Luminaire Lumens:

FL=257.01,FM=35.8,FH=2.33,FVH=1.22

BL=249.29,BM=33.85,BH=2.33,BVH=1.22

UL=2.41,UH=11.47

BUG Rating:B1-U2-G0

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Intensity data(cd)									Appendix Page: 17 Total:19
C/γ(°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
0.0	6969.59	6972.34	6566.58	5836.53	5058.58	4155.66	3331.46	2681.25	2120.77
45.0	7016.39	6532.99	5653.74	4878.55	4106.66	3197.68	2552.97	1931.38	1494.23
90.0	6736.70	5795.79	5079.50	4173.28	3220.80	2626.19	1968.27	1498.08	1091.60
135.0	7059.88	6535.19	5619.06	4811.93	4007.00	3157.48	2406.52	1846.59	1362.10
180.0	6969.59	6577.04	5969.21	5142.82	4262.47	3515.35	2819.44	2070.12	1591.68
225.0	7016.39	7169.99	6913.43	6290.74	5560.70	4769.54	3828.07	3130.51	2498.46
270.0	6736.70	7265.79	7464.55	7154.03	6531.89	5714.30	4658.87	3873.22	3158.59
315.0	7059.88	7259.19	7024.10	6388.19	5599.24	4630.79	3737.78	3038.56	2349.26
360.0	6969.59	6972.34	6566.58	5836.53	5058.58	4155.66	3331.46	2681.25	2120.77
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	1555.89	1211.24	948.07	711.33	578.64	482.29	404.66	349.06	313.27
45.0	1112.14	857.23	649.11	519.18	417.33	350.71	309.42	278.03	254.64
90.0	823.70	592.24	468.59	383.91	322.47	284.42	262.84	246.05	234.43
135.0	1002.58	766.94	576.44	459.72	373.28	313.27	286.29	279.69	254.00
180.0	1069.64	882.99	692.11	554.14	445.74	373.28	328.63	293.18	268.62
225.0	1896.69	1425.96	1066.39	826.29	649.83	510.04	414.41	354.34	307.66
270.0	2382.84	1870.27	1453.49	1087.36	819.24	647.46	512.02	416.78	358.97
315.0	1837.23	1256.94	1074.21	813.73	646.80	517.03	428.50	370.91	323.62
360.0	1555.89	1211.24	948.07	711.33	578.64	482.29	404.66	349.06	313.27
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	284.09	278.59	247.26	236.63	227.82	221.66	215.93	211.25	207.51
45.0	241.09	231.35	222.65	217.42	213.73	209.16	205.80	203.43	200.30
90.0	227.00	221.05	217.20	213.56	210.54	208.17	205.91	203.21	201.12
135.0	235.59	229.70	223.36	219.95	216.87	213.67	210.98	208.77	206.02
180.0	253.42	240.98	232.89	226.23	221.38	217.86	214.83	211.31	208.72
225.0	274.51	258.38	244.89	233.16	226.50	221.60	216.76	213.73	210.98
270.0	313.82	285.19	279.14	243.35	232.78	224.80	217.53	213.34	209.93
315.0	290.37	268.51	251.88	237.02	228.10	221.22	215.22	210.37	206.85
360.0	284.09	278.59	247.26	236.63	227.82	221.66	215.93	211.25	207.51
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	203.54	199.85	196.66	192.75	188.13	184.66	180.36	164.56	136.59
45.0	197.71	195.45	191.21	188.40	185.49	171.78	149.26	119.97	79.34
90.0	198.20	194.13	191.27	185.54	168.42	134.01	103.40	73.23	40.96
135.0	203.43	200.13	196.06	192.86	182.73	157.08	129.33	97.89	57.31
180.0	206.24	202.94	199.30	195.78	192.04	182.07	161.10	130.26	98.39
225.0	207.78	205.36	203.05	199.69	196.55	192.92	188.57	179.59	157.08
270.0	206.57	204.26	202.11	200.07	196.88	193.91	191.16	188.02	176.84
315.0	203.27	200.13	197.65	194.57	191.38	188.29	185.21	177.01	156.31
360.0	203.54	199.85	196.66	192.75	188.13	184.66	180.36	164.56	136.59
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	106.15	71.08	39.20	17.95	7.49	6.22	5.29	4.29	3.52
45.0	51.86	26.26	9.47	6.22	5.56	4.68	3.85	3.19	2.86
90.0	17.23	7.49	5.84	5.12	4.40	3.69	3.19	2.81	2.75
135.0	32.59	13.76	6.06	5.45	4.84	4.07	3.47	3.03	2.86
180.0	62.93	32.81	14.04	6.33	5.45	4.84	4.18	3.41	2.97
225.0	120.57	89.36	58.64	22.46	10.57	6.39	5.67	4.79	4.02
270.0	154.27	120.79	85.28	54.51	24.94	9.36	6.50	5.62	4.73
315.0	116.66	89.63	58.80	25.49	10.63	6.61	5.62	4.68	3.85
360.0	106.15	71.08	39.20	17.95	7.49	6.22	5.29	4.29	3.52

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Intensity data(cd)										Appendix Page: 18 Total:19	
C/ γ (°)	45.0	46.0	47.0	48.0	49.0	50.0	51.0	52.0	53.0		
0.0	3.03	2.75	2.75	2.64	2.59	2.53	2.53	2.48	2.48		
45.0	2.75	2.70	2.64	2.59	2.53	2.48	2.48	2.42	2.42		
90.0	2.70	2.64	2.59	2.59	2.53	2.48	2.48	2.42	2.42		
135.0	2.75	2.70	2.64	2.59	2.53	2.53	2.48	2.48	2.42		
180.0	2.75	2.70	2.64	2.59	2.59	2.48	2.48	2.42	2.42		
225.0	3.25	2.86	2.75	2.64	2.64	2.53	2.53	2.48	2.42		
270.0	3.91	3.14	2.86	2.75	2.70	2.64	2.59	2.53	2.48		
315.0	3.08	2.86	2.75	2.70	2.64	2.59	2.53	2.48	2.42		
360.0	3.03	2.75	2.75	2.64	2.59	2.53	2.53	2.48	2.48		
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0		
0.0	2.42	2.37	2.37	2.37	2.31	2.31	2.31	2.31	2.31		
45.0	2.37	2.37	2.37	2.37	2.37	2.31	2.31	2.31	2.31		
90.0	2.37	2.37	2.37	2.37	2.31	2.31	2.31	2.31	2.31		
135.0	2.42	2.42	2.37	2.42	2.37	2.37	2.37	2.31	2.31		
180.0	2.42	2.37	2.37	2.37	2.37	2.31	2.31	2.31	2.31		
225.0	2.42	2.42	2.37	2.37	2.31	2.31	2.31	2.31	2.26		
270.0	2.48	2.42	2.37	2.37	2.37	2.37	2.31	2.31	2.31		
315.0	2.42	2.42	2.37	2.37	2.31	2.31	2.31	2.31	2.31		
360.0	2.42	2.37	2.37	2.37	2.31	2.31	2.31	2.31	2.31		
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0		
0.0	2.31	2.31	2.26	2.26	2.31	2.31	2.26	2.26	2.26		
45.0	2.31	2.31	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
90.0	2.31	2.31	2.26	2.26	2.31	2.26	2.31	2.26	2.26		
135.0	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31		
180.0	2.31	2.31	2.31	2.26	2.31	2.26	2.26	2.26	2.26		
225.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
270.0	2.31	2.31	2.26	2.31	2.31	2.31	2.26	2.26	2.26		
315.0	2.31	2.31	2.31	2.26	2.26	2.26	2.26	2.26	2.26		
360.0	2.31	2.31	2.26	2.26	2.31	2.31	2.26	2.26	2.26		
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0		
0.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
45.0	2.26	2.26	2.26	2.26	2.26	2.20	2.20	2.26	2.20		
90.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
135.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
180.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
225.0	2.20	2.26	2.26	2.26	2.20	2.20	2.26	2.20	2.20		
270.0	2.31	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
315.0	2.26	2.26	2.26	2.26	2.26	2.26	2.20	2.26	2.26		
360.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0		
0.0	2.26	2.20	2.20	2.26	2.20	2.26	2.20	2.26	2.20		
45.0	2.26	2.20	2.20	2.20	2.26	2.20	2.20	2.26	2.20		
90.0	2.26	2.26	2.26	2.26	2.26	2.26	2.20	2.20	2.26		
135.0	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26		
180.0	2.26	2.26	2.20	2.26	2.20	2.20	2.20	2.26	2.20		
225.0	2.26	2.20	2.26	2.20	2.20	2.26	2.26	2.20	2.20		
270.0	2.26	2.26	2.26	2.26	2.26	2.20	2.26	2.20	2.20		
315.0	2.20	2.26	2.26	2.20	2.26	2.26	2.26	2.20	2.26		
360.0	2.26	2.20	2.20	2.26	2.20	2.26	2.20	2.26	2.20		

Intensity data(cd)

Appendix Page: 19 Total:19

C/ $\gamma(^{\circ})$	90.0
0.0	2.20
45.0	2.20
90.0	2.20
135.0	2.26
180.0	2.20
225.0	2.20
270.0	2.20
315.0	2.20
360.0	2.20