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## NATA

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Client:

LumCAT: 2-1674-M

Luminaire: 92.70.135.00

Report No: NT2018010511

Test No: GC2018010511

LampCAT: BXRV-DR-1830-H-3000-A-13

Lamp flux(lm): 1355.0

Number of Lamps: 1

Length(mm): 70

Phm Type: C

Voltage(V): 220.3000

Current(A): 0.0950

Power (W): 19.4200

PF: 0.9210

Ballast type: AC

Width(mm): 70

Height(mm): 0

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## Photometric Results

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Lumens(lm): 1246.11, Efficiency(%): 91.96% , Luminous Efficacy(lm/W): 64.17

Central intensity(cd): 7650.797, Maximum intensity(cd): 7650.797

Angle of maximum intensity: C=0.0  $\gamma$ =0.0

Beam Angle(50%Imax): [C0/180]Total=15.8

[C90/270]Total=15.8

Field angle(10%Imax): [C0/180]Total=35.8

[C90/270]Total=35.8

Maximum s/h(1/2): C0\_180=0.27 C90\_270=0.27

Maximum s/h(1/4): C0\_180=0.28 C90\_270=0.28

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 92.10%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 99.361%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	7650.798	1.830	1.83	.135%	.147%
1.0	7572.724	14.493	16.323	1.070%	1.310%
2.0	7355.266	28.149	44.473	2.077%	3.569%
3.0	6947.903	39.875	84.348	2.943%	6.769%
4.0	6440.309	49.266	133.614	3.636%	10.722%
5.0	5796.520	55.401	189.014	4.089%	15.168%
6.0	5122.512	58.718	247.732	4.333%	19.880%
7.0	4446.937	59.430	307.162	4.386%	24.650%
8.0	3745.202	57.159	364.321	4.218%	29.237%
9.0	3107.040	53.300	417.622	3.934%	33.514%
10.0	2519.922	47.985	465.607	3.541%	37.365%
11.0	2061.051	43.126	508.733	3.183%	40.826%
12.0	1728.107	39.400	548.133	2.908%	43.988%
13.0	1419.583	35.019	583.152	2.584%	46.798%
14.0	1197.978	31.782	614.934	2.346%	49.348%
15.0	1024.667	29.082	644.016	2.146%	51.682%
16.0	916.478	27.702	671.718	2.044%	53.905%
17.0	837.696	26.858	698.576	1.982%	56.061%
18.0	757.871	25.682	724.258	1.895%	58.122%
19.0	692.767	24.733	748.991	1.825%	60.106%
20.0	648.342	24.317	773.308	1.795%	62.058%
21.0	606.016	23.816	797.124	1.758%	63.969%
22.0	575.958	23.660	820.784	1.746%	65.868%
23.0	550.518	23.589	844.373	1.741%	67.761%
24.0	530.106	23.644	868.017	1.745%	69.658%
25.0	512.774	23.764	891.782	1.754%	71.565%
26.0	498.726	23.975	915.756	1.769%	73.489%
27.0	486.452	24.218	939.974	1.787%	75.433%
28.0	476.197	24.516	964.49	1.809%	77.400%
29.0	467.682	24.864	989.354	1.835%	79.396%
30.0	459.207	25.179	1014.533	1.858%	81.416%
31.0	450.774	25.459	1039.993	1.879%	83.459%
32.0	439.202	25.523	1065.515	1.884%	85.507%
33.0	421.081	25.149	1090.664	1.856%	87.526%
34.0	394.956	24.219	1114.884	1.787%	89.469%
35.0	359.191	22.593	1137.477	1.667%	91.282%
36.0	321.471	20.721	1158.198	1.529%	92.945%
37.0	273.861	18.074	1176.271	1.334%	94.396%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	234.192	15.811	1192.082	1.167%	95.664%
39.0	202.510	13.976	1206.058	1.031%	96.786%
40.0	142.046	10.013	1216.071	.739%	97.590%
41.0	87.000	6.259	1222.33	.462%	98.092%
42.0	53.863	3.952	1226.282	.292%	98.409%
43.0	31.908	2.386	1228.669	.176%	98.601%
44.0	19.223	1.464	1230.133	.108%	98.718%
45.0	14.431	1.119	1231.252	.083%	98.808%
46.0	12.123	0.956	1232.208	.071%	98.885%
47.0	10.255	0.822	1233.031	.061%	98.951%
48.0	9.124	0.744	1233.774	.055%	99.010%
49.0	8.202	0.679	1234.453	.050%	99.065%
50.0	7.604	0.639	1235.092	.047%	99.116%
51.0	7.088	0.604	1235.696	.045%	99.164%
52.0	6.653	0.575	1236.271	.042%	99.211%
53.0	6.241	0.547	1236.817	.040%	99.254%
54.0	5.829	0.517	1237.335	.038%	99.296%
55.0	5.470	0.491	1237.826	.036%	99.335%
56.0	5.139	0.467	1238.293	.034%	99.373%
57.0	4.820	0.443	1238.736	.033%	99.408%
58.0	4.501	0.419	1239.155	.031%	99.442%
59.0	4.200	0.395	1239.55	.029%	99.474%
60.0	3.921	0.372	1239.922	.027%	99.504%
61.0	3.625	0.348	1240.27	.026%	99.532%
62.0	3.387	0.328	1240.598	.024%	99.558%
63.0	3.184	0.311	1240.909	.023%	99.583%
64.0	2.976	0.293	1241.202	.022%	99.606%
65.0	2.813	0.280	1241.482	.021%	99.629%
66.0	2.680	0.268	1241.75	.020%	99.650%
67.0	2.546	0.257	1242.007	.019%	99.671%
68.0	2.401	0.244	1242.252	.018%	99.691%
69.0	2.303	0.236	1242.487	.017%	99.709%
70.0	2.193	0.226	1242.713	.017%	99.728%
71.0	2.111	0.219	1242.932	.016%	99.745%
72.0	2.007	0.209	1243.141	.015%	99.762%
73.0	1.932	0.203	1243.344	.015%	99.778%
74.0	1.891	0.199	1243.543	.015%	99.794%
75.0	1.821	0.193	1243.736	.014%	99.810%

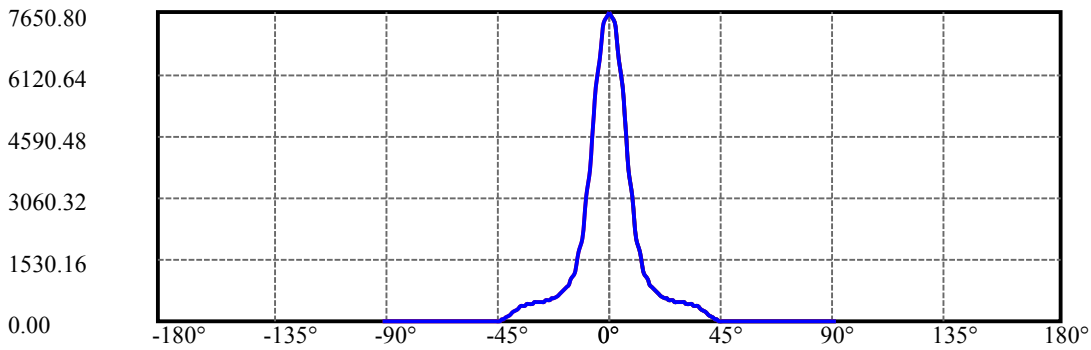
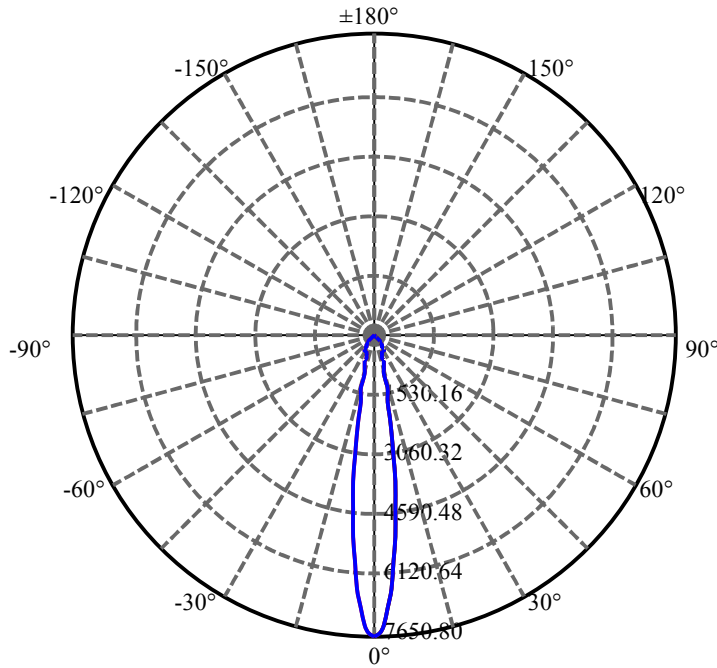
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	1.740	0.185	1243.921	.014%	99.825%
77.0	1.711	0.183	1244.104	.013%	99.839%
78.0	1.671	0.179	1244.283	.013%	99.854%
79.0	1.624	0.175	1244.458	.013%	99.868%
80.0	1.572	0.170	1244.628	.013%	99.881%
81.0	1.555	0.168	1244.796	.012%	99.895%
82.0	1.502	0.163	1244.96	.012%	99.908%
83.0	1.479	0.161	1245.121	.012%	99.921%
84.0	1.439	0.157	1245.277	.012%	99.933%
85.0	1.415	0.155	1245.432	.011%	99.946%
86.0	1.410	0.154	1245.586	.011%	99.958%
87.0	1.363	0.149	1245.735	.011%	99.970%
88.0	1.357	0.149	1245.884	.011%	99.982%
89.0	1.351	0.148	1246.032	.011%	99.994%
90.0	1.369	0.075	1246.107	.006%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1014.53	74.87%	81.42%
0-40	1216.07	89.75%	97.59%
0-60	1239.92	91.51%	99.50%
0-90	1246.03	91.96%	99.99%
0-120	1246.03	91.96%	99.99%
0-180	1246.11	91.96%	100.00%
60-90	6.48	0.48%	0.52%
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%
0-29.30	996.89	73.57%	80.00%

ZONAL LUMEN SUMMARY

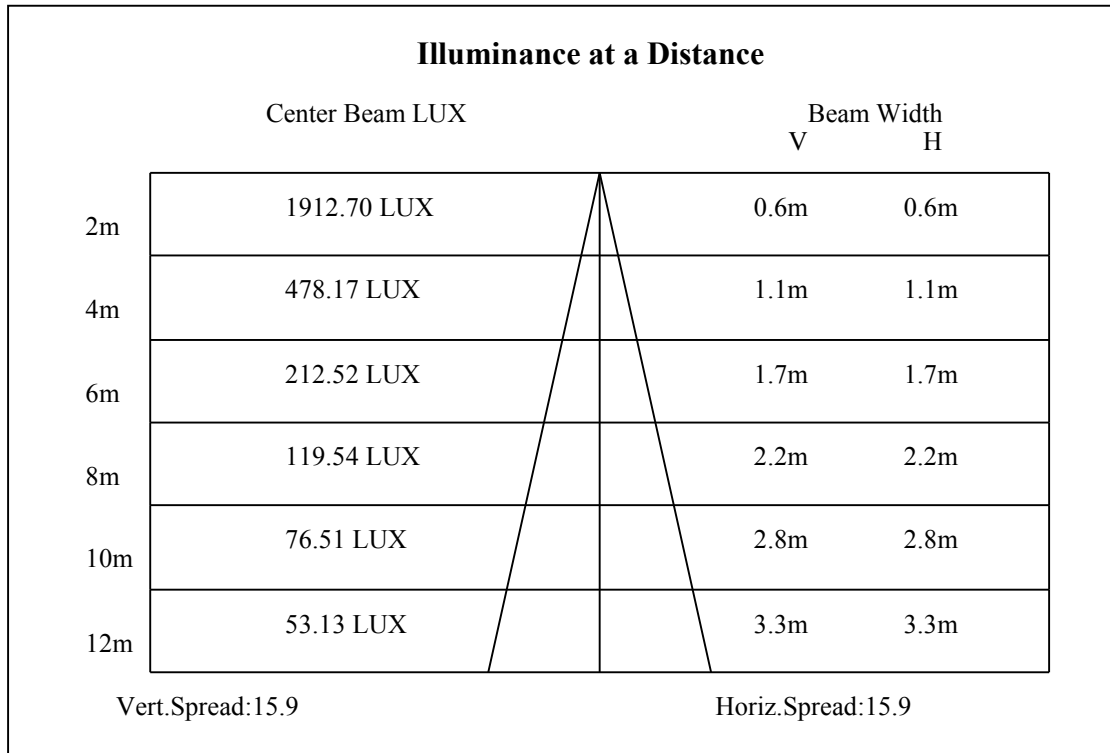
0-10	465.61
10-20	307.70
20-30	241.22
30-40	201.54
40-50	19.02
50-60	4.83
60-70	2.79
70-80	1.91
80-90	1.40
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

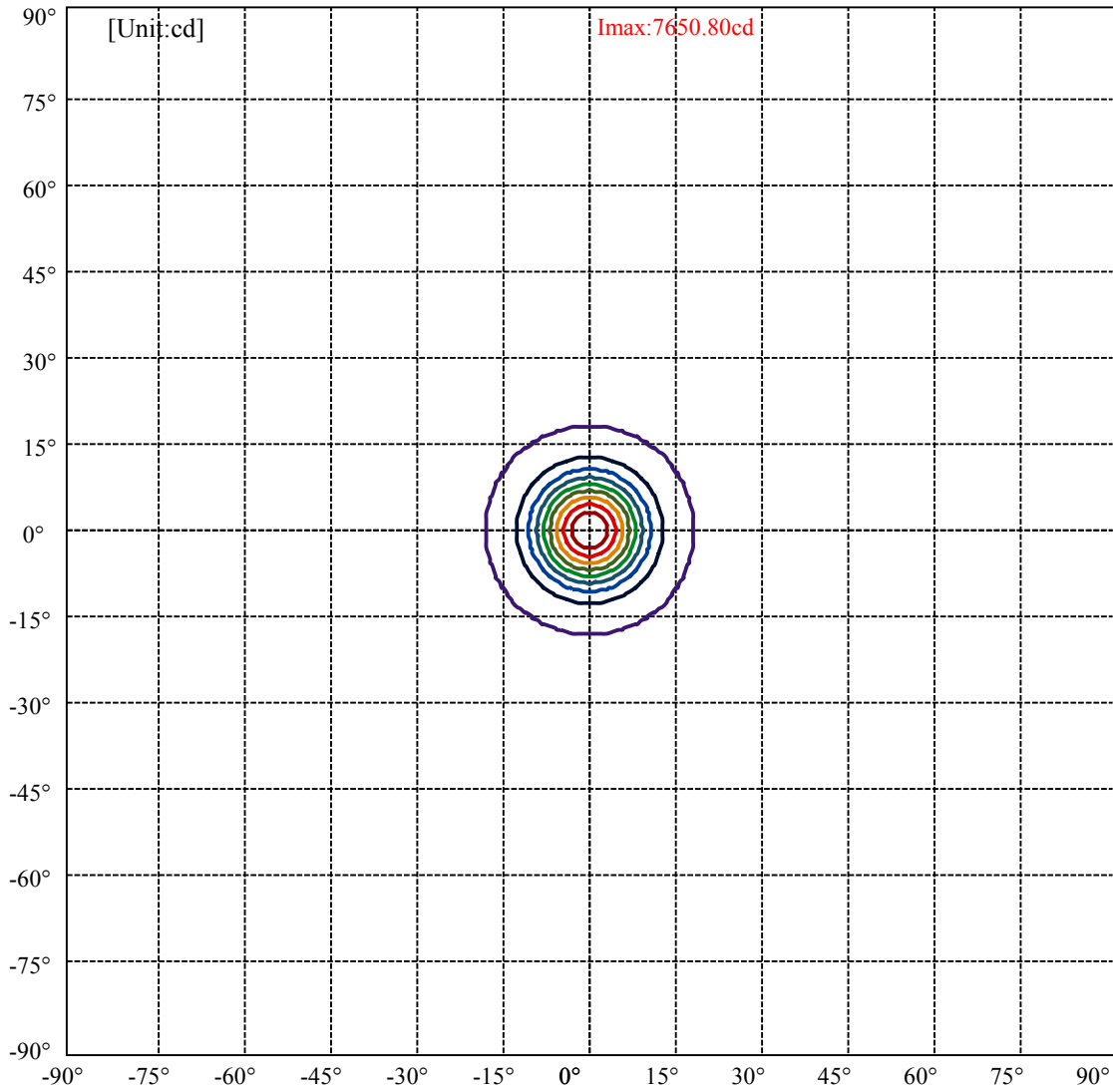


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:17.9 Right:17.9  
:C90/270Left:17.9 Right:17.9

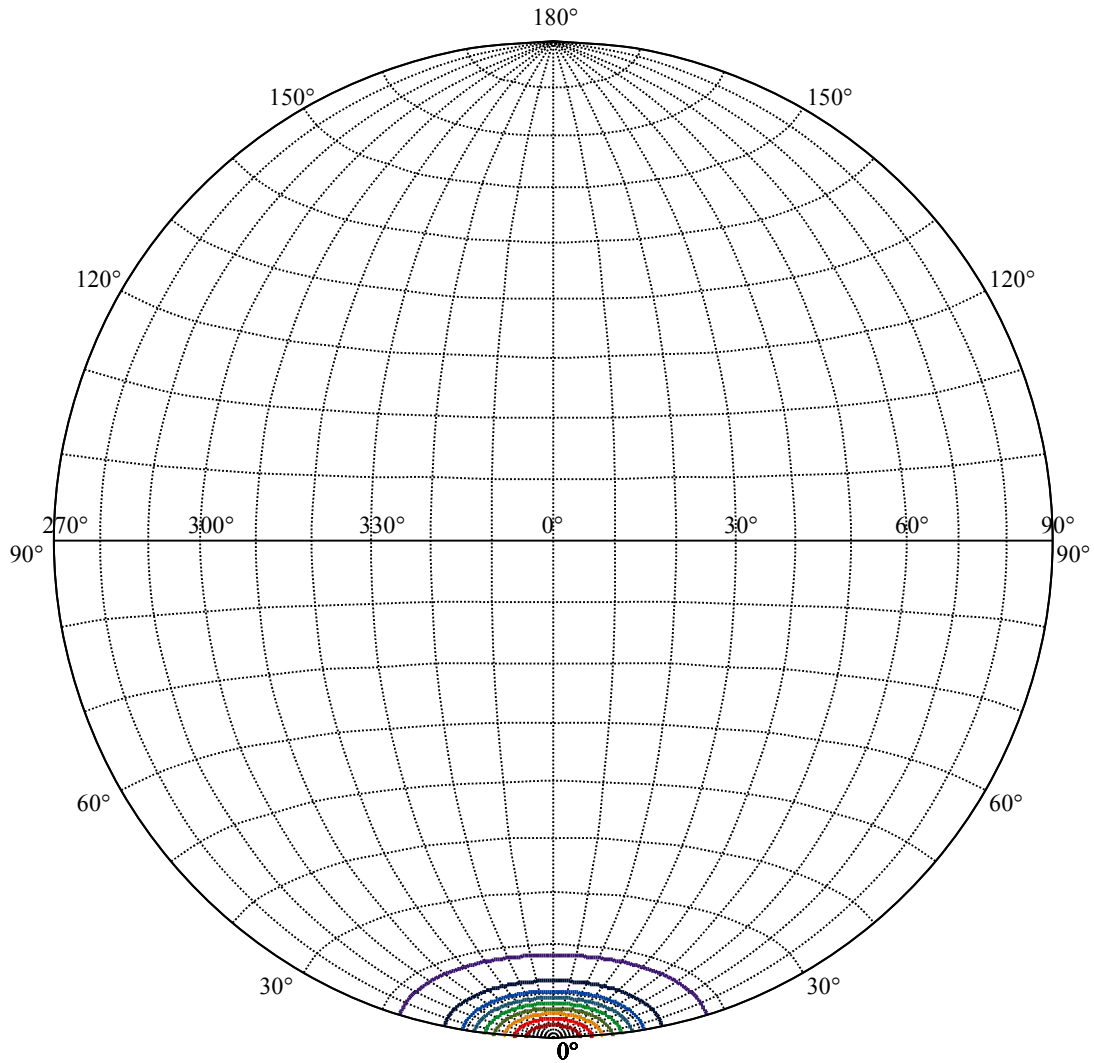
Beam Angle(50%Imax):C0/180Left:7.9 Right:7.9  
:C90/270Left:7.9 Right:7.9





(10%Imax) 765.08	—
(20%Imax) 1530.16	—
(30%Imax) 2295.24	—
(40%Imax) 3060.32	—
(50%Imax) 3825.4	—
(60%Imax) 4590.48	—
(70%Imax) 5355.56	—
(80%Imax) 6120.64	—
(90%Imax) 6885.72	—





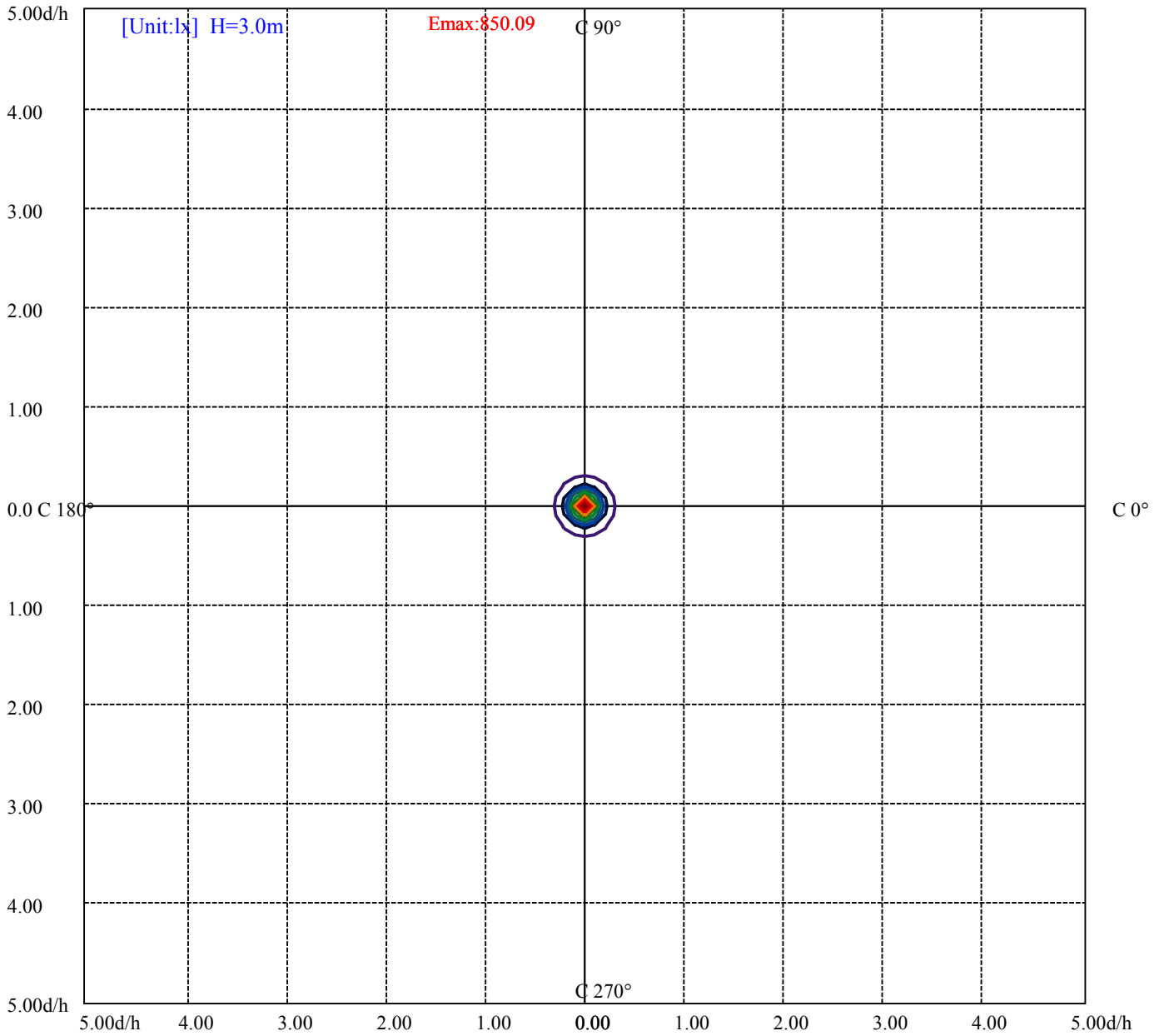
House

[Unit:cd]

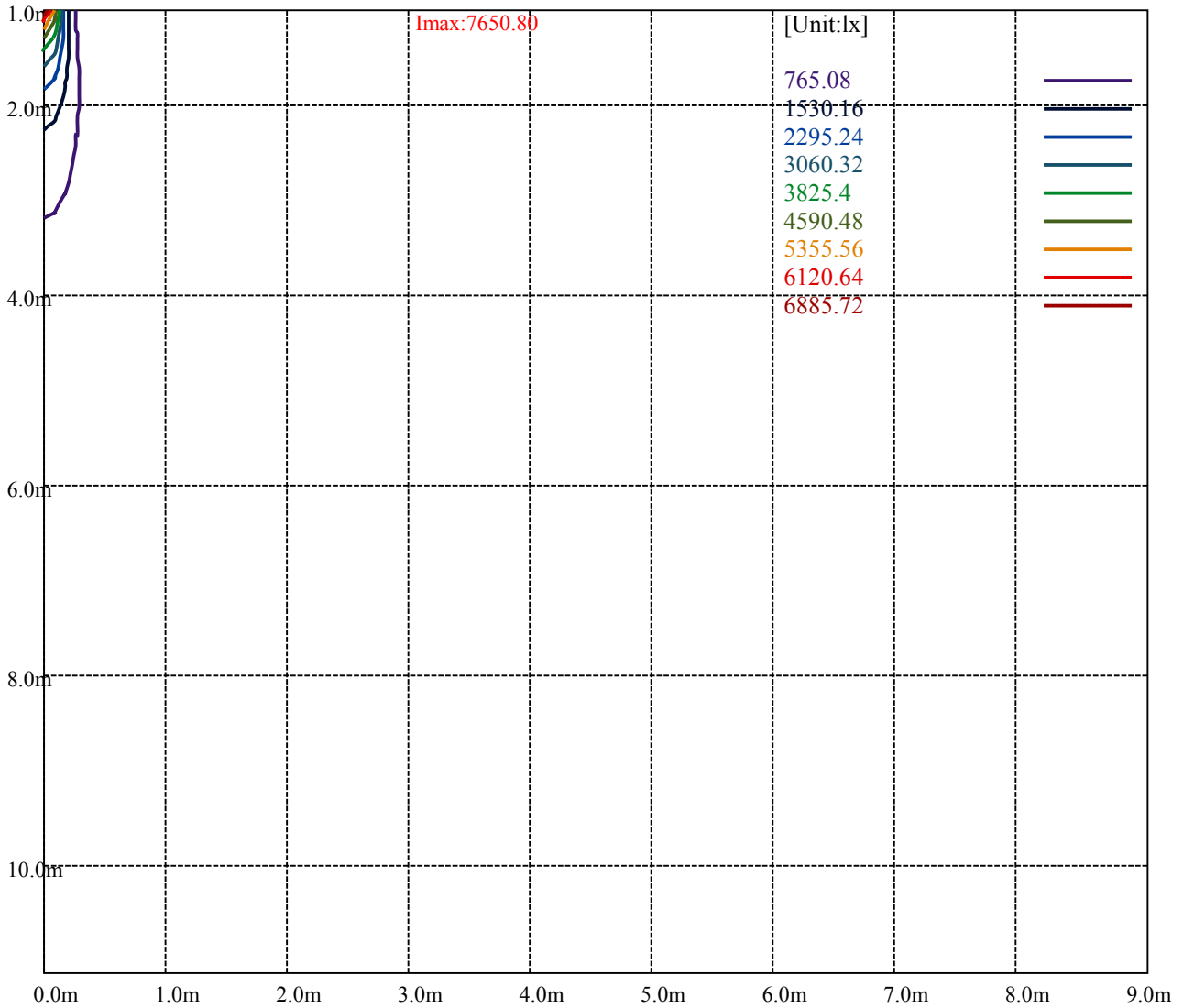
Road

Imax:7650.80

(10%Imax)	765.08	—
(20%Imax)	1530.16	—
(30%Imax)	2295.24	—
(40%Imax)	3060.32	—
(50%Imax)	3825.4	—
(60%Imax)	4590.48	—
(70%Imax)	5355.56	—
(80%Imax)	6120.64	—
(90%Imax)	6885.72	—



(10%Emax) 85.00877	—
(20%Emax) 170.0178	—
(30%Emax) 255.0267	—
(40%Emax) 340.0345	—
(50%Emax) 425.0433	—
(60%Emax) 510.0522	—
(70%Emax) 595.0611	—
(80%Emax) 680.07	—
(90%Emax) 765.0789	—



Luminance Table

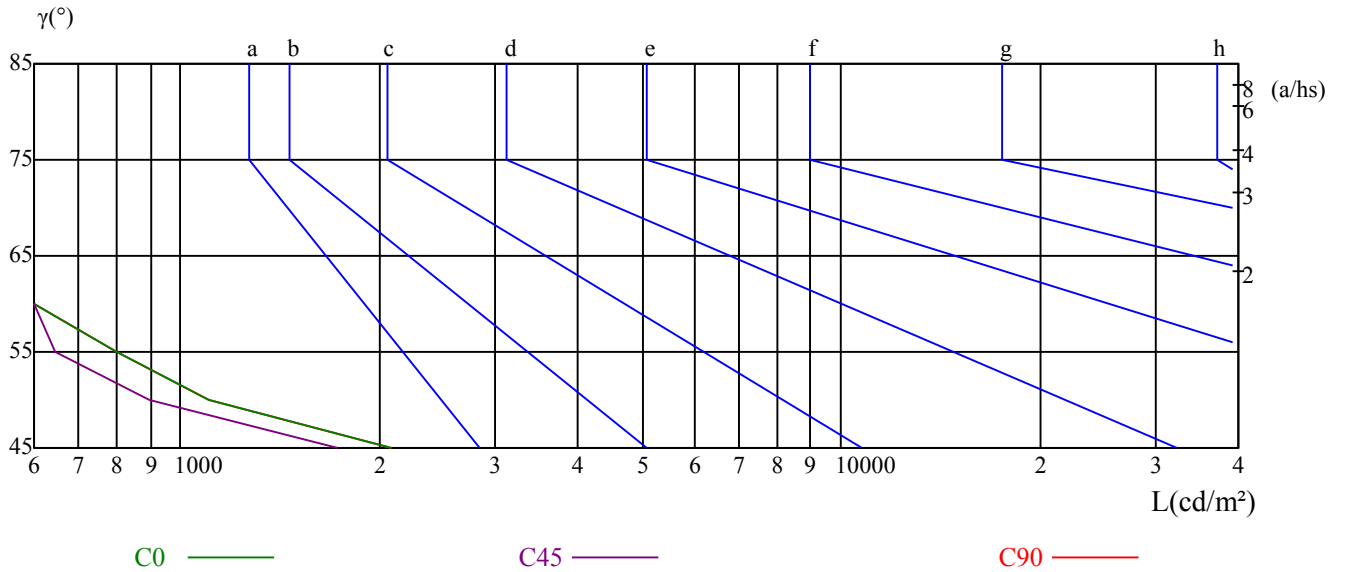
$\gamma$	45	50	55	60	65	70	75	80	85
C0	2083	1102	802	586	432	349	303	277	267
C45	1725	899	644	464	337	268	229	205	193
C90	2083	1102	802	586	432	349	303	277	267

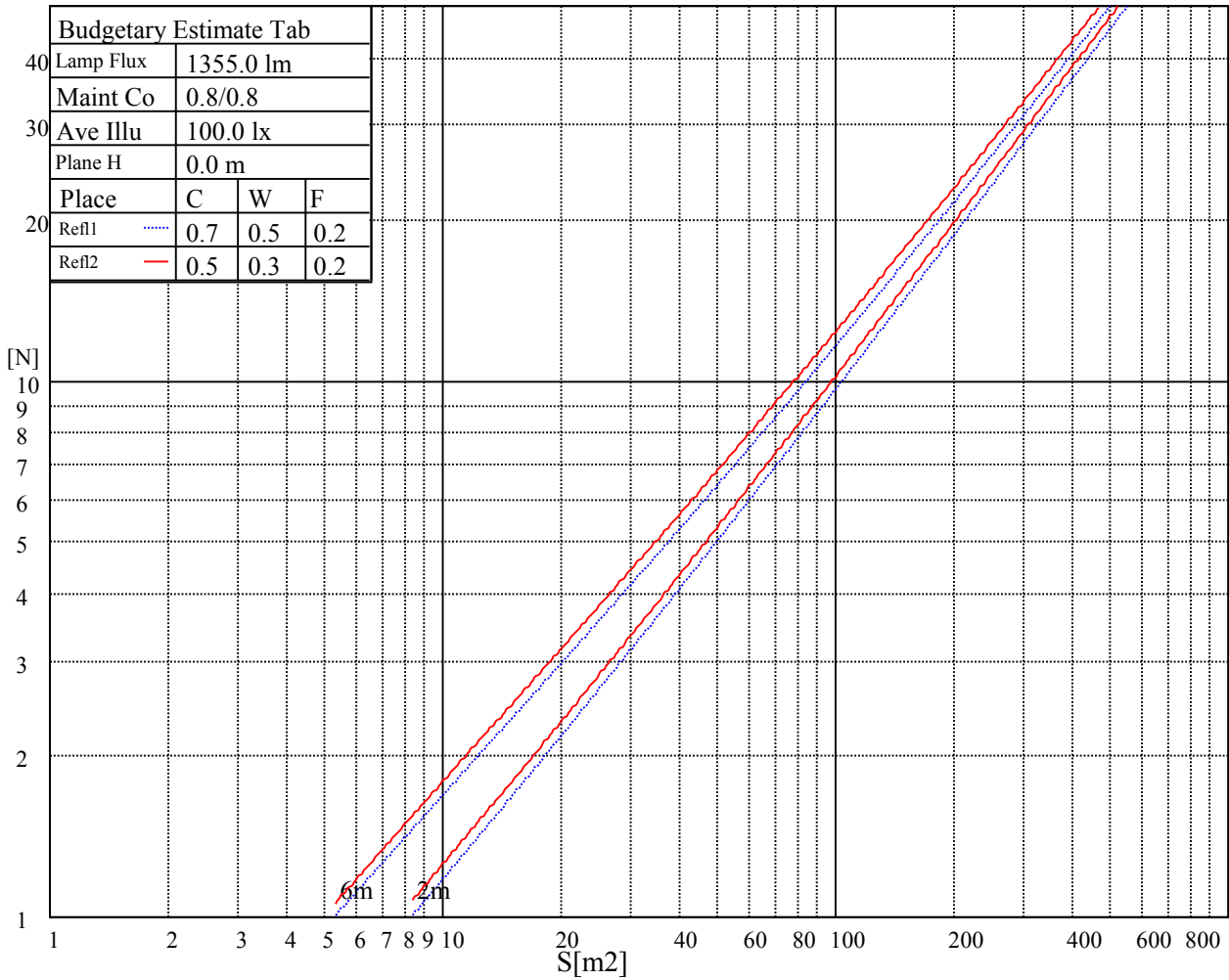
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1358	1358	1358	1436	1436	1436	3314	3314	3314

Glare Table

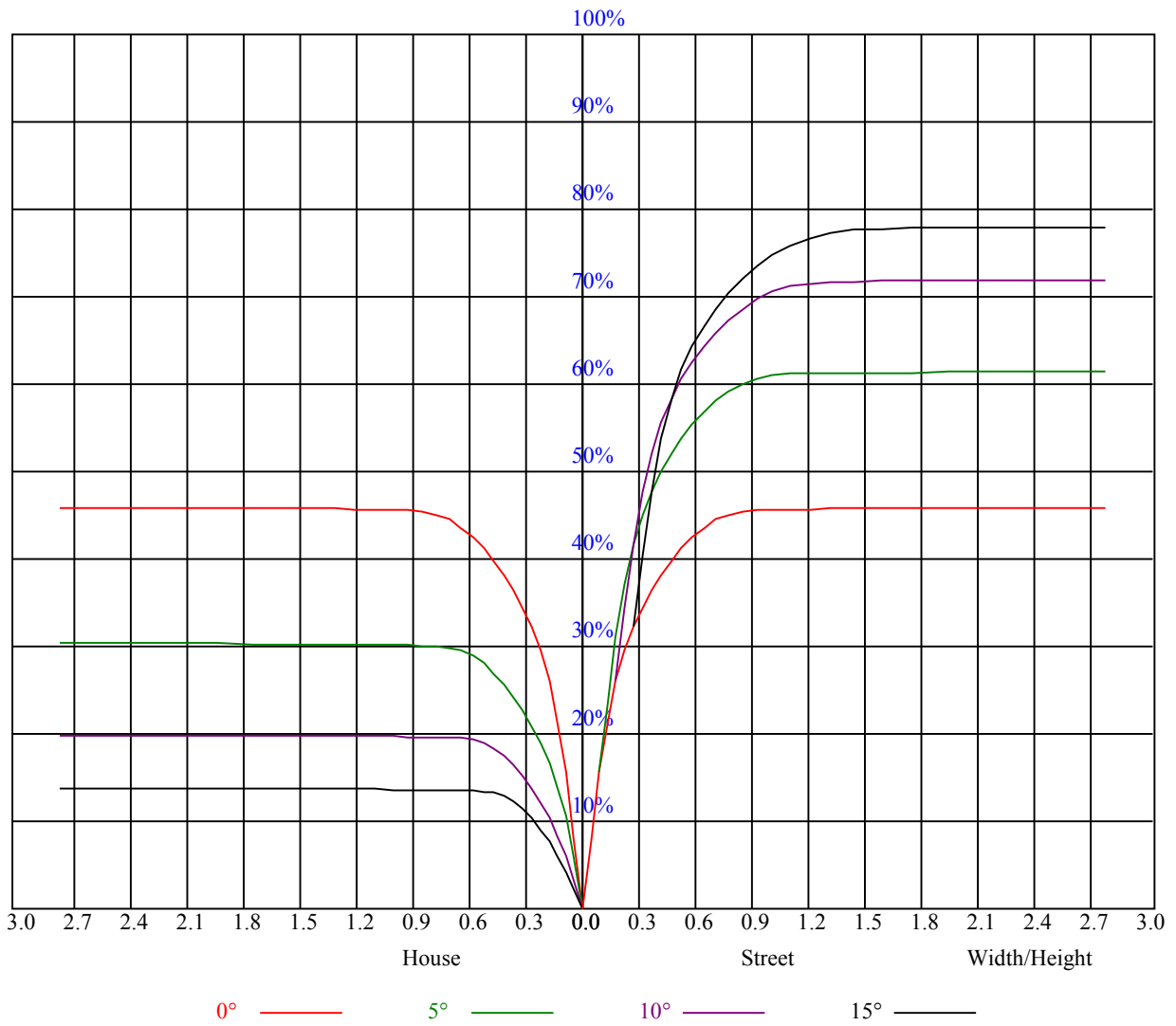
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

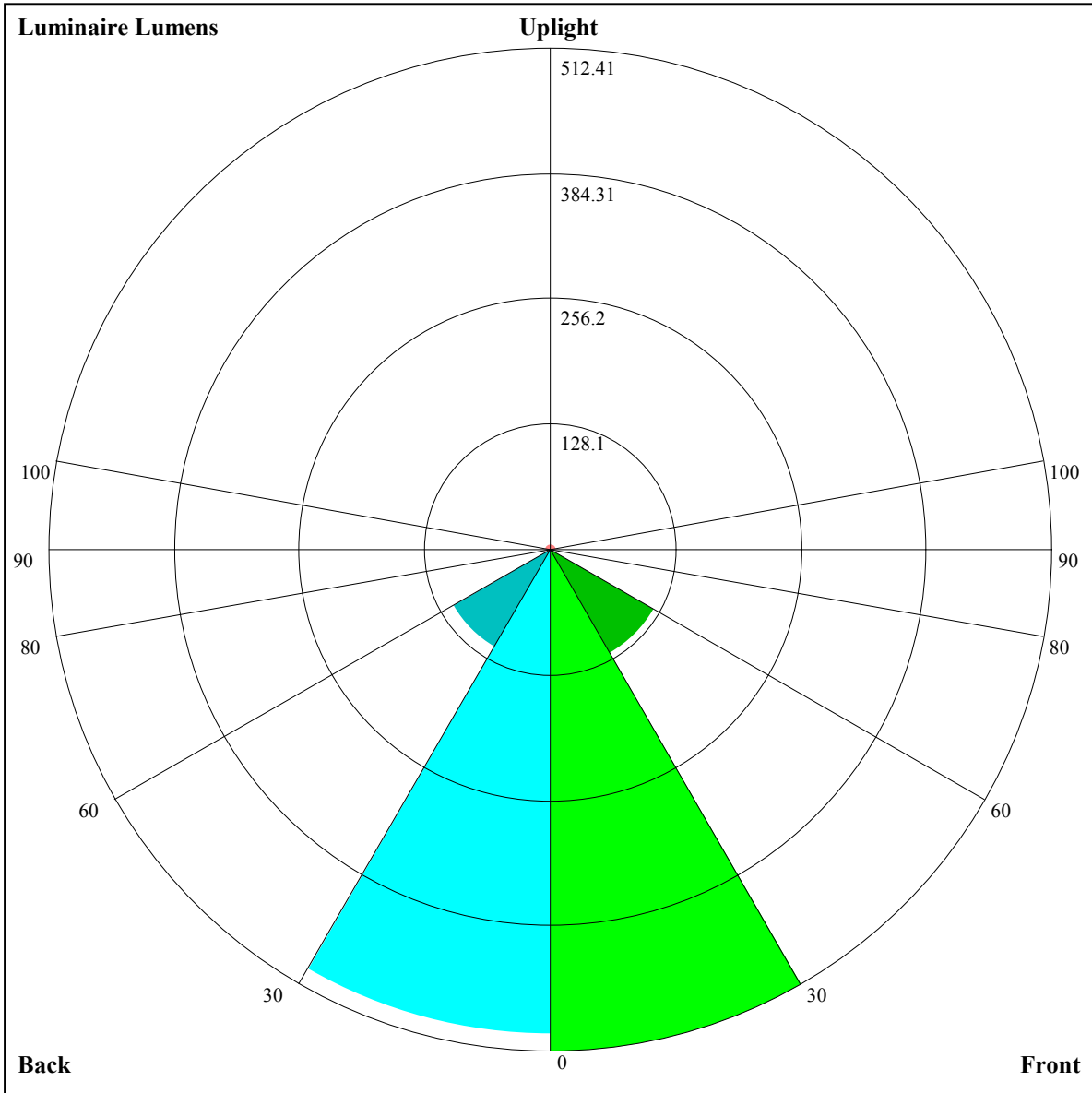
Luminance Limiting Curve





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	1.10	1.10	1.10	1.07	1.07	1.07	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.92
1	1.03	1.01	0.99	1.01	0.99	0.98	0.98	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88
2	0.98	0.95	0.92	0.96	0.93	0.91	0.93	0.91	0.89	0.91	0.89	0.87	0.88	0.87	0.85	0.84
3	0.93	0.89	0.86	0.92	0.88	0.85	0.89	0.86	0.84	0.87	0.85	0.83	0.85	0.83	0.82	0.80
4	0.88	0.84	0.81	0.87	0.84	0.81	0.86	0.82	0.80	0.84	0.81	0.79	0.82	0.80	0.78	0.77
5	0.85	0.80	0.77	0.84	0.80	0.77	0.82	0.79	0.76	0.81	0.78	0.76	0.80	0.77	0.75	0.74
6	0.81	0.77	0.74	0.80	0.76	0.73	0.79	0.76	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.71
7	0.78	0.74	0.71	0.77	0.73	0.70	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.72	0.69	0.68
8	0.75	0.71	0.68	0.75	0.71	0.68	0.74	0.70	0.68	0.73	0.70	0.67	0.72	0.69	0.67	0.66
9	0.73	0.68	0.66	0.72	0.68	0.65	0.71	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.64
10	0.70	0.66	0.63	0.70	0.66	0.63	0.69	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62





Luminaire Lumens:

FL=512.41,FM=122.95,FH=2.48,FVH=0.79

BL=494.9,BM=114.6,BH=2.34,BVH=0.78

UL=1.49,UH=7.11

BUG Rating:B1-U1-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	7676.09	7598.59	7370.75	6979.11	6445.01	5819.49	5143.39	4437.13	3731.34
45.0	7634.32	7651.49	7500.22	7020.87	6727.60	6138.28	5464.97	4759.64	4048.74
90.0	7586.53	7292.33	6838.04	6238.51	5555.45	4838.52	4112.77	3409.76	2770.79
135.0	7706.25	7605.09	7348.94	6925.28	6345.24	5670.54	4947.11	4506.28	3787.02
180.0	7676.09	7602.31	7364.26	6941.06	6363.80	5691.88	4973.09	4239.46	3532.73
225.0	7634.32	7447.78	7257.53	6815.31	6233.41	5554.53	4844.09	4127.16	3430.18
270.0	7586.53	7715.99	7688.15	7559.15	7256.60	6681.66	6194.89	5522.04	4806.50
315.0	7706.25	7668.20	7474.23	7103.93	6595.35	5977.26	5299.77	4574.02	3854.31
360.0	7676.09	7598.59	7370.75	6979.11	6445.01	5819.49	5143.39	4437.13	3731.34
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3082.16	2510.00	2040.87	1814.88	1511.40	1281.24	1036.70	889.18	869.60
45.0	3368.93	2751.76	2235.30	1836.23	1536.00	1310.01	1135.54	1001.43	892.38
90.0	2243.65	1836.69	1527.18	1297.48	1054.79	926.49	926.49	796.37	750.99
135.0	3113.71	2524.39	2043.65	1671.49	1391.22	1181.94	1024.17	901.66	804.22
180.0	3007.45	2335.06	1978.68	1626.95	1360.13	1158.27	1004.21	887.74	796.33
225.0	2791.21	2258.50	1848.76	1532.75	1293.31	1039.48	892.71	853.78	801.11
270.0	4080.29	3383.31	2752.23	2225.09	1813.95	1503.05	1272.89	1097.02	959.67
315.0	3168.93	2559.65	2061.75	1819.99	1395.86	1183.33	904.63	904.63	827.28
360.0	3082.16	2510.00	2040.87	1814.88	1511.40	1281.24	1036.70	889.18	869.60
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	785.10	720.69	667.84	625.38	590.67	567.19	538.70	519.39	503.80
45.0	804.68	735.08	700.27	631.60	607.93	574.52	547.61	525.80	508.63
90.0	690.25	640.64	600.97	569.42	543.80	523.06	507.00	493.13	481.99
135.0	729.97	672.89	627.42	590.30	561.99	539.25	520.69	505.84	495.17
180.0	723.94	667.79	623.71	589.37	561.99	539.72	522.55	508.63	496.10
225.0	729.55	655.12	629.28	593.03	563.99	540.51	521.06	505.80	492.66
270.0	851.08	763.85	698.88	648.77	607.47	575.45	559.21	536.47	517.91
315.0	748.39	686.07	638.37	600.27	569.83	544.45	524.03	507.14	493.55
360.0	785.10	720.69	667.84	625.38	590.67	567.19	538.70	519.39	503.80
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	490.07	478.51	470.67	460.04	453.36	444.68	433.41	412.94	381.53
45.0	493.78	481.71	471.50	463.15	454.80	445.52	435.31	411.18	378.23
90.0	472.71	464.59	456.42	447.98	436.66	413.13	378.74	346.49	294.52
135.0	482.18	472.43	465.94	458.98	451.09	440.41	421.85	394.94	361.99
180.0	485.43	477.07	469.18	461.76	453.41	445.98	426.49	397.72	360.60
225.0	482.46	473.92	466.08	457.72	449.05	429.32	397.91	358.98	317.49
270.0	503.52	490.07	479.39	470.11	462.22	453.87	445.05	427.42	397.26
315.0	481.48	471.27	462.27	453.92	445.61	440.69	429.88	409.97	381.90
360.0	490.07	478.51	470.67	460.04	453.36	444.68	433.41	412.94	381.53
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	341.44	294.43	244.13	192.53	142.09	95.73	59.44	33.78	19.81
45.0	339.72	296.56	252.94	252.94	235.31	129.09	74.01	53.50	27.24
90.0	258.00	201.48	155.27	119.63	79.26	45.06	22.46	15.50	13.13
135.0	320.23	268.72	257.58	235.31	95.36	60.00	35.17	19.77	15.41
180.0	315.13	266.40	245.52	235.31	110.86	67.93	38.61	21.02	14.29
225.0	291.27	247.14	203.25	159.35	100.88	78.19	45.52	23.02	15.68
270.0	360.14	317.91	273.36	245.98	245.98	134.62	101.21	56.75	29.42
315.0	345.84	298.23	241.48	179.02	126.63	85.38	54.48	31.93	18.79
360.0	341.44	294.43	244.13	192.53	142.09	95.73	59.44	33.78	19.81

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	15.92	13.18	10.90	9.88	8.58	8.17	7.42	7.01	6.68
45.0	17.17	14.25	11.60	10.07	8.54	7.70	7.24	6.82	6.31
90.0	10.86	9.37	8.26	7.80	7.29	6.82	6.36	6.03	5.61
135.0	12.30	11.09	9.47	8.58	7.70	7.05	6.59	6.22	5.85
180.0	12.44	10.44	9.00	7.93	7.42	6.91	6.45	6.03	5.71
225.0	13.36	11.14	9.79	8.68	8.07	7.56	7.10	6.64	6.17
270.0	18.33	14.94	12.48	10.44	9.47	8.63	7.84	7.29	6.87
315.0	15.08	12.58	10.53	9.61	8.54	7.98	7.70	7.19	6.73
360.0	15.92	13.18	10.90	9.88	8.58	8.17	7.42	7.01	6.68

C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	6.31	5.94	5.57	5.20	4.87	4.64	4.27	3.90	3.62
45.0	5.85	5.52	5.20	4.87	4.50	4.36	3.94	3.76	3.57
90.0	5.24	4.92	4.64	4.36	4.13	3.62	3.43	3.20	3.02
135.0	5.43	5.06	4.78	4.50	4.13	3.85	3.62	3.39	3.20
180.0	5.20	4.92	4.69	4.41	4.08	3.76	3.57	3.34	3.06
225.0	5.75	5.38	5.06	4.73	4.36	4.08	3.76	3.53	3.25
270.0	6.50	6.03	5.61	5.29	5.01	4.69	4.50	3.99	3.76
315.0	6.36	5.99	5.57	5.20	4.92	4.59	4.27	3.90	3.62
360.0	6.31	5.94	5.57	5.20	4.87	4.64	4.27	3.90	3.62

C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	3.48	3.25	3.02	2.83	2.74	2.60	2.46	2.27	2.23
45.0	3.29	3.06	2.88	2.78	2.64	2.46	2.37	2.27	2.18
90.0	2.83	2.60	2.51	2.46	2.32	2.13	2.09	2.04	1.95
135.0	3.02	2.74	2.64	2.55	2.41	2.23	2.18	2.13	2.04
180.0	2.92	2.78	2.64	2.46	2.41	2.32	2.18	2.04	2.04
225.0	2.97	2.78	2.74	2.60	2.41	2.27	2.23	2.13	2.00
270.0	3.53	3.39	3.16	2.92	2.74	2.64	2.51	2.32	2.23
315.0	3.43	3.20	2.92	2.83	2.69	2.55	2.41	2.32	2.23
360.0	3.48	3.25	3.02	2.83	2.74	2.60	2.46	2.27	2.23

C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	2.13	2.04	2.00	1.95	1.81	1.76	1.76	1.72	1.62
45.0	2.04	1.95	1.90	1.90	1.76	1.72	1.67	1.72	1.67
90.0	1.86	1.81	1.81	1.67	1.62	1.62	1.62	1.58	1.48
135.0	1.90	1.86	1.81	1.81	1.72	1.62	1.62	1.62	1.58
180.0	1.95	1.86	1.86	1.76	1.67	1.67	1.62	1.58	1.48
225.0	1.90	1.86	1.86	1.72	1.62	1.62	1.62	1.53	1.48
270.0	2.13	2.09	1.95	1.86	1.86	1.86	1.72	1.62	1.62
315.0	2.13	2.00	1.95	1.90	1.86	1.81	1.72	1.62	1.62
360.0	2.13	2.04	2.00	1.95	1.81	1.76	1.76	1.72	1.62

C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	1.58	1.53	1.48	1.44	1.44	1.39	1.35	1.39	1.35
45.0	1.48	1.53	1.53	1.44	1.39	1.35	1.35	1.35	1.39
90.0	1.53	1.44	1.44	1.44	1.39	1.39	1.30	1.35	1.44
135.0	1.53	1.48	1.48	1.44	1.39	1.48	1.44	1.39	1.35
180.0	1.53	1.44	1.44	1.44	1.44	1.44	1.35	1.30	1.30
225.0	1.53	1.53	1.44	1.44	1.39	1.35	1.35	1.35	1.30
270.0	1.62	1.53	1.53	1.39	1.39	1.48	1.39	1.35	1.30
315.0	1.62	1.53	1.48	1.48	1.48	1.39	1.39	1.39	1.39
360.0	1.58	1.53	1.48	1.44	1.44	1.39	1.35	1.39	1.35

Intensity data(cd)

C/ $\gamma$ (°)	90.0
0.0	1.30
45.0	1.39
90.0	1.53
135.0	1.44
180.0	1.35
225.0	1.25
270.0	1.35
315.0	1.35
360.0	1.30