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NATA

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Client:

LumCAT: 2-2008-M

Luminaire: 92.70.135.00

Report No: GC2019031803

Test No: GC2019041216

LampCAT: LUMILEDS LUXEON1205

Lamp flux(lm): 2032.0

Number of Lamps: 1

Length(mm): 75

Phm Type: C

Voltage(V): 35.5100

Current(A): 0.5010

Power (W): 17.7910

PF: 0.0000

Ballast type: DC

Width(mm): 75

Height(mm): 0

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Photometric Results

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Lumens(lm): 1769.93, Efficiency(%): 87.10% , Luminous Efficacy(lm/W): 99.48

Central intensity(cd): 3663.562, Maximum intensity(cd): 3663.562

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

Beam Angle(50%Imax): [C0/180]Total=37.6

[C90/270]Total=37.6

Field angle(10%Imax): [C0/180]Total=72.6

[C90/270]Total=72.6

Maximum s/h(1/2): C0\_180=0.62 C90\_270=0.62

Maximum s/h(1/4): C0\_180=0.61 C90\_270=0.61

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 87.10%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in  $\pi$  solid angle : 98.774%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	3663.563	0.000	0	.000%	.000%
1.0	3657.023	3.503	3.503	.172%	.198%
2.0	3634.594	10.466	13.968	.515%	.789%
3.0	3595.922	17.293	31.261	.851%	1.766%
4.0	3549.445	23.918	55.179	1.177%	3.118%
5.0	3489.680	30.282	85.461	1.490%	4.829%
6.0	3424.852	36.338	121.799	1.788%	6.882%
7.0	3349.688	42.049	163.848	2.069%	9.257%
8.0	3276.914	47.425	211.274	2.334%	11.937%
9.0	3191.906	52.426	263.7	2.580%	14.899%
10.0	3095.930	56.903	320.603	2.800%	18.114%
11.0	3000.727	60.918	381.521	2.998%	21.556%
12.0	2891.953	64.415	445.936	3.170%	25.195%
13.0	2758.008	67.051	512.987	3.300%	28.983%
14.0	2617.945	68.812	581.799	3.386%	32.871%
15.0	2468.320	69.827	651.625	3.436%	36.816%
16.0	2296.055	69.811	721.437	3.436%	40.761%
17.0	2140.313	69.086	790.523	3.400%	44.664%
18.0	1966.781	67.717	858.24	3.333%	48.490%
19.0	1804.500	65.613	923.852	3.229%	52.197%
20.0	1648.266	63.195	987.048	3.110%	55.768%
21.0	1481.147	60.091	1047.139	2.957%	59.163%
22.0	1342.540	56.743	1103.882	2.792%	62.369%
23.0	1198.533	53.319	1157.2	2.624%	65.381%
24.0	1085.941	49.947	1207.147	2.458%	68.203%
25.0	972.105	46.795	1253.943	2.303%	70.847%
26.0	887.836	43.904	1297.847	2.161%	73.328%
27.0	810.675	41.554	1339.401	2.045%	75.675%
28.0	754.474	39.626	1379.027	1.950%	77.914%
29.0	709.833	38.310	1417.338	1.885%	80.079%
30.0	676.512	37.431	1454.769	1.842%	82.194%
31.0	645.553	36.791	1491.56	1.811%	84.272%
32.0	612.788	36.050	1527.61	1.774%	86.309%
33.0	573.103	34.937	1562.547	1.719%	88.283%
34.0	518.892	33.047	1595.594	1.626%	90.150%
35.0	458.824	30.364	1625.958	1.494%	91.866%
36.0	387.942	26.961	1652.919	1.327%	93.389%
37.0	315.373	22.938	1675.857	1.129%	94.685%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	248.126	18.809	1694.666	.926%	95.748%
39.0	177.715	14.535	1709.201	.715%	96.569%
40.0	122.358	10.465	1719.667	.515%	97.160%
41.0	70.446	6.866	1726.532	.338%	97.548%
42.0	39.087	3.980	1730.512	.196%	97.773%
43.0	23.456	2.317	1732.829	.114%	97.904%
44.0	18.000	1.565	1734.393	.077%	97.992%
45.0	15.405	1.284	1735.677	.063%	98.065%
46.0	13.359	1.125	1736.802	.055%	98.128%
47.0	11.813	1.001	1737.803	.049%	98.185%
48.0	10.835	0.916	1738.719	.045%	98.237%
49.0	10.167	0.862	1739.581	.042%	98.285%
50.0	9.788	0.832	1740.413	.041%	98.332%
51.0	9.520	0.817	1741.23	.040%	98.379%
52.0	9.281	0.807	1742.037	.040%	98.424%
53.0	9.049	0.797	1742.834	.039%	98.469%
54.0	8.845	0.789	1743.623	.039%	98.514%
55.0	8.670	0.782	1744.405	.038%	98.558%
56.0	8.487	0.775	1745.18	.038%	98.602%
57.0	8.325	0.769	1745.949	.038%	98.645%
58.0	8.177	0.763	1746.712	.038%	98.688%
59.0	8.044	0.758	1747.47	.037%	98.731%
60.0	7.903	0.753	1748.224	.037%	98.774%
61.0	7.784	0.749	1748.972	.037%	98.816%
62.0	7.671	0.745	1749.717	.037%	98.858%
63.0	7.594	0.742	1750.459	.037%	98.900%
64.0	7.495	0.740	1751.2	.036%	98.942%
65.0	7.411	0.738	1751.938	.036%	98.984%
66.0	7.327	0.735	1752.673	.036%	99.025%
67.0	7.235	0.732	1753.405	.036%	99.066%
68.0	7.165	0.729	1754.134	.036%	99.108%
69.0	7.095	0.727	1754.862	.036%	99.149%
70.0	7.052	0.727	1755.588	.036%	99.190%
71.0	6.982	0.725	1756.314	.036%	99.231%
72.0	6.926	0.723	1757.037	.036%	99.272%
73.0	6.884	0.722	1757.759	.036%	99.312%
74.0	6.841	0.722	1758.481	.036%	99.353%
75.0	6.792	0.720	1759.201	.035%	99.394%

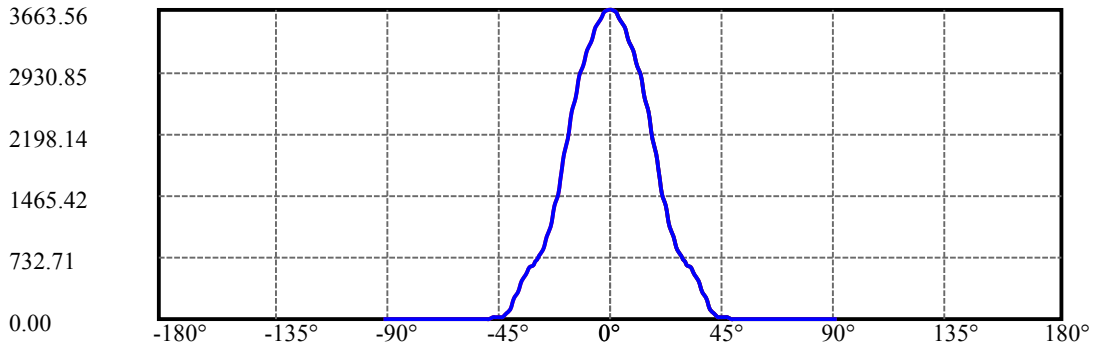
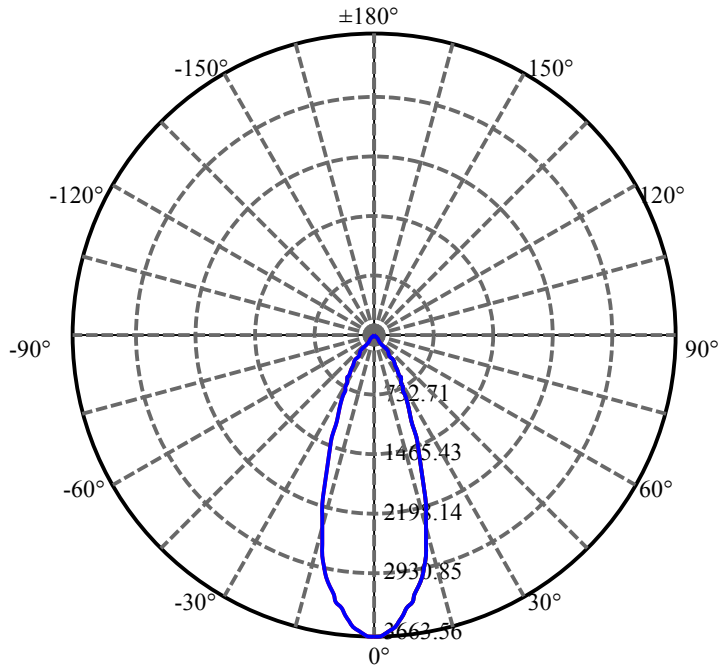
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	6.757	0.719	1759.92	.035%	99.435%
77.0	6.715	0.718	1760.639	.035%	99.475%
78.0	6.680	0.717	1761.356	.035%	99.516%
79.0	6.659	0.717	1762.072	.035%	99.556%
80.0	6.638	0.717	1762.789	.035%	99.597%
81.0	6.602	0.716	1763.505	.035%	99.637%
82.0	6.581	0.715	1764.22	.035%	99.677%
83.0	6.567	0.715	1764.935	.035%	99.718%
84.0	6.560	0.715	1765.65	.035%	99.758%
85.0	6.546	0.715	1766.365	.035%	99.799%
86.0	6.518	0.714	1767.079	.035%	99.839%
87.0	6.504	0.713	1767.792	.035%	99.879%
88.0	6.504	0.713	1768.505	.035%	99.920%
89.0	6.490	0.712	1769.217	.035%	99.960%
90.0	6.490	0.712	1769.928	.035%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1454.77	71.59%	82.19%
0-40	1719.67	84.63%	97.16%
0-60	1748.22	86.03%	98.77%
0-90	1769.22	87.07%	99.96%
0-120	1769.22	87.07%	99.96%
0-180	1769.93	87.10%	100.00%
60-90	21.75	1.07%	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%
0-28.96	1415.94	69.68%	80.00%

ZONAL LUMEN SUMMARY

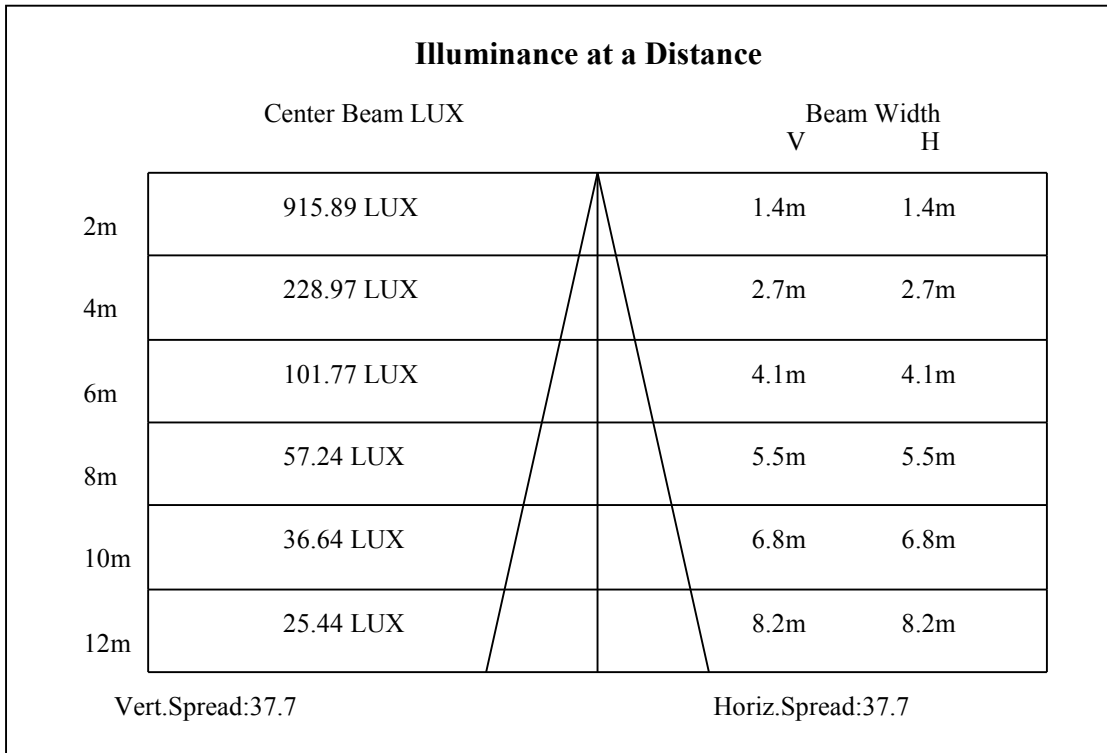
0-10	320.60
10-20	666.45
20-30	467.72
30-40	264.90
40-50	20.75
50-60	7.81
60-70	7.36
70-80	7.20
80-90	6.43
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

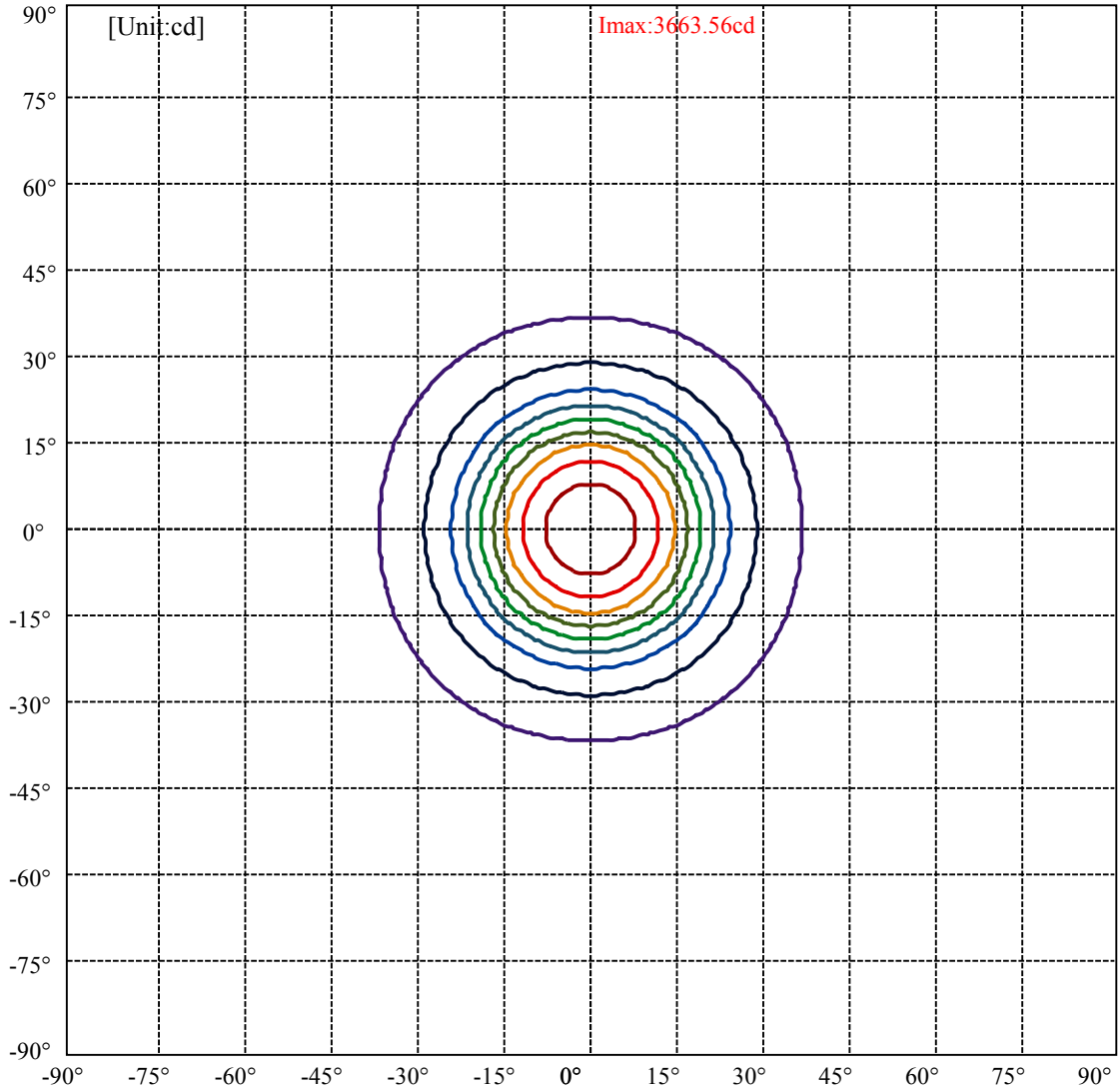


C0(Max): —————  
C0/C180: —————  
C90/C270: —————

Field angle(10%Imax):C0/180Left:36.3 Right:36.3  
:C90/270Left:36.3 Right:36.3

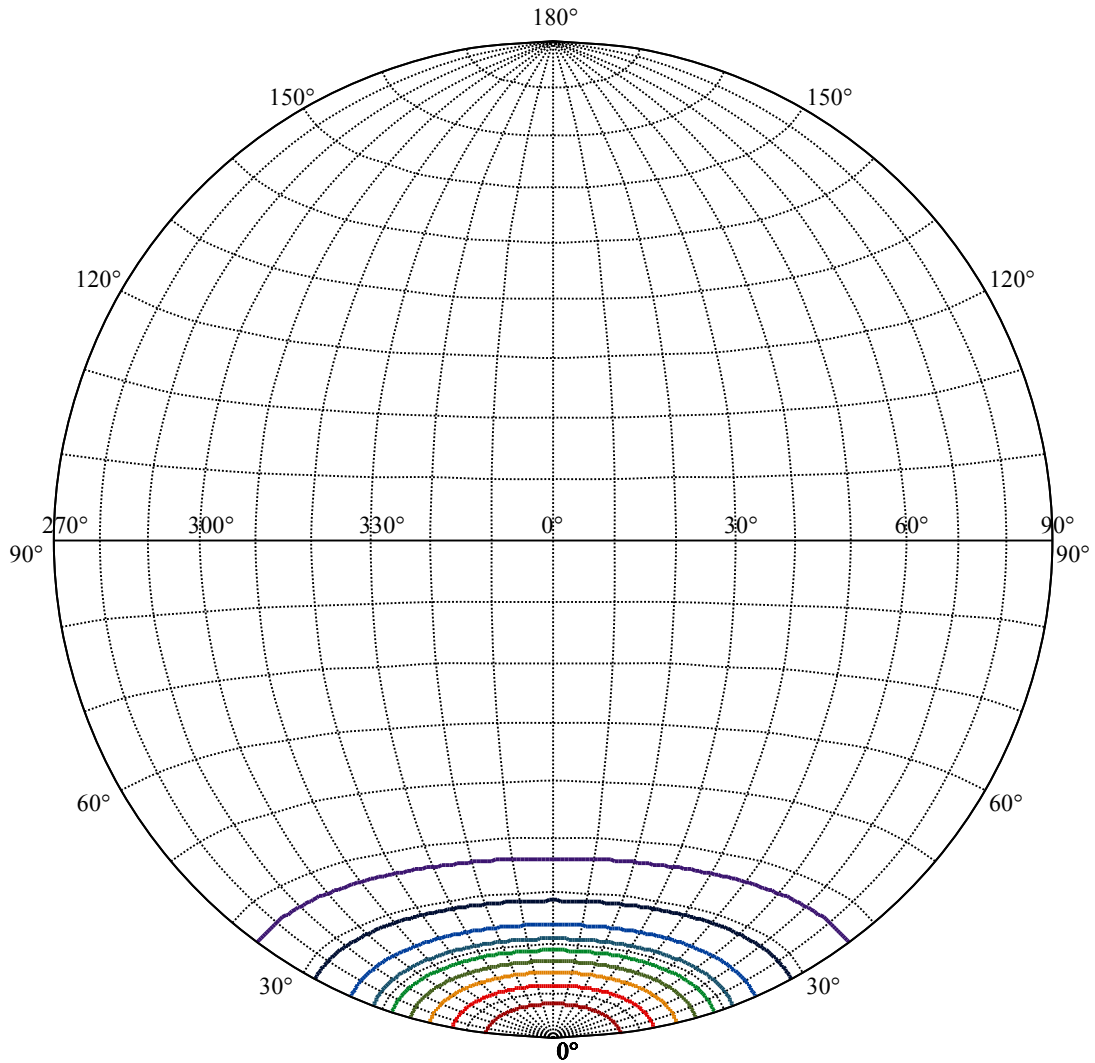
Beam Angle(50%Imax):C0/180Left:18.8 Right:18.8  
:C90/270Left:18.8 Right:18.8





(10%Imax) 366.356	—
(20%Imax) 732.712	—
(30%Imax) 1099.07	—
(40%Imax) 1465.42	—
(50%Imax) 1831.78	—
(60%Imax) 2198.14	—
(70%Imax) 2564.49	—
(80%Imax) 2930.85	—
(90%Imax) 3297.21	—





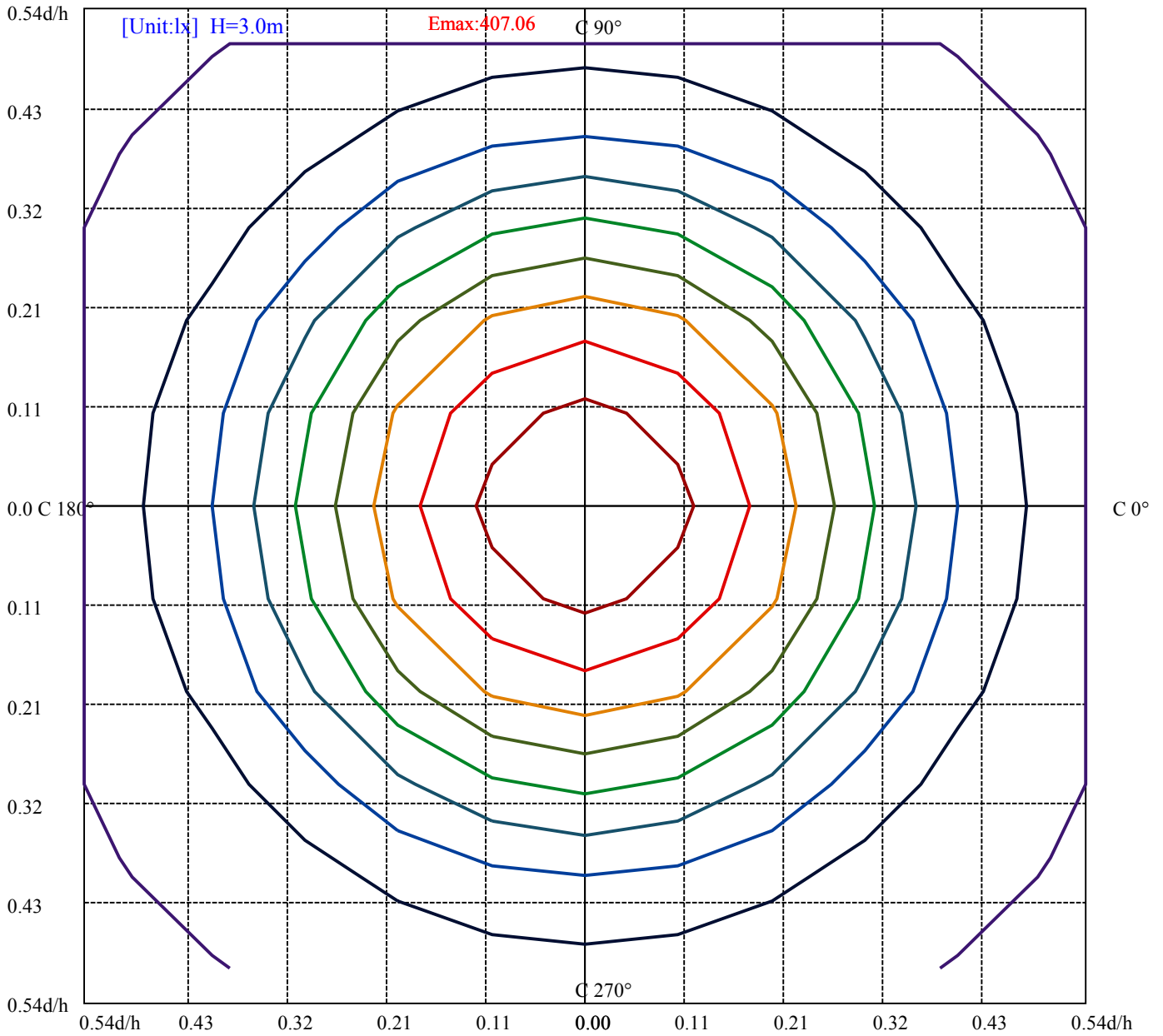
House

[Unit:cd]

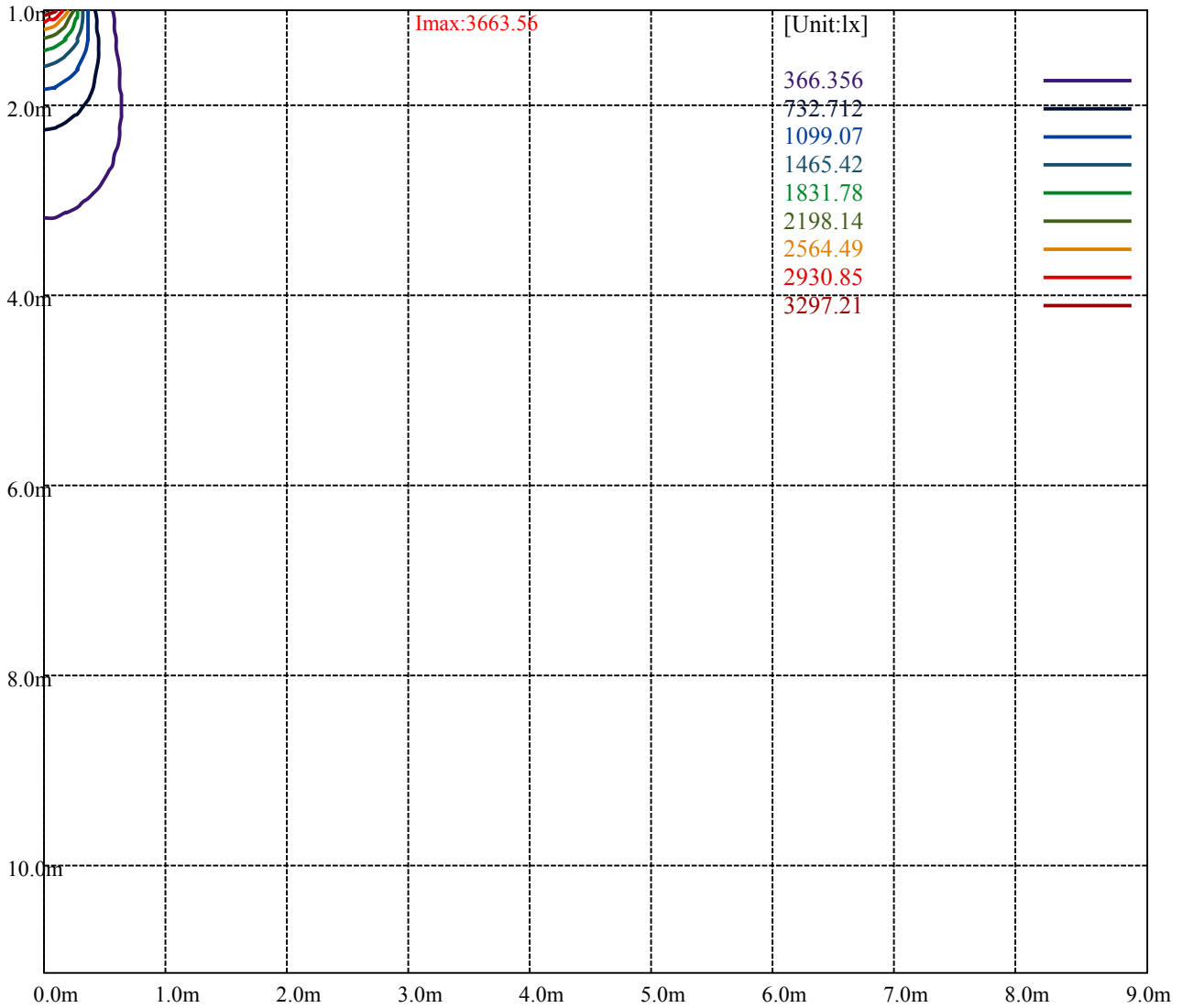
Road

**Imax:3663.56**

(10%Imax) 366.356	—
(20%Imax) 732.712	—
(30%Imax) 1099.07	—
(40%Imax) 1465.42	—
(50%Imax) 1831.78	—
(60%Imax) 2198.14	—
(70%Imax) 2564.49	—
(80%Imax) 2930.85	—
(90%Imax) 3297.21	—



- (10%Emax) 40.70622
- (20%Emax) 81.41245
- (30%Emax) 122.1189
- (40%Emax) 162.8244
- (50%Emax) 203.5311
- (60%Emax) 244.2378
- (70%Emax) 284.9433
- (80%Emax) 325.65
- (90%Emax) 366.3567



Luminance Table

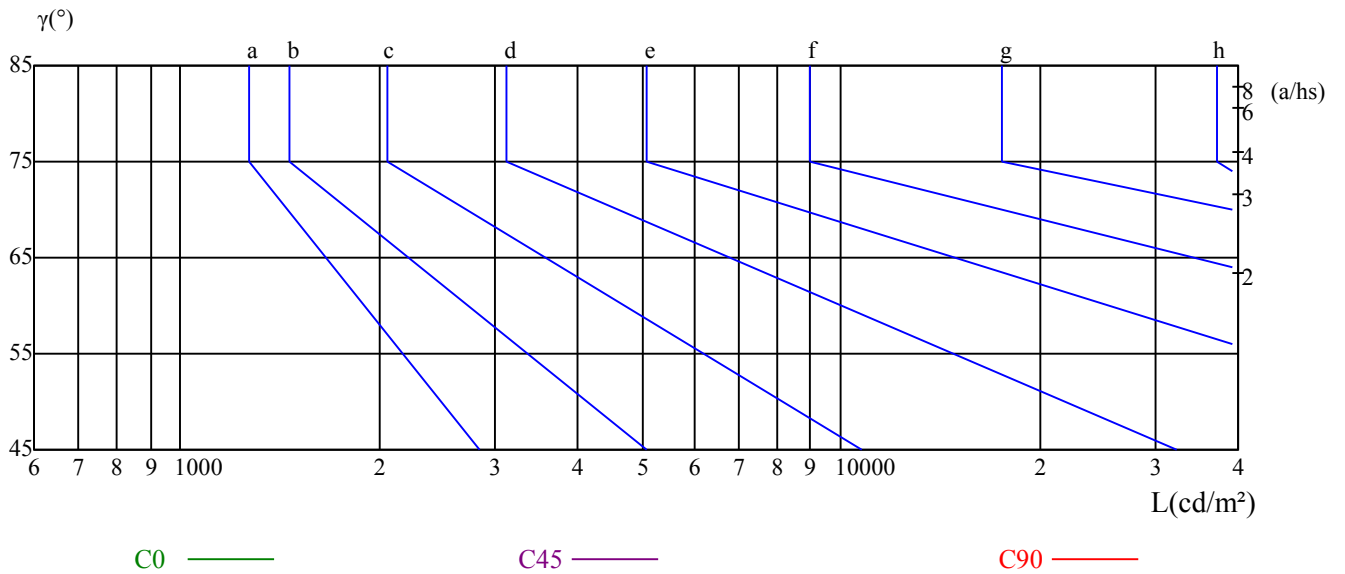
$\gamma$	45	50	55	60	65	70	75	80	85
C0	0	0	0	0	0	0	0	0	0
C45	0	0	0	0	0	0	0	0	0
C90	0	0	0	0	0	0	0	0	0

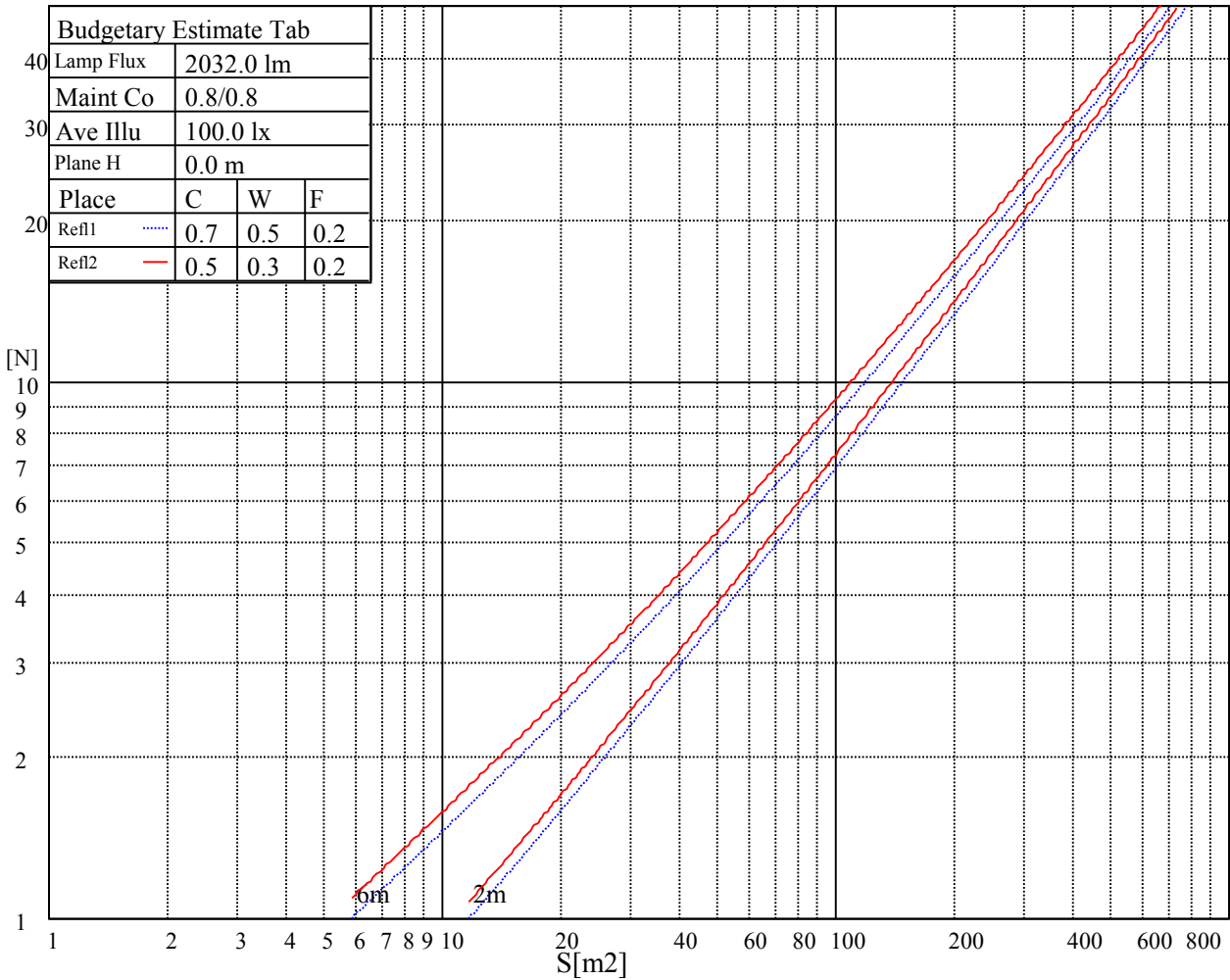
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
0	0	0	0	0	0	0	0	0

Glare Table

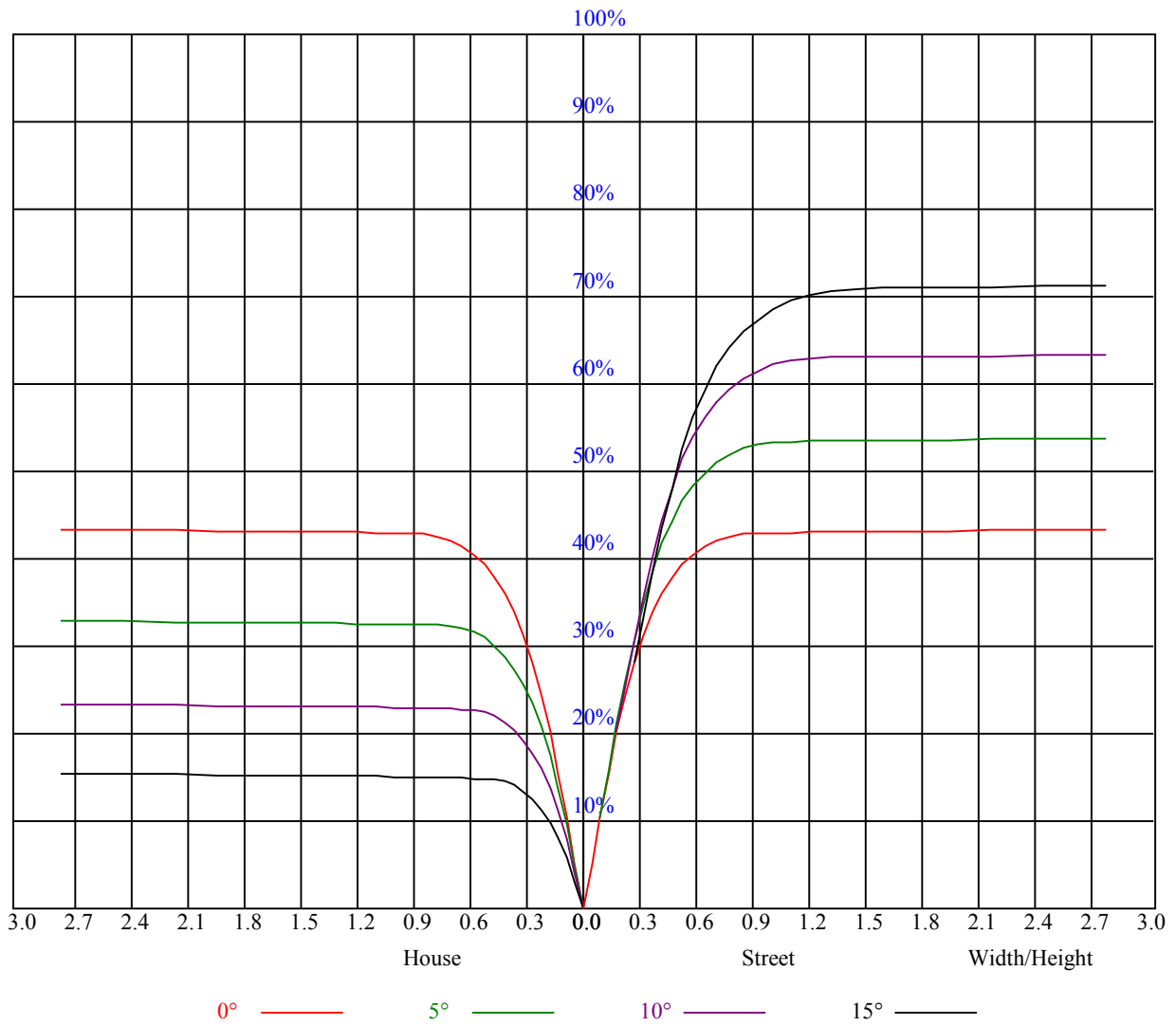
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

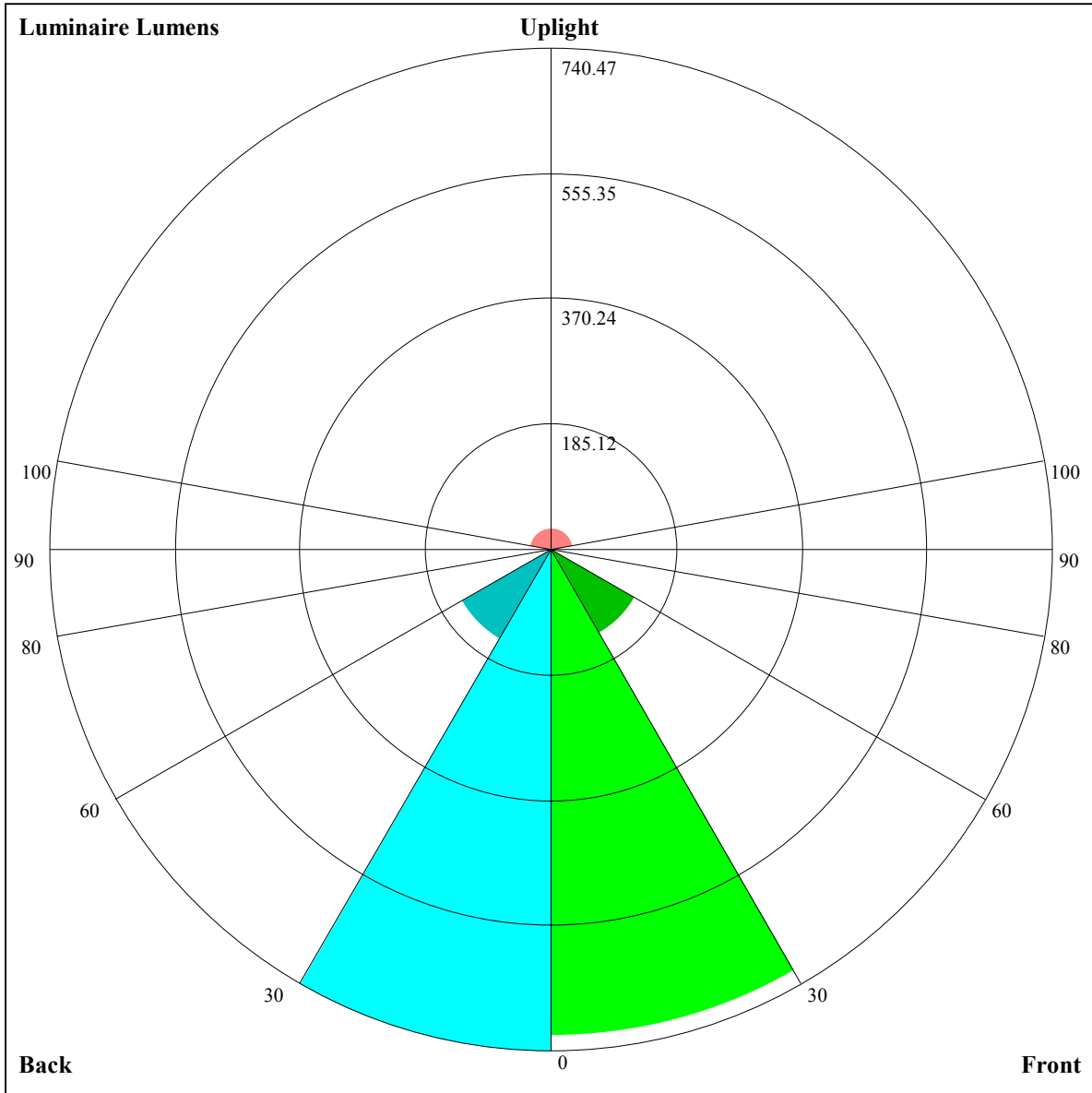
Luminance Limiting Curve





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	1.04	1.04	1.04	1.01	1.01	1.01	0.97	0.97	0.97	0.93	0.93	0.93	0.89	0.89	0.89	0.87
1	0.97	0.95	0.93	0.95	0.93	0.92	0.92	0.90	0.89	0.88	0.87	0.86	0.85	0.85	0.84	0.82
2	0.91	0.88	0.85	0.90	0.87	0.84	0.87	0.85	0.82	0.84	0.82	0.81	0.82	0.80	0.79	0.78
3	0.86	0.82	0.79	0.85	0.81	0.78	0.83	0.80	0.77	0.80	0.78	0.76	0.79	0.77	0.75	0.73
4	0.81	0.77	0.74	0.80	0.76	0.73	0.79	0.75	0.72	0.77	0.74	0.72	0.75	0.73	0.71	0.70
5	0.77	0.73	0.69	0.76	0.72	0.69	0.75	0.71	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.66
6	0.73	0.69	0.65	0.73	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.64	0.69	0.66	0.64	0.63
7	0.70	0.65	0.62	0.69	0.65	0.62	0.68	0.64	0.61	0.67	0.64	0.61	0.66	0.63	0.61	0.60
8	0.67	0.62	0.59	0.66	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.58	0.64	0.60	0.58	0.57
9	0.64	0.59	0.56	0.63	0.59	0.56	0.62	0.59	0.56	0.62	0.58	0.56	0.61	0.58	0.55	0.54
10	0.61	0.57	0.54	0.61	0.56	0.53	0.60	0.56	0.53	0.59	0.56	0.53	0.59	0.55	0.53	0.52





Luminaire Lumens:

FL=718.9,FM=142.45,FH=7.26,FVH=3.57

BL=740.47,BM=151.83,BH=7.3,BVH=3.57

UL=7.08,UH=33.7

BUG Rating:B2-U2-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	3662.44	3651.19	3620.25	3579.75	3528.56	3454.31	3391.88	3325.50	3255.75
45.0	3662.44	3668.06	3657.94	3633.75	3601.69	3554.44	3495.94	3440.25	3380.06
90.0	3672.00	3690.00	3691.69	3678.75	3652.88	3616.88	3573.56	3506.63	3449.25
135.0	3657.38	3680.44	3688.31	3678.19	3656.25	3615.19	3559.50	3502.69	3441.94
180.0	3662.44	3660.75	3641.63	3605.63	3561.19	3498.75	3435.75	3353.63	3264.75
225.0	3662.44	3644.44	3614.63	3560.06	3505.50	3441.94	3371.06	3275.44	3195.56
270.0	3672.00	3644.44	3596.06	3533.63	3468.38	3387.38	3300.75	3222.56	3140.44
315.0	3657.38	3616.88	3566.25	3497.63	3421.13	3348.56	3270.38	3170.81	3087.56
360.0	3662.44	3651.19	3620.25	3579.75	3528.56	3454.31	3391.88	3325.50	3255.75
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3162.94	3081.94	2991.38	2875.50	2739.94	2600.44	2427.75	2245.50	2079.00
45.0	3308.06	3225.38	3144.94	3052.13	2916.00	2788.31	2643.75	2447.44	2282.63
90.0	3385.69	3299.06	3223.69	3139.88	3034.13	2908.69	2778.19	2612.81	2451.94
135.0	3358.69	3285.56	3204.56	3108.38	3000.38	2891.25	2752.31	2594.25	2441.25
180.0	3180.38	3076.88	2963.81	2857.50	2739.94	2577.38	2434.50	2287.13	2117.25
225.0	3109.50	2990.25	2887.31	2773.13	2630.81	2474.44	2330.44	2165.06	2017.69
270.0	3033.56	2937.38	2832.19	2698.88	2549.25	2402.44	2234.81	2066.63	1918.69
315.0	2996.44	2871.00	2757.94	2630.25	2453.63	2300.63	2144.81	1949.63	1814.06
360.0	3162.94	3081.94	2991.38	2875.50	2739.94	2600.44	2427.75	2245.50	2079.00
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1899.00	1746.00	1580.06	1416.94	1283.63	1147.50	1028.81	934.88	864.56
45.0	2109.94	1931.63	1760.06	1623.38	1436.06	1288.13	1167.19	1040.06	939.38
90.0	2262.94	2077.31	1918.13	1743.19	1573.31	1429.31	1291.50	1117.52	1020.88
135.0	2257.88	2103.75	1931.06	1761.75	1610.44	1461.38	1286.44	1158.19	1042.31
180.0	1947.38	1800.00	1637.44	1476.00	1338.19	1115.89	1073.76	960.98	864.11
225.0	1857.38	1701.00	1559.25	1404.00	1256.63	1117.01	1022.85	905.18	831.88
270.0	1754.44	1611.56	1455.19	1302.19	1175.06	1061.44	936.56	855.56	791.44
315.0	1645.31	1464.75	1344.94	1121.74	1067.01	967.61	880.43	804.49	748.13
360.0	1899.00	1746.00	1580.06	1416.94	1283.63	1147.50	1028.81	934.88	864.56
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	779.06	734.06	702.56	668.81	646.88	631.69	590.63	531.00	479.25
45.0	851.06	782.44	731.81	696.94	656.44	636.19	617.63	559.69	498.94
90.0	922.95	833.63	763.59	715.84	674.66	644.40	624.21	592.76	545.46
135.0	919.13	842.06	777.94	722.81	682.88	657.56	633.94	613.13	570.38
180.0	796.22	743.29	694.69	665.61	643.11	621.11	586.91	533.70	466.54
225.0	774.17	723.32	685.35	659.87	637.26	596.31	543.60	472.95	408.26
270.0	732.38	696.38	669.94	646.88	614.81	569.25	501.19	426.94	360.56
315.0	710.44	680.63	652.78	635.34	608.40	545.79	486.73	420.98	341.21
360.0	779.06	734.06	702.56	668.81	646.88	631.69	590.63	531.00	479.25
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	396.56	324.00	288.00	167.12	108.11	58.78	24.08	20.14	17.94
45.0	442.69	362.25	285.19	244.74	149.40	91.24	43.09	22.56	20.25
90.0	477.56	402.41	336.60	259.26	185.85	125.66	72.79	30.99	20.87
135.0	511.31	449.44	371.25	294.75	286.31	155.48	85.44	43.59	23.79
180.0	393.08	325.58	248.12	173.42	115.82	60.36	29.36	19.97	17.89
225.0	330.24	253.24	188.83	118.80	63.06	31.28	21.15	18.73	16.37
270.0	291.38	212.06	139.89	89.49	38.08	20.81	18.73	16.14	13.84
315.0	260.72	194.01	127.13	74.14	32.23	19.97	18.06	15.53	13.05
360.0	396.56	324.00	288.00	167.12	108.11	58.78	24.08	20.14	17.94

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	14.79	12.77	11.48	10.29	9.96	9.68	9.39	9.17	8.94
45.0	17.33	14.40	12.77	11.81	10.80	10.46	10.18	9.90	9.62
90.0	18.84	16.26	13.22	11.81	10.63	10.13	9.84	9.51	9.28
135.0	18.90	16.76	14.29	12.43	10.86	10.07	9.79	9.51	9.23
180.0	15.64	13.44	11.98	10.46	10.13	9.79	9.51	9.28	9.06
225.0	13.95	12.15	10.97	10.63	10.24	9.96	9.68	9.45	9.23
270.0	12.09	10.91	10.07	9.79	9.51	9.23	9.00	8.83	8.61
315.0	11.70	10.18	9.73	9.45	9.23	9.00	8.78	8.61	8.44
360.0	14.79	12.77	11.48	10.29	9.96	9.68	9.39	9.17	8.94
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	8.78	8.61	8.44	8.21	8.10	7.99	7.82	7.71	7.59
45.0	9.39	9.17	9.00	8.78	8.61	8.49	8.27	8.16	7.99
90.0	9.00	8.83	8.66	8.49	8.33	8.16	8.04	7.93	7.76
135.0	9.06	8.83	8.61	8.44	8.27	8.10	7.99	7.88	7.76
180.0	8.83	8.66	8.44	8.33	8.16	7.99	7.88	7.76	7.65
225.0	9.06	8.83	8.66	8.49	8.33	8.16	8.04	7.88	7.82
270.0	8.44	8.33	8.16	8.04	7.93	7.82	7.65	7.54	7.48
315.0	8.21	8.10	7.93	7.82	7.71	7.65	7.54	7.43	7.31
360.0	8.78	8.61	8.44	8.21	8.10	7.99	7.82	7.71	7.59
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	7.54	7.43	7.37	7.26	7.20	7.09	7.09	7.03	6.98
45.0	7.93	7.82	7.71	7.59	7.43	7.43	7.31	7.26	7.14
90.0	7.65	7.59	7.48	7.43	7.31	7.26	7.14	7.09	7.03
135.0	7.71	7.54	7.48	7.43	7.31	7.20	7.14	7.09	7.03
180.0	7.54	7.48	7.37	7.26	7.26	7.14	7.03	7.03	6.98
225.0	7.71	7.59	7.48	7.43	7.31	7.26	7.14	7.14	7.03
270.0	7.43	7.31	7.26	7.14	7.09	7.03	6.98	6.92	6.86
315.0	7.26	7.20	7.14	7.09	6.98	6.92	6.92	6.86	6.81
360.0	7.54	7.43	7.37	7.26	7.20	7.09	7.09	7.03	6.98
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	6.92	6.86	6.81	6.75	6.75	6.69	6.64	6.64	6.58
45.0	7.09	7.03	6.98	6.92	6.86	6.81	6.81	6.75	6.75
90.0	6.92	6.92	6.86	6.86	6.81	6.75	6.69	6.64	6.64
135.0	6.98	6.92	6.86	6.81	6.75	6.75	6.69	6.69	6.64
180.0	6.92	6.86	6.81	6.81	6.75	6.69	6.64	6.64	6.64
225.0	6.98	6.98	6.92	6.86	6.81	6.75	6.75	6.69	6.69
270.0	6.86	6.81	6.81	6.69	6.69	6.64	6.64	6.64	6.64
315.0	6.75	6.69	6.69	6.64	6.64	6.64	6.58	6.58	6.53
360.0	6.92	6.86	6.81	6.75	6.75	6.69	6.64	6.64	6.58
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	6.58	6.58	6.53	6.53	6.53	6.53	6.53	6.47	6.47
45.0	6.69	6.64	6.64	6.64	6.58	6.58	6.53	6.58	6.53
90.0	6.58	6.58	6.58	6.58	6.58	6.53	6.53	6.53	6.47
135.0	6.64	6.58	6.58	6.58	6.53	6.47	6.47	6.53	6.47
180.0	6.64	6.58	6.53	6.53	6.53	6.47	6.47	6.47	6.47
225.0	6.64	6.64	6.64	6.64	6.64	6.58	6.53	6.53	6.58
270.0	6.58	6.53	6.58	6.53	6.53	6.47	6.53	6.47	6.53
315.0	6.47	6.53	6.47	6.47	6.47	6.47	6.47	6.47	6.41
360.0	6.58	6.58	6.53	6.53	6.53	6.53	6.53	6.47	6.47

Intensity data(cd)

C/γ(°)	90.0
0.0	6.47
45.0	6.53
90.0	6.53
135.0	6.47
180.0	6.47
225.0	6.53
270.0	6.47
315.0	6.47
360.0	6.47