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Nata

Client:

LumCAT: 2-1650-A

Luminaire: 92.70.131.00+92.70.148.00

Report No: NT2018031202

Voltage(V): 35.2200

Test No: nata-0100

Current(A): 0.5000

LampCAT: CITIZEN CLU721

Power (W): 17.6100

Lamp flux(lm): 1963.0

PF: 0.0000

Number of Lamps: 1

Ballast type: DC

Length(mm): 70

Width(mm): 70

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1669.45, Efficiency(%): 85.05% , Luminous Efficacy(lm/W): 94.80

Central intensity(cd): 12863.930, Maximum intensity(cd): 12863.930

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=15.2

[C90/270]Total=15.2

Field angle(10%Imax): [C0/180]Total=32.8

[C90/270]Total=32.8

Maximum s/h(1/2): C0_180=0.26 C90_270=0.26

Maximum s/h(1/4): C0_180=0.27 C90_270=0.27

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 85.20%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 97.925%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	12863.928	3.078	3.078	.157%	.184%
1.0	12713.211	24.331	27.409	1.239%	1.642%
2.0	12221.144	46.772	74.18	2.383%	4.443%
3.0	11474.717	65.856	140.036	3.355%	8.388%
4.0	10501.871	80.335	220.371	4.092%	13.200%
5.0	9540.035	91.180	311.55	4.645%	18.662%
6.0	8256.533	94.642	406.192	4.821%	24.331%
7.0	7096.151	94.835	501.028	4.831%	30.011%
8.0	5966.393	91.058	592.086	4.639%	35.466%
9.0	4824.799	82.768	674.854	4.216%	40.424%
10.0	3862.619	73.554	748.407	3.747%	44.829%
11.0	3157.140	66.061	814.468	3.365%	48.786%
12.0	2526.745	57.609	872.078	2.935%	52.237%
13.0	2060.348	50.825	922.903	2.589%	55.282%
14.0	1728.977	45.869	968.772	2.337%	58.029%
15.0	1514.395	42.982	1011.754	2.190%	60.604%
16.0	1356.934	41.016	1052.769	2.089%	63.061%
17.0	1195.233	38.321	1091.09	1.952%	65.356%
18.0	1071.804	36.320	1127.411	1.850%	67.532%
19.0	971.924	34.700	1162.11	1.768%	69.610%
20.0	875.528	32.838	1194.948	1.673%	71.577%
21.0	795.627	31.267	1226.216	1.593%	73.450%
22.0	731.865	30.065	1256.28	1.532%	75.251%
23.0	674.159	28.886	1285.167	1.472%	76.981%
24.0	617.499	27.542	1312.709	1.403%	78.631%
25.0	570.054	26.419	1339.128	1.346%	80.213%
26.0	521.694	25.079	1364.207	1.278%	81.716%
27.0	476.142	23.705	1387.912	1.208%	83.136%
28.0	430.383	22.157	1410.069	1.129%	84.463%
29.0	386.055	20.525	1430.593	1.046%	85.692%
30.0	347.626	19.060	1449.654	.971%	86.834%
31.0	314.324	17.753	1467.407	.904%	87.897%
32.0	278.751	16.199	1483.605	.825%	88.868%
33.0	251.160	15.001	1498.606	.764%	89.766%
34.0	222.490	13.643	1512.249	.695%	90.583%
35.0	196.930	12.387	1524.636	.631%	91.325%
36.0	176.442	11.373	1536.009	.579%	92.007%
37.0	159.636	10.535	1546.544	.537%	92.638%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	143.814	9.709	1556.254	.495%	93.219%
39.0	128.164	8.845	1565.099	.451%	93.749%
40.0	115.852	8.166	1573.265	.416%	94.238%
41.0	104.951	7.551	1580.816	.385%	94.691%
42.0	94.422	6.928	1587.744	.353%	95.106%
43.0	84.739	6.337	1594.081	.323%	95.485%
44.0	75.799	5.774	1599.856	.294%	95.831%
45.0	67.217	5.212	1605.068	.266%	96.143%
46.0	58.546	4.618	1609.686	.235%	96.420%
47.0	51.147	4.102	1613.788	.209%	96.666%
48.0	44.678	3.641	1617.429	.185%	96.884%
49.0	38.808	3.212	1620.641	.164%	97.076%
50.0	33.048	2.776	1623.417	.141%	97.242%
51.0	28.340	2.415	1625.832	.123%	97.387%
52.0	24.266	2.097	1627.929	.107%	97.513%
53.0	20.543	1.799	1629.728	.092%	97.620%
54.0	17.295	1.534	1631.263	.078%	97.712%
55.0	14.810	1.330	1632.593	.068%	97.792%
56.0	12.869	1.170	1633.763	.060%	97.862%
57.0	11.383	1.047	1634.81	.053%	97.925%
58.0	10.660	0.991	1635.801	.051%	97.984%
59.0	10.385	0.976	1636.777	.050%	98.043%
60.0	10.337	0.982	1637.759	.050%	98.101%
61.0	10.316	0.989	1638.749	.050%	98.161%
62.0	10.275	0.995	1639.743	.051%	98.220%
63.0	10.240	1.001	1640.744	.051%	98.280%
64.0	10.227	1.008	1641.752	.051%	98.341%
65.0	10.185	1.012	1642.764	.052%	98.401%
66.0	10.192	1.021	1643.785	.052%	98.462%
67.0	10.172	1.027	1644.812	.052%	98.524%
68.0	10.117	1.029	1645.841	.052%	98.586%
69.0	10.096	1.034	1646.874	.053%	98.647%
70.0	10.082	1.039	1647.913	.053%	98.710%
71.0	10.048	1.042	1648.955	.053%	98.772%
72.0	10.027	1.046	1650.001	.053%	98.835%
73.0	10.027	1.052	1651.052	.054%	98.898%
74.0	10.378	1.094	1652.146	.056%	98.963%
75.0	11.142	1.180	1653.327	.060%	99.034%

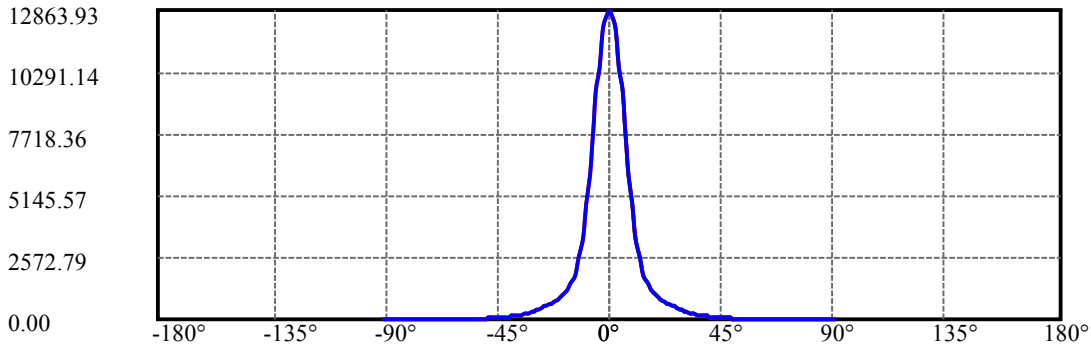
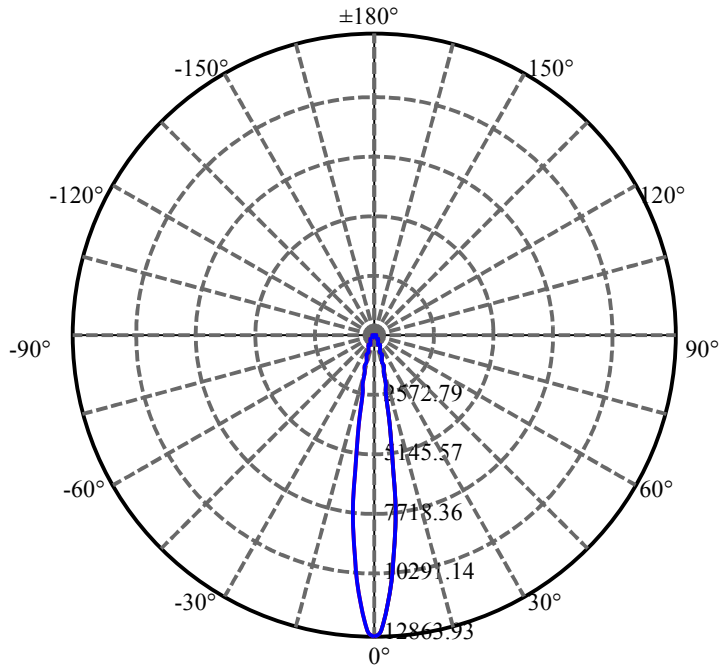
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	12.126	1.290	1654.617	.066%	99.111%
77.0	12.918	1.380	1655.997	.070%	99.194%
78.0	13.448	1.442	1657.44	.073%	99.280%
79.0	13.317	1.433	1658.873	.073%	99.366%
80.0	12.216	1.319	1660.192	.067%	99.445%
81.0	11.032	1.195	1661.387	.061%	99.517%
82.0	10.179	1.105	1662.492	.056%	99.583%
83.0	9.800	1.067	1663.559	.054%	99.647%
84.0	9.676	1.055	1664.614	.054%	99.710%
85.0	9.607	1.050	1665.664	.053%	99.773%
86.0	8.919	0.976	1666.64	.050%	99.831%
87.0	8.080	0.885	1667.524	.045%	99.884%
88.0	7.302	0.800	1668.325	.041%	99.932%
89.0	6.910	0.758	1669.082	.039%	99.978%
90.0	6.793	0.372	1669.455	.019%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1449.65	73.85%	86.83%
0-40	1573.26	80.15%	94.24%
0-60	1637.76	83.43%	98.10%
0-90	1669.08	85.03%	99.98%
0-120	1669.08	85.03%	99.98%
0-180	1669.45	85.05%	100.00%
60-90	32.30	1.65%	1.94%
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%
0-24.87	1335.56	68.04%	80.00%

ZONAL LUMEN SUMMARY

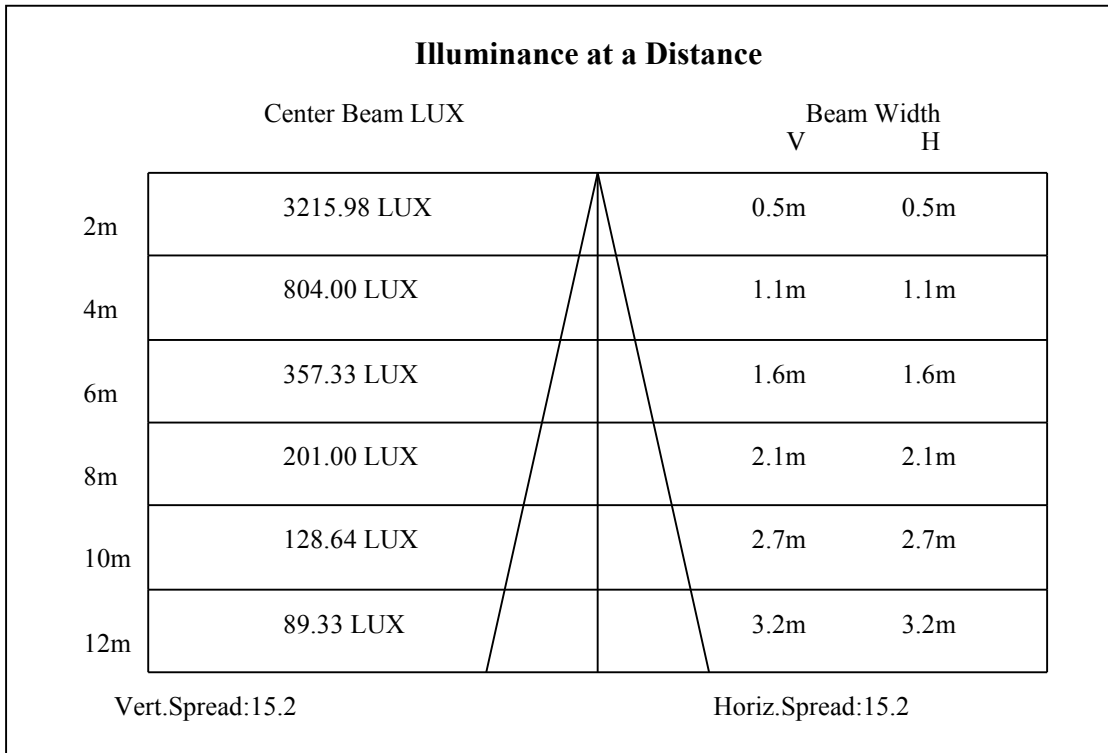
0-10	748.41
10-20	446.54
20-30	254.71
30-40	123.61
40-50	50.15
50-60	14.34
60-70	10.15
70-80	12.28
80-90	8.89
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

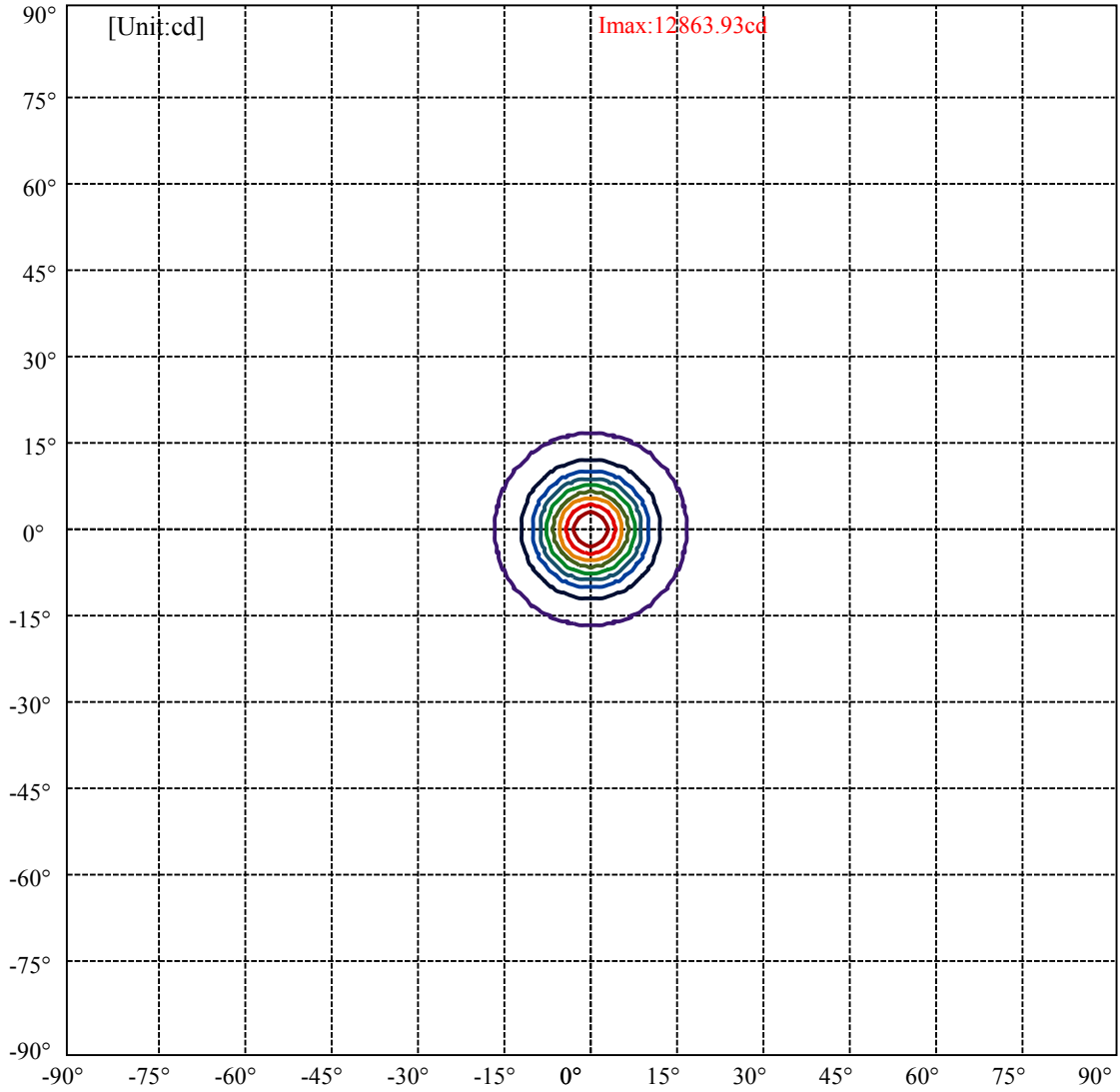


C0(Max): —————
C0/C180: —————
C90/C270: —————

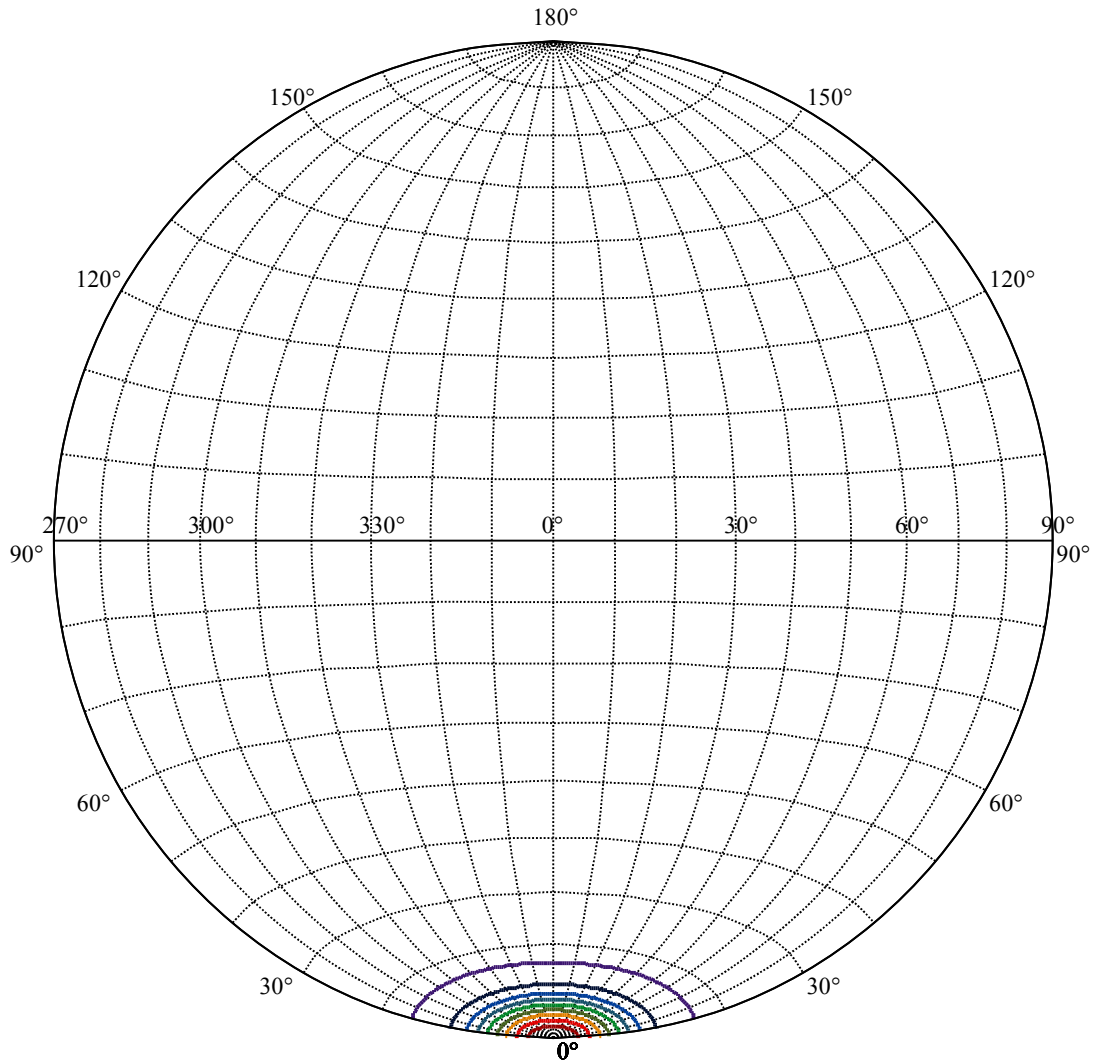
Field angle(10%Imax):C0/180Left:16.4 Right:16.4
:C90/270Left:16.4 Right:16.4

Beam Angle(50%Imax):C0/180Left:7.6 Right:7.6
:C90/270Left:7.6 Right:7.6





(10%I _{max}) 1286.39	—
(20%I _{max}) 2572.79	—
(30%I _{max}) 3859.18	—
(40%I _{max}) 5145.57	—
(50%I _{max}) 6431.96	—
(60%I _{max}) 7718.36	—
(70%I _{max}) 9004.75	—
(80%I _{max}) 10291.1	—
(90%I _{max}) 11577.5	—



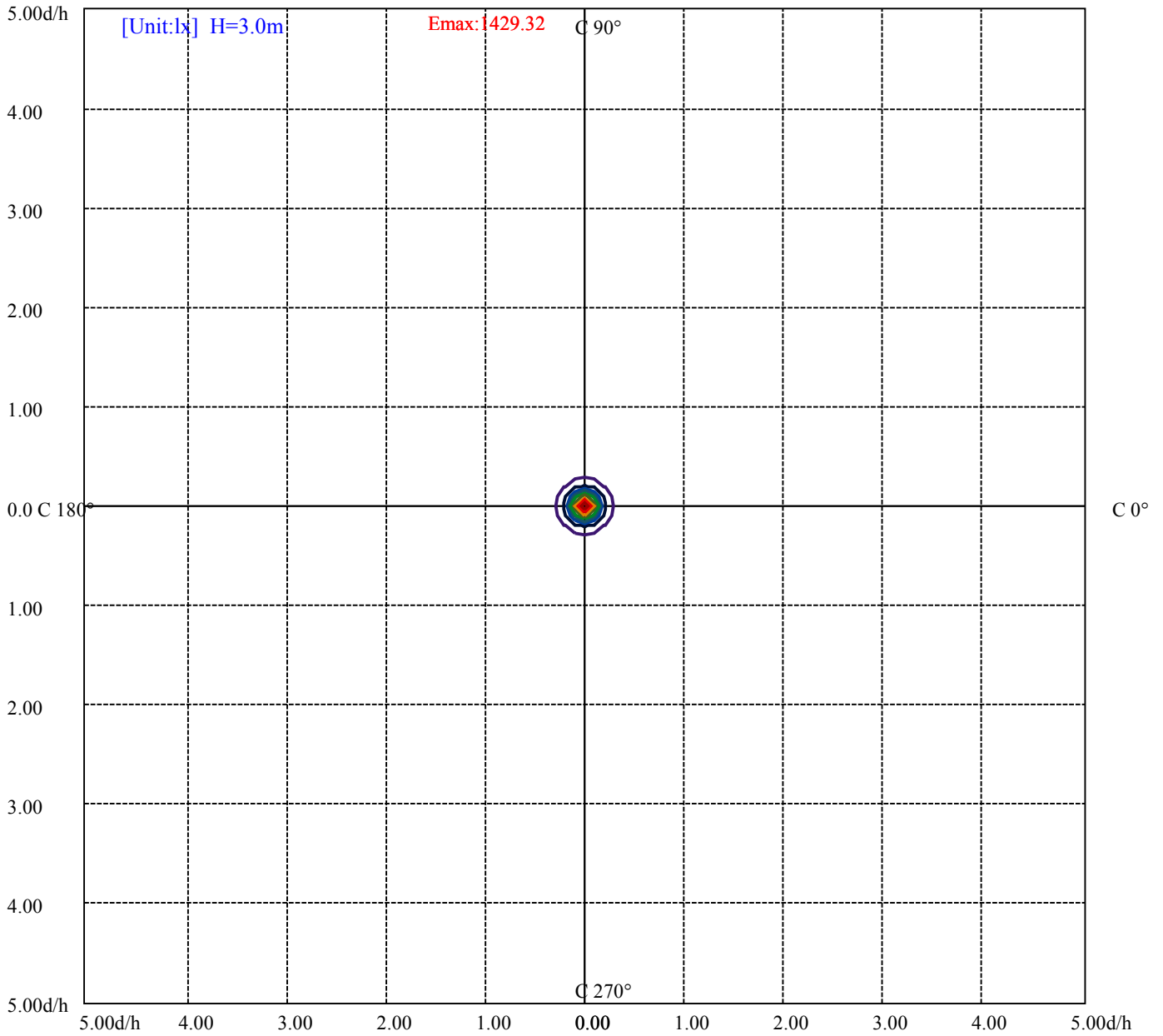
House

[Unit:cd]

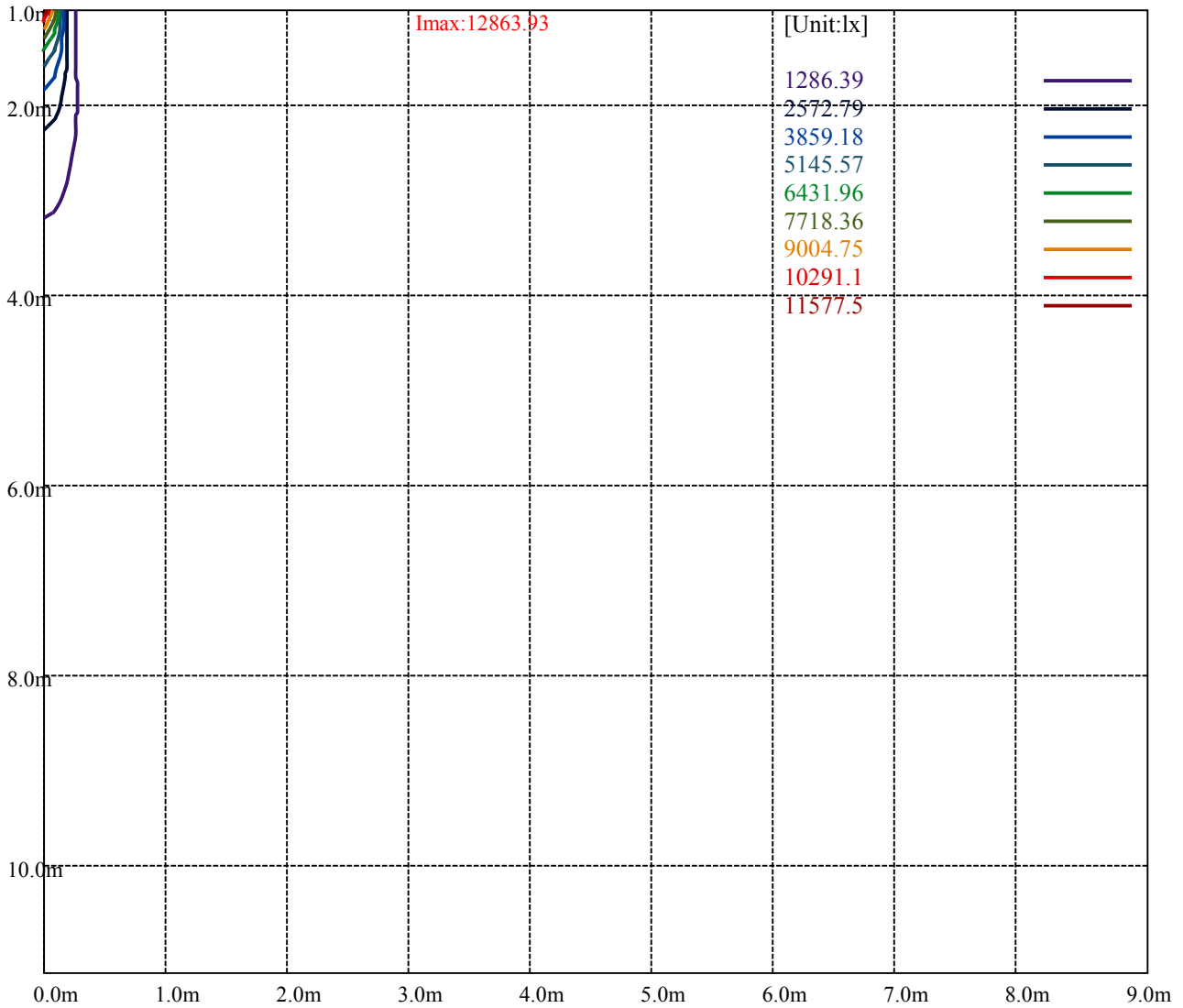
Road

Imax:12863.93

(10%Imax)	1286.39	—
(20%Imax)	2572.79	—
(30%Imax)	3859.18	—
(40%Imax)	5145.57	—
(50%Imax)	6431.96	—
(60%Imax)	7718.36	—
(70%Imax)	9004.75	—
(80%Imax)	10291.1	—
(90%Imax)	11577.5	—



(10%Emax) 142.9322	—
(20%Emax) 285.8644	—
(30%Emax) 428.7967	—
(40%Emax) 571.7289	—
(50%Emax) 714.6611	—
(60%Emax) 857.5933	—
(70%Emax) 1000.526	—
(80%Emax) 1143.456	—
(90%Emax) 1286.389	—



Luminance Table

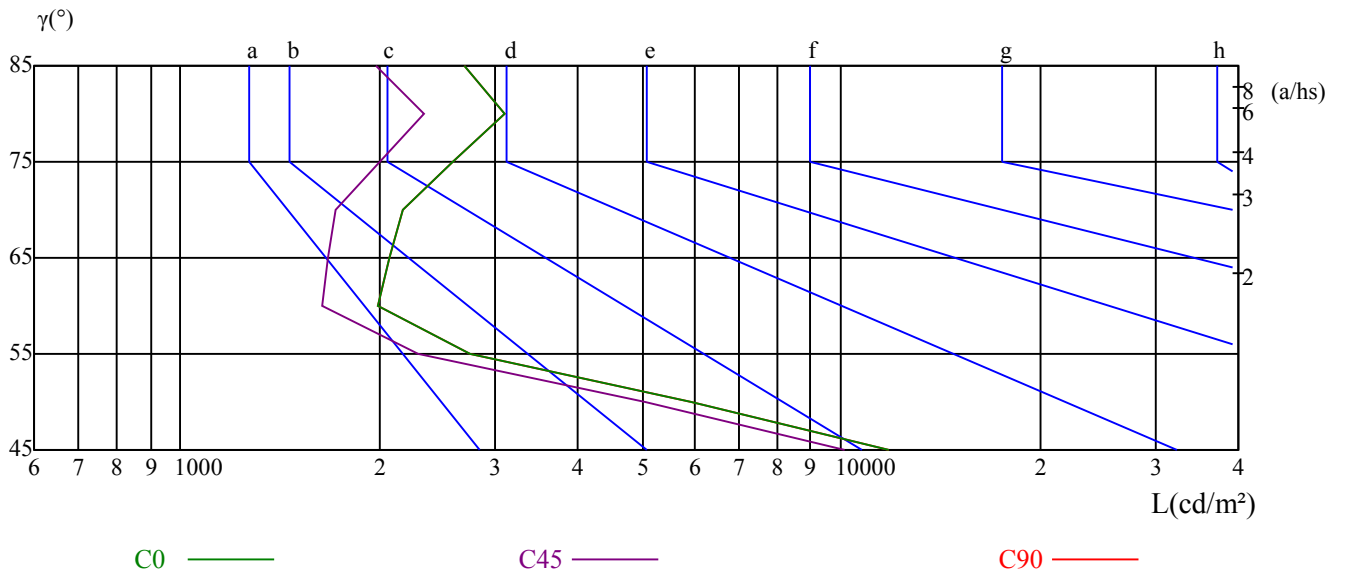
γ	45	50	55	60	65	70	75	80	85
C0	11809	5941	2747	1996	2068	2175	2585	3090	2695
C45	10162	5036	2293	1639	1667	1720	2000	2332	1975
C90	11809	5941	2747	1996	2068	2175	2585	3090	2695

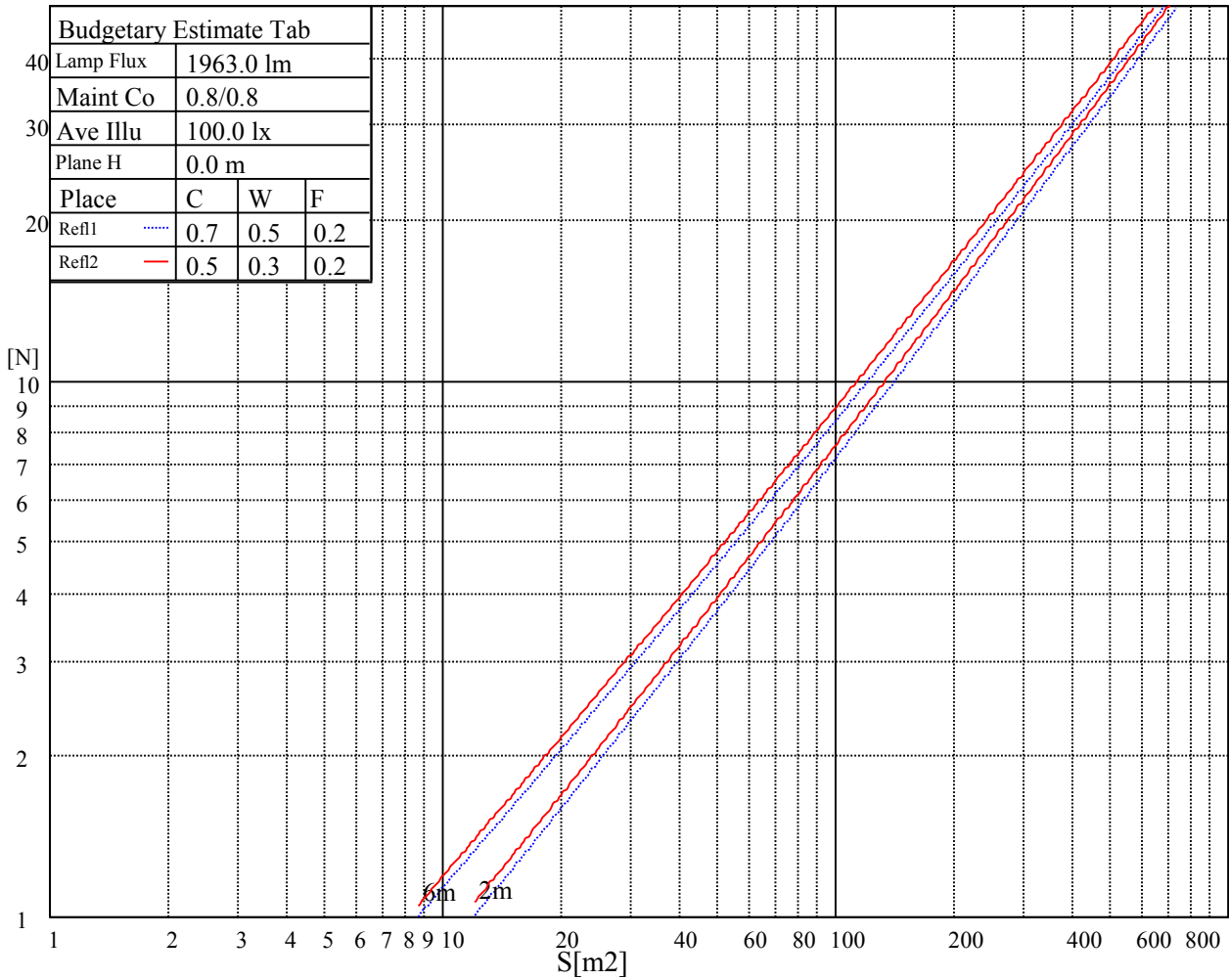
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
4919	4919	4919	8786	8786	8786	22496	22496	22496

Glare Table

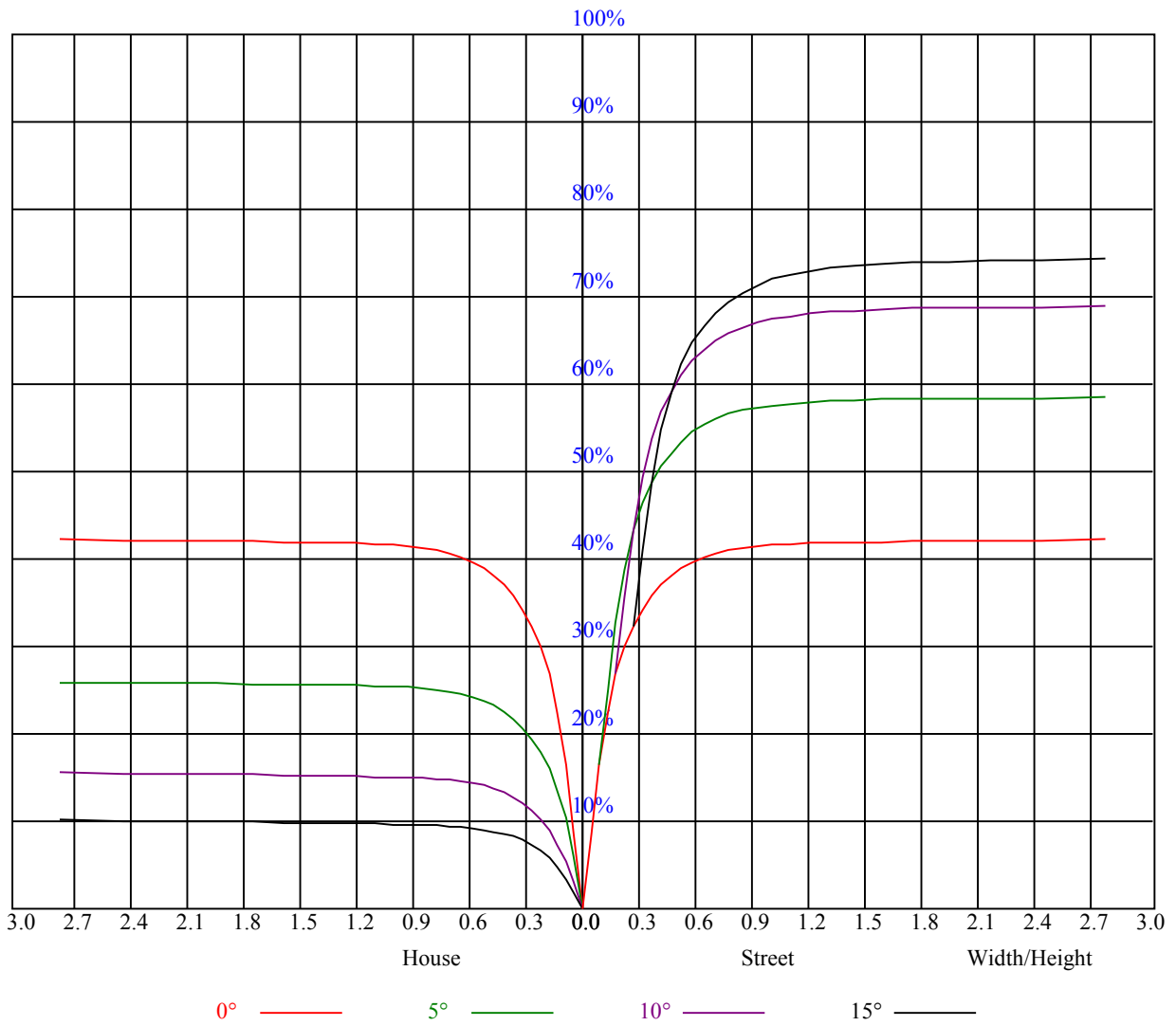
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

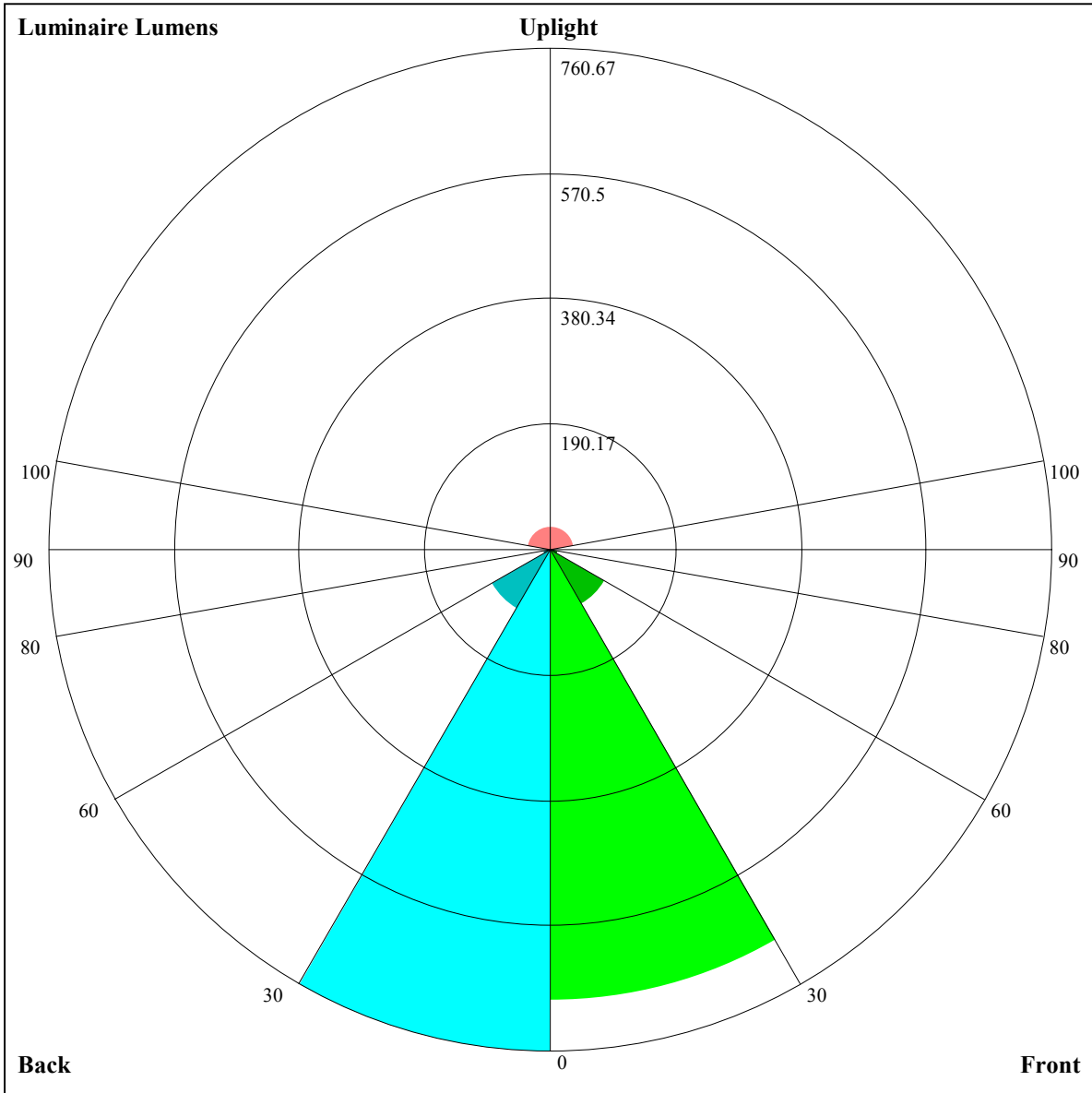
Luminance Limiting Curve





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	1.01	1.01	1.01	0.99	0.99	0.99	0.95	0.95	0.95	0.91	0.91	0.91	0.87	0.87	0.87	0.85
1	0.95	0.94	0.92	0.94	0.92	0.90	0.90	0.89	0.88	0.87	0.86	0.85	0.84	0.83	0.83	0.81
2	0.91	0.88	0.85	0.89	0.87	0.85	0.86	0.84	0.83	0.84	0.82	0.81	0.82	0.80	0.79	0.78
3	0.86	0.83	0.81	0.85	0.82	0.80	0.83	0.81	0.79	0.81	0.79	0.77	0.79	0.78	0.76	0.75
4	0.83	0.79	0.77	0.82	0.79	0.76	0.80	0.77	0.75	0.79	0.76	0.74	0.77	0.75	0.74	0.73
5	0.80	0.76	0.73	0.79	0.76	0.73	0.78	0.75	0.72	0.76	0.74	0.72	0.75	0.73	0.71	0.70
6	0.77	0.73	0.71	0.76	0.73	0.70	0.75	0.72	0.70	0.74	0.72	0.69	0.73	0.71	0.69	0.68
7	0.75	0.71	0.68	0.74	0.71	0.68	0.73	0.70	0.68	0.72	0.69	0.67	0.71	0.69	0.67	0.66
8	0.72	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.66	0.70	0.68	0.66	0.70	0.67	0.65	0.64
9	0.70	0.67	0.64	0.70	0.67	0.64	0.69	0.66	0.64	0.69	0.66	0.64	0.68	0.65	0.64	0.63
10	0.68	0.65	0.63	0.68	0.65	0.63	0.68	0.65	0.62	0.67	0.64	0.62	0.66	0.64	0.62	0.61





Luminaire Lumens:

FL=684.21,FM=94.54,FH=11,FVH=4.85

BL=760.67,BM=104.04,BH=11.52,BVH=5.17

UL=7.41,UH=35.27

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	12998.82	12778.59	12134.43	11363.64	10438.69	9100.82	7966.66	6832.50	5610.25
45.0	12778.59	12255.55	11451.73	10559.82	9420.15	8324.53	7052.72	5797.44	4789.91
90.0	12767.58	12393.20	11793.08	10774.54	9790.68	8722.59	7321.40	6196.05	5127.95
135.0	12910.73	12921.74	12536.34	11952.74	11176.45	10102.85	8902.62	7779.47	6524.18
180.0	12998.82	12932.75	12470.27	11831.62	10892.36	10024.12	8790.86	7497.03	6359.56
225.0	12778.59	12954.77	12833.65	12299.60	10974.94	10740.40	9327.10	8357.01	7211.84
270.0	12767.58	12855.67	12580.39	12046.34	11187.46	10229.48	9040.26	7779.47	6661.82
315.0	12910.73	12613.42	11969.26	10969.44	10134.23	9075.50	7650.64	6530.24	5445.63
360.0	12998.82	12778.59	12134.43	11363.64	10438.69	9100.82	7966.66	6832.50	5610.25
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	4503.61	3655.74	2873.94	2503.97	1926.42	1635.18	1453.49	1286.12	1140.77
45.0	3793.39	2984.06	2835.40	2024.42	1671.51	1479.92	1324.66	1185.36	1033.96
90.0	4069.77	3208.69	2608.02	2111.96	1770.61	1560.85	1376.96	1236.57	1093.86
135.0	5323.95	4354.96	3419.00	2835.40	2219.32	1836.68	1606.55	1435.32	1258.59
180.0	5147.22	4089.59	3299.53	2600.31	2151.05	1800.34	1563.60	1406.14	1266.85
225.0	5950.50	4797.61	3898.54	3056.18	2421.93	2025.52	1723.27	1536.62	1370.35
270.0	5467.10	4393.50	3562.15	2879.45	2507.27	1907.15	1662.70	1503.04	1300.43
315.0	4342.85	3416.80	2760.53	2202.26	1814.66	1586.17	1403.94	1266.30	1097.05
360.0	4503.61	3655.74	2873.94	2503.97	1926.42	1635.18	1453.49	1286.12	1140.77
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	1031.21	937.61	836.86	766.94	707.47	650.22	597.36	552.22	502.66
45.0	931.55	835.21	752.62	698.67	640.31	594.06	543.41	499.91	452.56
90.0	973.29	882.72	805.31	723.83	669.87	621.86	565.43	520.78	478.33
135.0	1134.16	1025.70	905.13	831.90	760.88	698.12	641.41	592.96	542.86
180.0	1095.18	1004.56	914.49	818.52	754.33	698.78	643.06	590.15	543.74
225.0	1227.76	1098.43	1010.84	911.24	826.56	759.72	694.21	636.34	587.73
270.0	1174.35	1075.80	942.57	862.18	801.07	726.19	668.94	626.54	566.53
315.0	1006.93	915.37	836.42	751.74	694.43	644.33	586.19	541.53	499.14
360.0	1031.21	937.61	836.86	766.94	707.47	650.22	597.36	552.22	502.66
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	455.32	414.57	370.53	335.29	300.61	278.59	239.72	213.23	189.45
45.0	412.37	371.63	328.69	298.41	279.69	232.78	208.17	186.92	163.68
90.0	432.47	385.78	349.44	316.74	283.04	251.88	226.67	201.40	179.32
135.0	500.46	454.77	406.32	365.02	325.93	289.05	278.03	233.16	204.53
180.0	493.80	450.42	402.57	358.09	322.58	287.28	256.01	230.74	207.40
225.0	539.99	482.18	439.18	396.41	354.01	315.64	284.59	252.60	223.86
270.0	521.38	476.79	422.83	384.84	349.61	307.77	281.34	247.81	216.59
315.0	453.33	406.92	368.88	326.21	299.12	267.02	234.76	214.06	190.61
360.0	455.32	414.57	370.53	335.29	300.61	278.59	239.72	213.23	189.45
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	170.62	154.43	137.53	122.50	110.55	100.48	89.58	81.26	73.00
45.0	148.21	134.61	120.35	108.57	98.33	88.97	79.50	71.57	62.82
90.0	162.64	146.95	133.73	120.41	108.41	98.94	90.24	79.83	71.63
135.0	184.22	166.55	149.59	133.90	121.29	108.74	97.17	87.87	78.13
180.0	181.96	164.73	149.97	133.84	120.24	109.18	98.17	87.87	79.01
225.0	201.29	179.59	163.30	146.39	131.47	120.24	109.62	97.78	88.75
270.0	194.24	174.58	156.03	138.30	125.58	112.26	100.64	91.23	81.15
315.0	168.36	155.64	140.01	121.40	110.94	100.81	90.46	80.49	71.90
360.0	170.62	154.43	137.53	122.50	110.55	100.48	89.58	81.26	73.00

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	63.15	55.77	49.17	42.39	36.34	31.44	26.48	22.68	19.16
45.0	55.99	48.61	42.28	37.00	32.21	26.98	23.23	20.04	16.52
90.0	63.87	55.17	48.84	43.22	37.44	32.04	27.69	23.40	19.88
135.0	70.25	60.95	52.80	46.80	40.80	34.52	29.84	25.66	21.31
180.0	69.26	61.22	53.13	45.86	40.14	34.41	29.18	25.05	21.58
225.0	79.94	68.99	60.67	53.35	45.97	39.42	34.13	28.90	24.89
270.0	72.51	63.20	54.62	47.79	41.79	35.18	30.50	26.37	22.08
315.0	62.76	54.45	47.68	41.02	35.79	30.39	25.66	22.02	18.94
360.0	63.15	55.77	49.17	42.39	36.34	31.44	26.48	22.68	19.16
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	16.02	13.87	12.00	10.74	10.19	10.13	10.08	10.08	10.02
45.0	14.26	12.55	11.18	10.46	10.41	10.35	10.30	10.30	10.30
90.0	16.35	13.71	12.00	10.85	10.57	10.52	10.52	10.46	10.41
135.0	18.33	15.69	13.65	11.84	10.90	10.57	10.57	10.57	10.46
180.0	17.84	15.31	13.38	11.78	10.74	10.57	10.52	10.46	10.46
225.0	20.98	17.56	15.03	12.88	11.40	10.57	10.46	10.41	10.41
270.0	19.10	16.46	13.98	12.17	11.01	10.35	10.30	10.30	10.24
315.0	15.47	13.32	11.73	10.35	10.08	10.02	9.97	9.97	9.91
360.0	16.02	13.87	12.00	10.74	10.19	10.13	10.08	10.08	10.02
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.02	10.02	9.97	9.97	9.97	9.91	9.80	9.80	9.74
45.0	10.24	10.24	10.19	10.24	10.19	10.13	10.13	10.13	10.08
90.0	10.41	10.41	10.35	10.35	10.35	10.30	10.30	10.24	10.30
135.0	10.46	10.41	10.35	10.41	10.35	10.30	10.30	10.30	10.24
180.0	10.35	10.35	10.35	10.30	10.30	10.24	10.13	10.13	10.08
225.0	10.35	10.35	10.30	10.35	10.30	10.24	10.24	10.24	10.19
270.0	10.19	10.13	10.13	10.13	10.08	10.02	10.08	10.02	10.02
315.0	9.91	9.91	9.86	9.80	9.86	9.80	9.80	9.80	9.74
360.0	10.02	10.02	9.97	9.97	9.97	9.91	9.80	9.80	9.74
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.58	9.47	9.47	9.41	9.47	9.58	9.47	9.47	9.58
45.0	10.02	10.08	10.02	9.97	9.91	9.80	9.74	9.58	9.47
90.0	10.30	10.46	13.27	17.07	20.32	22.85	24.33	22.30	15.97
135.0	10.24	10.24	10.24	10.24	10.24	10.24	10.24	10.19	10.02
180.0	10.08	10.02	9.97	9.91	9.91	9.91	9.86	9.97	9.97
225.0	10.24	10.24	10.35	12.33	15.20	17.56	19.82	21.75	21.86
270.0	10.02	10.02	10.02	9.97	9.91	9.86	9.86	9.74	9.63
315.0	9.74	9.69	9.69	10.24	12.06	13.54	14.26	13.54	11.23
360.0	9.58	9.47	9.47	9.41	9.47	9.58	9.47	9.47	9.58
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.69	9.69	9.74	9.80	9.74	9.47	8.15	7.05	6.72
45.0	9.36	9.25	9.19	9.08	9.03	7.43	6.88	6.83	6.83
90.0	11.12	9.63	9.69	9.80	9.80	7.49	6.94	6.83	6.83
135.0	9.91	9.86	9.80	9.74	9.69	9.14	7.38	6.83	6.77
180.0	10.02	10.02	10.02	10.02	9.86	9.25	7.32	6.83	6.72
225.0	18.72	13.76	11.01	10.24	10.08	10.02	10.08	8.48	7.27
270.0	9.52	9.47	9.36	9.25	9.19	9.14	9.08	8.26	7.32
315.0	9.91	9.74	9.58	9.47	9.47	9.41	8.81	7.32	6.83
360.0	9.69	9.69	9.74	9.80	9.74	9.47	8.15	7.05	6.72

Intensity data(cd)

C/ γ (°)	90.0
0.0	6.72
45.0	6.83
90.0	6.83
135.0	6.77
180.0	6.72
225.0	6.83
270.0	6.88
315.0	6.77
360.0	6.72