



NATA LIGHTING CO.,LTD.
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Nata

Client:

LumCAT: LM01D03024AE

Luminaire:

Report No: GC2019091909

Voltage(V): 220.5000

Test No: NATA07

Current(A): 0.0180

LampCAT: CREE CXA1304

Power (W): 2.9800

Lamp flux(lm): 231.0

PF: 0.7290

Number of Lamps: 1

Ballast type: AC

Length(mm): 30

Width(mm): 30

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 211.49, Efficiency(%): 91.55% , Luminous Efficacy(lm/W): 70.97

Central intensity(cd): 905.990, Maximum intensity(cd): 905.990

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=22.6

[C90/270]Total=22.6

Field angle(10%Imax): [C0/180]Total=45.2

[C90/270]Total=45.2

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

Maximum s/h(1/4): C0_180=0.39 C90_270=0.39

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 91.55%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 94.955%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	905.990	0.000	0	.000%	.000%
1.0	903.276	0.866	0.866	.375%	.409%
2.0	888.525	2.572	3.437	1.113%	1.625%
3.0	870.724	4.208	7.645	1.821%	3.615%
4.0	844.982	5.743	13.388	2.486%	6.330%
5.0	805.893	7.102	20.49	3.074%	9.688%
6.0	758.555	8.222	28.712	3.559%	13.576%
7.0	707.941	9.103	37.814	3.940%	17.880%
8.0	647.547	9.701	47.515	4.200%	22.467%
9.0	587.188	10.007	57.522	4.332%	27.198%
10.0	529.364	10.104	67.626	4.374%	31.976%
11.0	470.774	9.993	77.62	4.326%	36.701%
12.0	415.861	9.692	87.312	4.196%	41.284%
13.0	360.397	9.212	96.524	3.988%	45.640%
14.0	312.399	8.612	105.136	3.728%	49.712%
15.0	274.632	8.059	113.195	3.489%	53.522%
16.0	234.917	7.466	120.661	3.232%	57.053%
17.0	199.952	6.772	127.433	2.932%	60.255%
18.0	172.377	6.139	133.572	2.658%	63.157%
19.0	152.766	5.657	139.229	2.449%	65.832%
20.0	135.973	5.285	144.514	2.288%	68.331%
21.0	113.213	4.785	149.299	2.071%	70.593%
22.0	99.193	4.268	153.567	1.848%	72.612%
23.0	85.800	3.882	157.449	1.680%	74.447%
24.0	75.052	3.517	160.965	1.522%	76.110%
25.0	65.609	3.198	164.164	1.385%	77.622%
26.0	56.989	2.894	167.058	1.253%	78.990%
27.0	49.936	2.616	169.674	1.132%	80.227%
28.0	43.747	2.372	172.045	1.027%	81.349%
29.0	38.648	2.156	174.201	.933%	82.368%
30.0	33.956	1.960	176.161	.849%	83.295%
31.0	30.145	1.784	177.945	.772%	84.138%
32.0	26.815	1.632	179.577	.706%	84.910%
33.0	24.095	1.500	181.077	.649%	85.619%
34.0	21.427	1.378	182.455	.596%	86.270%
35.0	19.246	1.263	183.718	.547%	86.868%
36.0	17.488	1.170	184.887	.506%	87.421%
37.0	15.818	1.086	185.974	.470%	87.934%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	14.501	1.012	186.986	.438%	88.413%
39.0	13.306	0.949	187.935	.411%	88.862%
40.0	12.332	0.894	188.829	.387%	89.284%
41.0	11.351	0.843	189.672	.365%	89.683%
42.0	10.615	0.798	190.47	.345%	90.061%
43.0	9.994	0.763	191.234	.330%	90.422%
44.0	9.362	0.731	191.964	.316%	90.767%
45.0	8.805	0.698	192.662	.302%	91.097%
46.0	8.382	0.672	193.335	.291%	91.415%
47.0	7.941	0.649	193.984	.281%	91.722%
48.0	7.564	0.627	194.61	.271%	92.018%
49.0	7.198	0.606	195.217	.262%	92.305%
50.0	6.873	0.587	195.803	.254%	92.582%
51.0	6.583	0.569	196.373	.246%	92.851%
52.0	6.288	0.552	196.925	.239%	93.113%
53.0	6.003	0.535	197.46	.231%	93.365%
54.0	5.783	0.519	197.979	.225%	93.611%
55.0	5.528	0.505	198.484	.219%	93.850%
56.0	5.331	0.491	198.975	.212%	94.082%
57.0	5.168	0.480	199.455	.208%	94.309%
58.0	4.959	0.468	199.923	.203%	94.530%
59.0	4.774	0.455	200.378	.197%	94.745%
60.0	4.623	0.444	200.822	.192%	94.955%
61.0	4.501	0.435	201.257	.188%	95.161%
62.0	4.356	0.427	201.684	.185%	95.363%
63.0	4.240	0.418	202.102	.181%	95.561%
64.0	4.124	0.410	202.513	.178%	95.755%
65.0	3.979	0.401	202.914	.174%	95.944%
66.0	3.880	0.392	203.306	.170%	96.130%
67.0	3.799	0.386	203.692	.167%	96.312%
68.0	3.619	0.376	204.068	.163%	96.490%
69.0	3.509	0.364	204.432	.157%	96.662%
70.0	3.445	0.357	204.789	.155%	96.831%
71.0	3.364	0.352	205.141	.152%	96.997%
72.0	3.283	0.346	205.486	.150%	97.161%
73.0	3.202	0.339	205.825	.147%	97.321%
74.0	3.150	0.334	206.159	.145%	97.479%
75.0	3.109	0.331	206.49	.143%	97.635%

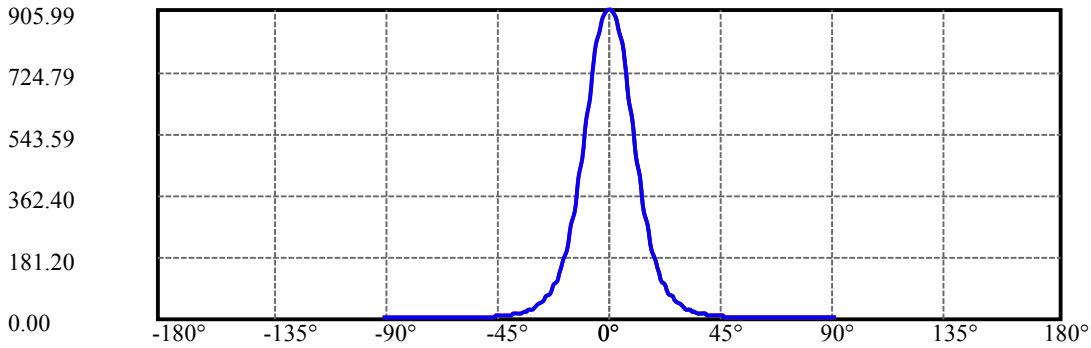
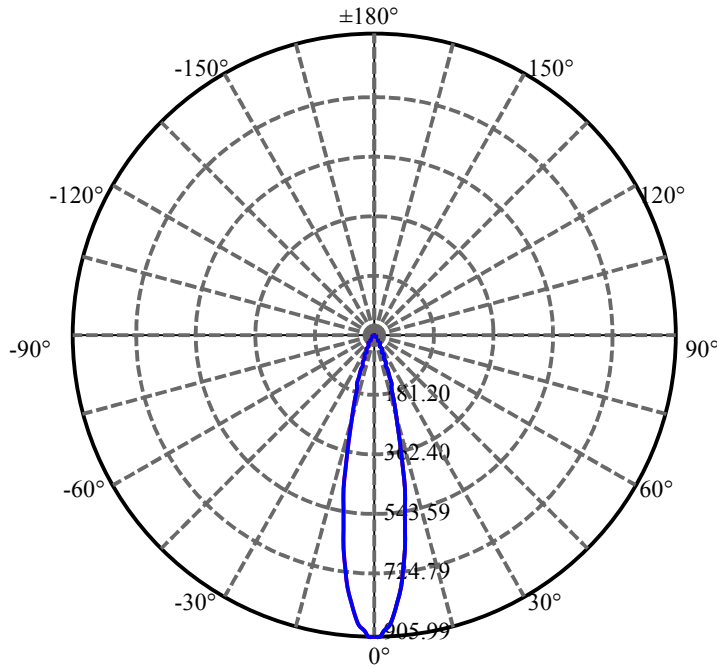
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	3.039	0.326	206.816	.141%	97.790%
77.0	3.022	0.323	207.14	.140%	97.942%
78.0	3.045	0.325	207.464	.141%	98.096%
79.0	3.092	0.330	207.794	.143%	98.252%
80.0	3.126	0.335	208.129	.145%	98.410%
81.0	3.196	0.342	208.471	.148%	98.572%
82.0	3.248	0.349	208.821	.151%	98.737%
83.0	3.266	0.354	209.175	.153%	98.905%
84.0	3.208	0.353	209.528	.153%	99.071%
85.0	3.092	0.344	209.871	.149%	99.234%
86.0	3.057	0.336	210.207	.145%	99.393%
87.0	2.993	0.331	210.538	.143%	99.550%
88.0	2.941	0.325	210.864	.141%	99.703%
89.0	2.836	0.317	211.18	.137%	99.853%
90.0	2.836	0.311	211.491	.135%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	176.16	76.26%	83.29%
0-40	188.83	81.74%	89.28%
0-60	200.82	86.94%	94.96%
0-90	211.18	91.42%	99.85%
0-120	211.18	91.42%	99.85%
0-180	211.49	91.55%	100.00%
60-90	10.80	4.68%	5.11%
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%
0-26.82	169.19	73.24%	80.00%

ZONAL LUMEN SUMMARY

0-10	67.63
10-20	76.89
20-30	31.65
30-40	12.67
40-50	6.97
50-60	5.02
60-70	3.97
70-80	3.34
80-90	3.05
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: —————

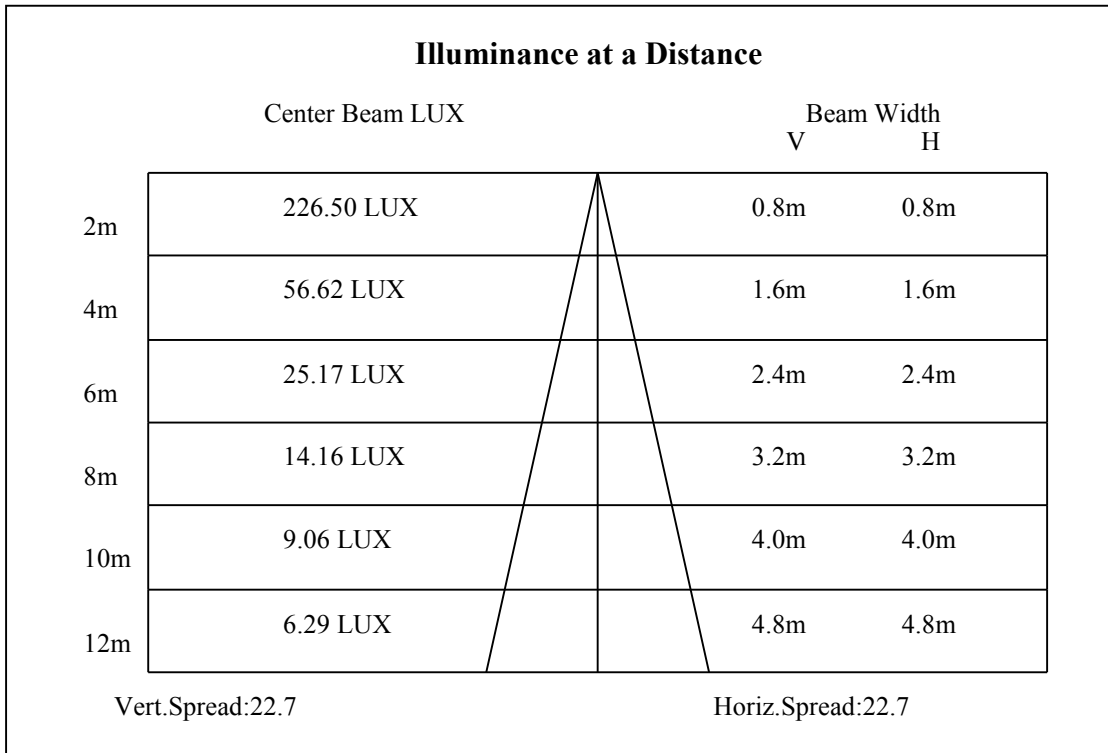
C90/C270: —————

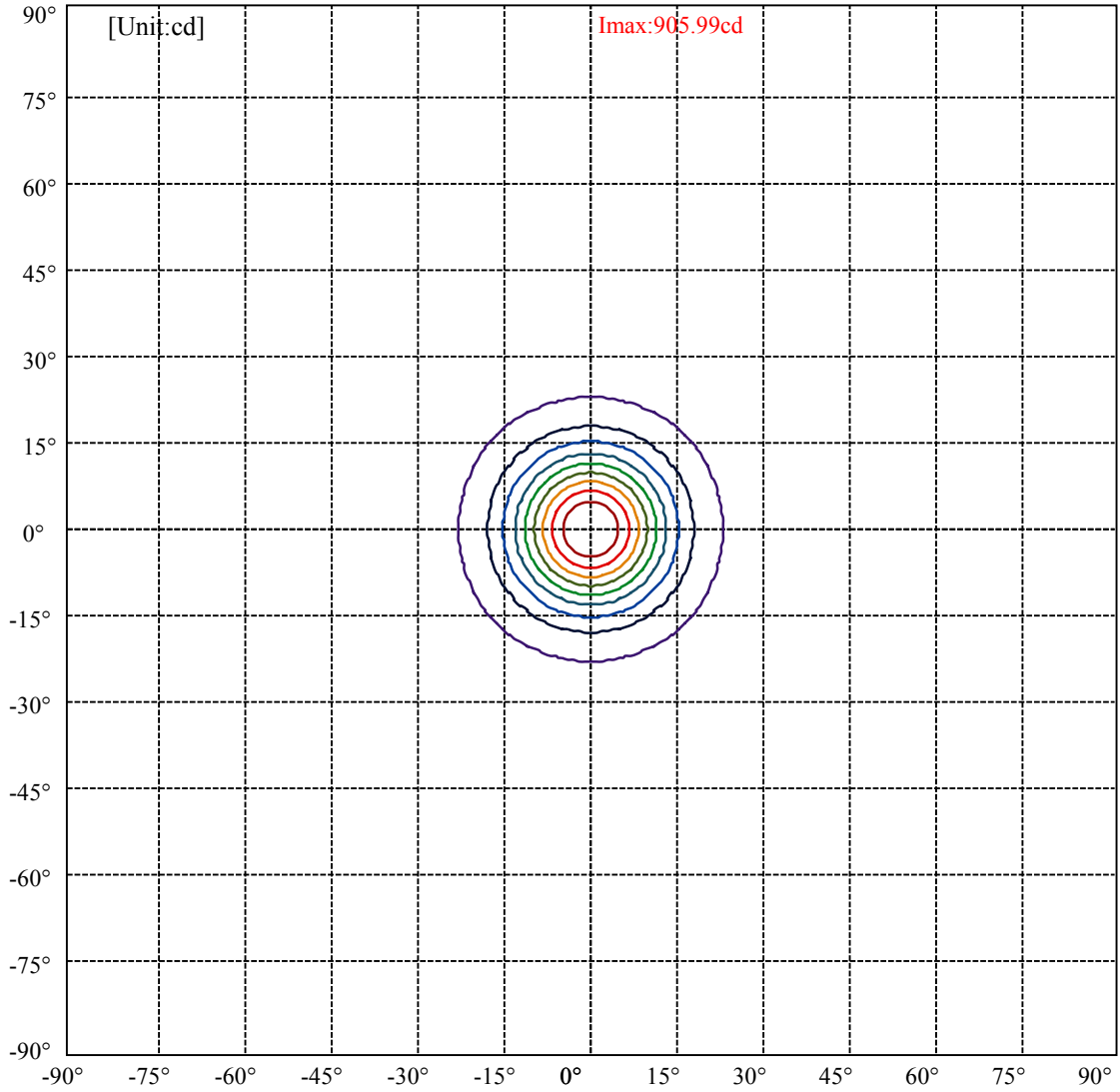
Field angle(10%Imax):C0/180Left:22.6 Right:22.6

:C90/270Left:22.6 Right:22.6

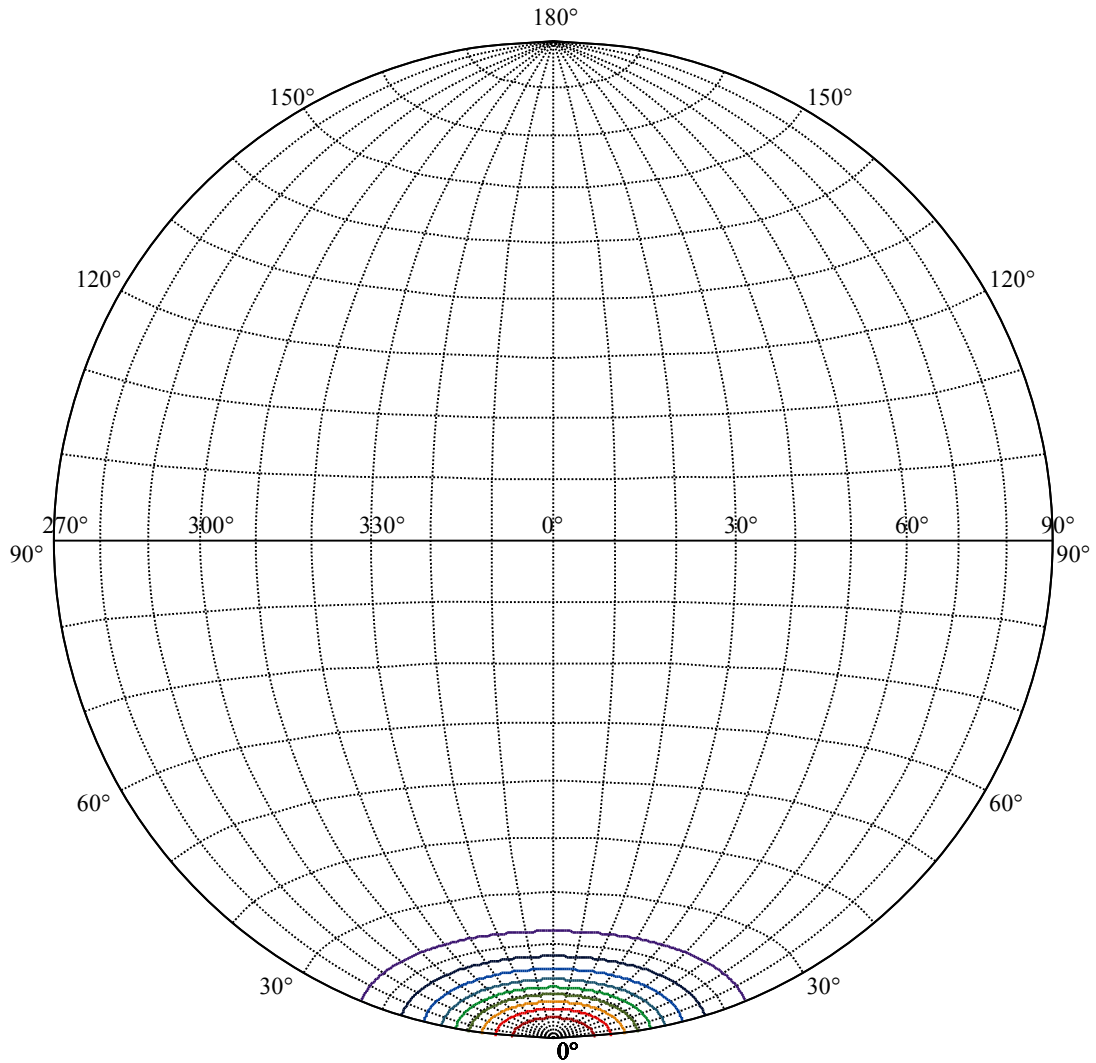
Beam Angle(50%Imax):C0/180Left:11.3 Right:11.3

:C90/270Left:11.3 Right:11.3





(10%Imax) 90.599	—
(20%Imax) 181.198	—
(30%Imax) 271.797	—
(40%Imax) 362.396	—
(50%Imax) 452.995	—
(60%Imax) 543.594	—
(70%Imax) 634.193	—
(80%Imax) 724.792	—
(90%Imax) 815.391	—



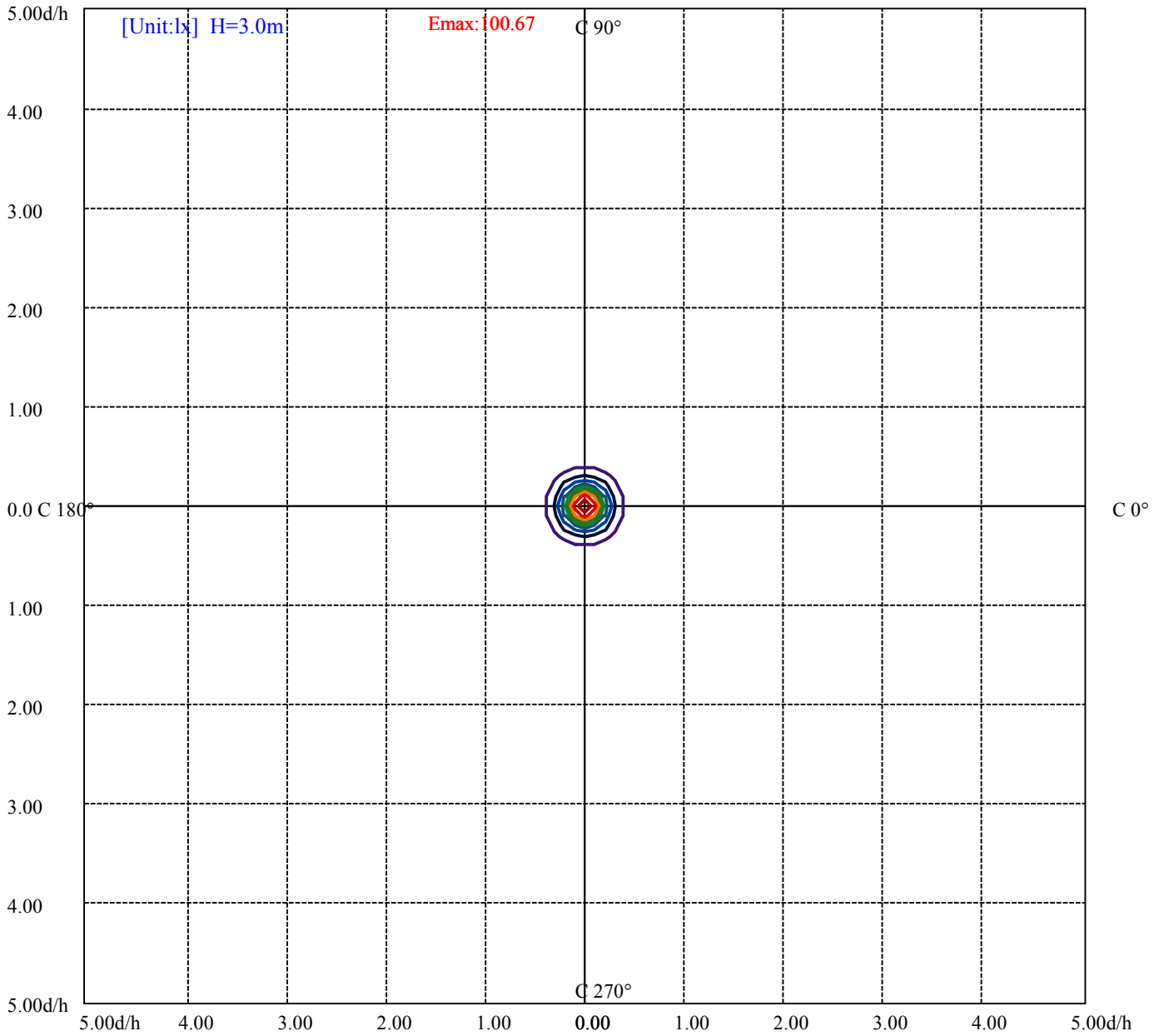
House

[Unit:cd]

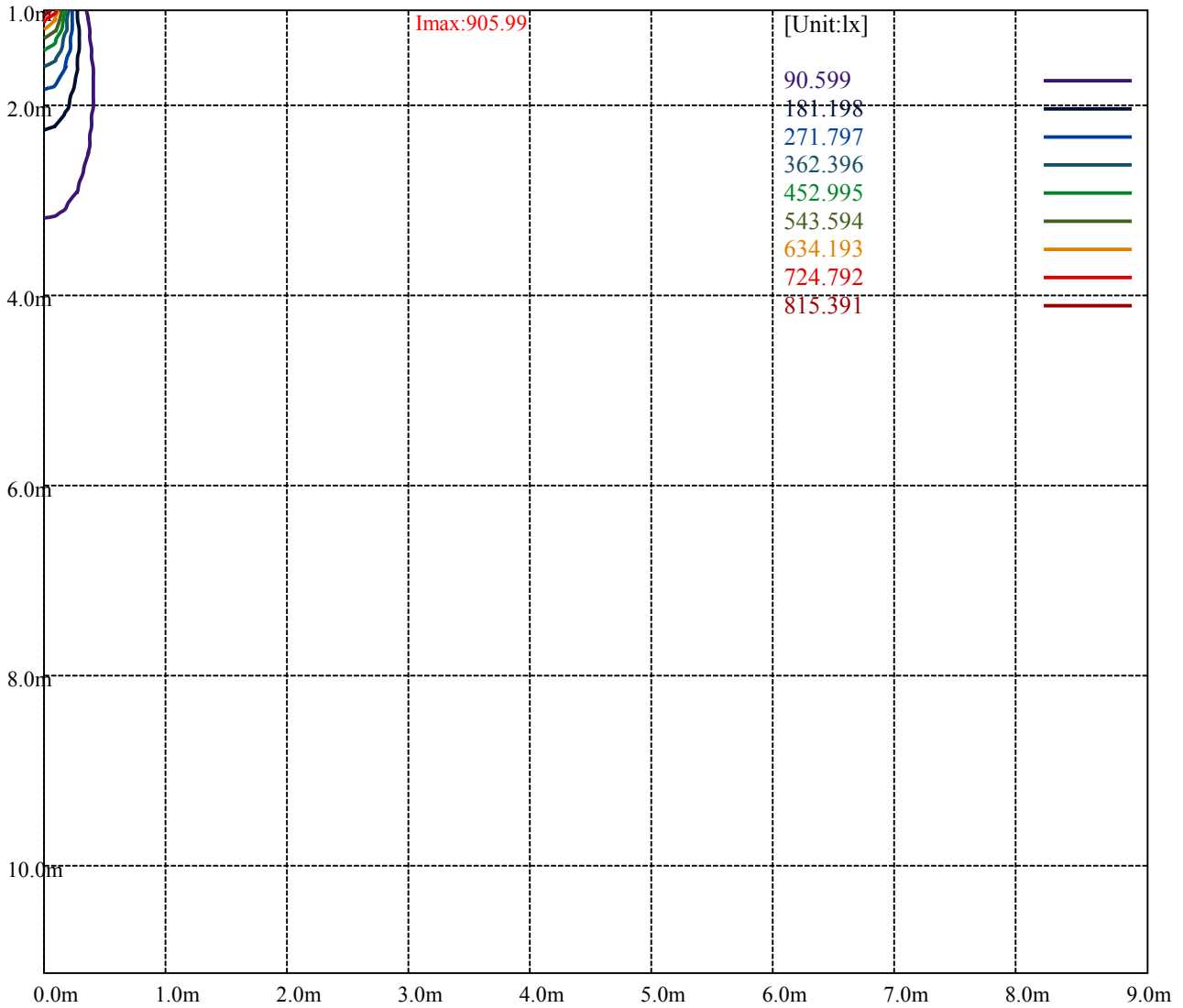
Road

Imax:905.99

(10%Imax) 90.599	—
(20%Imax) 181.198	—
(30%Imax) 271.797	—
(40%Imax) 362.396	—
(50%Imax) 452.995	—
(60%Imax) 543.594	—
(70%Imax) 634.193	—
(80%Imax) 724.792	—
(90%Imax) 815.391	—



- (10%Emax) 10.06656
- (20%Emax) 20.13311
- (30%Emax) 30.19967
- (40%Emax) 40.26622
- (50%Emax) 50.33278
- (60%Emax) 60.39933
- (70%Emax) 70.46589
- (80%Emax) 80.53244
- (90%Emax) 90.599



Luminance Table

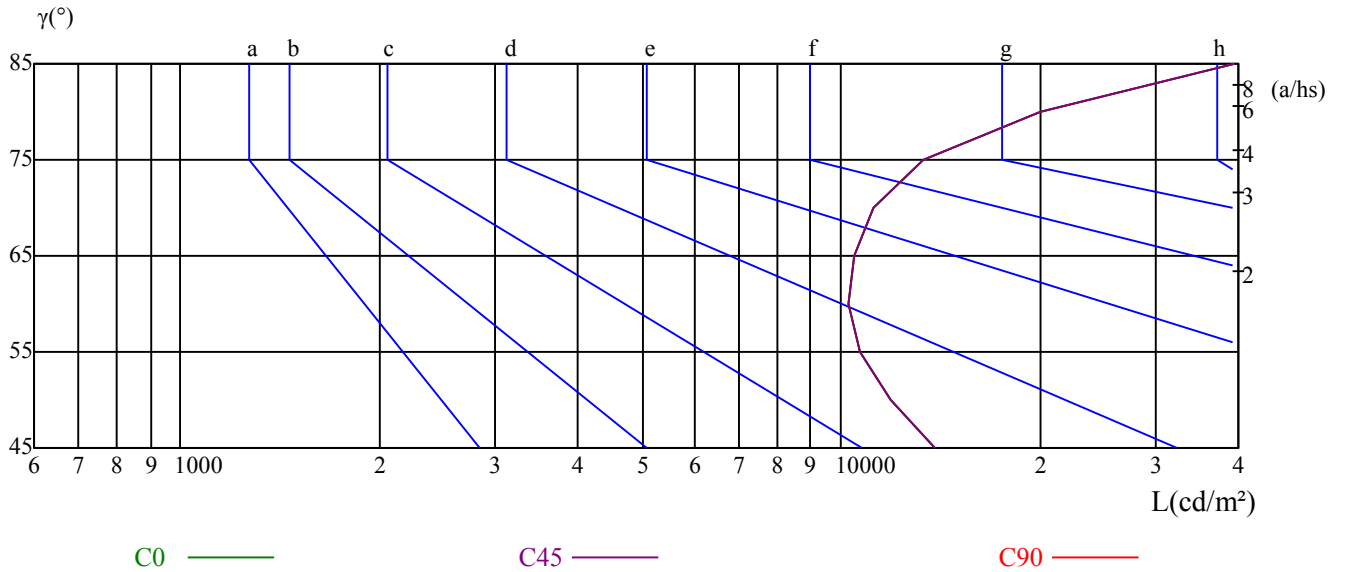
γ	45	50	55	60	65	70	75	80	85
C0	13836	11881	10708	10273	10461	11193	13347	20005	39414
C45	13836	11881	10708	10273	10461	11193	13347	20005	39414
C90	13836	11881	10708	10273	10461	11193	13347	20005	39414

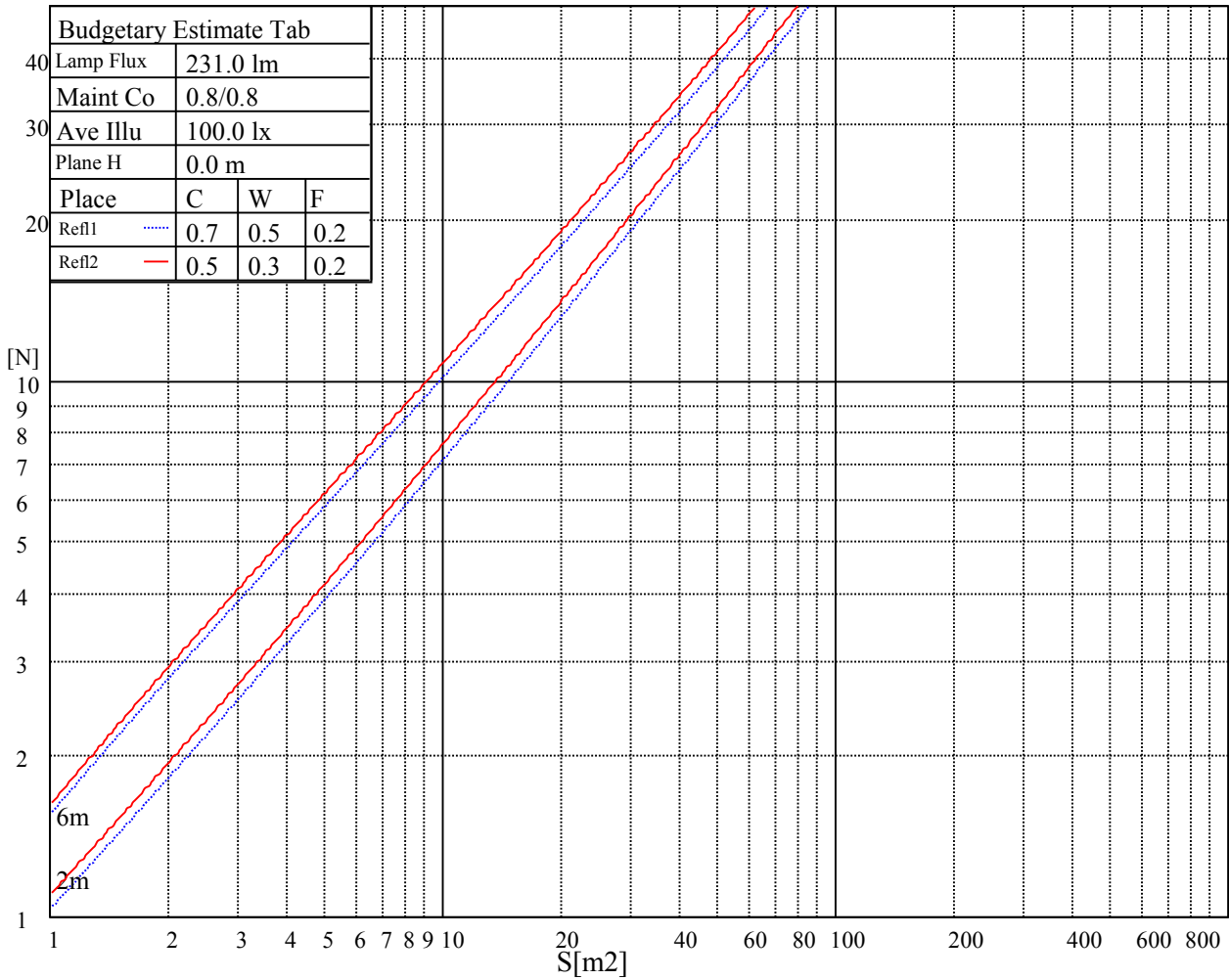
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
10461	10461	10461	13347	13347	13347	39414	39414	39414

Glare Table

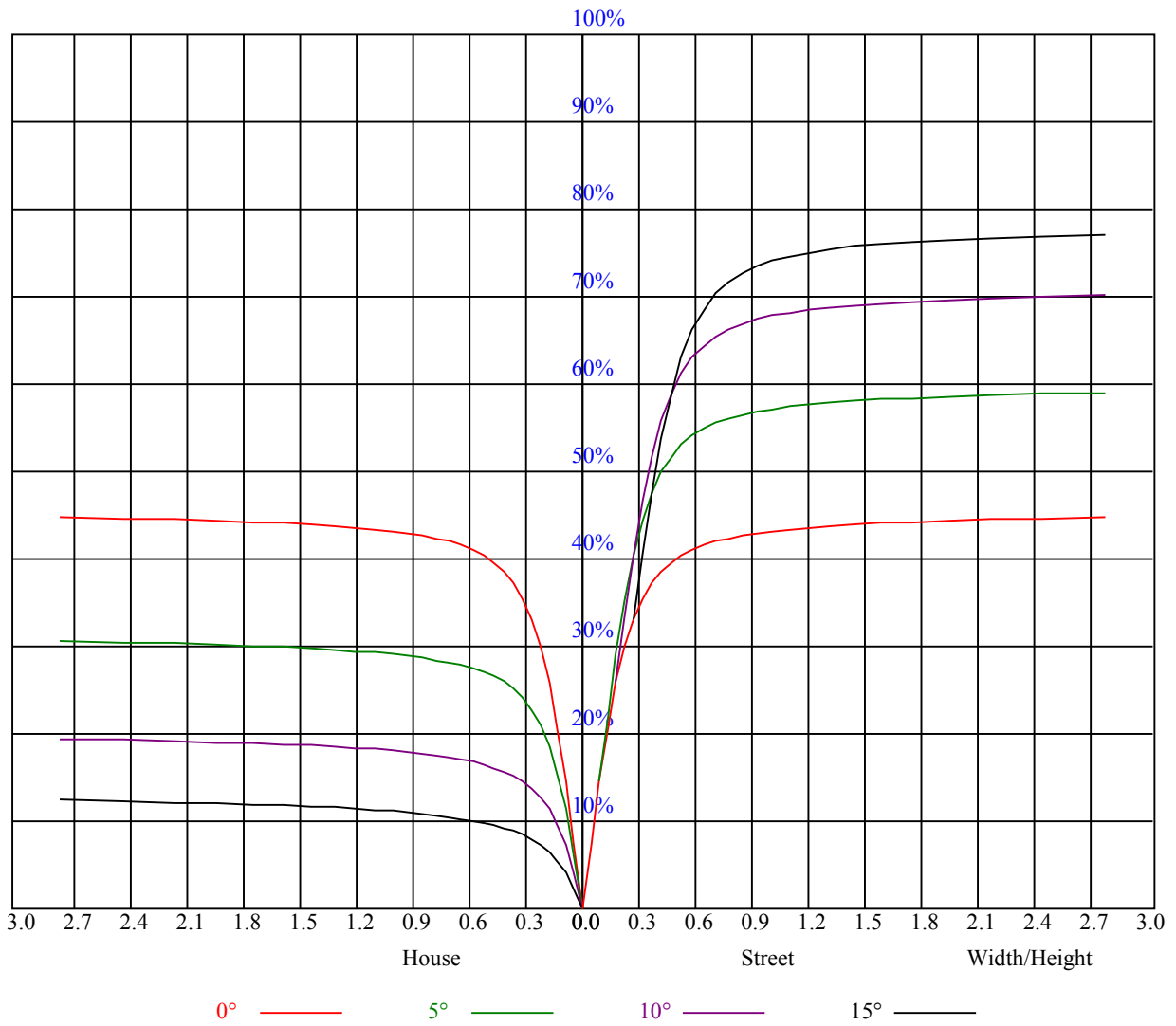
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

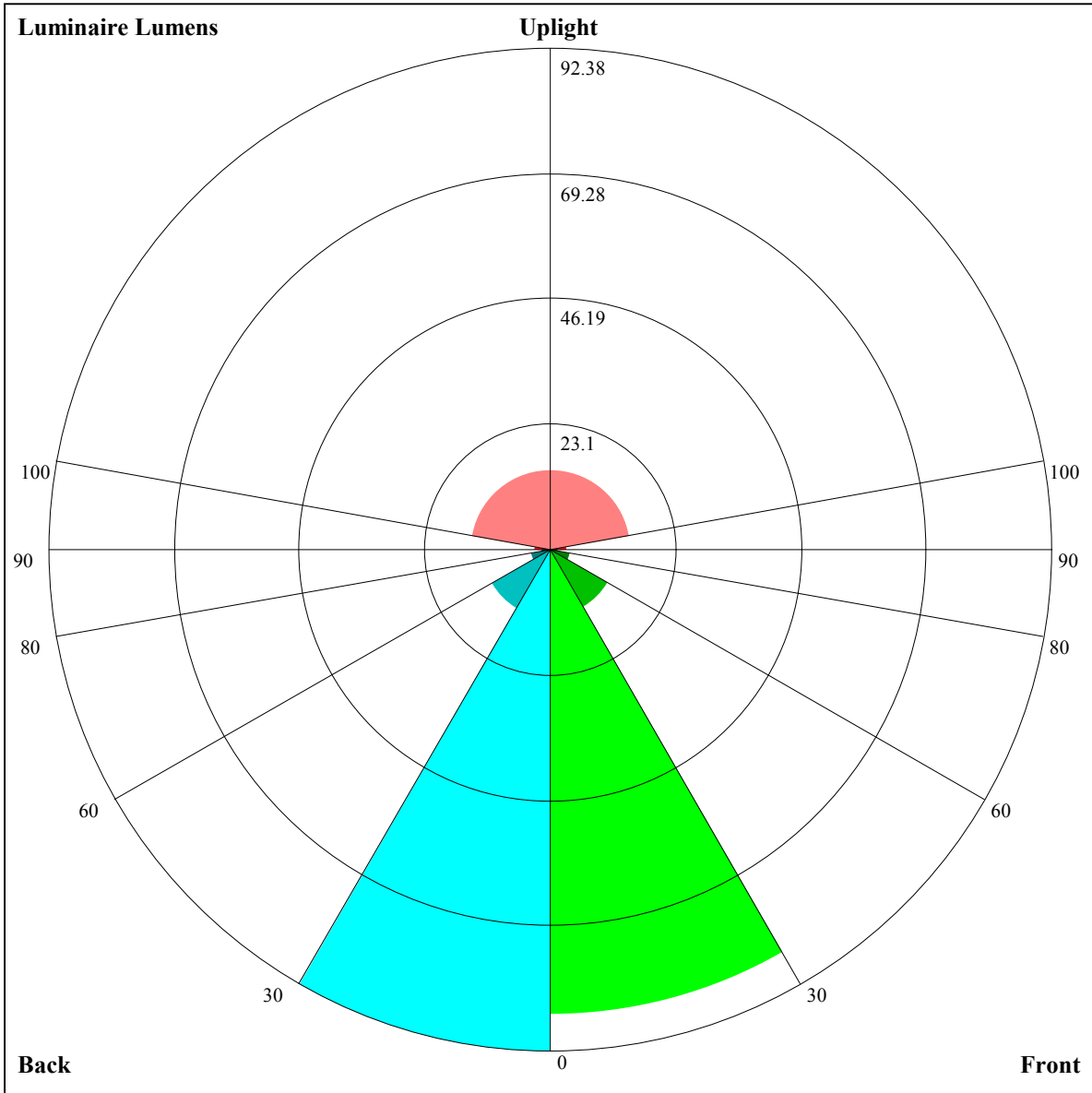
Luminance Limiting Curve





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	1.09	1.09	1.09	1.06	1.06	1.06	1.02	1.02	1.02	0.97	0.97	0.97	0.93	0.93	0.93	0.92
1	1.01	0.99	0.97	0.99	0.97	0.96	0.96	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87	0.86
2	0.95	0.92	0.89	0.94	0.91	0.88	0.91	0.88	0.86	0.88	0.86	0.84	0.86	0.84	0.82	0.81
3	0.90	0.86	0.83	0.89	0.85	0.82	0.87	0.84	0.81	0.85	0.82	0.80	0.82	0.80	0.79	0.77
4	0.86	0.82	0.78	0.85	0.81	0.78	0.83	0.80	0.77	0.81	0.78	0.76	0.80	0.77	0.75	0.74
5	0.82	0.78	0.74	0.81	0.77	0.74	0.80	0.76	0.73	0.78	0.75	0.73	0.77	0.74	0.72	0.71
6	0.79	0.74	0.71	0.78	0.74	0.71	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.69	0.68
7	0.76	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
8	0.73	0.69	0.66	0.73	0.68	0.66	0.72	0.68	0.65	0.71	0.68	0.65	0.70	0.67	0.65	0.64
9	0.71	0.66	0.63	0.70	0.66	0.63	0.70	0.66	0.63	0.69	0.65	0.63	0.68	0.65	0.63	0.62
10	0.69	0.64	0.61	0.68	0.64	0.61	0.67	0.64	0.61	0.67	0.63	0.61	0.66	0.63	0.61	0.60





Luminaire Lumens:

FL=85.58,FM=12.15,FH=3.64,FVH=1.59

BL=92.38,BM=12.46,BH=3.76,BVH=1.79

UL=3.09,UH=14.73

BUG Rating:B0-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	903.57	882.96	857.63	838.14	798.23	748.67	692.52	629.88	564.64
45.0	915.12	901.20	864.54	826.95	799.58	742.04	680.32	613.50	546.68
90.0	892.10	861.94	817.86	767.14	703.06	636.19	566.45	498.00	433.55
135.0	913.17	903.10	884.17	857.86	821.34	772.06	709.55	642.73	573.92
180.0	903.57	907.51	910.71	907.46	892.20	864.77	828.30	781.34	726.44
225.0	915.12	933.68	942.03	920.74	920.74	895.68	865.33	828.86	782.17
270.0	892.10	917.63	917.63	946.67	947.14	939.25	919.76	892.38	856.19
315.0	913.17	918.18	913.64	900.83	877.58	848.49	806.21	776.84	696.79
360.0	903.57	882.96	857.63	838.14	798.23	748.67	692.52	629.88	564.64
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	500.51	438.51	381.81	330.21	284.82	246.59	214.38	186.96	163.20
45.0	482.64	423.24	366.63	317.45	275.22	238.56	204.41	175.52	153.41
90.0	375.50	324.08	278.98	255.36	207.28	189.37	163.53	134.24	123.57
135.0	507.42	443.99	384.22	351.69	302.46	244.17	222.50	191.37	165.52
180.0	664.08	596.75	530.39	466.17	405.52	349.93	299.58	256.70	219.95
225.0	724.17	658.09	603.20	518.84	450.81	399.49	341.62	290.72	248.91
270.0	812.10	758.74	697.02	628.35	558.74	488.67	423.71	363.38	309.56
315.0	631.09	591.50	523.94	458.84	398.33	342.41	293.18	251.55	215.50
360.0	500.51	438.51	381.81	330.21	284.82	246.59	214.38	186.96	163.20
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	143.11	125.34	110.21	97.03	85.47	75.54	66.91	60.65	52.34
45.0	135.27	125.29	105.15	97.54	86.50	76.66	67.75	60.46	53.60
90.0	107.98	94.99	83.15	73.13	64.18	56.43	49.61	43.76	38.56
135.0	143.29	124.27	107.75	94.06	82.23	71.97	63.06	55.31	48.35
180.0	188.26	171.88	148.12	121.58	111.65	96.94	83.94	73.04	63.53
225.0	213.08	182.83	157.59	136.15	117.77	102.04	88.03	75.78	65.38
270.0	262.23	237.63	237.63	166.91	142.69	118.28	104.83	90.16	77.31
315.0	185.80	159.91	138.19	119.30	103.06	88.54	76.29	65.71	56.84
360.0	143.11	125.34	110.21	97.03	85.47	75.54	66.91	60.65	52.34
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	47.42	42.00	37.31	33.27	29.61	26.40	23.57	21.21	19.16
45.0	47.75	42.64	38.10	33.87	30.21	26.96	24.32	21.95	19.81
90.0	34.06	30.25	26.77	23.76	21.16	19.07	17.91	15.55	14.76
135.0	42.60	37.77	33.78	30.16	26.96	24.13	21.39	19.77	17.59
180.0	55.68	48.96	43.16	38.05	33.78	30.25	26.91	24.13	21.58
225.0	56.57	49.09	42.97	37.54	33.13	29.37	27.29	23.34	20.74
270.0	66.22	56.47	48.63	42.00	36.38	31.88	27.93	24.64	21.72
315.0	49.19	42.78	38.47	32.99	29.93	26.45	23.43	20.84	18.61
360.0	47.42	42.00	37.31	33.27	29.61	26.40	23.57	21.21	19.16
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	17.40	15.87	14.57	13.27	12.06	11.14	10.49	9.79	9.14
45.0	17.96	17.08	15.08	13.78	13.18	12.02	11.14	10.49	9.79
90.0	13.55	12.16	11.69	10.90	10.26	9.70	9.19	8.72	8.26
135.0	16.38	14.99	13.78	12.95	11.93	11.09	10.44	9.88	9.28
180.0	19.35	17.59	16.24	14.90	13.64	12.71	11.74	11.14	10.35
225.0	19.49	16.80	15.78	14.39	13.09	12.02	11.04	10.35	9.65
270.0	19.21	17.12	15.27	13.74	12.90	11.46	10.95	10.21	9.56
315.0	16.57	14.94	13.60	12.53	11.60	10.67	9.93	9.37	8.86
360.0	17.40	15.87	14.57	13.27	12.06	11.14	10.49	9.79	9.14

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	8.58	8.21	7.56	7.29	6.91	6.45	6.22	5.99	5.75
45.0	9.10	8.63	8.07	7.66	7.19	6.82	6.50	6.13	5.80
90.0	7.89	7.56	7.15	6.77	6.50	6.31	6.03	5.71	5.48
135.0	8.77	8.40	7.98	7.56	7.19	6.87	6.64	6.36	6.03
180.0	9.61	9.00	8.49	8.03	7.56	7.10	6.73	6.36	5.99
225.0	9.00	8.54	8.17	7.80	7.38	7.01	6.73	6.45	6.08
270.0	9.10	8.72	8.35	7.98	7.75	7.47	7.24	6.96	6.73
315.0	8.40	7.98	7.75	7.42	7.10	6.96	6.59	6.36	6.17
360.0	8.58	8.21	7.56	7.29	6.91	6.45	6.22	5.99	5.75
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	5.52	5.29	5.15	5.01	4.78	4.59	4.55	4.36	4.22
45.0	5.57	5.34	5.06	4.83	4.64	4.45	4.22	4.08	3.99
90.0	5.29	5.10	4.97	4.83	4.64	4.55	4.45	4.32	4.13
135.0	5.80	5.66	5.43	5.29	5.10	4.83	4.73	4.59	4.50
180.0	5.61	5.38	5.24	5.06	4.83	4.64	4.55	4.41	4.27
225.0	5.94	5.43	5.20	5.06	4.78	4.69	4.45	4.41	4.27
270.0	6.54	6.31	6.08	5.94	5.75	5.52	5.29	5.20	4.97
315.0	5.99	5.71	5.52	5.34	5.15	4.92	4.73	4.64	4.50
360.0	5.52	5.29	5.15	5.01	4.78	4.59	4.55	4.36	4.22
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	4.08	3.99	3.90	3.71	3.71	3.57	3.43	3.39	3.29
45.0	3.94	3.81	3.62	3.62	3.53	3.34	3.11	3.02	2.92
90.0	3.99	3.94	3.81	3.67	3.57	3.53	3.43	3.34	3.25
135.0	4.41	4.27	4.08	3.99	3.94	3.76	3.62	3.53	3.43
180.0	4.08	4.04	3.90	3.81	3.81	3.71	3.57	3.53	3.43
225.0	4.18	4.04	3.99	3.94	3.76	3.62	3.53	3.48	3.39
270.0	4.87	4.73	4.55	4.45	4.36	4.22	4.08	3.99	3.90
315.0	4.36	4.18	3.99	3.85	3.71	3.20	3.29	3.29	3.29
360.0	4.08	3.99	3.90	3.71	3.71	3.57	3.43	3.39	3.29
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	3.16	3.11	3.06	3.02	2.97	3.06	3.20	3.43	3.67
45.0	2.88	2.88	2.97	2.97	2.88	2.92	2.97	3.06	3.06
90.0	3.25	3.20	3.16	3.06	3.11	3.20	3.20	3.16	3.16
135.0	3.34	3.20	3.11	3.11	3.02	3.02	3.06	2.97	2.97
180.0	3.39	3.29	3.25	3.25	3.20	3.11	3.16	3.29	3.53
225.0	3.34	3.25	3.25	3.20	3.06	3.02	3.02	3.06	3.02
270.0	3.81	3.67	3.57	3.53	3.43	3.34	3.34	3.34	3.20
315.0	3.11	3.02	2.83	2.74	2.64	2.51	2.41	2.41	2.41
360.0	3.16	3.11	3.06	3.02	2.97	3.06	3.20	3.43	3.67
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	3.90	3.90	3.76	3.29	2.83	2.69	2.55	2.51	2.37
45.0	3.20	3.16	3.20	3.06	2.88	2.74	2.74	2.83	2.83
90.0	3.16	3.16	3.06	3.06	2.97	3.02	3.06	3.16	2.97
135.0	2.97	2.97	2.97	2.78	2.83	2.78	2.69	2.69	2.64
180.0	3.76	4.04	4.41	4.59	4.69	4.73	4.32	3.43	2.97
225.0	3.02	3.11	3.16	3.34	3.34	3.29	3.34	3.11	3.11
270.0	3.20	3.25	3.25	3.34	3.39	3.39	3.34	3.53	3.48
315.0	2.37	2.41	2.32	2.18	1.81	1.81	1.90	2.27	2.32
360.0	3.90	3.90	3.76	3.29	2.83	2.69	2.55	2.51	2.37

Intensity data(cd)

C/γ(°)	90.0
0.0	2.27
45.0	2.92
90.0	2.97
135.0	2.74
180.0	2.78
225.0	3.11
270.0	3.53
315.0	2.37
360.0	2.27