
NATA

Client:

LumCAT: LM04L05060BQ

Luminaire:

Report No: GC2019031803

Voltage(V):

Test No: GC2018113004

Current(A):

LampCAT: LUMILEDS LUXEON3030 2D(ROUND LES) Power (W): 3.7200

Lamp flux(lm): 404.0

PF:

Number of Lamps: 1

Ballast type:

Length(mm): 50

Width(mm): 50

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 377.31, Efficiency(%): 93.39% , Luminous Efficacy(lm/W): 101.43

Central intensity(cd): 318.375, Maximum intensity(cd): 318.375

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=59.4

[C90/270]Total=59.4

Field angle(10%Imax): [C0/180]Total=111.0

[C90/270]Total=111.0

Maximum s/h(1/2): C0_180=0.88 C90_270=0.88

Maximum s/h(1/4): C0_180=0.92 C90_270=0.92

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 93.39%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 93.462%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	318.375	0.000	0	.000%	.000%
1.0	318.185	0.305	0.305	.075%	.081%
2.0	317.405	0.912	1.217	.226%	.323%
3.0	316.287	1.516	2.732	.375%	.724%
4.0	314.754	2.112	4.845	.523%	1.284%
5.0	312.652	2.699	7.544	.668%	1.999%
6.0	309.867	3.272	10.815	.810%	2.866%
7.0	306.886	3.828	14.643	.948%	3.881%
8.0	303.434	4.368	19.011	1.081%	5.039%
9.0	299.511	4.887	23.898	1.210%	6.334%
10.0	295.489	5.385	29.282	1.333%	7.761%
11.0	291.094	5.861	35.144	1.451%	9.314%
12.0	286.566	6.315	41.458	1.563%	10.988%
13.0	281.517	6.742	48.2	1.669%	12.775%
14.0	275.935	7.135	55.335	1.766%	14.666%
15.0	270.274	7.499	62.834	1.856%	16.653%
16.0	264.242	7.832	70.666	1.939%	18.729%
17.0	257.358	8.123	78.789	2.011%	20.882%
18.0	250.369	8.371	87.16	2.072%	23.101%
19.0	243.506	8.592	95.753	2.127%	25.378%
20.0	235.899	8.774	104.527	2.172%	27.703%
21.0	227.932	8.906	113.433	2.205%	30.064%
22.0	220.437	9.010	122.444	2.230%	32.452%
23.0	212.583	9.086	131.53	2.249%	34.860%
24.0	204.279	9.114	140.644	2.256%	37.276%
25.0	196.207	9.106	149.75	2.254%	39.689%
26.0	188.360	9.078	158.828	2.247%	42.095%
27.0	180.366	9.021	167.849	2.233%	44.486%
28.0	172.287	8.928	176.777	2.210%	46.852%
29.0	164.602	8.814	185.591	2.182%	49.188%
30.0	157.170	8.688	194.279	2.150%	51.491%
31.0	149.780	8.542	202.821	2.114%	53.755%
32.0	142.256	8.366	211.187	2.071%	55.972%
33.0	135.499	8.183	219.37	2.025%	58.141%
34.0	128.588	7.992	227.362	1.978%	60.259%
35.0	121.746	7.774	235.136	1.924%	62.320%
36.0	115.249	7.546	242.682	1.868%	64.320%
37.0	109.083	7.316	249.999	1.811%	66.259%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	102.889	7.075	257.074	1.751%	68.134%
39.0	96.855	6.818	263.892	1.688%	69.941%
40.0	91.357	6.564	270.456	1.625%	71.681%
41.0	86.070	6.318	276.774	1.564%	73.355%
42.0	80.965	6.069	282.843	1.502%	74.964%
43.0	75.853	5.809	288.652	1.438%	76.503%
44.0	71.388	5.557	294.209	1.376%	77.976%
45.0	67.064	5.321	299.53	1.317%	79.386%
46.0	62.740	5.076	304.606	1.257%	80.732%
47.0	58.711	4.830	309.437	1.196%	82.012%
48.0	55.231	4.606	314.043	1.140%	83.233%
49.0	51.638	4.389	318.432	1.086%	84.396%
50.0	47.932	4.151	322.583	1.028%	85.496%
51.0	44.810	3.924	326.507	.971%	86.536%
52.0	41.745	3.714	330.221	.919%	87.521%
53.0	38.538	3.492	333.713	.864%	88.446%
54.0	35.634	3.269	336.982	.809%	89.313%
55.0	33.040	3.066	340.048	.759%	90.125%
56.0	30.481	2.870	342.918	.710%	90.886%
57.0	28.083	2.678	345.596	.663%	91.596%
58.0	25.967	2.499	348.095	.619%	92.258%
59.0	24.153	2.343	350.438	.580%	92.879%
60.0	22.395	2.199	352.638	.544%	93.462%
61.0	20.813	2.062	354.699	.510%	94.008%
62.0	19.512	1.943	356.643	.481%	94.523%
63.0	18.324	1.840	358.483	.455%	95.011%
64.0	17.128	1.740	360.222	.431%	95.472%
65.0	15.996	1.639	361.862	.406%	95.907%
66.0	14.920	1.543	363.404	.382%	96.315%
67.0	13.711	1.440	364.844	.356%	96.697%
68.0	12.256	1.315	366.159	.326%	97.046%
69.0	10.674	1.170	367.329	.290%	97.356%
70.0	9.232	1.022	368.351	.253%	97.627%
71.0	8.044	0.893	369.244	.221%	97.863%
72.0	7.031	0.784	370.028	.194%	98.071%
73.0	6.286	0.696	370.724	.172%	98.256%
74.0	5.695	0.630	371.354	.156%	98.422%
75.0	5.203	0.576	371.93	.143%	98.575%

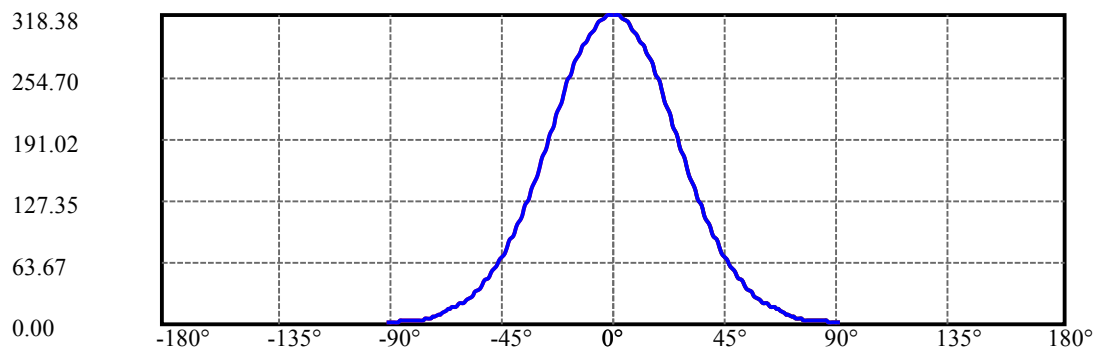
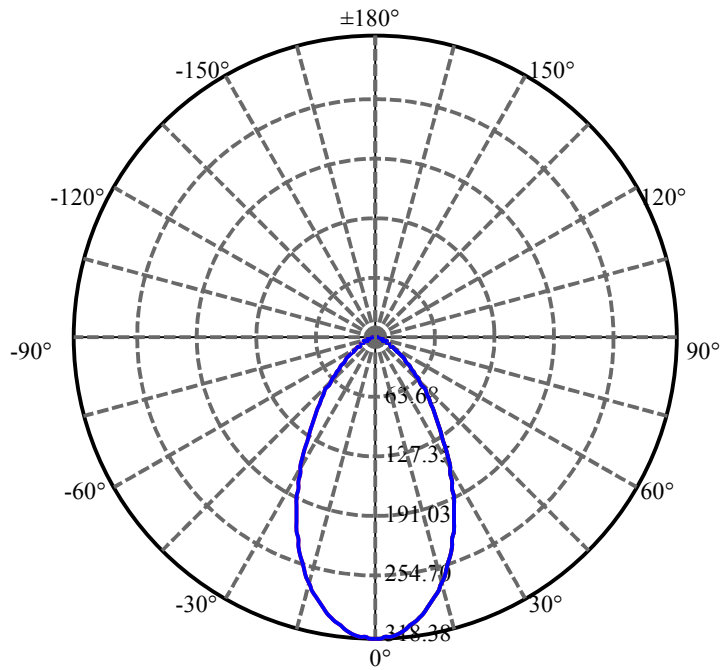
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	4.796	0.531	372.461	.131%	98.716%
77.0	4.486	0.495	372.956	.122%	98.847%
78.0	4.226	0.466	373.422	.115%	98.971%
79.0	3.994	0.442	373.864	.109%	99.088%
80.0	3.881	0.425	374.288	.105%	99.200%
81.0	3.776	0.414	374.702	.102%	99.310%
82.0	3.691	0.405	375.107	.100%	99.417%
83.0	3.509	0.391	375.499	.097%	99.521%
84.0	3.291	0.370	375.869	.092%	99.619%
85.0	3.108	0.349	376.218	.086%	99.712%
86.0	2.756	0.321	376.539	.079%	99.797%
87.0	1.927	0.256	376.795	.063%	99.865%
88.0	1.547	0.190	376.985	.047%	99.915%
89.0	1.449	0.164	377.15	.041%	99.959%
90.0	1.406	0.157	377.306	.039%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	194.28	48.09%	51.49%
0-40	270.46	66.94%	71.68%
0-60	352.64	87.29%	93.46%
0-90	377.15	93.35%	99.96%
0-120	377.15	93.35%	99.96%
0-180	377.31	93.39%	100.00%
60-90	26.71	6.61%	7.08%
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%
0-45.46	301.85	74.71%	80.00%

ZONAL LUMEN SUMMARY

0-10	29.28
10-20	75.24
20-30	89.75
30-40	76.18
40-50	52.13
50-60	30.05
60-70	15.71
70-80	5.94
80-90	2.86
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:

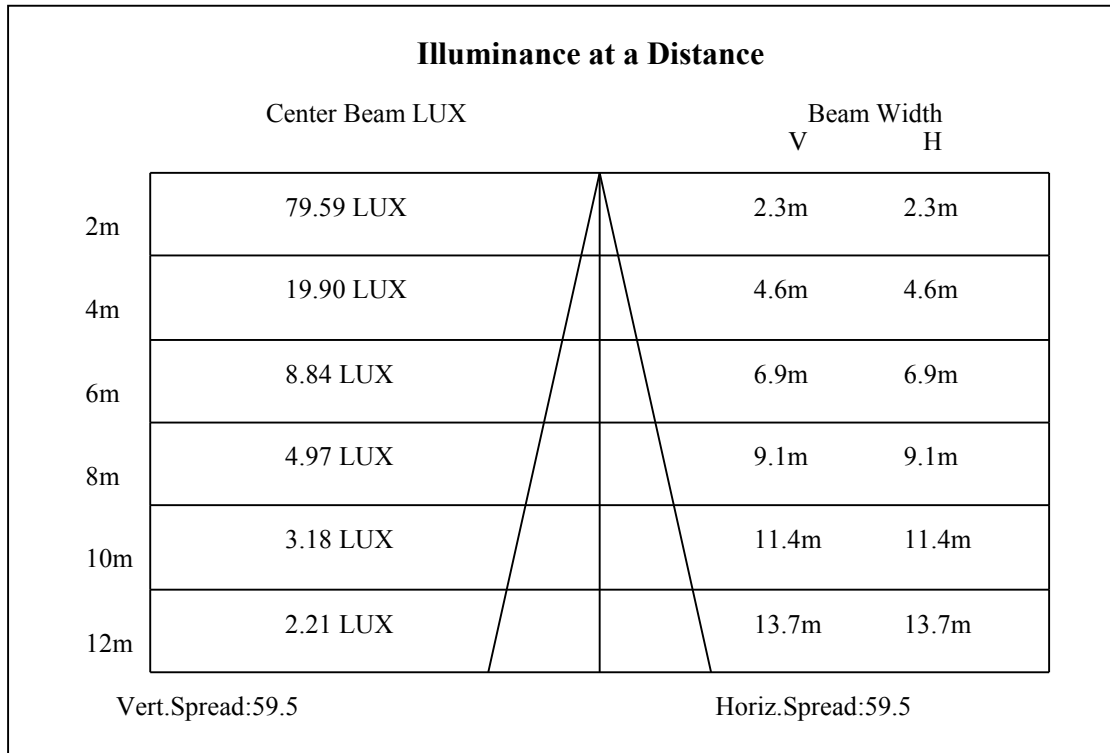
C90/C270:

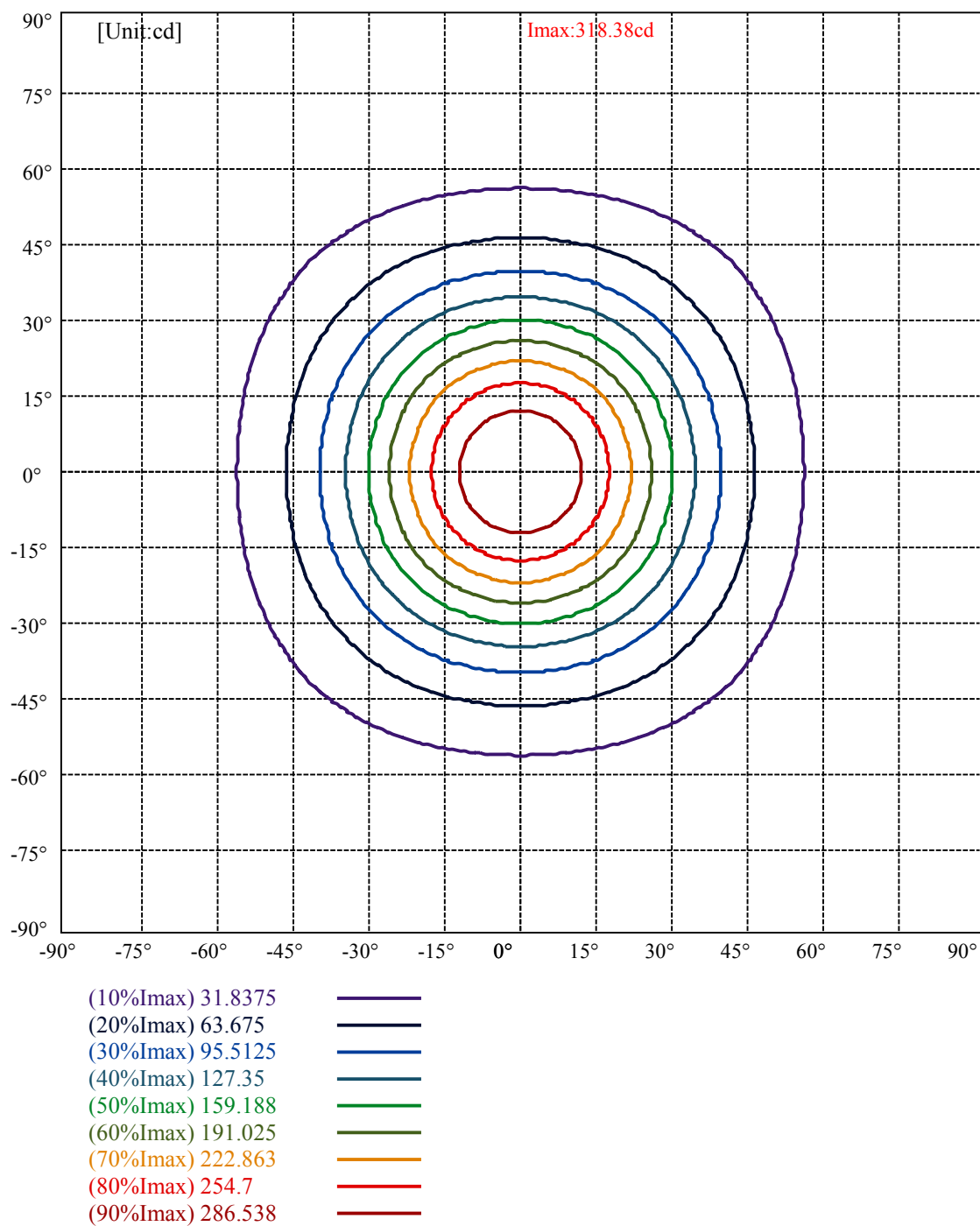
Field angle(10%Imax):C0/180Left:55.5 Right:55.5

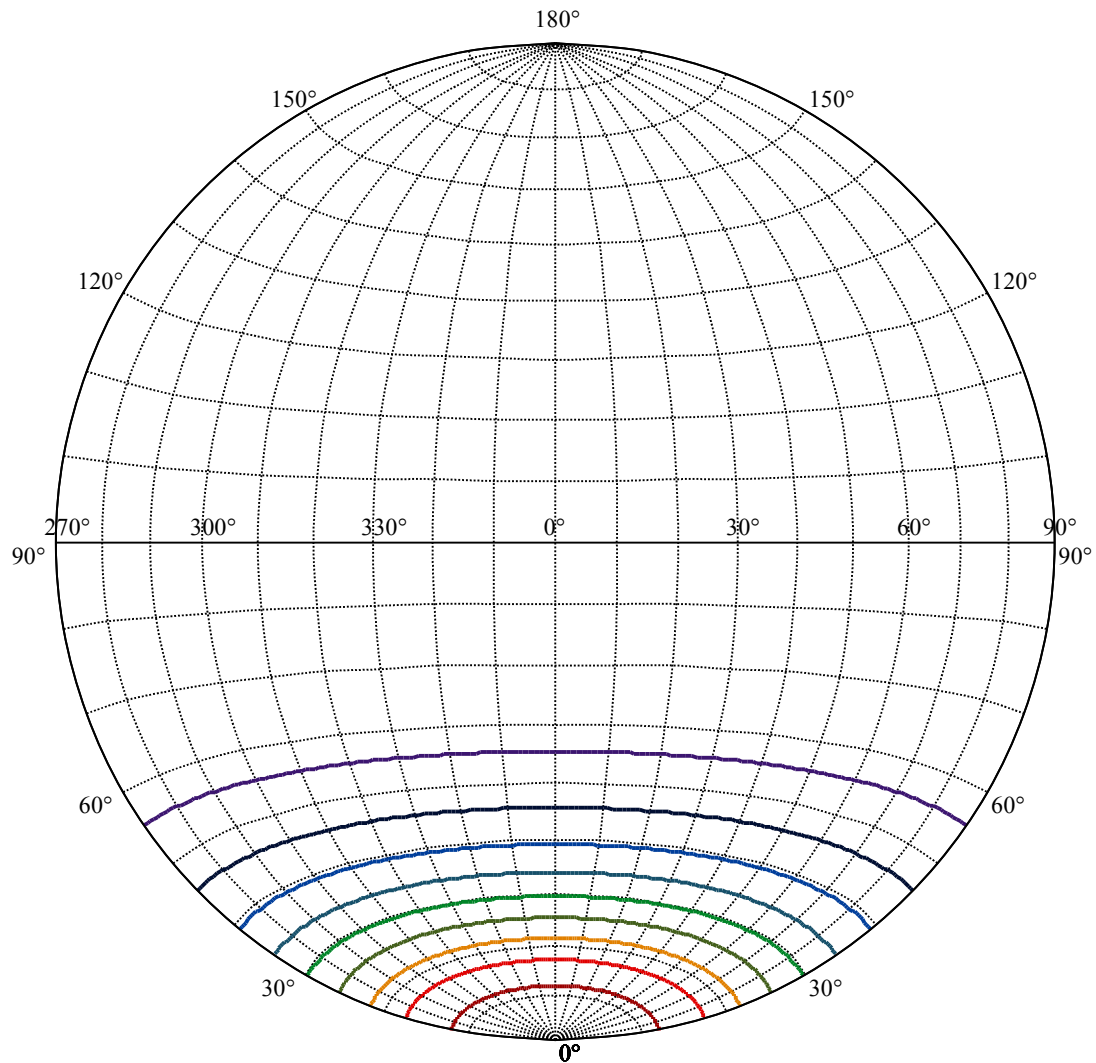
:C90/270Left:55.5 Right:55.5

Beam Angle(50%Imax):C0/180Left:29.7 Right:29.7

:C90/270Left:29.7 Right:29.7







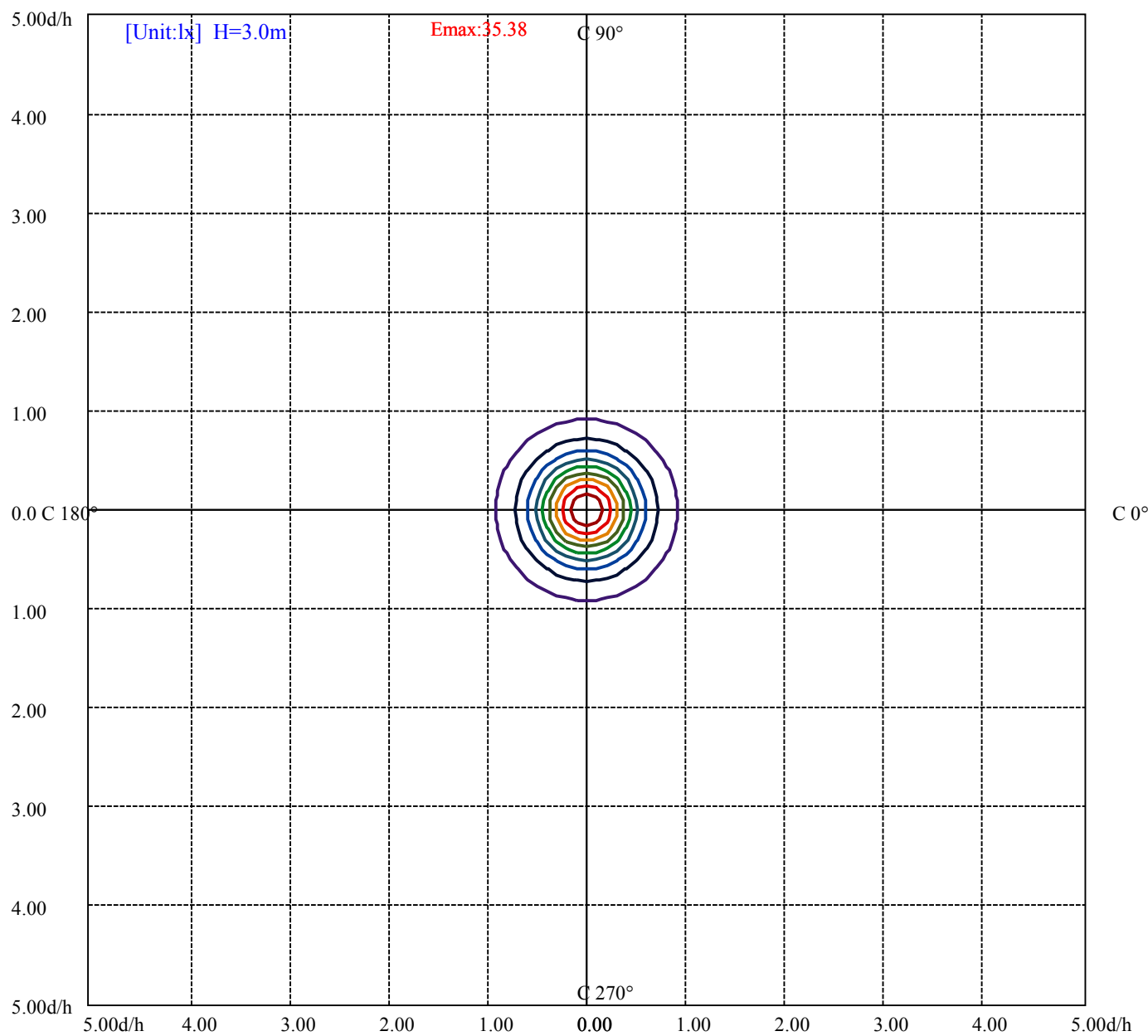
House

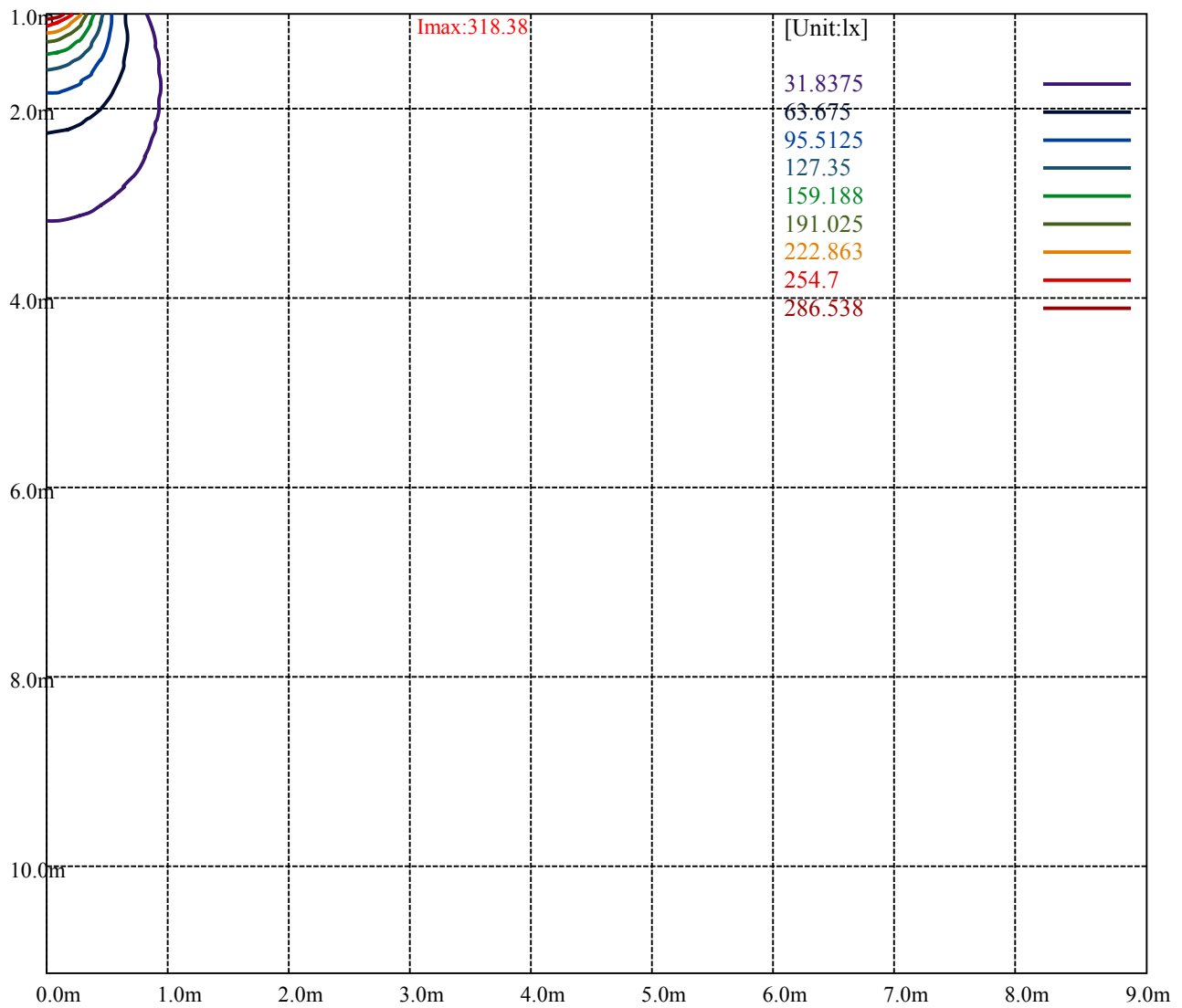
[Unit:cd]

Road

Imax:318.38
 (10%Imax) 31.8375
 (20%Imax) 63.675
 (30%Imax) 95.5125
 (40%Imax) 127.35
 (50%Imax) 159.188
 (60%Imax) 191.025
 (70%Imax) 222.863
 (80%Imax) 254.7
 (90%Imax) 286.538







Luminance Table

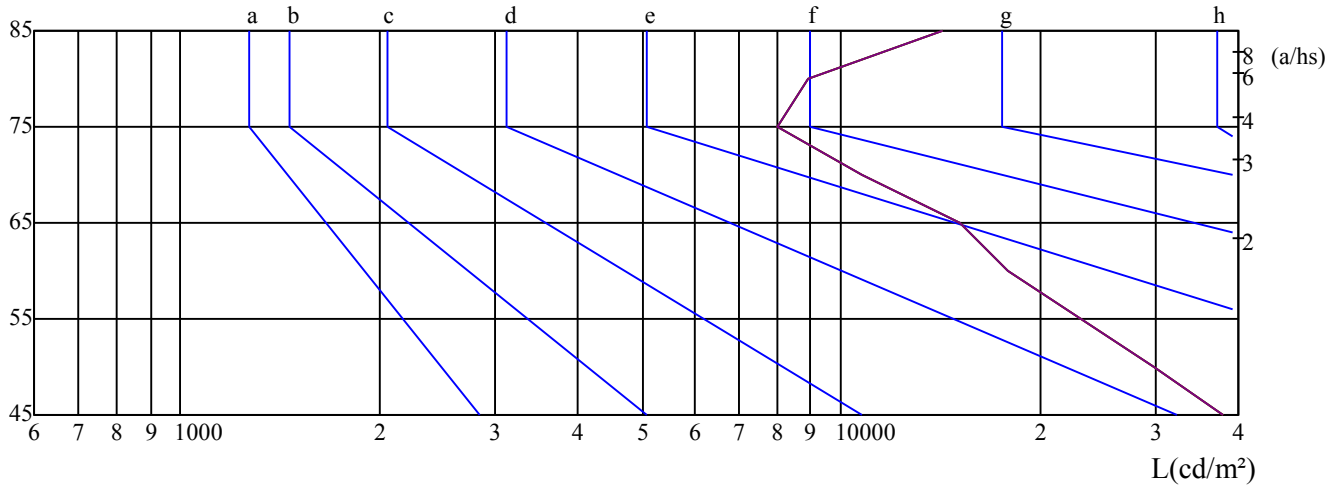
γ	45	50	55	60	65	70	75	80	85
C0	37937	29828	23041	17916	15140	10797	8042	8941	14264
C45	37937	29828	23041	17916	15140	10797	8042	8941	14264
C90	37937	29828	23041	17916	15140	10797	8042	8941	14264

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
15140	15140	15140	8042	8042	8042	14264	14264	14264

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

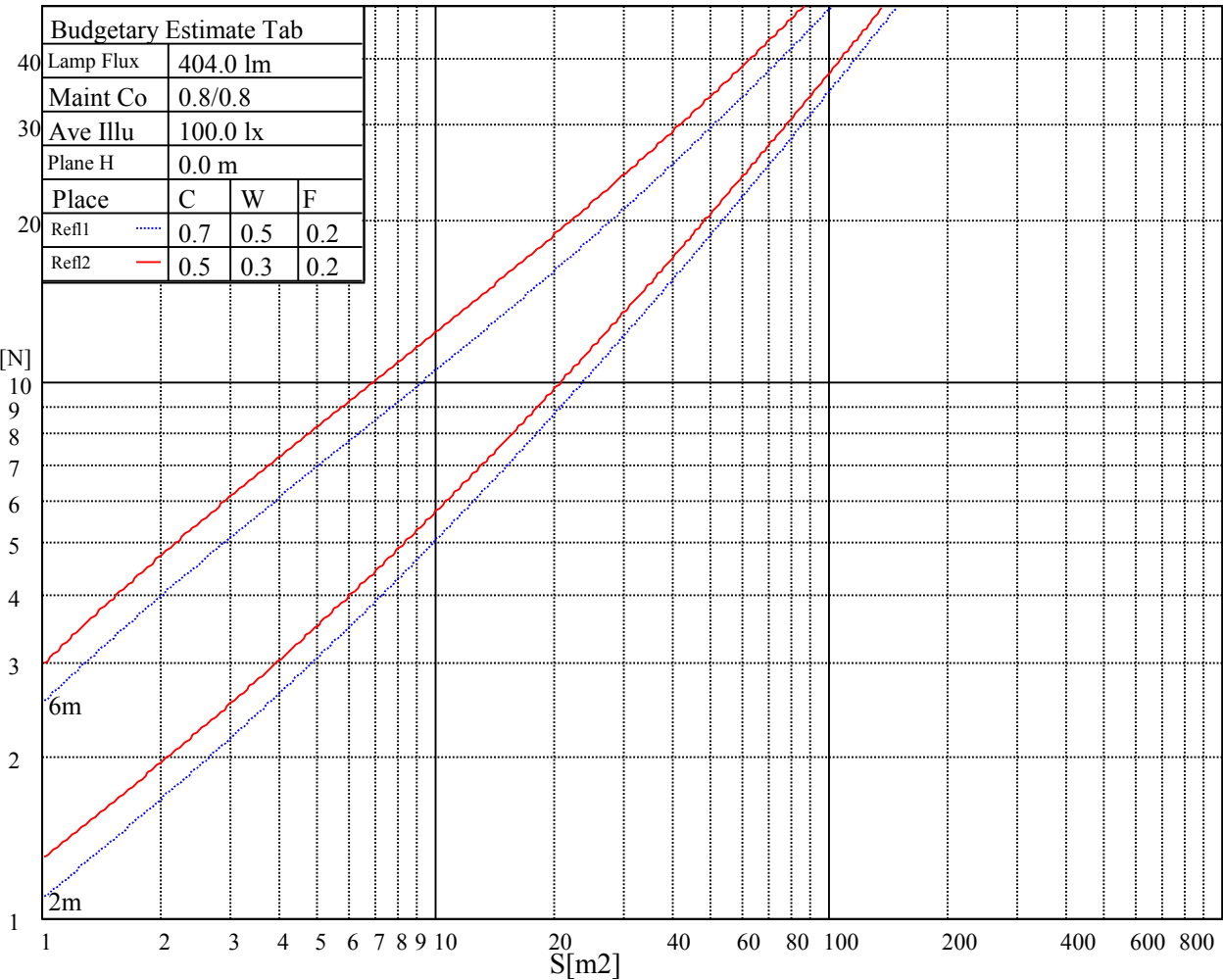
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

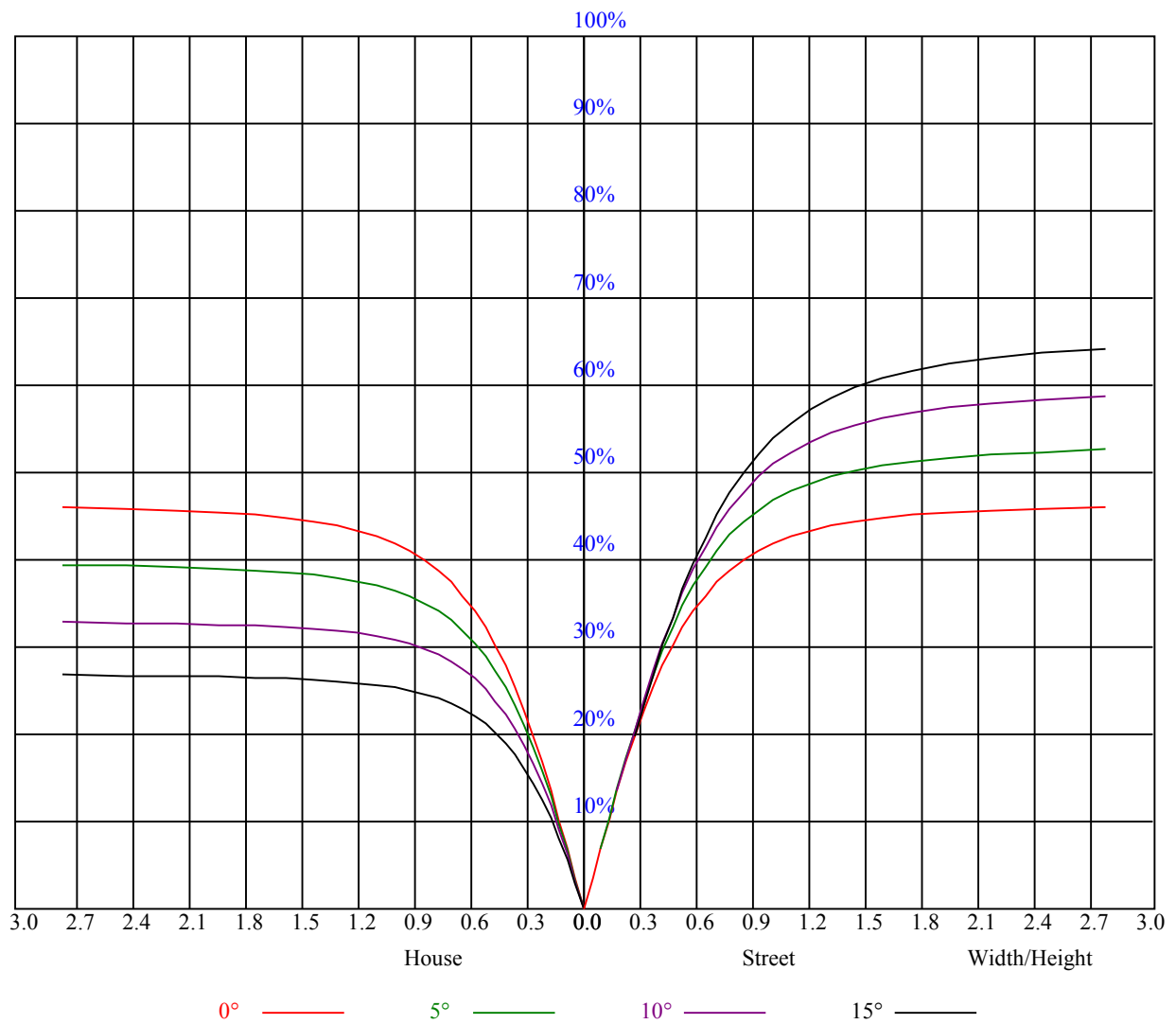
C0 ———

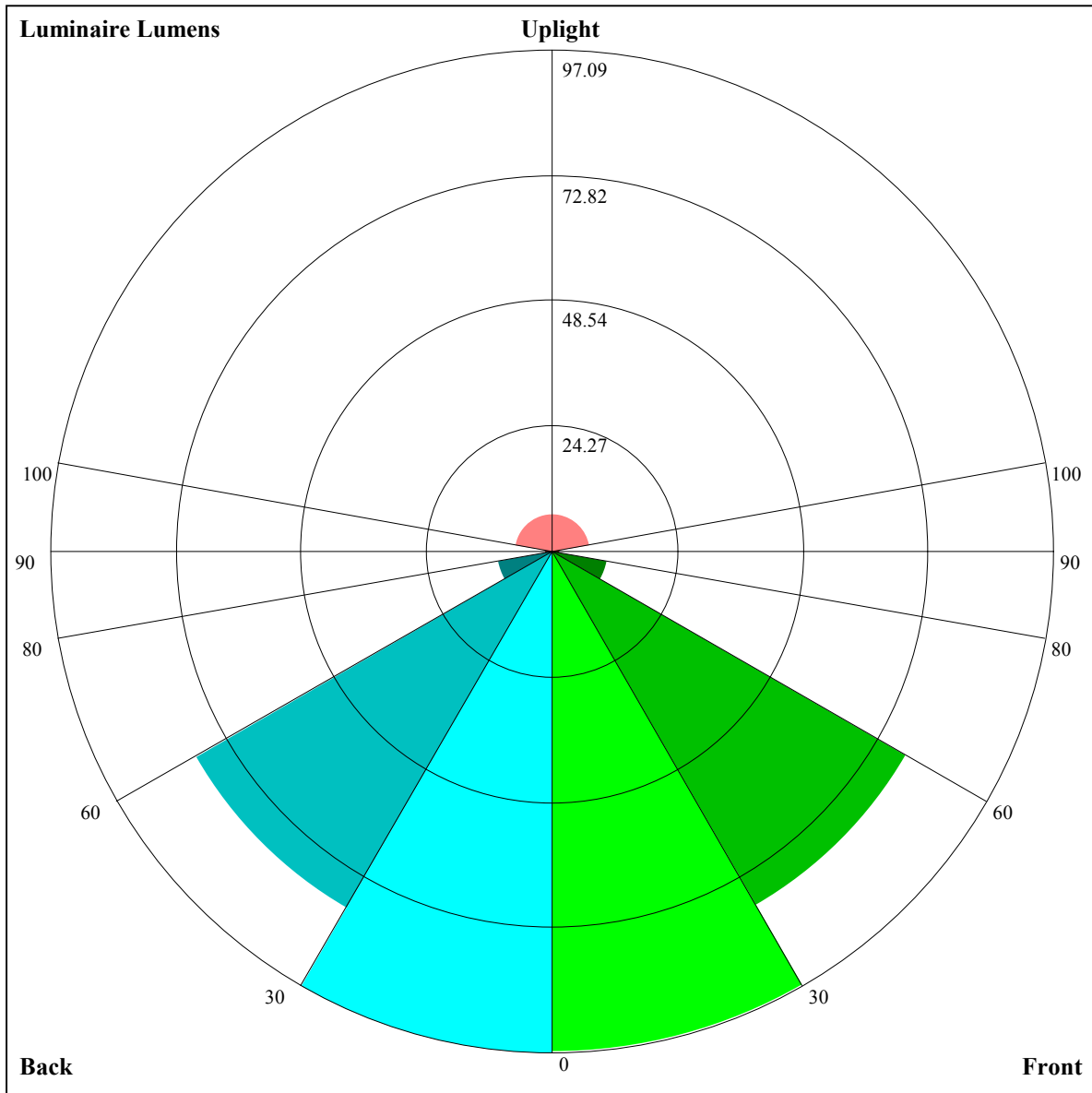
C45 ———

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	1.11	1.11	1.11	1.09	1.09	1.09	1.04	1.04	1.04	0.99	0.99	0.99	0.95	0.95	0.95	0.93
1	1.01	0.98	0.96	0.99	0.96	0.94	0.95	0.93	0.91	0.92	0.90	0.88	0.88	0.87	0.86	0.84
2	0.92	0.87	0.83	0.90	0.86	0.82	0.87	0.84	0.80	0.84	0.81	0.79	0.82	0.79	0.77	0.75
3	0.84	0.78	0.73	0.82	0.77	0.73	0.80	0.75	0.72	0.78	0.74	0.70	0.75	0.72	0.69	0.68
4	0.77	0.70	0.66	0.76	0.70	0.65	0.74	0.68	0.64	0.72	0.67	0.64	0.70	0.66	0.63	0.61
5	0.71	0.64	0.59	0.70	0.63	0.59	0.68	0.62	0.58	0.66	0.61	0.58	0.65	0.60	0.57	0.56
6	0.65	0.59	0.54	0.64	0.58	0.54	0.63	0.57	0.53	0.61	0.57	0.53	0.60	0.56	0.52	0.51
7	0.61	0.54	0.49	0.60	0.53	0.49	0.59	0.53	0.49	0.57	0.52	0.48	0.56	0.52	0.48	0.47
8	0.56	0.50	0.45	0.56	0.49	0.45	0.55	0.49	0.45	0.54	0.48	0.45	0.53	0.48	0.44	0.43
9	0.53	0.46	0.42	0.52	0.46	0.42	0.51	0.46	0.42	0.50	0.45	0.41	0.49	0.45	0.41	0.40
10	0.49	0.43	0.39	0.49	0.43	0.39	0.48	0.43	0.39	0.47	0.42	0.39	0.47	0.42	0.38	0.37





Luminaire Lumens:

FL=96.97,FM=78.95,FH=10.69,FVH=1.49

BL=97.09,BM=79.71,BH=10.93,BVH=1.53

UL=1.53,UH=7.3

BUG Rating:B0-U1-G0

NATA LM04L05060BQ

Appendix Page: 17 Total:19

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	318.94	318.99	318.71	318.15	316.86	314.61	312.19	309.09	306.06
45.0	317.31	317.87	317.93	317.19	315.84	314.16	312.08	308.59	305.21
90.0	317.70	318.71	319.11	318.99	317.70	315.90	313.43	310.56	307.07
135.0	319.56	320.12	319.84	319.56	318.88	317.08	314.49	311.74	307.80
180.0	318.94	318.43	317.93	316.46	315.34	313.76	310.95	308.25	304.76
225.0	317.31	316.35	314.44	312.53	310.22	308.03	304.65	301.50	298.69
270.0	317.70	316.35	313.93	311.68	309.32	306.39	303.02	300.15	296.38
315.0	319.56	318.66	317.36	315.73	313.88	311.29	308.14	305.21	301.50
360.0	318.94	318.99	318.71	318.15	316.86	314.61	312.19	309.09	306.06
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	302.06	297.79	293.79	289.58	283.84	278.94	273.32	265.95	259.59
45.0	301.84	297.11	293.23	288.62	283.44	277.88	272.42	265.84	259.65
90.0	303.30	299.76	295.37	291.32	286.09	280.58	275.06	269.21	261.73
135.0	303.47	300.04	294.53	289.69	284.96	278.04	272.36	266.40	258.47
180.0	300.09	295.99	291.77	286.31	282.21	276.81	270.51	265.67	259.76
225.0	294.41	290.87	286.93	282.15	277.20	272.14	266.40	260.33	254.59
270.0	292.84	288.56	283.95	279.73	274.44	268.93	263.70	258.13	250.82
315.0	298.07	293.79	289.18	285.13	279.96	274.16	268.43	262.41	254.25
360.0	302.06	297.79	293.79	289.58	283.84	278.94	273.32	265.95	259.59
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	252.96	245.03	237.15	230.01	221.79	213.58	206.04	197.44	189.62
45.0	252.45	244.91	237.94	230.06	221.96	214.54	207.11	197.66	190.29
90.0	255.60	249.19	240.86	233.89	226.63	218.19	209.48	201.66	192.88
135.0	251.38	244.52	235.63	228.43	220.73	212.18	204.30	196.71	188.33
180.0	250.76	244.86	237.99	228.32	221.96	214.82	206.61	198.23	190.63
225.0	247.67	241.03	233.89	226.41	219.21	212.18	203.46	196.03	189.06
270.0	244.63	237.99	230.46	222.30	214.93	206.55	198.23	190.86	182.81
315.0	247.50	240.53	233.27	224.04	216.28	208.63	199.01	191.08	183.26
360.0	252.96	245.03	237.15	230.01	221.79	213.58	206.04	197.44	189.62
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	180.90	172.35	165.15	158.12	149.79	143.21	136.86	128.93	122.79
45.0	182.81	173.31	166.16	158.91	150.24	143.33	136.63	128.42	122.63
90.0	185.34	176.79	168.47	161.16	153.45	145.58	138.94	132.58	124.76
135.0	181.18	173.70	165.49	158.68	152.27	143.61	137.59	131.06	123.36
180.0	182.08	174.54	166.05	157.84	150.69	142.93	135.23	128.70	122.18
225.0	180.39	173.59	166.56	158.29	150.98	144.28	137.48	130.28	124.26
270.0	175.73	167.96	160.03	153.17	146.25	137.81	131.23	125.04	117.34
315.0	174.49	166.05	158.91	151.20	144.56	137.31	130.05	123.69	116.66
360.0	180.90	172.35	165.15	158.12	149.79	143.21	136.86	128.93	122.79
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	116.61	109.91	103.39	97.71	91.86	86.79	81.45	76.28	72.11
45.0	115.71	108.34	103.05	97.48	90.39	86.01	81.28	75.21	71.66
90.0	118.69	112.89	106.37	100.18	95.18	89.72	84.88	80.61	75.99
135.0	117.34	111.32	104.68	98.55	93.49	87.53	82.29	77.63	72.68
180.0	114.41	108.28	102.49	95.68	90.28	84.99	80.16	74.48	70.26
225.0	117.73	111.77	105.41	99.17	93.99	88.65	82.07	77.06	72.51
270.0	111.60	105.92	99.00	93.88	88.48	82.29	78.13	73.01	67.56
315.0	109.91	104.23	98.72	92.19	87.19	82.58	77.46	72.56	68.34
360.0	116.61	109.91	103.39	97.71	91.86	86.79	81.45	76.28	72.11

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	67.50	63.11	59.40	56.08	51.86	48.77	45.56	42.19	38.76
45.0	67.67	63.45	59.63	56.48	52.99	49.67	46.86	43.76	41.06
90.0	72.11	67.95	63.96	60.58	57.32	53.33	50.23	47.19	43.43
135.0	68.46	64.18	59.96	56.59	53.49	49.56	46.69	43.93	40.33
180.0	66.21	61.93	58.11	54.79	51.24	47.87	44.89	41.74	38.87
225.0	66.83	62.61	58.39	54.06	49.84	46.24	42.53	39.32	36.00
270.0	63.90	59.34	54.62	51.53	47.98	43.37	40.50	37.46	34.26
315.0	63.84	59.34	55.63	51.75	48.38	44.66	41.23	38.36	35.61
360.0	67.50	63.11	59.40	56.08	51.86	48.77	45.56	42.19	38.76
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	35.78	32.79	29.81	27.56	25.14	23.34	21.38	19.58	18.17
45.0	38.08	35.33	32.91	30.60	28.07	26.21	24.69	22.89	21.66
90.0	40.50	37.80	35.16	32.12	29.98	27.96	25.82	24.30	22.95
135.0	37.91	35.49	32.63	30.38	28.35	26.33	24.41	23.06	21.60
180.0	35.78	32.91	30.43	28.13	25.54	23.74	22.11	20.31	19.01
225.0	33.13	30.60	28.13	25.71	23.96	22.28	20.42	19.01	17.83
270.0	31.44	29.14	26.72	24.58	22.84	21.15	19.74	18.23	16.99
315.0	32.46	30.26	28.07	25.59	23.85	22.22	20.59	19.13	17.89
360.0	35.78	32.79	29.81	27.56	25.14	23.34	21.38	19.58	18.17
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	16.93	15.36	14.23	13.22	11.87	10.80	9.45	7.71	6.47
45.0	20.64	19.58	18.34	17.16	15.92	14.34	12.71	11.25	9.84
90.0	21.54	20.31	19.07	17.72	16.26	13.78	11.08	9.22	7.82
135.0	20.48	19.18	18.00	16.88	15.75	14.23	12.83	11.48	9.90
180.0	17.89	16.71	15.64	14.68	13.28	11.48	9.62	8.27	7.26
225.0	16.65	15.53	14.63	13.67	12.54	11.70	10.80	9.73	8.78
270.0	15.81	14.79	13.50	12.54	11.53	10.24	8.83	7.48	6.58
315.0	16.65	15.58	14.57	13.50	12.54	11.48	10.07	8.72	7.71
360.0	16.93	15.36	14.23	13.22	11.87	10.80	9.45	7.71	6.47
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	5.74	5.01	4.50	4.11	3.83	3.66	3.49	3.32	3.21
45.0	8.61	7.71	6.92	6.36	5.74	5.23	4.84	4.50	4.28
90.0	6.64	5.91	5.46	4.89	4.61	4.44	4.39	4.22	4.22
135.0	8.83	7.99	7.26	6.47	5.85	5.34	4.95	4.67	4.56
180.0	6.36	5.57	5.06	4.67	4.28	4.05	3.88	3.71	3.66
225.0	7.82	7.09	6.36	5.79	5.29	4.89	4.44	4.11	3.94
270.0	5.68	5.12	4.56	4.16	3.88	3.66	3.49	3.38	3.26
315.0	6.58	5.91	5.46	5.18	4.89	4.61	4.33	4.05	3.94
360.0	5.74	5.01	4.50	4.11	3.83	3.66	3.49	3.32	3.21
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	3.15	2.98	2.81	2.70	2.53	2.42	2.03	1.63	1.46
45.0	4.16	3.94	3.71	3.49	3.38	2.98	1.74	1.58	1.41
90.0	4.22	4.56	4.28	3.71	3.26	2.64	1.69	1.52	1.46
135.0	4.39	4.22	4.05	3.77	3.60	2.81	1.63	1.52	1.41
180.0	3.54	3.43	3.21	3.04	2.87	2.48	1.69	1.46	1.46
225.0	3.77	3.66	3.54	3.43	3.26	3.15	2.42	1.58	1.46
270.0	3.21	3.15	2.98	2.87	2.76	2.53	1.86	1.52	1.46
315.0	3.77	3.60	3.49	3.32	3.21	3.04	2.36	1.58	1.46
360.0	3.15	2.98	2.81	2.70	2.53	2.42	2.03	1.63	1.46

Intensity data(cd)

Appendix Page: 19 Total:19

C/ $\gamma(^{\circ})$	90.0
0.0	1.41
45.0	1.41
90.0	1.41
135.0	1.41
180.0	1.41
225.0	1.41
270.0	1.41
315.0	1.41
360.0	1.41