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NATA

Client:

LumCAT: 3-2040-M

Luminaire: 92.70.135.00

Report No: NT2018010515

Voltage(V): 220.3000

Test No: GC2018010515

Current(A): 0.0950

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

Power (W): 19.2600

Lamp flux(lm): 1355.0

PF: 0.9190

Number of Lamps: 1

Ballast type: AC

Length(mm): 78

Width(mm): 78

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1219.45, Efficiency(%): 90.00% , Luminous Efficacy(lm/W): 63.32

Central intensity(cd): 5209.285, Maximum intensity(cd): 5209.285

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=21.6

[C90/270]Total=21.6

Field angle(10%Imax): [C0/180]Total=50.4

[C90/270]Total=50.4

Maximum s/h(1/2): C0_180=0.37 C90_270=0.37

Maximum s/h(1/4): C0_180=0.38 C90_270=0.38

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 90.09%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 99.508%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5209.286	1.246	1.246	.092%	.102%
1.0	5171.351	9.897	11.143	.730%	.914%
2.0	5055.981	19.350	30.493	1.428%	2.501%
3.0	4868.917	27.944	58.437	2.062%	4.792%
4.0	4664.395	35.681	94.118	2.633%	7.718%
5.0	4401.810	42.071	136.188	3.105%	11.168%
6.0	4137.775	47.430	183.618	3.500%	15.057%
7.0	3832.151	51.214	234.832	3.780%	19.257%
8.0	3512.432	53.606	288.438	3.956%	23.653%
9.0	3182.620	54.597	343.035	4.029%	28.130%
10.0	2849.792	54.267	397.302	4.005%	32.580%
11.0	2540.281	53.154	450.456	3.923%	36.939%
12.0	2229.205	50.825	501.281	3.751%	41.107%
13.0	1955.135	48.230	549.511	3.559%	45.062%
14.0	1695.625	44.984	594.495	3.320%	48.751%
15.0	1475.325	41.873	636.368	3.090%	52.185%
16.0	1258.644	38.045	674.413	2.808%	55.305%
17.0	1089.179	34.921	709.334	2.577%	58.168%
18.0	962.255	32.608	741.942	2.406%	60.842%
19.0	886.304	31.643	773.585	2.335%	63.437%
20.0	795.748	29.845	803.43	2.203%	65.885%
21.0	722.454	28.392	831.822	2.095%	68.213%
22.0	654.629	26.892	858.714	1.985%	70.418%
23.0	605.413	25.941	884.654	1.914%	72.545%
24.0	562.675	25.097	909.751	1.852%	74.603%
25.0	526.272	24.390	934.141	1.800%	76.603%
26.0	496.510	23.868	958.01	1.761%	78.561%
27.0	474.584	23.627	981.637	1.744%	80.498%
28.0	458.291	23.594	1005.231	1.741%	82.433%
29.0	446.099	23.717	1028.948	1.750%	84.378%
30.0	435.658	23.887	1052.835	1.763%	86.337%
31.0	422.323	23.853	1076.687	1.760%	88.293%
32.0	400.206	23.257	1099.944	1.716%	90.200%
33.0	368.356	22.000	1121.944	1.624%	92.004%
34.0	327.347	20.073	1142.018	1.481%	93.650%
35.0	279.012	17.550	1159.567	1.295%	95.089%
36.0	236.094	15.218	1174.785	1.123%	96.337%
37.0	198.688	13.112	1187.898	.968%	97.412%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	138.833	9.373	1197.271	.692%	98.181%
39.0	84.332	5.820	1203.091	.430%	98.658%
40.0	47.761	3.367	1206.457	.248%	98.934%
41.0	24.721	1.779	1208.236	.131%	99.080%
42.0	12.952	0.950	1209.186	.070%	99.158%
43.0	8.561	0.640	1209.827	.047%	99.211%
44.0	6.427	0.490	1210.316	.036%	99.251%
45.0	5.261	0.408	1210.724	.030%	99.284%
46.0	4.455	0.351	1211.075	.026%	99.313%
47.0	4.049	0.325	1211.4	.024%	99.340%
48.0	3.747	0.305	1211.706	.023%	99.365%
49.0	3.590	0.297	1212.003	.022%	99.389%
50.0	3.422	0.287	1212.29	.021%	99.413%
51.0	3.231	0.275	1212.566	.020%	99.435%
52.0	3.080	0.266	1212.832	.020%	99.457%
53.0	2.958	0.259	1213.091	.019%	99.478%
54.0	2.778	0.246	1213.337	.018%	99.499%
55.0	2.610	0.234	1213.572	.017%	99.518%
56.0	2.523	0.229	1213.801	.017%	99.537%
57.0	2.401	0.221	1214.022	.016%	99.555%
58.0	2.285	0.213	1214.235	.016%	99.572%
59.0	2.222	0.209	1214.443	.015%	99.589%
60.0	2.158	0.205	1214.648	.015%	99.606%
61.0	2.059	0.197	1214.846	.015%	99.622%
62.0	2.001	0.194	1215.04	.014%	99.638%
63.0	1.961	0.192	1215.231	.014%	99.654%
64.0	1.891	0.186	1215.417	.014%	99.669%
65.0	1.816	0.180	1215.598	.013%	99.684%
66.0	1.775	0.178	1215.776	.013%	99.699%
67.0	1.752	0.177	1215.953	.013%	99.713%
68.0	1.705	0.173	1216.126	.013%	99.727%
69.0	1.665	0.170	1216.296	.013%	99.741%
70.0	1.630	0.168	1216.464	.012%	99.755%
71.0	1.589	0.165	1216.629	.012%	99.768%
72.0	1.549	0.162	1216.791	.012%	99.782%
73.0	1.537	0.161	1216.952	.012%	99.795%
74.0	1.508	0.159	1217.111	.012%	99.808%
75.0	1.514	0.160	1217.271	.012%	99.821%

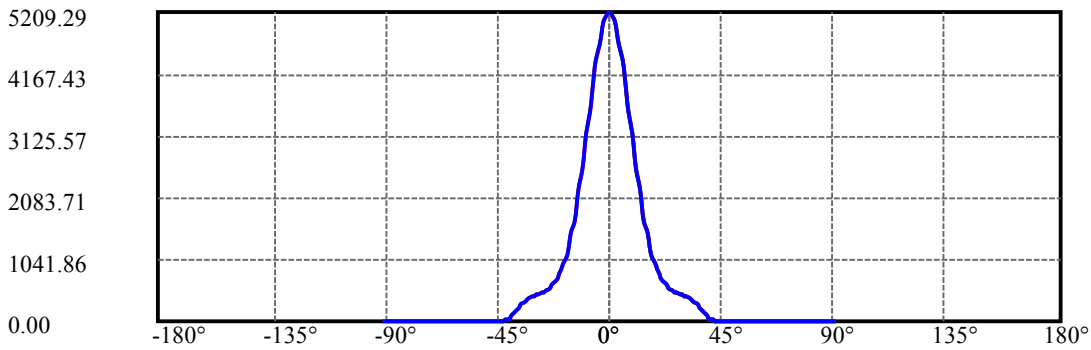
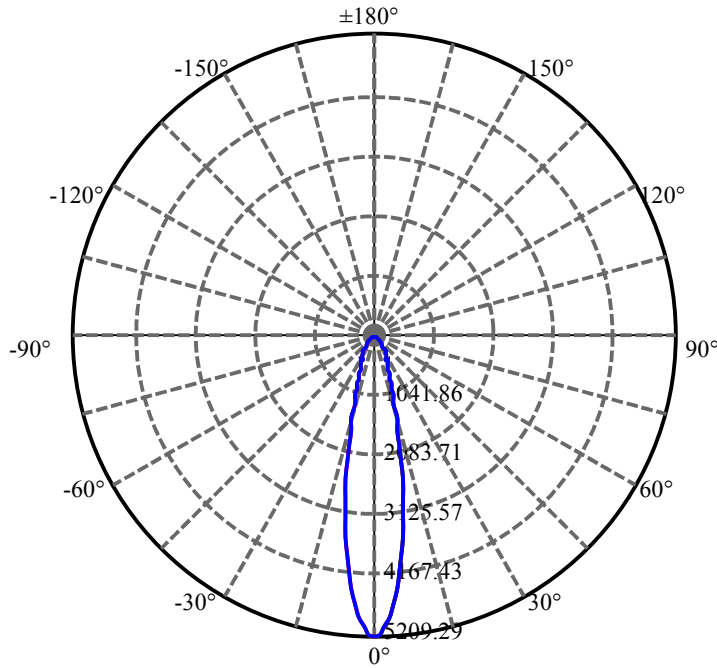
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	1.473	0.157	1217.428	.012%	99.834%
77.0	1.439	0.154	1217.582	.011%	99.847%
78.0	1.450	0.156	1217.737	.011%	99.859%
79.0	1.433	0.154	1217.891	.011%	99.872%
80.0	1.427	0.154	1218.045	.011%	99.885%
81.0	1.380	0.150	1218.195	.011%	99.897%
82.0	1.386	0.151	1218.346	.011%	99.909%
83.0	1.369	0.149	1218.495	.011%	99.921%
84.0	1.380	0.151	1218.645	.011%	99.934%
85.0	1.346	0.147	1218.792	.011%	99.946%
86.0	1.351	0.148	1218.94	.011%	99.958%
87.0	1.328	0.145	1219.085	.011%	99.970%
88.0	1.322	0.145	1219.23	.011%	99.982%
89.0	1.340	0.147	1219.377	.011%	99.994%
90.0	1.369	0.075	1219.452	.006%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	1052.83	77.70%	86.34%
0-40	1206.46	89.04%	98.93%
0-60	1214.65	89.64%	99.61%
0-90	1219.38	89.99%	99.99%
0-120	1219.38	89.99%	99.99%
0-180	1219.45	90.00%	100.00%
60-90	4.93	0.36%	0.40%
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%
0-26.74	975.56	72.00%	80.00%

ZONAL LUMEN SUMMARY

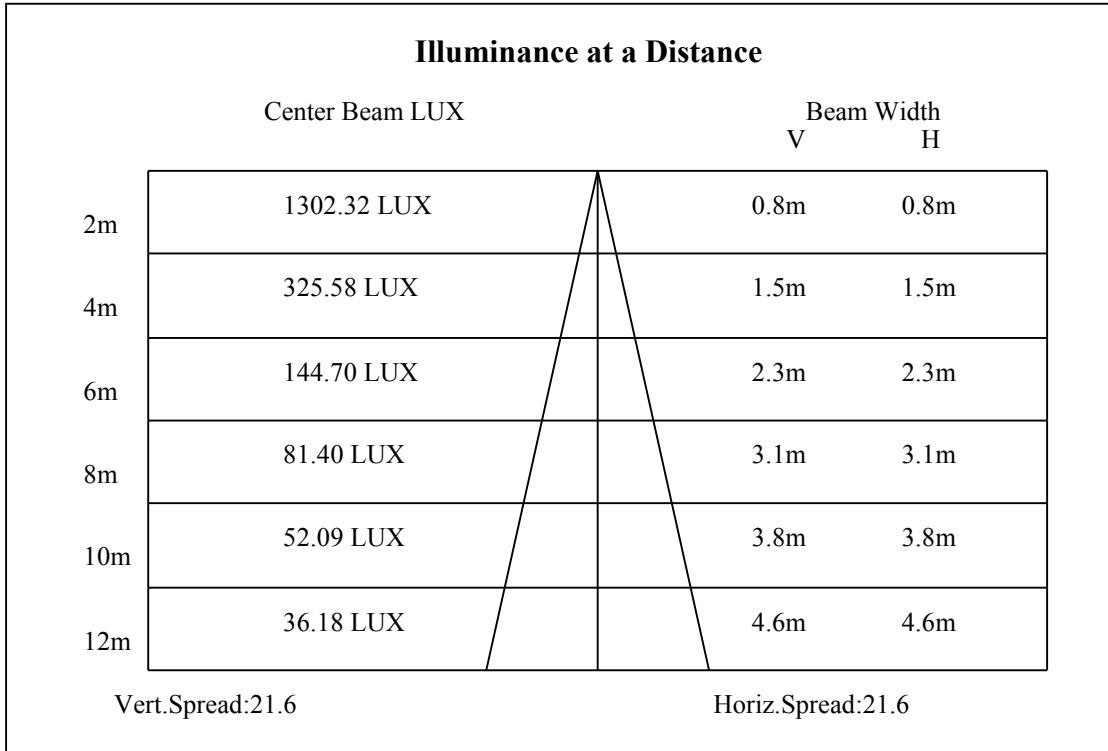
0-10	397.30
10-20	406.13
20-30	249.40
30-40	153.62
40-50	5.83
50-60	2.36
60-70	1.82
70-80	1.58
80-90	1.33
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

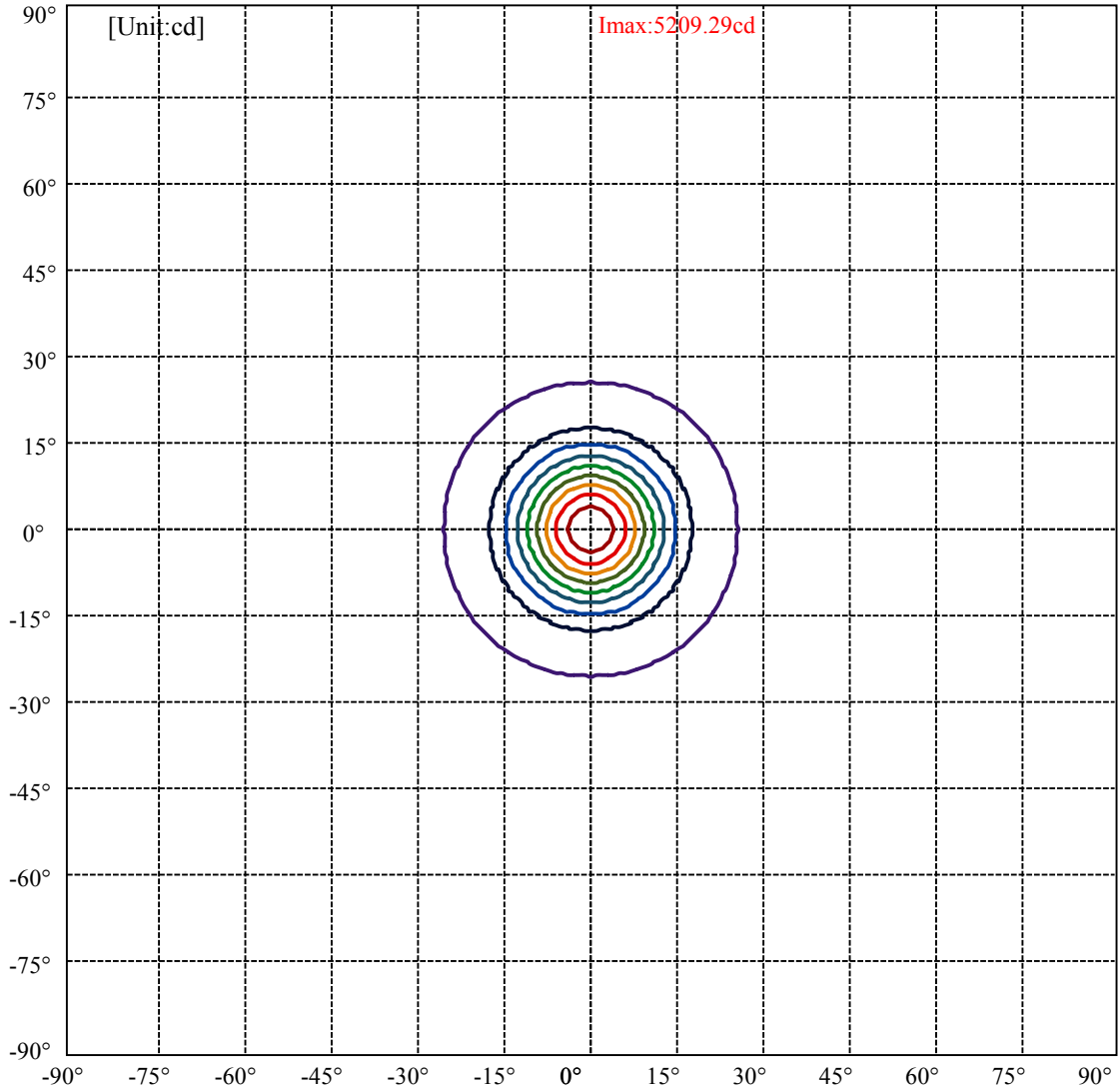


C0(Max): —————
C0/C180: —————
C90/C270: —————

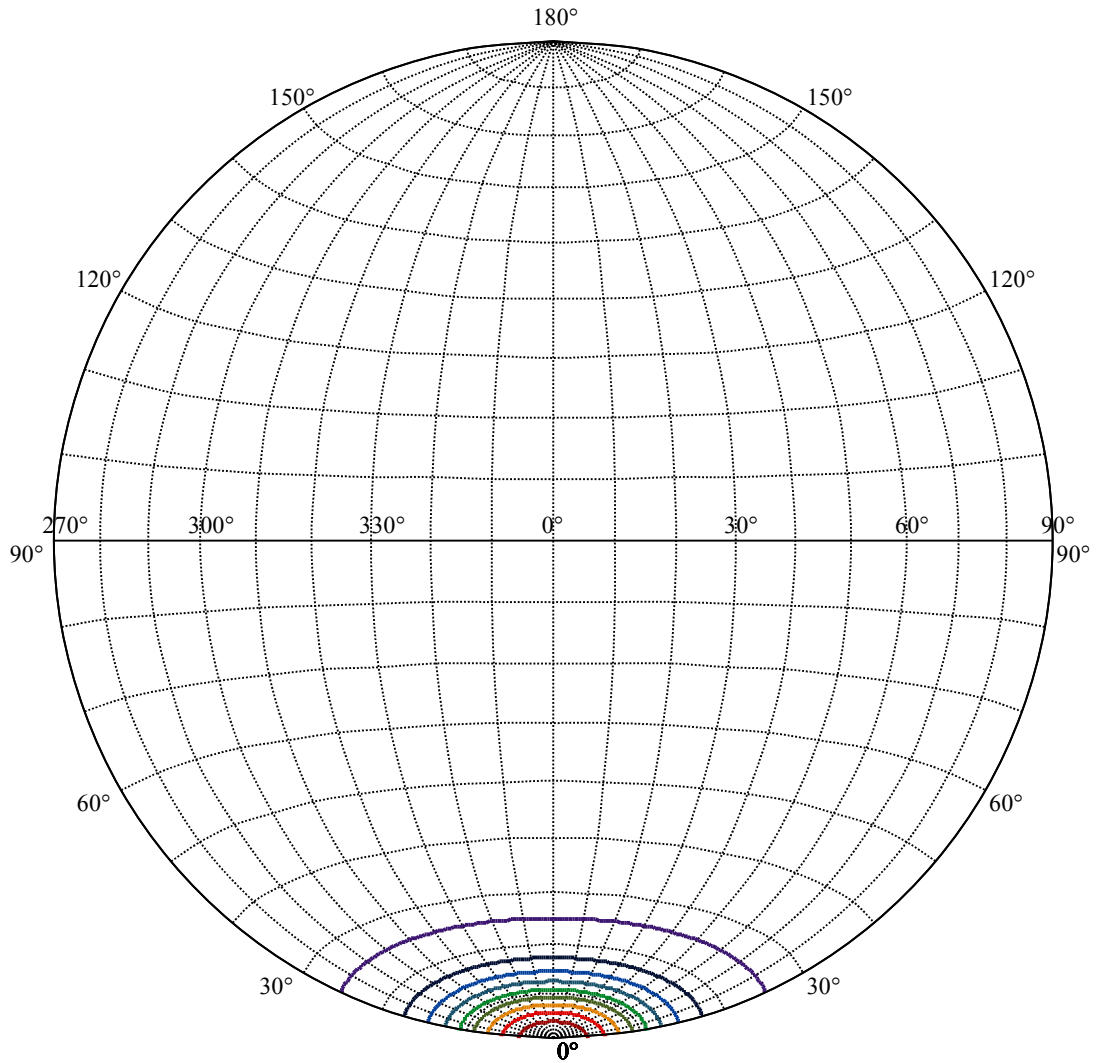
Field angle(10%Imax):C0/180Left:25.2 Right:25.2
:C90/270Left:25.2 Right:25.2

Beam Angle(50%Imax):C0/180Left:10.8 Right:10.8
:C90/270Left:10.8 Right:10.8





(10%Imax) 520.929	—
(20%Imax) 1041.86	—
(30%Imax) 1562.79	—
(40%Imax) 2083.71	—
(50%Imax) 2604.64	—
(60%Imax) 3125.57	—
(70%Imax) 3646.5	—
(80%Imax) 4167.43	—
(90%Imax) 4688.36	—



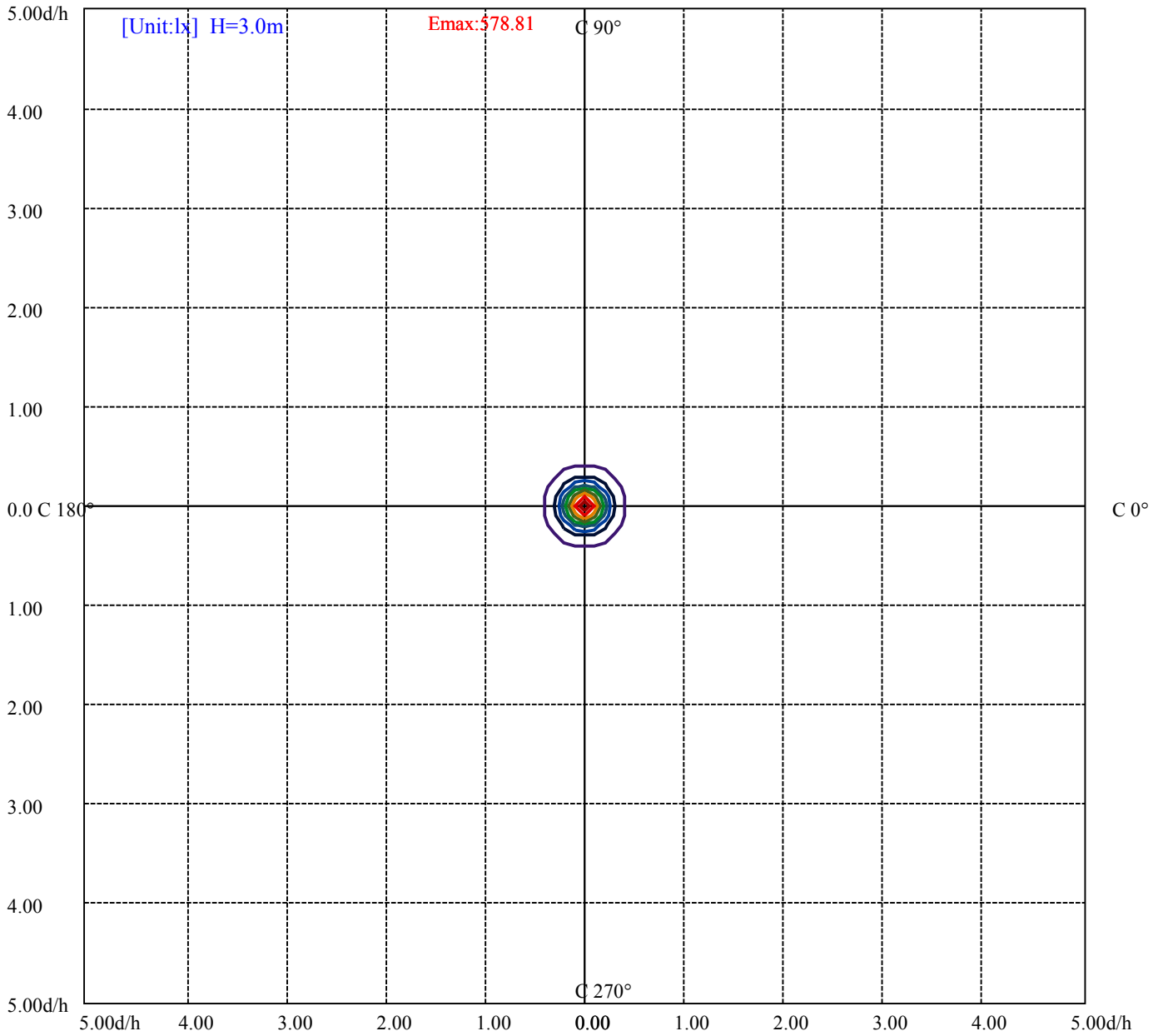
House

[Unit:cd]

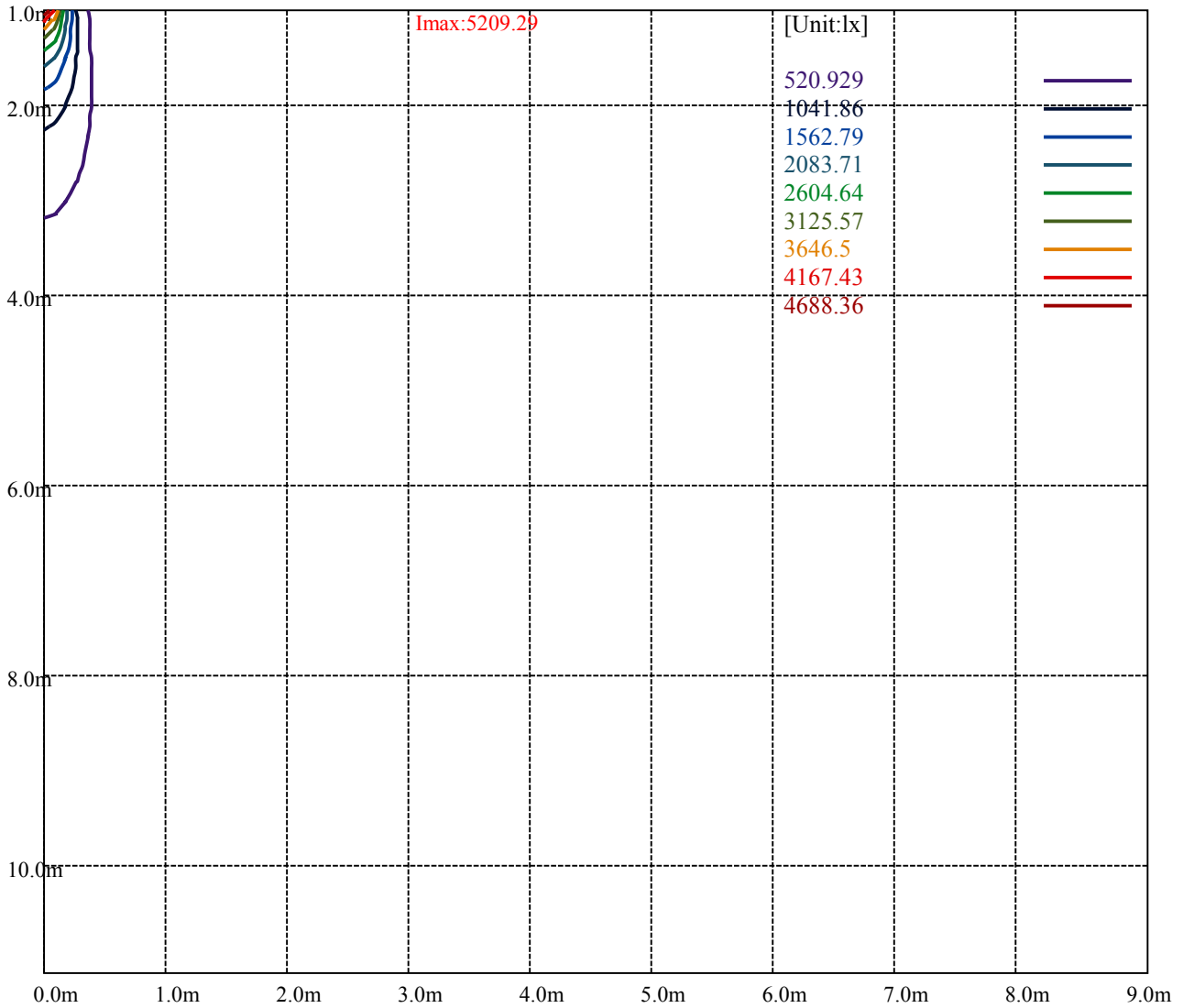
Road

Imax:5209.29

(10%Imax) 520.929	—
(20%Imax) 1041.86	—
(30%Imax) 1562.79	—
(40%Imax) 2083.71	—
(50%Imax) 2604.64	—
(60%Imax) 3125.57	—
(70%Imax) 3646.5	—
(80%Imax) 4167.43	—
(90%Imax) 4688.36	—



(10%Emax)	57.88089	—
(20%Emax)	115.7622	—
(30%Emax)	173.6422	—
(40%Emax)	231.5233	—
(50%Emax)	289.4044	—
(60%Emax)	347.2856	—
(70%Emax)	405.1667	—
(80%Emax)	463.0467	—
(90%Emax)	520.9278	—



Luminance Table

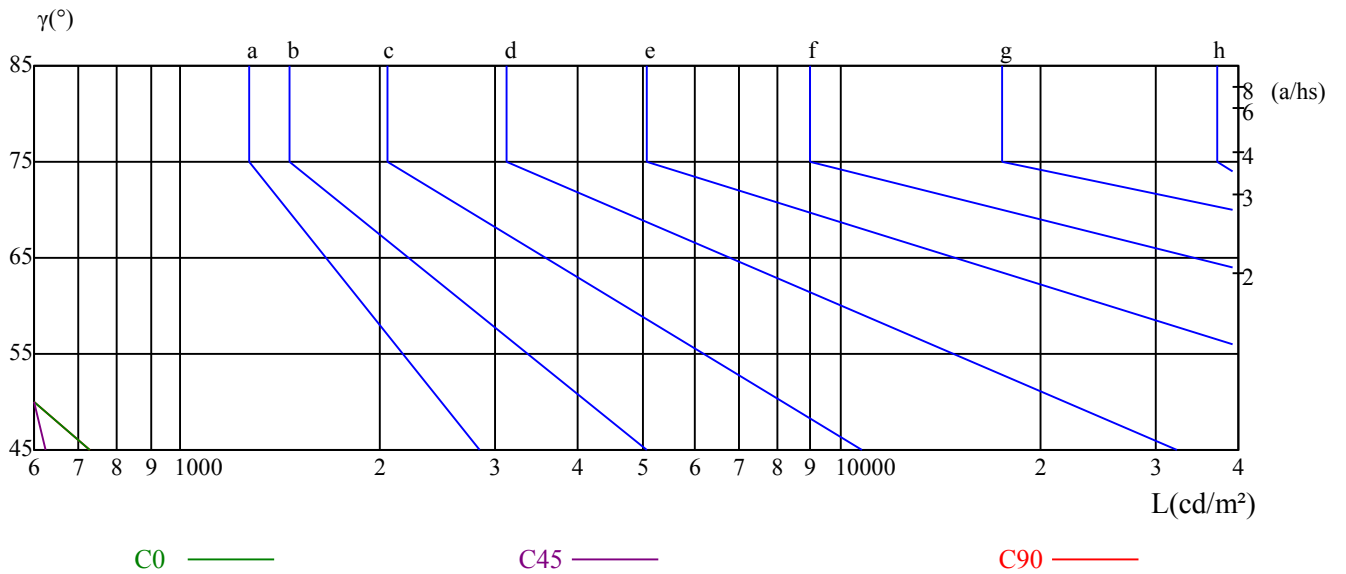
γ	45	50	55	60	65	70	75	80	85
C0	728	484	380	326	287	273	272	278	289
C45	624	408	315	266	231	215	210	209	212
C90	728	484	380	326	287	273	272	278	289

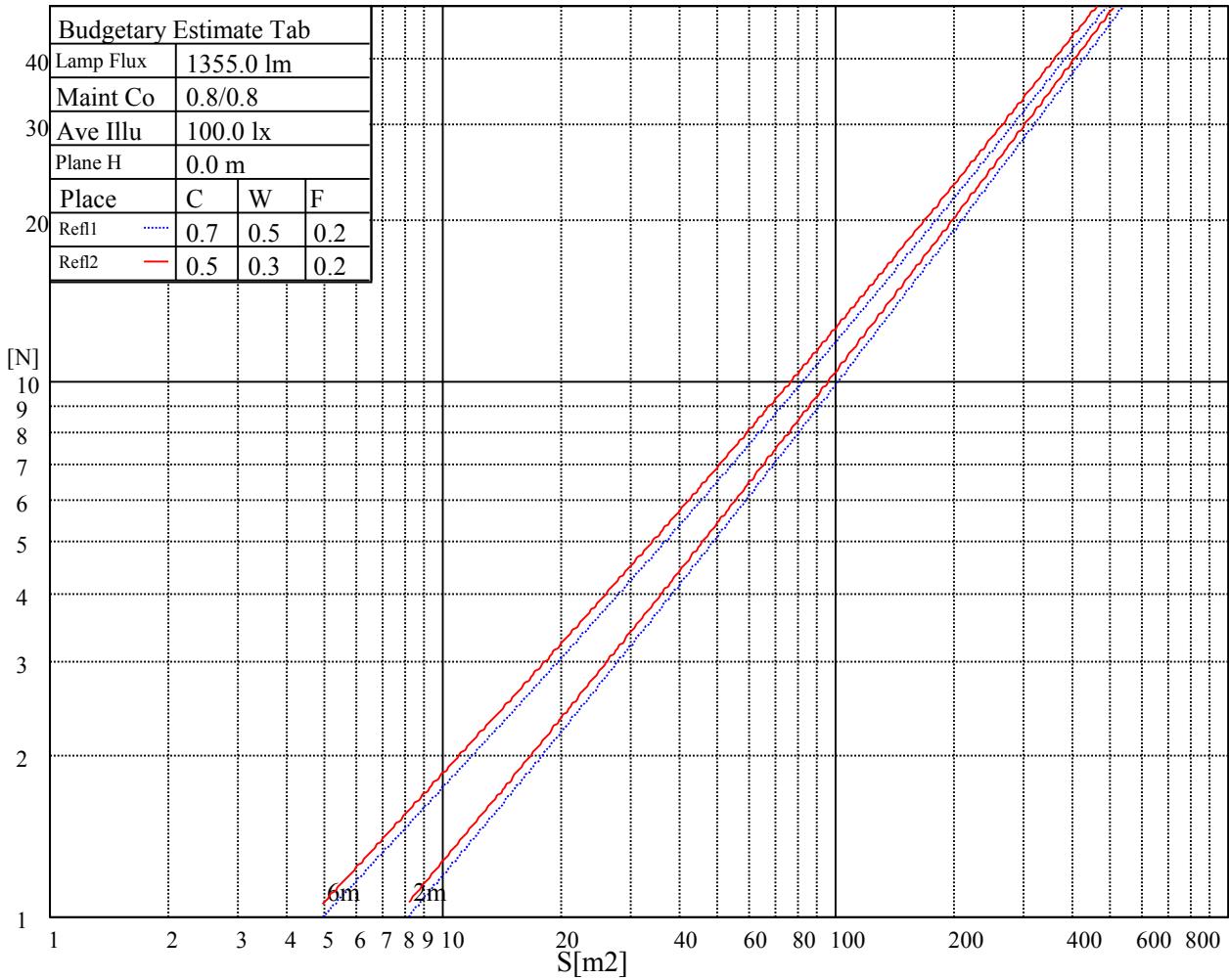
L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
706	706	706	961	961	961	2538	2538	2538

Glare Table

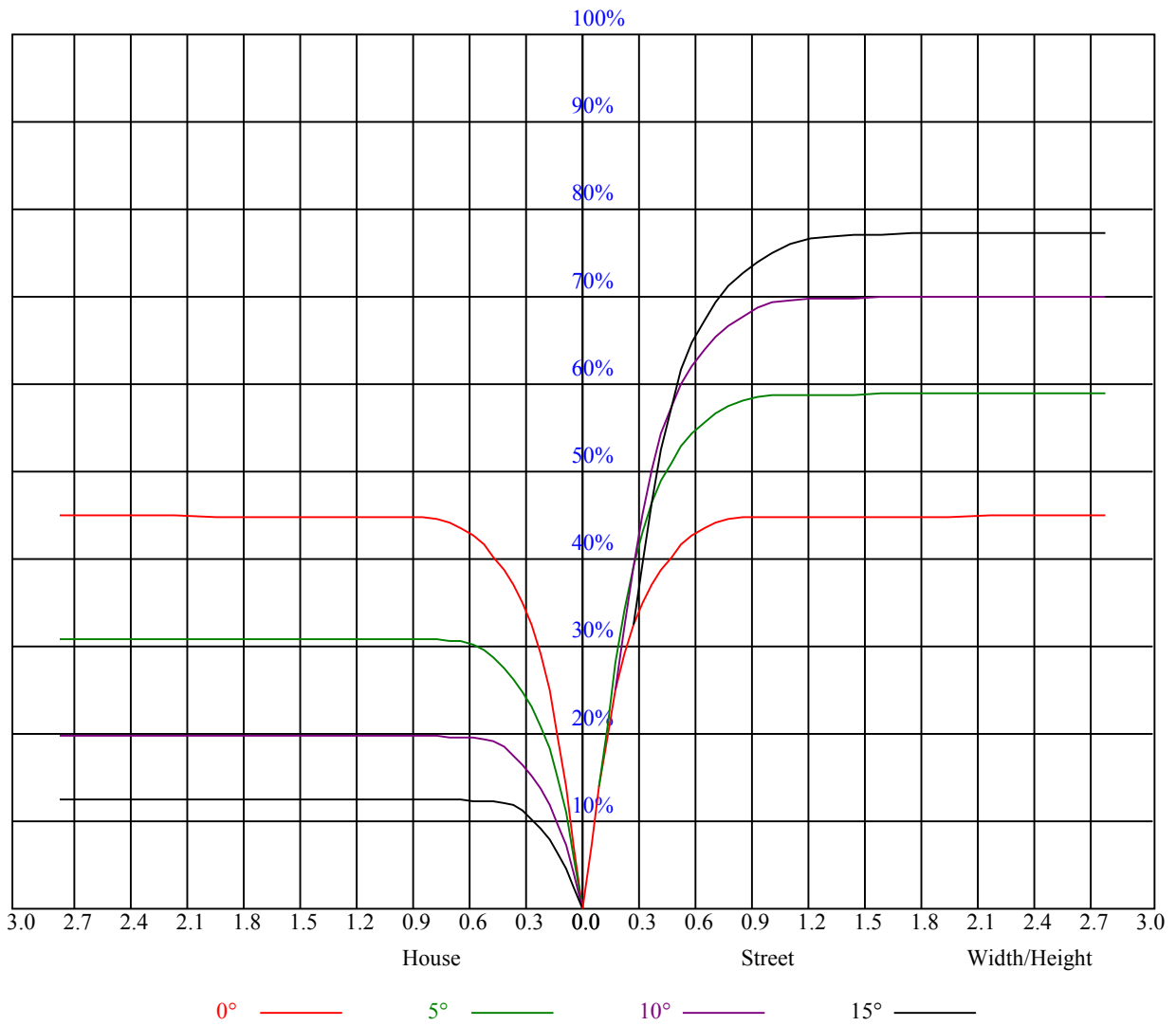
Glare	Quality	Service Values Illuminance(lx)							
1.15	A	2000	1000	500	<=300				
1.5	B		2000	1000	500	<=300			
1.85	C			2000	1000	500	<=300		
2.2	D				2000	1000	500	<=300	
2.55	E					2000	1000	500	<=300
		a	b	c	d	e	f	g	h

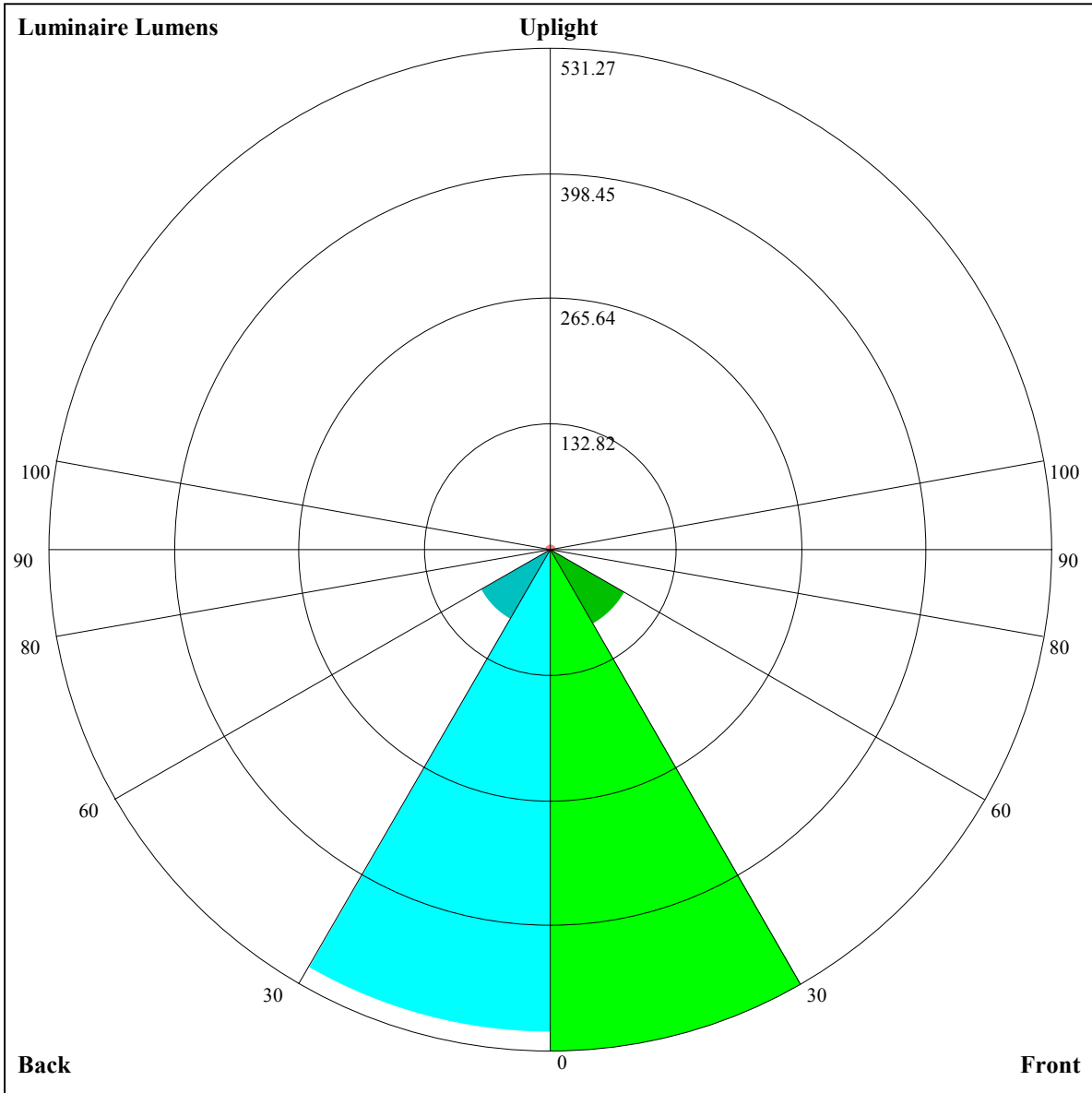
Luminance Limiting Curve





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	1.07	1.07	1.07	1.05	1.05	1.05	1.00	1.00	1.00	0.96	0.96	0.96	0.92	0.92	0.92	0.90
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	0.88	0.86
2	0.96	0.93	0.90	0.94	0.92	0.89	0.91	0.89	0.87	0.89	0.87	0.86	0.86	0.85	0.84	0.82
3	0.91	0.88	0.85	0.90	0.87	0.84	0.88	0.85	0.83	0.86	0.83	0.81	0.84	0.82	0.80	0.79
4	0.87	0.83	0.80	0.86	0.82	0.80	0.84	0.81	0.79	0.82	0.80	0.78	0.81	0.79	0.77	0.76
5	0.83	0.79	0.76	0.82	0.79	0.76	0.81	0.78	0.75	0.80	0.77	0.75	0.78	0.76	0.74	0.73
6	0.80	0.76	0.73	0.79	0.75	0.72	0.78	0.75	0.72	0.77	0.74	0.72	0.76	0.73	0.71	0.70
7	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.69	0.74	0.71	0.69	0.73	0.71	0.69	0.68
8	0.74	0.70	0.67	0.74	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.66	0.71	0.68	0.66	0.65
9	0.71	0.67	0.65	0.71	0.67	0.65	0.70	0.67	0.64	0.70	0.66	0.64	0.69	0.66	0.64	0.63
10	0.69	0.65	0.62	0.69	0.65	0.62	0.68	0.65	0.62	0.67	0.64	0.62	0.67	0.64	0.62	0.61





Luminaire Lumens:

FL=531.27,FM=90.35,FH=1.73,FVH=0.75

BL=511.28,BM=84.7,BH=1.7,BVH=0.74

UL=1.49,UH=7.11

BUG Rating:B2-U1-G0

NATA 3-2040-M

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	5215.32	5181.44	5071.93	4899.31	4683.07	4430.17	4148.51	3841.32	3649.21
45.0	5187.94	5204.65	5129.94	4980.05	4777.27	4536.90	4266.37	3974.49	3669.62
90.0	5170.77	5054.30	4815.32	4574.49	4358.71	4066.37	3754.54	3429.72	3099.33
135.0	5263.11	5198.15	5120.66	4867.29	4735.04	4484.47	4197.69	3884.93	3558.25
180.0	5215.32	5165.20	5038.52	4850.59	4621.36	4355.00	4060.34	3747.58	3421.36
225.0	5187.94	5077.50	4896.06	4669.61	4410.68	4127.16	3948.51	3646.89	3212.09
270.0	5170.77	5246.41	5228.31	5121.12	4946.64	4680.75	4477.51	4200.48	3902.10
315.0	5263.11	5243.16	5147.11	4988.87	4782.38	4533.65	4248.74	3931.80	3587.49
360.0	5215.32	5181.44	5071.93	4899.31	4683.07	4430.17	4148.51	3841.32	3649.21
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
0.0	3189.81	2856.17	2660.35	2344.34	2045.51	1779.61	1545.74	1348.53	1181.94
45.0	3354.54	3034.36	2712.79	2399.10	2219.05	1935.99	1683.56	1462.22	1277.07
90.0	2771.25	2448.75	2142.95	1858.96	1605.60	1387.51	1205.14	888.86	888.86
135.0	3214.87	2863.60	2520.21	2197.24	1902.58	1642.26	1417.67	1228.34	1071.50
180.0	3088.19	2751.30	2421.37	2112.33	1829.73	1581.01	1408.39	1192.15	1074.28
225.0	3019.51	2698.86	2384.71	2086.34	1811.63	1567.55	1361.06	1190.76	891.18
270.0	3588.88	3260.35	2928.10	2598.17	2280.77	1985.65	1720.22	1487.27	1288.67
315.0	3233.90	2884.94	2551.77	2237.15	1946.20	1685.42	1460.82	1271.03	1039.95
360.0	3189.81	2856.17	2660.35	2344.34	2045.51	1779.61	1545.74	1348.53	1181.94
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0
0.0	886.81	886.81	831.59	752.15	682.73	623.38	574.47	540.97	498.51
45.0	1120.69	987.97	878.93	786.58	710.02	645.52	594.01	550.39	515.12
90.0	829.83	777.21	702.31	640.88	590.39	548.39	514.85	488.12	468.16
135.0	943.89	840.87	773.13	689.60	632.52	593.08	551.32	512.34	491.92
180.0	949.46	850.62	768.95	700.27	643.20	594.01	552.71	519.76	491.46
225.0	891.18	816.47	737.53	672.34	617.58	572.52	549.37	516.61	489.37
270.0	1185.65	1039.95	877.07	819.53	707.70	669.18	613.50	567.56	531.36
315.0	890.53	890.53	796.47	718.28	652.90	597.21	551.18	514.43	486.17
360.0	886.81	886.81	831.59	752.15	682.73	623.38	574.47	540.97	498.51
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0
0.0	477.58	458.56	445.33	434.85	425.33	409.14	380.41	339.58	290.16
45.0	485.43	464.54	451.09	439.95	429.74	413.50	382.87	342.97	297.49
90.0	453.96	443.20	433.64	423.99	402.27	365.94	321.34	273.41	222.78
135.0	471.04	457.12	446.45	437.17	427.89	407.93	378.70	341.58	292.39
180.0	471.50	457.58	446.45	435.77	419.53	390.76	351.78	303.06	248.77
225.0	469.93	456.01	444.59	433.96	412.53	376.75	333.27	286.54	238.56
270.0	501.67	477.54	460.83	448.30	438.56	429.28	415.36	384.27	343.43
315.0	465.56	451.78	440.41	431.27	422.73	408.35	383.11	347.38	298.51
360.0	477.58	458.56	445.33	434.85	425.33	409.14	380.41	339.58	290.16
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0
0.0	235.91	179.49	124.82	76.89	41.86	19.72	11.51	8.72	6.31
45.0	249.23	249.23	230.21	114.80	72.02	36.15	15.08	11.00	7.89
90.0	172.06	132.20	77.17	39.72	19.03	10.63	7.70	5.99	5.01
135.0	232.99	232.99	98.98	58.24	40.19	18.89	9.93	7.98	6.08
180.0	248.77	237.63	101.81	56.33	27.42	12.39	8.68	6.68	5.10
225.0	190.62	142.55	97.45	56.61	25.71	10.95	8.68	6.54	5.15
270.0	297.03	247.84	247.84	188.49	106.96	64.36	30.12	12.71	9.42
315.0	262.13	167.56	132.39	83.57	48.91	24.69	11.93	8.86	6.45
360.0	235.91	179.49	124.82	76.89	41.86	19.72	11.51	8.72	6.31

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	5.38	4.45	4.18	3.85	3.76	3.57	3.39	3.29	3.06
45.0	6.13	4.97	4.45	4.13	3.94	3.81	3.57	3.39	3.34
90.0	4.32	4.04	3.76	3.57	3.43	3.29	3.06	2.92	2.83
135.0	5.06	4.55	3.94	3.67	3.48	3.34	3.25	3.06	2.88
180.0	4.45	3.99	3.71	3.48	3.34	3.20	3.02	2.88	2.74
225.0	4.69	4.08	3.81	3.67	3.48	3.29	3.11	2.97	2.88
270.0	7.05	5.43	4.69	3.94	3.76	3.57	3.34	3.16	3.06
315.0	5.01	4.13	3.85	3.67	3.53	3.29	3.11	2.97	2.88
360.0	5.38	4.45	4.18	3.85	3.76	3.57	3.39	3.29	3.06
C/γ(°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	2.83	2.69	2.64	2.46	2.37	2.27	2.18	2.04	2.00
45.0	3.11	2.97	2.83	2.64	2.51	2.46	2.37	2.23	2.13
90.0	2.64	2.46	2.41	2.37	2.23	2.09	2.04	2.00	2.00
135.0	2.78	2.60	2.51	2.32	2.18	2.13	2.13	2.13	2.00
180.0	2.60	2.51	2.41	2.23	2.18	2.18	2.09	1.95	1.90
225.0	2.64	2.46	2.41	2.37	2.23	2.09	2.09	2.04	2.00
270.0	2.92	2.69	2.55	2.46	2.37	2.32	2.23	2.09	2.04
315.0	2.69	2.51	2.41	2.37	2.23	2.23	2.13	2.00	1.95
360.0	2.83	2.69	2.64	2.46	2.37	2.27	2.18	2.04	2.00
C/γ(°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	2.00	1.90	1.81	1.76	1.81	1.76	1.76	1.67	1.58
45.0	2.09	2.04	1.90	1.86	1.86	1.81	1.72	1.67	1.67
90.0	1.95	1.86	1.76	1.76	1.76	1.67	1.62	1.62	1.62
135.0	1.90	1.86	1.86	1.81	1.72	1.67	1.67	1.67	1.58
180.0	1.90	1.86	1.76	1.72	1.67	1.67	1.62	1.58	1.53
225.0	1.86	1.81	1.86	1.72	1.67	1.67	1.67	1.58	1.53
270.0	2.04	1.95	1.81	1.81	1.81	1.72	1.67	1.67	1.62
315.0	1.95	1.86	1.76	1.76	1.72	1.67	1.58	1.58	1.58
360.0	2.00	1.90	1.81	1.76	1.81	1.76	1.76	1.67	1.58
C/γ(°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	1.58	1.62	1.53	1.48	1.53	1.53	1.44	1.39	1.44
45.0	1.62	1.58	1.53	1.58	1.58	1.48	1.44	1.48	1.48
90.0	1.53	1.48	1.48	1.53	1.44	1.39	1.48	1.44	1.39
135.0	1.53	1.53	1.58	1.53	1.44	1.44	1.48	1.48	1.44
180.0	1.48	1.53	1.44	1.53	1.44	1.39	1.44	1.44	1.39
225.0	1.58	1.53	1.44	1.44	1.48	1.44	1.39	1.39	1.39
270.0	1.53	1.53	1.53	1.53	1.44	1.44	1.48	1.44	1.44
315.0	1.53	1.48	1.53	1.48	1.44	1.39	1.44	1.39	1.44
360.0	1.58	1.62	1.53	1.48	1.53	1.53	1.44	1.39	1.44
C/γ(°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	1.39	1.35	1.39	1.44	1.30	1.35	1.35	1.30	1.30
45.0	1.39	1.44	1.39	1.39	1.35	1.39	1.35	1.35	1.35
90.0	1.35	1.39	1.35	1.39	1.39	1.35	1.35	1.30	1.48
135.0	1.39	1.44	1.39	1.35	1.39	1.39	1.35	1.35	1.39
180.0	1.44	1.39	1.30	1.39	1.35	1.30	1.35	1.35	1.30
225.0	1.35	1.30	1.39	1.35	1.30	1.35	1.30	1.30	1.30
270.0	1.39	1.39	1.35	1.35	1.35	1.35	1.35	1.35	1.30
315.0	1.35	1.39	1.39	1.39	1.35	1.35	1.25	1.30	1.30
360.0	1.39	1.35	1.39	1.44	1.30	1.35	1.35	1.30	1.30

Intensity data(cd)

C/γ(°)	90.0
0.0	1.35
45.0	1.39
90.0	1.58
135.0	1.39
180.0	1.30
225.0	1.25
270.0	1.35
315.0	1.35
360.0	1.35