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Nata

LumCAT: 2-2187-M
Luminaire: 92.70.129.00
Report No: NATA0100
Test No: GC20200211714
LampCAT: CREE CXA1830
Lamp flux(lm): 3098.0
Number of Lamps: 1
Length(mm): 0
Phm Type: C

Voltage(V): 35.7200
Current(A): 0.6000
Power (W): 21.4300
PF: 0.0000
Ballast type: DC
Width(mm): 0
Height(mm): 0

Photometric Results

Lumens(lm): 2505.22
Efficiency(%): 80.87%
Lumens(lm)/Power(W): 116.90
Central intensity(cd): 11393.440
Maximum intensity(cd): 11393.440
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=25.0
[C90/270]Total=25.0
Field angle(10%Imax): [C0/180]Total=47.2
[C90/270]Total=47.2
Maximum s/h(1/2): C0_180=0.42 C90_270=0.42
Maximum s/h(1/4): C0_180=0.43 C90_270=0.43
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 80.87%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 98.758%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	11393.438	0.000	0	.000%	.000%
1.0	11286.000	10.852	10.852	.350%	.433%
2.0	11146.922	32.198	43.05	1.039%	1.718%
3.0	10896.328	52.720	95.77	1.702%	3.823%
4.0	10599.188	71.952	167.722	2.323%	6.695%
5.0	10183.219	89.405	257.127	2.886%	10.264%
6.0	9698.063	104.481	361.608	3.373%	14.434%
7.0	9193.570	117.260	478.868	3.785%	19.115%
8.0	8591.695	127.286	606.154	4.109%	24.196%
9.0	7965.352	134.186	740.34	4.331%	29.552%
10.0	7325.930	138.380	878.721	4.467%	35.076%
11.0	6636.516	139.514	1018.234	4.503%	40.644%
12.0	6028.383	138.445	1156.68	4.469%	46.171%
13.0	5391.281	135.523	1292.202	4.375%	51.580%
14.0	4775.695	130.136	1422.339	4.201%	56.775%
15.0	4252.289	123.940	1546.279	4.001%	61.722%
16.0	3766.430	117.497	1663.775	3.793%	66.412%
17.0	3243.234	109.159	1772.935	3.524%	70.770%
18.0	2850.047	100.465	1873.4	3.243%	74.780%
19.0	2558.250	94.093	1967.493	3.037%	78.536%
20.0	2142.141	86.030	2053.523	2.777%	81.970%
21.0	1832.766	76.326	2129.849	2.464%	85.016%
22.0	1570.148	68.383	2198.232	2.207%	87.746%
23.0	1262.018	59.427	2257.659	1.918%	90.118%
24.0	1051.770	50.588	2308.247	1.633%	92.137%
25.0	833.077	42.857	2351.104	1.383%	93.848%
26.0	620.670	34.316	2385.42	1.108%	95.218%
27.0	428.569	25.670	2411.09	.829%	96.243%
28.0	274.514	17.801	2428.89	.575%	96.953%
29.0	162.703	11.439	2440.329	.369%	97.410%
30.0	58.500	5.972	2446.302	.193%	97.648%
31.0	22.669	2.259	2448.56	.073%	97.738%
32.0	16.235	1.115	2449.675	.036%	97.783%
33.0	15.180	0.926	2450.6	.030%	97.820%
34.0	14.400	0.895	2451.496	.029%	97.855%
35.0	13.697	0.873	2452.368	.028%	97.890%
36.0	13.120	0.854	2453.222	.028%	97.924%
37.0	12.677	0.841	2454.063	.027%	97.958%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
38.0	12.298	0.834	2454.897	.027%	97.991%
39.0	11.911	0.826	2455.723	.027%	98.024%
40.0	11.651	0.822	2456.545	.027%	98.057%
41.0	11.440	0.822	2457.367	.027%	98.090%
42.0	11.201	0.823	2458.19	.027%	98.123%
43.0	11.053	0.824	2459.014	.027%	98.156%
44.0	10.927	0.830	2459.844	.027%	98.189%
45.0	10.800	0.835	2460.679	.027%	98.222%
46.0	10.688	0.840	2461.519	.027%	98.256%
47.0	10.610	0.847	2462.366	.027%	98.289%
48.0	10.533	0.855	2463.221	.028%	98.323%
49.0	10.477	0.863	2464.084	.028%	98.358%
50.0	10.399	0.870	2464.954	.028%	98.393%
51.0	10.364	0.878	2465.833	.028%	98.428%
52.0	10.308	0.887	2466.72	.029%	98.463%
53.0	10.266	0.895	2467.615	.029%	98.499%
54.0	10.230	0.903	2468.518	.029%	98.535%
55.0	10.209	0.912	2469.43	.029%	98.571%
56.0	10.181	0.921	2470.352	.030%	98.608%
57.0	10.139	0.929	2471.281	.030%	98.645%
58.0	10.090	0.935	2472.216	.030%	98.683%
59.0	10.097	0.944	2473.16	.030%	98.720%
60.0	10.055	0.952	2474.112	.031%	98.758%
61.0	10.062	0.960	2475.072	.031%	98.796%
62.0	10.027	0.968	2476.04	.031%	98.835%
63.0	9.998	0.974	2477.014	.031%	98.874%
64.0	9.991	0.981	2477.995	.032%	98.913%
65.0	9.977	0.988	2478.983	.032%	98.953%
66.0	9.970	0.995	2479.978	.032%	98.992%
67.0	9.949	1.002	2480.98	.032%	99.032%
68.0	9.942	1.008	2481.988	.033%	99.073%
69.0	9.935	1.014	2483.002	.033%	99.113%
70.0	9.914	1.019	2484.021	.033%	99.154%
71.0	9.914	1.025	2485.046	.033%	99.195%
72.0	9.900	1.030	2486.076	.033%	99.236%
73.0	9.886	1.035	2487.111	.033%	99.277%
74.0	9.900	1.040	2488.151	.034%	99.319%
75.0	9.872	1.045	2489.196	.034%	99.360%

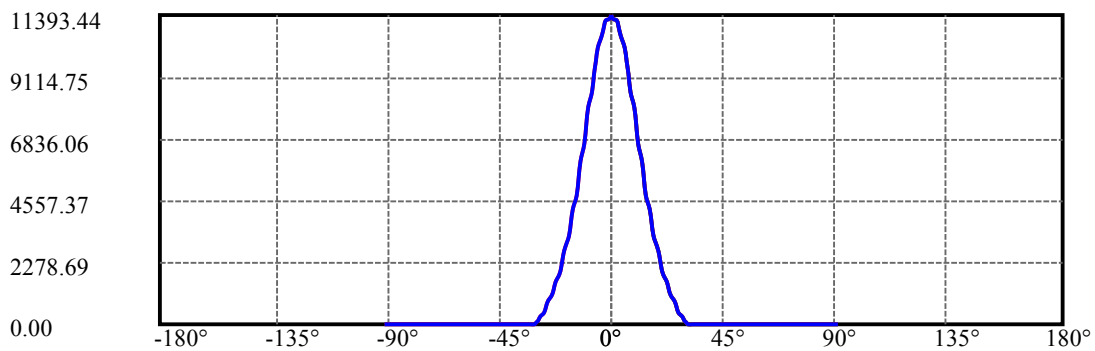
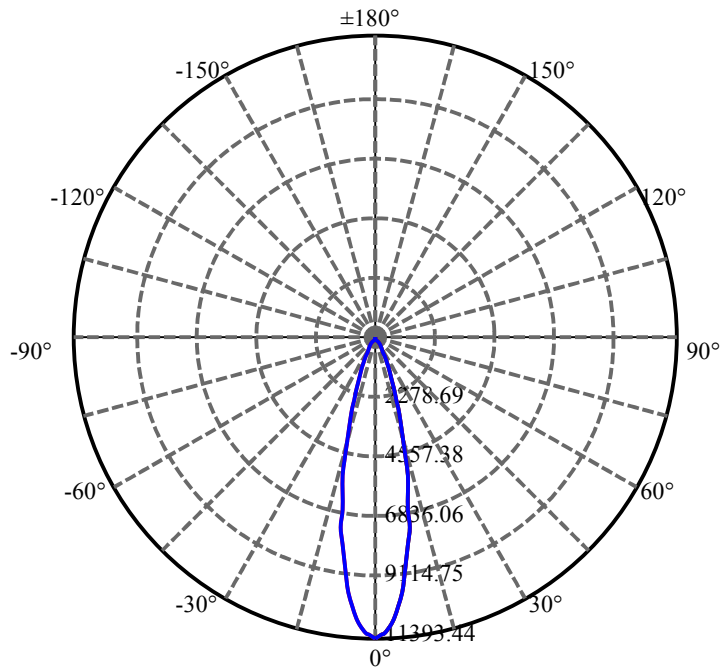
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	9.872	1.048	2490.244	.034%	99.402%
77.0	9.879	1.053	2491.297	.034%	99.444%
78.0	9.865	1.057	2492.354	.034%	99.486%
79.0	9.865	1.060	2493.414	.034%	99.529%
80.0	9.865	1.064	2494.477	.034%	99.571%
81.0	9.879	1.068	2495.545	.034%	99.614%
82.0	9.858	1.070	2496.615	.035%	99.656%
83.0	9.865	1.072	2497.688	.035%	99.699%
84.0	9.865	1.075	2498.762	.035%	99.742%
85.0	9.858	1.076	2499.839	.035%	99.785%
86.0	9.844	1.077	2500.916	.035%	99.828%
87.0	9.837	1.077	2501.993	.035%	99.871%
88.0	9.816	1.077	2503.069	.035%	99.914%
89.0	9.823	1.076	2504.146	.035%	99.957%
90.0	9.816	1.077	2505.222	.035%	100.000%

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-30	2446.30	78.96%	97.65%
0-40	2456.55	79.29%	98.06%
0-60	2474.11	79.86%	98.76%
0-90	2504.15	80.83%	99.96%
0-120	2504.15	80.83%	99.96%
0-180	2505.22	80.87%	100.00%
60-90	30.99	1.00%	1.24%
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%
0-19.43	2004.18	64.69%	80.00%

ZONAL LUMEN SUMMARY

0-10	878.72
10-20	1174.80
20-30	392.78
30-40	10.24
40-50	8.41
50-60	9.16
60-70	9.91
70-80	10.46
80-90	9.67
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: —————

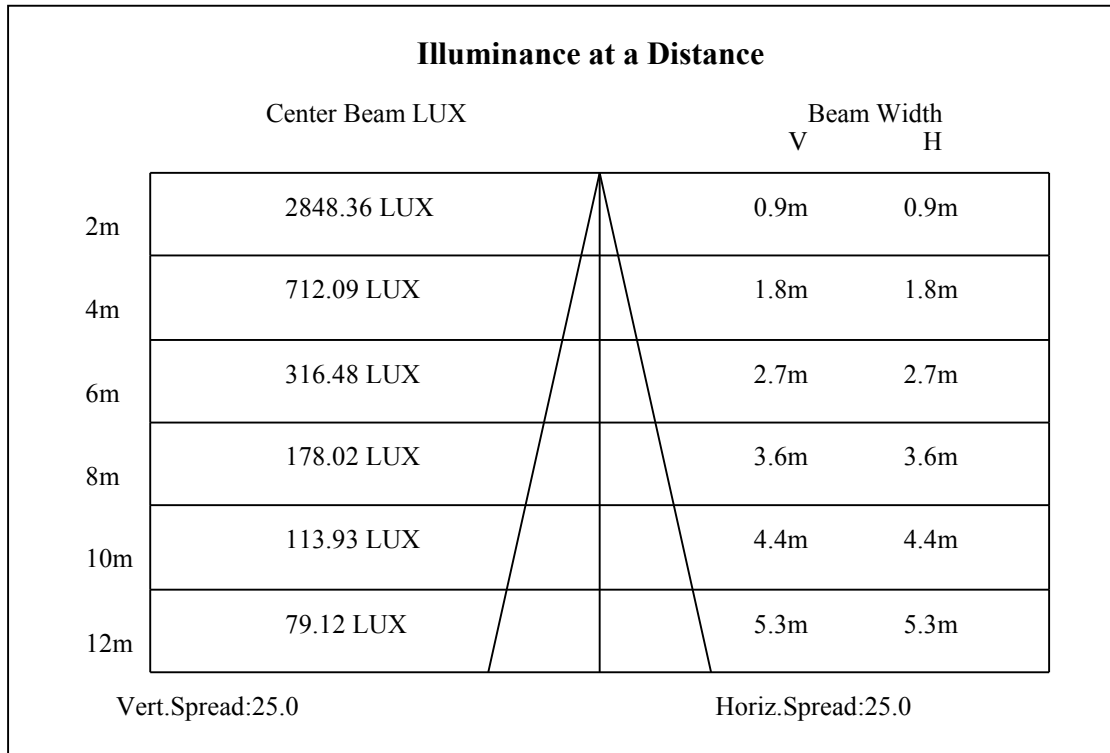
C90/C270: —————

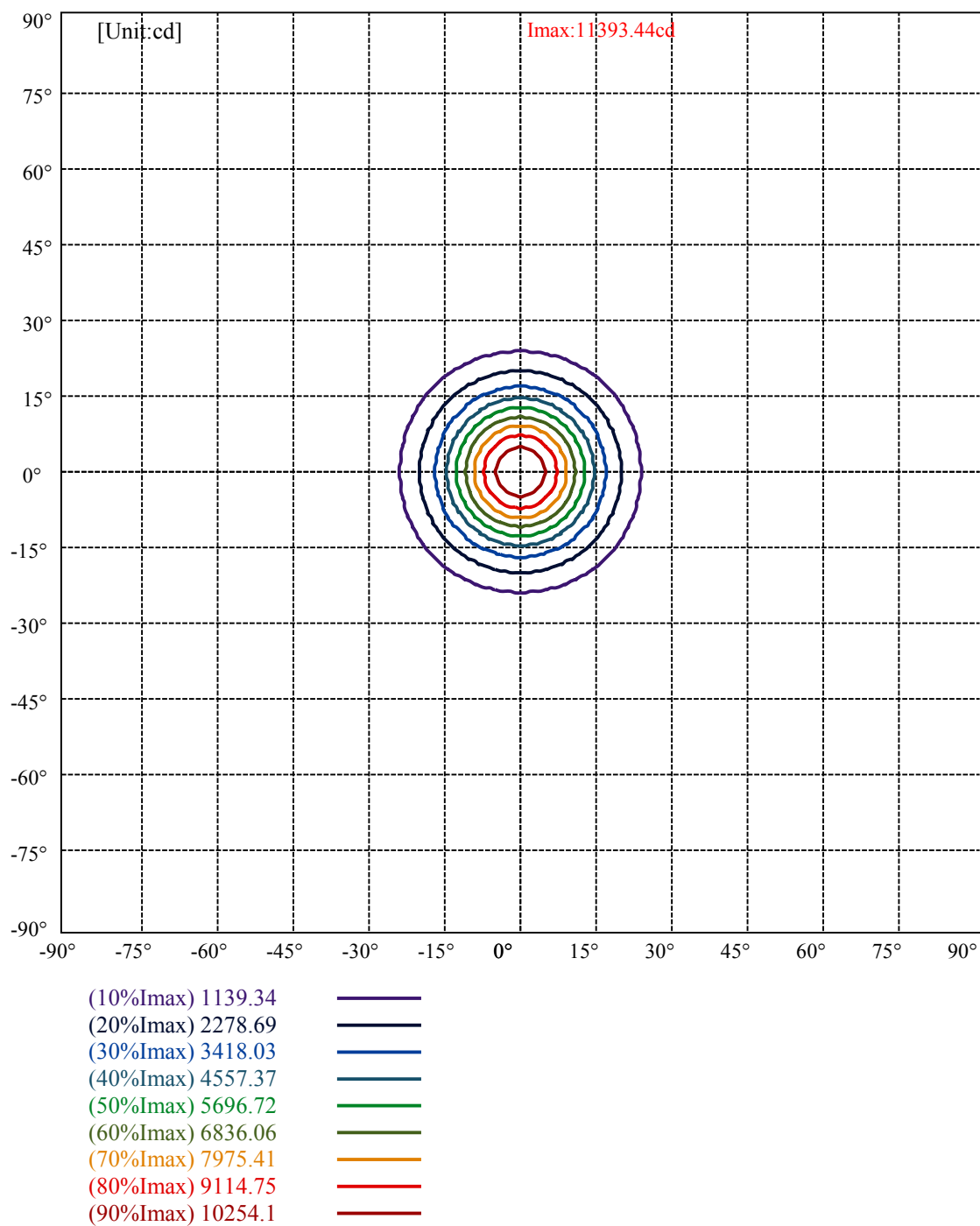
Field angle(10%Imax):C0/180Left:23.6 Right:23.6

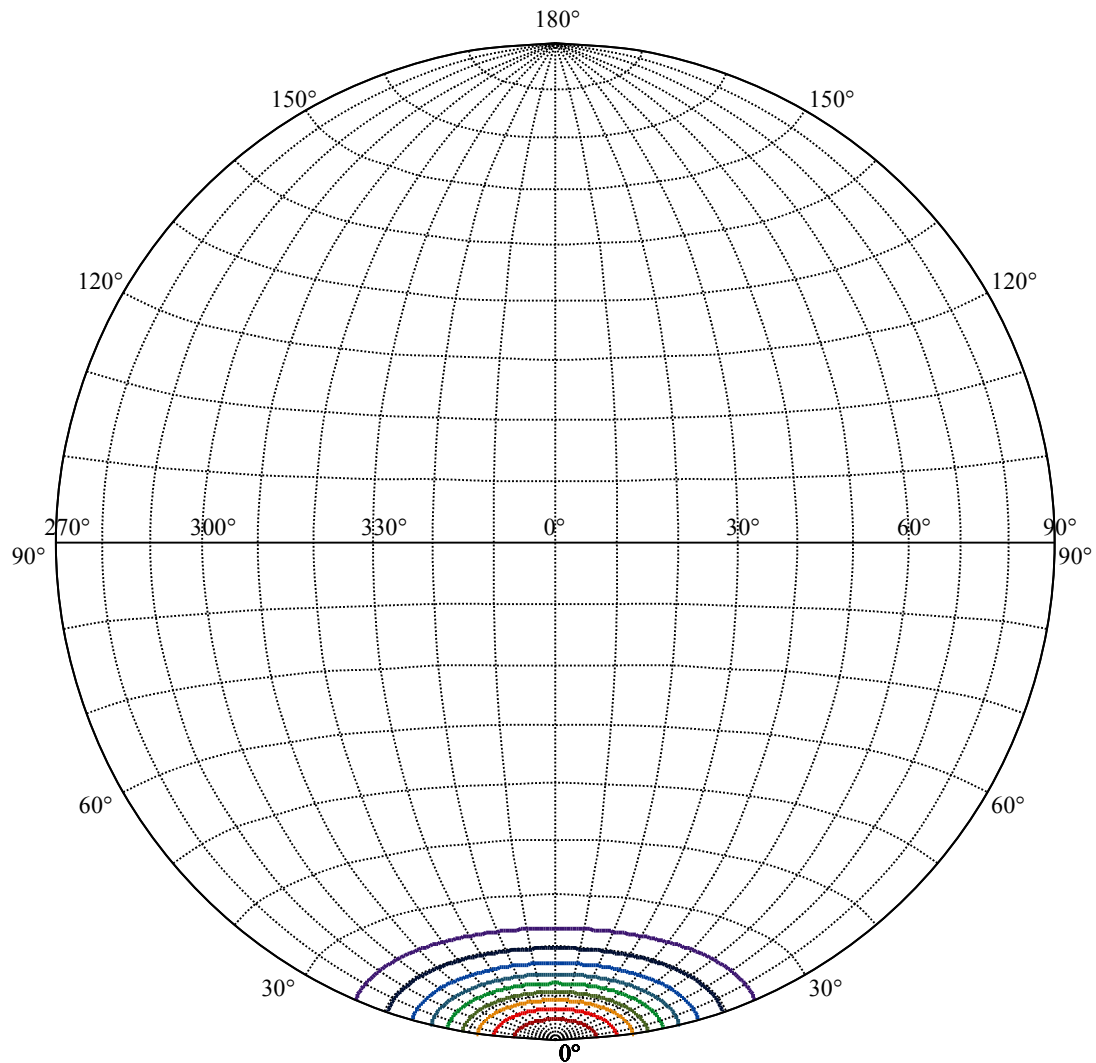
:C90/270Left:23.6 Right:23.6

Beam Angle(50%Imax):C0/180Left:12.5 Right:12.5

:C90/270Left:12.5 Right:12.5







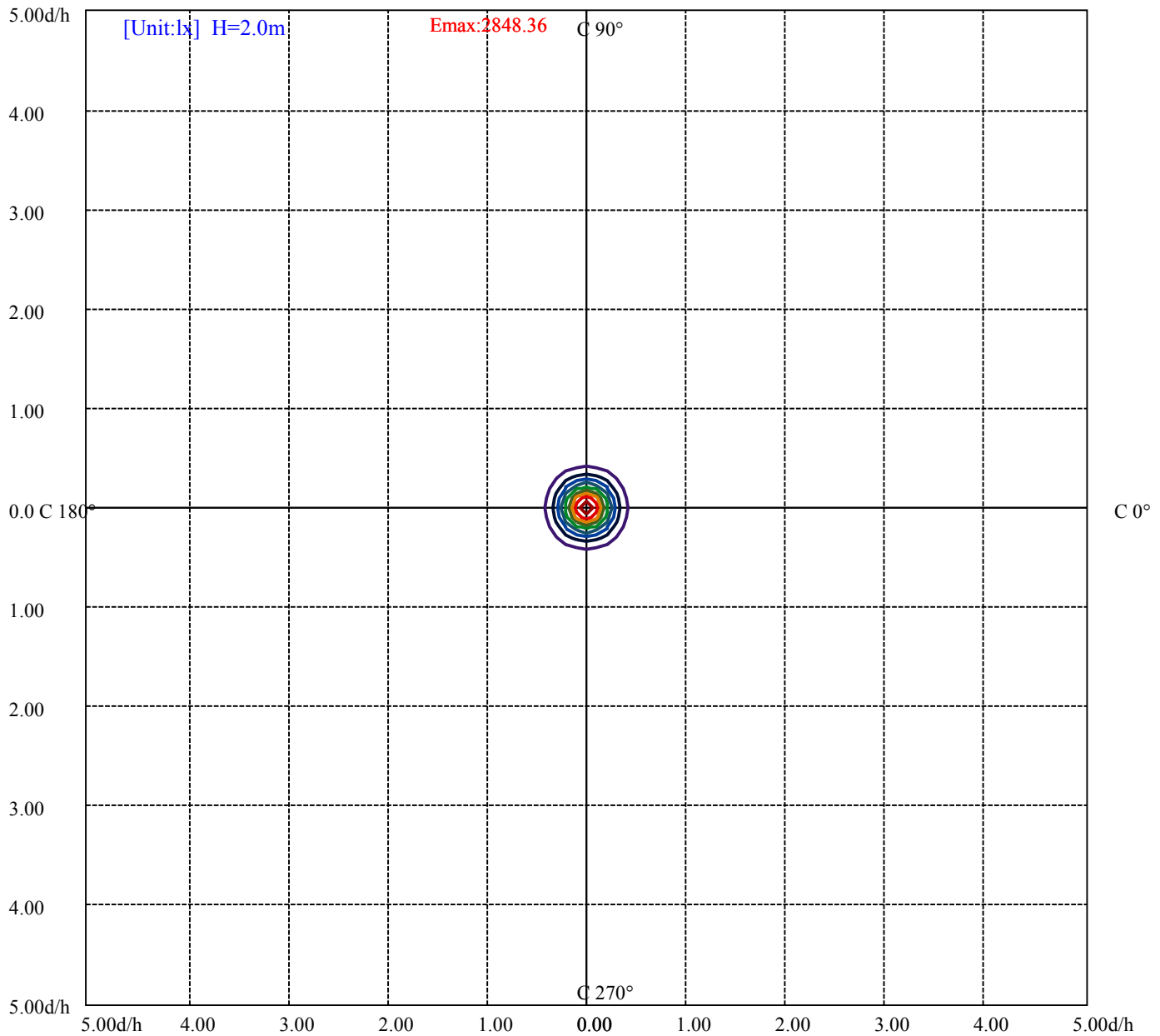
House

[Unit:cd]

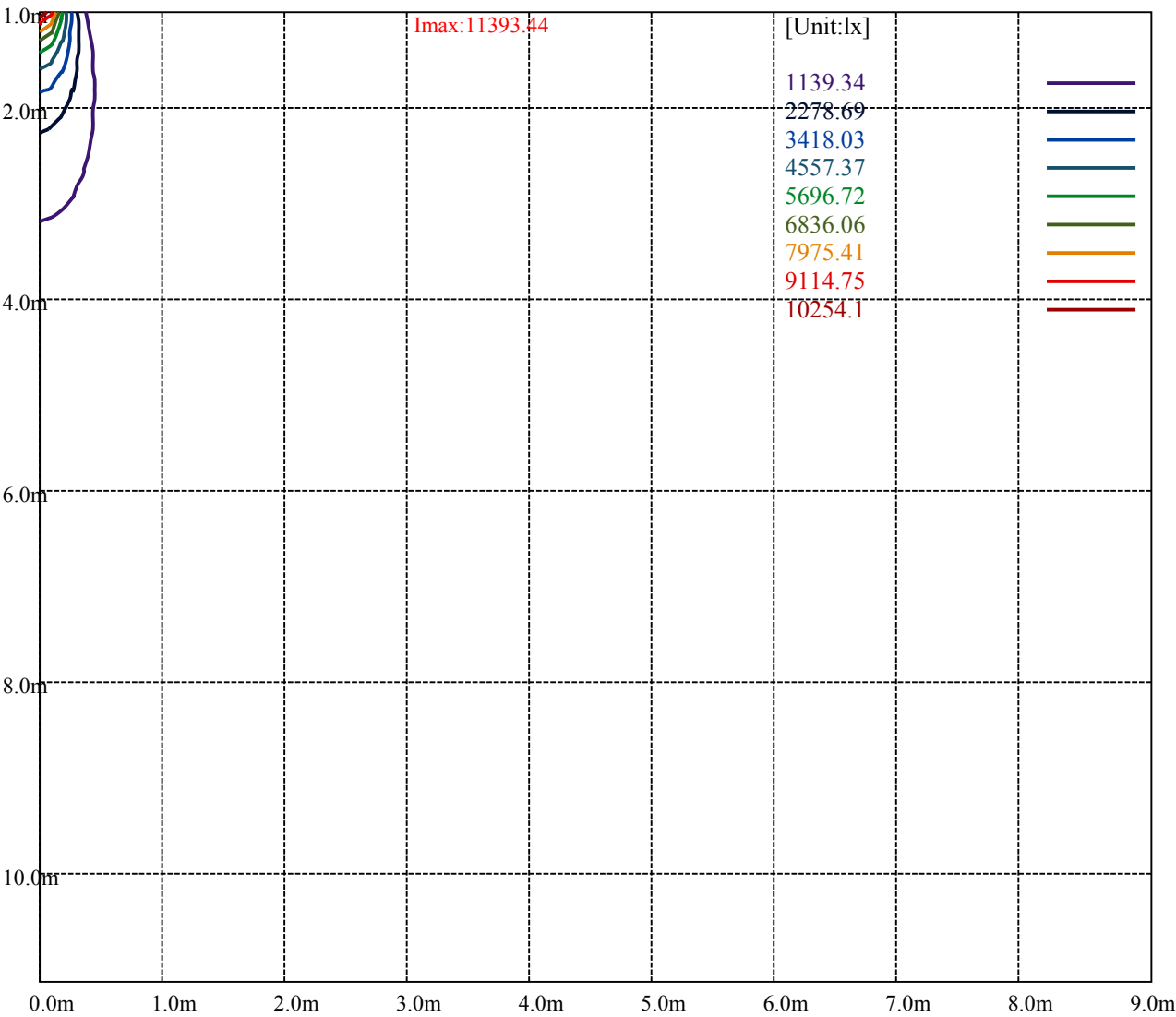
Road

Imax:11393.44

(10%Imax)	1139.34	—
(20%Imax)	2278.69	—
(30%Imax)	3418.03	—
(40%Imax)	4557.37	—
(50%Imax)	5696.72	—
(60%Imax)	6836.06	—
(70%Imax)	7975.41	—
(80%Imax)	9114.75	—
(90%Imax)	10254.1	—



(10%Emax)	284.835	
(20%Emax)	569.67	
(30%Emax)	854.5075	
(40%Emax)	1139.343	
(50%Emax)	1424.177	
(60%Emax)	1709.012	
(70%Emax)	1993.848	
(80%Emax)	2278.685	
(90%Emax)	2563.525	



Luminance Table

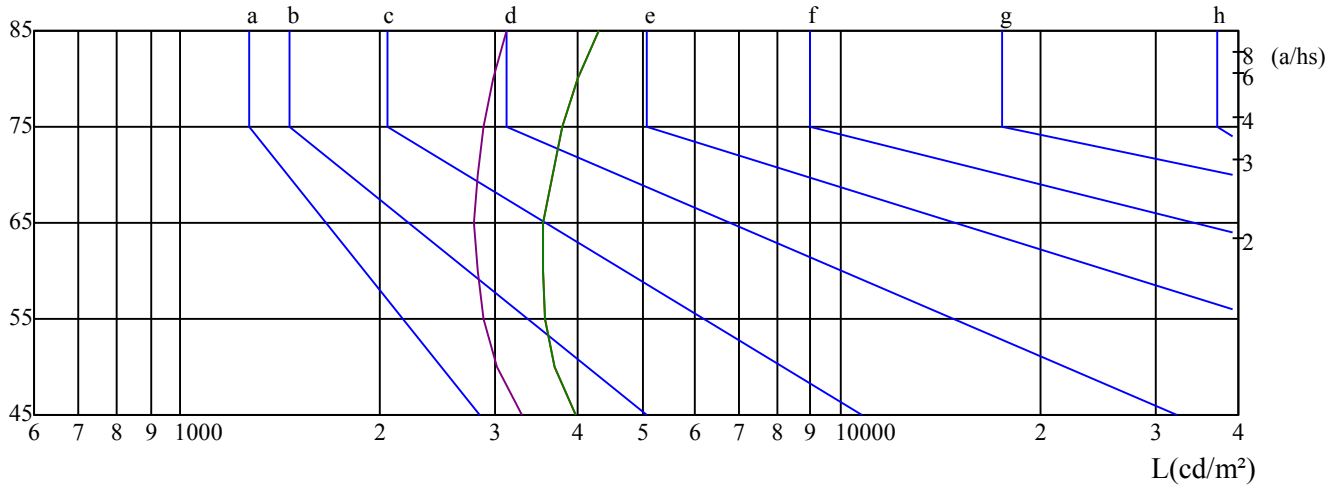
γ	45	50	55	60	65	70	75	80	85
C0	3955	3683	3556	3535	3547	3659	3797	4003	4302
C45	3296	3023	2875	2815	2780	2819	2873	2969	3120
C90	3955	3683	3556	3535	3547	3659	3797	4003	4302

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
10648	10648	10648	17024	17024	17024	50197	50197	50197

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

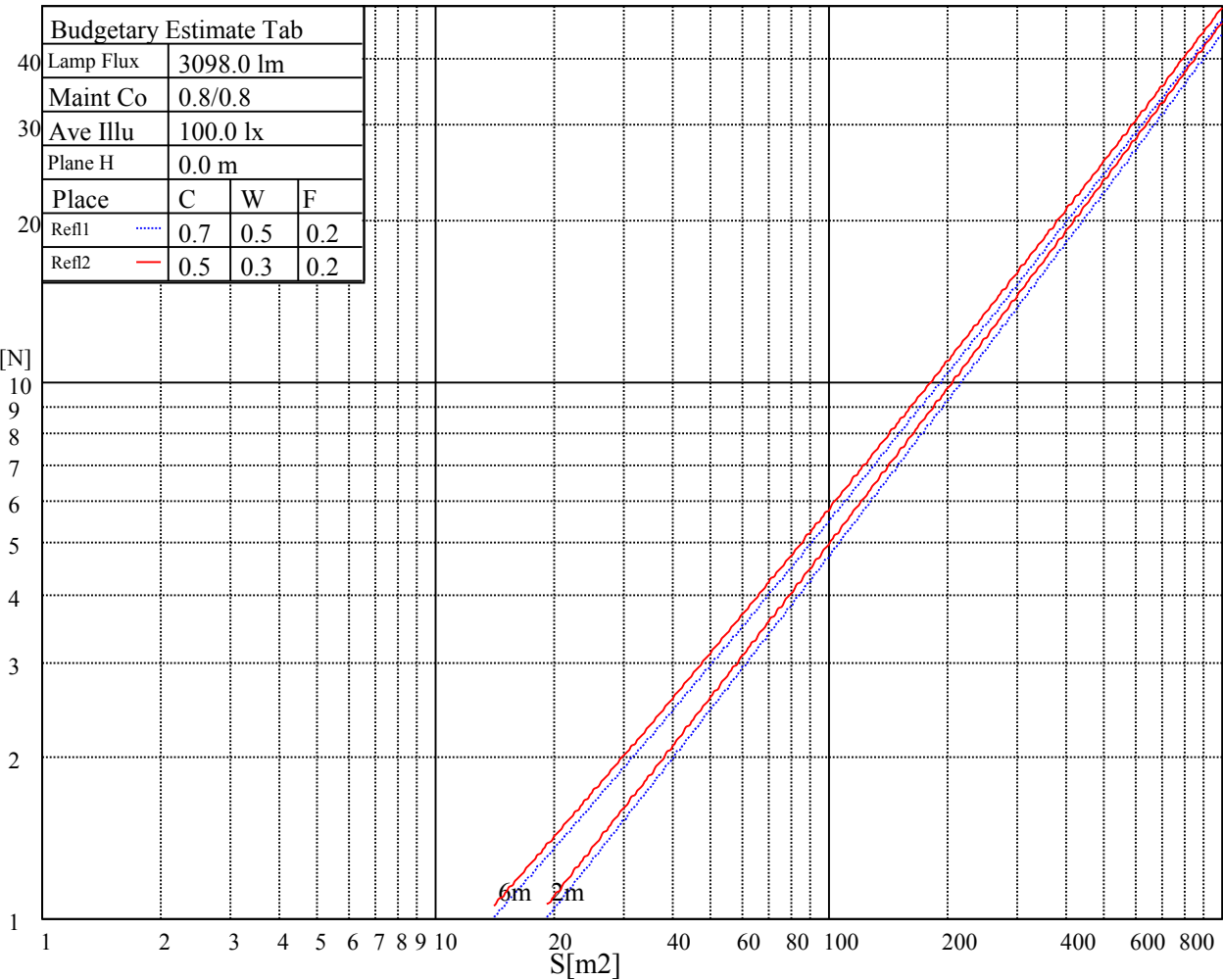
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

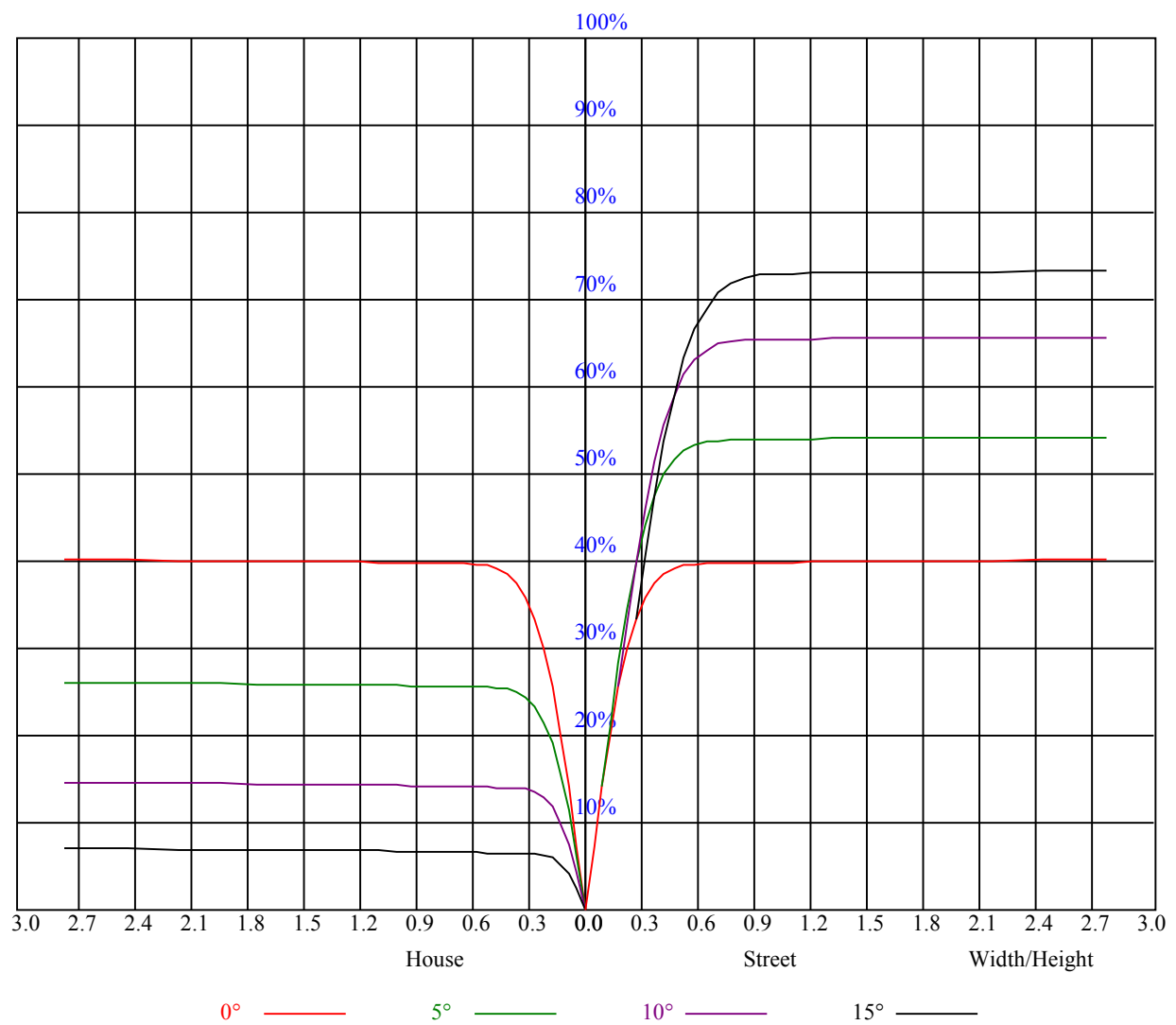
C0 ———

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



Nata 2-2187-M

Intensity data(cd)										Appendix Page: 16 Total:18	
C/γ(°)	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0		
0.0	11480.63	11373.75	11283.75	11109.38	10873.13	10518.75	10080.00	9635.63	9073.13		
45.0	11356.88	11373.75	11250.00	11064.38	10777.50	10451.25	10001.25	9466.88	8943.75		
90.0	11368.13	11211.19	11166.19	10877.06	10571.06	10203.75	9647.44	9131.63	8567.44		
135.0	11368.13	11323.13	11143.13	10906.88	10614.38	10158.75	9725.63	9219.38	8611.88		
180.0	11480.63	11224.69	10957.50	10666.13	10308.38	9772.31	9272.25	8722.69	7984.69		
225.0	11356.88	11218.50	11066.06	10733.63	10396.69	9982.13	9387.56	8863.88	8305.31		
270.0	11368.13	11340.00	11154.38	10923.75	10665.00	10209.38	9731.25	9315.00	8662.50		
315.0	11368.13	11223.00	11154.38	10889.44	10587.38	10169.44	9739.13	9193.50	8584.88		
360.0	11480.63	11373.75	11283.75	11109.38	10873.13	10518.75	10080.00	9635.63	9073.13		
C/γ(°)	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0		
0.0	8460.00	7869.38	7194.38	6592.50	5923.13	5287.50	4730.63	4213.13	3622.50		
45.0	8313.75	7706.25	7008.75	6395.63	5664.38	5101.88	4573.13	4072.50	3504.38		
90.0	7887.94	7187.63	6569.44	5896.13	5253.75	4710.38	4135.50	3667.50	3187.13		
135.0	7948.13	7323.75	6609.38	5996.25	5349.38	4719.38	4201.88	3667.50	3183.75		
180.0	7445.25	6746.63	5986.13	5481.56	4860.56	4209.19	3786.19	3343.50	2800.13		
225.0	7636.50	6947.44	6338.81	5676.75	5045.63	4514.06	3962.25	3506.06	3037.50		
270.0	8026.88	7503.75	6750.00	6153.75	5580.00	4893.75	4370.63	3881.25	3324.38		
315.0	8004.38	7322.63	6635.25	6034.50	5453.44	4769.44	4258.13	3780.00	3286.13		
360.0	8460.00	7869.38	7194.38	6592.50	5923.13	5287.50	4730.63	4213.13	3622.50		
C/γ(°)	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0		
0.0	3200.63	2863.13	2406.94	2103.19	1822.50	1573.31	1275.75	1037.25	811.69		
45.0	3088.13	2851.88	2293.31	1998.56	1733.63	1465.31	1207.69	973.13	728.44		
90.0	2755.69	2413.13	2108.81	1766.25	1523.81	1112.46	998.94	787.22	592.26		
135.0	2846.25	2448.56	2059.88	1783.69	1554.19	1238.63	1015.88	813.94	583.88		
180.0	2490.75	2172.94	1852.88	1569.38	1244.81	1098.84	829.29	631.13	455.06		
225.0	2633.06	2311.31	2019.94	1686.38	1444.50	1118.14	892.74	709.31	521.16		
270.0	2930.63	2891.25	2194.88	1909.69	1648.69	1382.63	1116.56	888.19	650.81		
315.0	2855.25	2513.81	2200.50	1845.00	1589.06	1106.83	1077.30	824.46	622.07		
360.0	3200.63	2863.13	2406.94	2103.19	1822.50	1573.31	1275.75	1037.25	811.69		
C/γ(°)	27.0	28.0	29.0	30.0	31.0	32.0	33.0	34.0	35.0		
0.0	581.06	388.13	295.88	117.84	41.74	18.00	16.48	15.47	14.57		
45.0	536.63	352.13	298.13	91.46	28.41	16.20	15.19	14.46	13.67		
90.0	400.33	237.09	121.11	39.66	17.61	15.58	14.63	13.95	13.33		
135.0	391.50	300.94	126.84	42.81	17.27	15.81	14.91	14.12	13.56		
180.0	288.34	153.96	67.39	21.94	16.03	15.02	14.23	13.61	13.05		
225.0	338.79	190.69	93.77	31.67	17.16	15.92	14.85	14.12	13.44		
270.0	466.31	294.19	151.93	66.60	22.11	16.59	15.58	14.74	13.89		
315.0	425.59	279.00	146.59	56.03	21.04	16.76	15.58	14.74	14.06		
360.0	581.06	388.13	295.88	117.84	41.74	18.00	16.48	15.47	14.57		
C/γ(°)	36.0	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0		
0.0	13.84	13.28	12.77	12.21	11.93	11.70	11.42	11.25	11.08		
45.0	13.16	12.71	12.32	11.98	11.70	11.48	11.25	11.08	10.97		
90.0	12.83	12.43	12.09	11.76	11.59	11.31	11.08	10.97	10.86		
135.0	12.99	12.60	12.26	11.87	11.64	11.53	11.25	11.08	10.97		
180.0	12.60	12.26	11.98	11.70	11.48	11.31	11.14	10.97	10.80		
225.0	12.88	12.49	12.09	11.76	11.48	11.31	11.08	10.97	10.86		
270.0	13.33	12.83	12.43	11.98	11.70	11.42	11.19	11.03	10.97		
315.0	13.33	12.83	12.43	12.04	11.70	11.48	11.19	11.08	10.91		
360.0	13.84	13.28	12.77	12.21	11.93	11.70	11.42	11.25	11.08		

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	10.91	10.80	10.69	10.63	10.58	10.46	10.41	10.35	10.29
45.0	10.86	10.74	10.63	10.58	10.52	10.46	10.41	10.35	10.29
90.0	10.74	10.63	10.58	10.52	10.41	10.35	10.35	10.29	10.24
135.0	10.80	10.69	10.63	10.58	10.52	10.41	10.35	10.29	10.29
180.0	10.74	10.63	10.58	10.52	10.46	10.41	10.35	10.35	10.29
225.0	10.74	10.63	10.58	10.46	10.46	10.35	10.35	10.24	10.24
270.0	10.80	10.69	10.63	10.52	10.41	10.35	10.35	10.29	10.24
315.0	10.80	10.69	10.58	10.46	10.46	10.41	10.35	10.29	10.24
360.0	10.91	10.80	10.69	10.63	10.58	10.46	10.41	10.35	10.29
C/ γ (°)	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0
0.0	10.29	10.24	10.18	10.18	10.13	10.13	10.07	10.07	10.07
45.0	10.29	10.29	10.24	10.13	10.13	10.13	10.13	10.13	10.07
90.0	10.13	10.18	10.18	10.18	10.07	10.07	10.07	10.07	10.01
135.0	10.24	10.24	10.18	10.18	10.13	10.13	10.07	10.07	10.01
180.0	10.24	10.18	10.18	10.13	10.07	10.13	10.01	10.07	10.01
225.0	10.24	10.18	10.18	10.13	10.07	10.07	10.01	10.07	10.01
270.0	10.18	10.18	10.18	10.13	10.07	10.07	10.07	10.01	10.01
315.0	10.24	10.18	10.13	10.07	10.07	10.07	10.01	10.01	10.01
360.0	10.29	10.24	10.18	10.18	10.13	10.13	10.07	10.07	10.07
C/ γ (°)	63.0	64.0	65.0	66.0	67.0	68.0	69.0	70.0	71.0
0.0	10.07	9.96	10.01	10.01	9.96	9.96	9.96	9.96	9.90
45.0	10.07	10.01	10.01	10.01	10.01	9.96	9.96	9.96	9.96
90.0	10.01	10.01	9.96	9.96	9.96	9.96	9.90	9.90	9.84
135.0	9.96	10.01	10.01	9.96	9.96	9.90	9.90	9.84	9.96
180.0	10.01	10.07	10.01	9.96	9.96	9.90	10.01	9.90	9.96
225.0	9.96	9.96	9.96	10.01	9.90	9.96	9.96	9.96	9.90
270.0	9.96	9.96	9.90	9.96	9.90	9.96	9.90	9.90	9.90
315.0	9.96	9.96	9.96	9.90	9.96	9.96	9.90	9.90	9.90
360.0	10.07	9.96	10.01	10.01	9.96	9.96	9.96	9.96	9.90
C/ γ (°)	72.0	73.0	74.0	75.0	76.0	77.0	78.0	79.0	80.0
0.0	9.96	9.90	9.84	9.90	9.90	9.90	9.90	9.84	9.90
45.0	9.96	9.90	9.96	9.90	9.84	9.90	9.90	9.90	9.90
90.0	9.84	9.90	9.90	9.84	9.84	9.84	9.84	9.84	9.84
135.0	9.90	9.90	9.90	9.90	9.90	9.84	9.84	9.90	9.84
180.0	9.90	9.90	9.90	9.84	9.90	9.90	9.84	9.84	9.84
225.0	9.90	9.90	9.90	9.84	9.90	9.90	9.90	9.84	9.90
270.0	9.84	9.84	9.90	9.84	9.84	9.84	9.84	9.84	9.84
315.0	9.90	9.84	9.90	9.90	9.84	9.90	9.84	9.90	9.84
360.0	9.96	9.90	9.84	9.90	9.90	9.90	9.90	9.84	9.90
C/ γ (°)	81.0	82.0	83.0	84.0	85.0	86.0	87.0	88.0	89.0
0.0	9.90	9.90	9.84	9.90	9.90	9.90	9.90	9.84	9.84
45.0	9.90	9.90	9.90	9.90	9.90	9.90	9.84	9.84	9.79
90.0	9.90	9.79	9.84	9.84	9.84	9.79	9.84	9.79	9.79
135.0	9.84	9.90	9.90	9.90	9.90	9.84	9.79	9.79	9.79
180.0	9.84	9.84	9.84	9.84	9.84	9.84	9.84	9.79	9.84
225.0	9.90	9.84	9.84	9.84	9.84	9.84	9.84	9.84	9.84
270.0	9.84	9.84	9.84	9.84	9.79	9.79	9.84	9.84	9.84
315.0	9.90	9.84	9.90	9.84	9.84	9.84	9.79	9.79	9.84
360.0	9.90	9.90	9.84	9.90	9.90	9.90	9.90	9.84	9.84

Intensity data(cd)

Appendix Page: 18 Total:18

C/ $\gamma(^{\circ})$	90.0
0.0	9.84
45.0	9.79
90.0	9.84
135.0	9.79
180.0	9.84
225.0	9.84
270.0	9.79
315.0	9.79
360.0	9.84