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Nata

LumCAT: 1656-S	
Luminaire: 92.70.126.00	
Report No: NATA0100	Voltage(V): 36.1000
Test No: GC2018082002	Current(A): 0.4000
LampCAT: LUMINUS CHM-9-AA10	Power (W): 15.4400
Lamp flux(lm): 1813.0	PF: 0.0000
Number of Lamps: 1	Ballast type: DC
Length(mm): 47	Width(mm): 47
Phm Type: C	Height(mm): 0

Photometric Results

Lumens(lm): 1653.70
Efficiency(%): 91.21%
Lumens(lm)/Power(W): 107.82
Central intensity(cd): 11836.440
Maximum intensity(cd): 11836.440
Angle of maximum intensity: C=0.0 γ =0.0
Beam Angle(50%Imax): [C0/180]Total=14.8
[C90/270]Total=14.8
Field angle(10%Imax): [C0/180]Total=33.6
[C90/270]Total=33.6
Maximum s/h(1/2): C0_180=0.25 C90_270=0.25
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(%): 91.82%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.839%

$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	11836.438	11.327	11.327	.625%	.685%
2.0	11255.111	86.146	97.473	4.752%	5.894%
4.0	9608.374	146.994	244.467	8.108%	14.783%
6.0	7340.050	168.267	412.734	9.281%	24.958%
8.0	5315.420	162.240	574.974	8.949%	34.769%
10.0	3672.606	139.865	714.839	7.715%	43.227%
12.0	2566.661	117.034	831.873	6.455%	50.304%
14.0	1805.643	95.802	927.675	5.284%	56.097%
16.0	1295.477	78.313	1005.987	4.320%	60.833%
18.0	1015.412	68.816	1074.804	3.796%	64.994%
20.0	849.231	63.700	1138.504	3.514%	68.846%
22.0	748.368	61.483	1199.987	3.391%	72.564%
24.0	687.985	61.370	1261.357	3.385%	76.275%
26.0	647.284	62.230	1323.588	3.432%	80.038%
28.0	617.540	63.583	1387.17	3.507%	83.883%
30.0	577.555	63.333	1450.503	3.493%	87.713%
32.0	492.356	57.221	1507.724	3.156%	91.173%
34.0	370.956	45.494	1553.218	2.509%	93.924%
36.0	234.981	30.291	1583.509	1.671%	95.756%
38.0	113.981	15.390	1598.899	.849%	96.686%
40.0	45.786	6.455	1605.353	.356%	97.077%
42.0	24.858	3.648	1609.001	.201%	97.297%
44.0	17.384	2.648	1611.65	.146%	97.457%
46.0	14.232	2.245	1613.895	.124%	97.593%
48.0	13.220	2.155	1616.05	.119%	97.723%
50.0	12.608	2.118	1618.168	.117%	97.852%
52.0	12.326	2.130	1620.298	.117%	97.980%
54.0	12.009	2.131	1622.429	.118%	98.109%
56.0	11.727	2.132	1624.561	.118%	98.238%
58.0	11.472	2.134	1626.695	.118%	98.367%
60.0	11.073	2.103	1628.798	.116%	98.494%
62.0	10.357	2.006	1630.803	.111%	98.616%
64.0	9.621	1.896	1632.7	.105%	98.730%
66.0	8.940	1.791	1634.491	.099%	98.839%
68.0	8.465	1.721	1636.212	.095%	98.943%
70.0	8.203	1.691	1637.903	.093%	99.045%
72.0	8.080	1.685	1639.588	.093%	99.147%
74.0	7.983	1.683	1641.271	.093%	99.249%

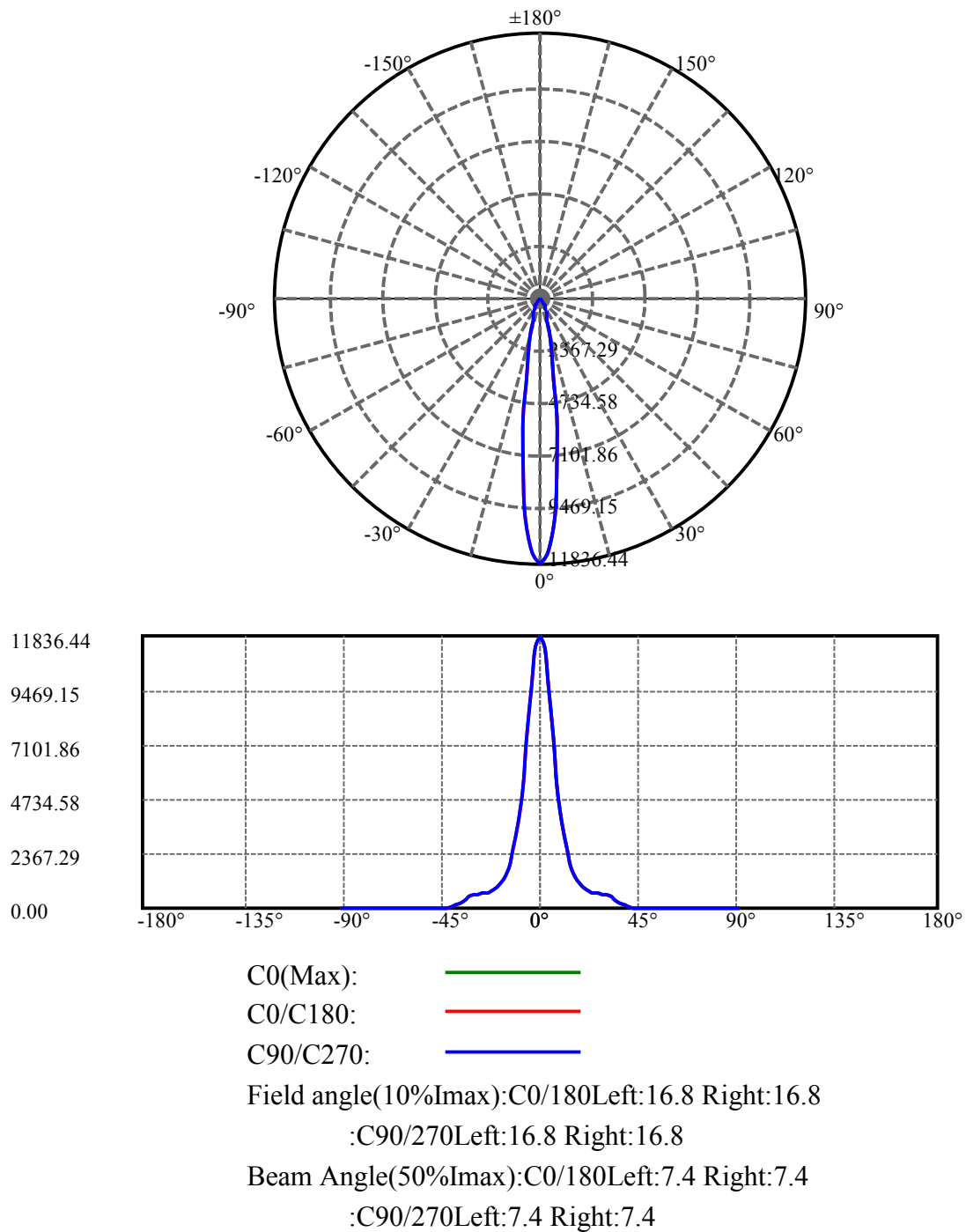
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
76.0	7.914	1.684	1642.955	.093%	99.351%
78.0	7.832	1.680	1644.635	.093%	99.452%
80.0	7.749	1.674	1646.309	.092%	99.553%
82.0	7.694	1.671	1647.98	.092%	99.654%
84.0	7.646	1.668	1649.648	.092%	99.755%
86.0	7.515	1.644	1651.292	.091%	99.855%
88.0	7.350	1.611	1652.903	.089%	99.952%
90.0	7.233	0.793	1653.696	.044%	100.000%

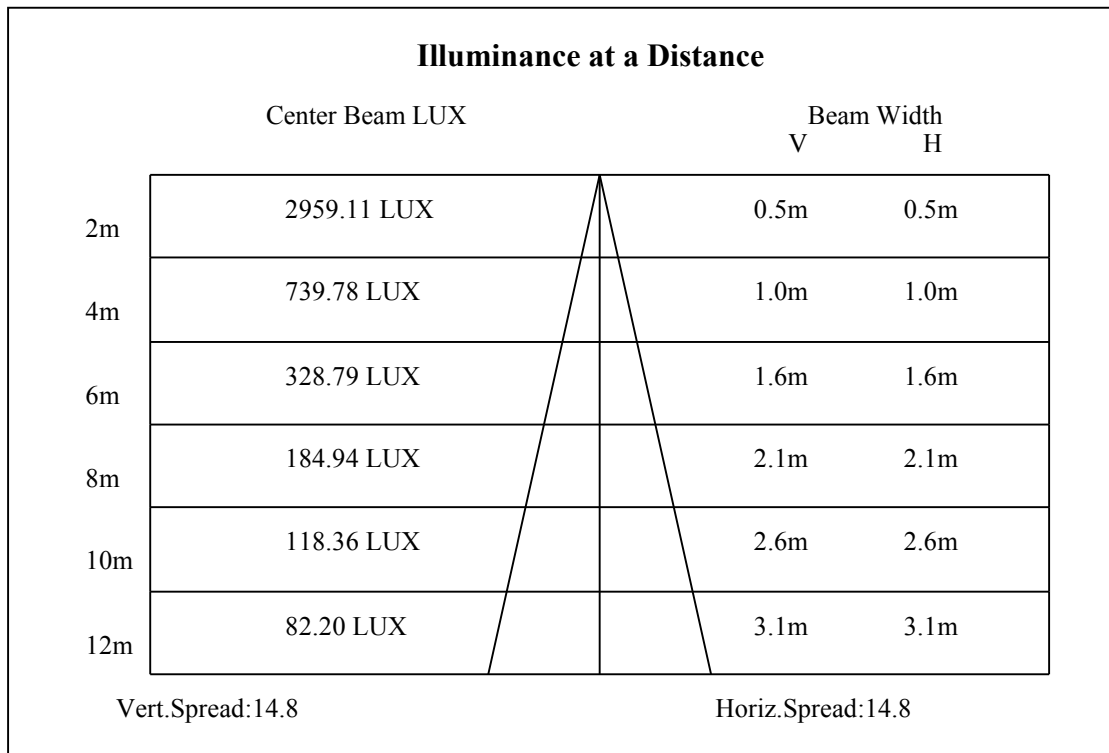
ZONAL LUMEN SUMMARY

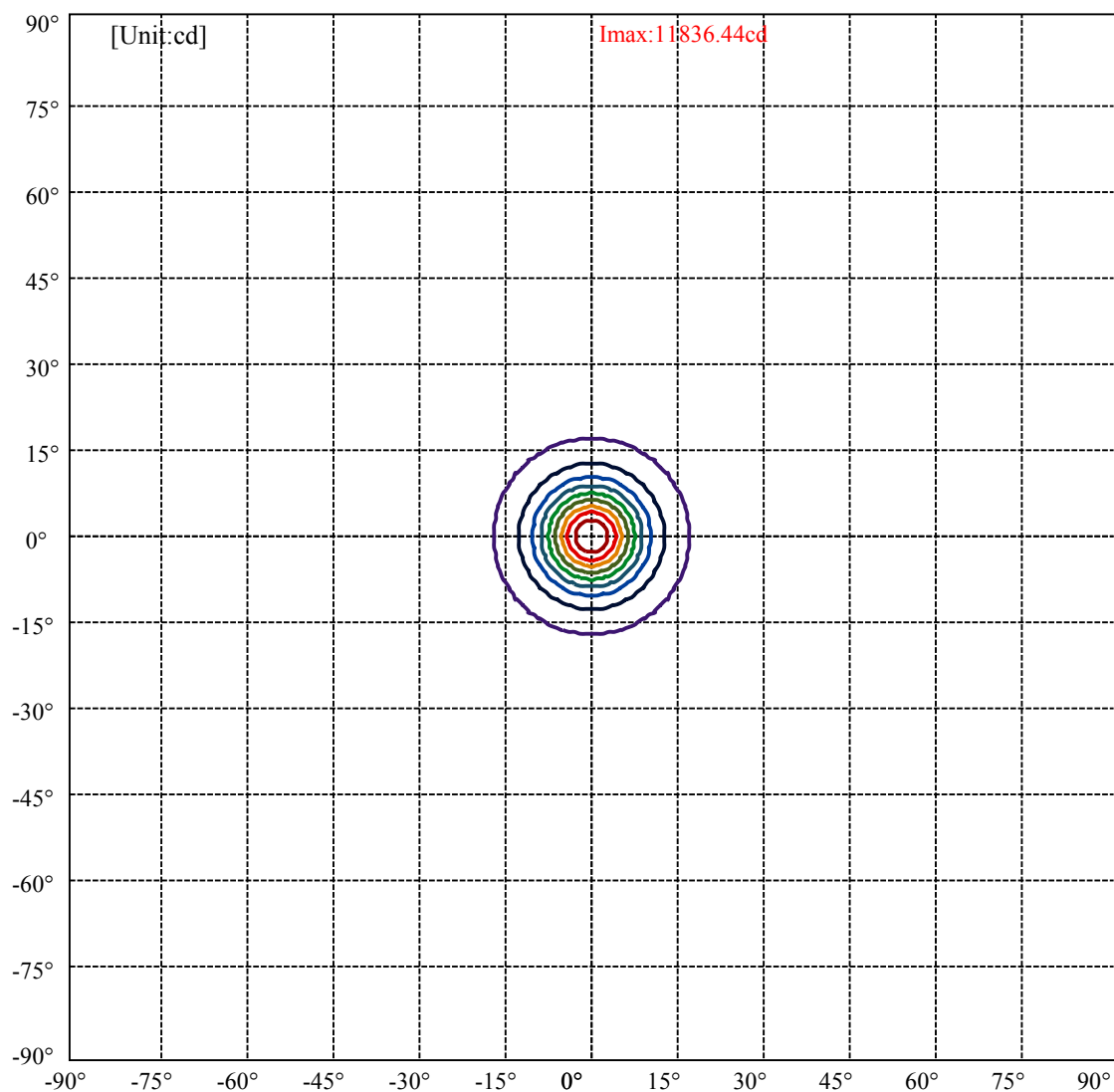
Zone	Lumens	%Lamp	%Fixt
0-30	1450.50	80.01%	87.71%
0-40	1605.35	88.55%	97.08%
0-60	1628.80	89.84%	98.49%
0-90	1652.90	91.17%	99.95%
0-120	1652.90	91.17%	99.95%
0-180	1653.70	91.21%	100.00%
60-90	26.21	1.45%	1.58%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-25.98	1322.96	72.97%	80.00%

ZONAL LUMEN SUMMARY

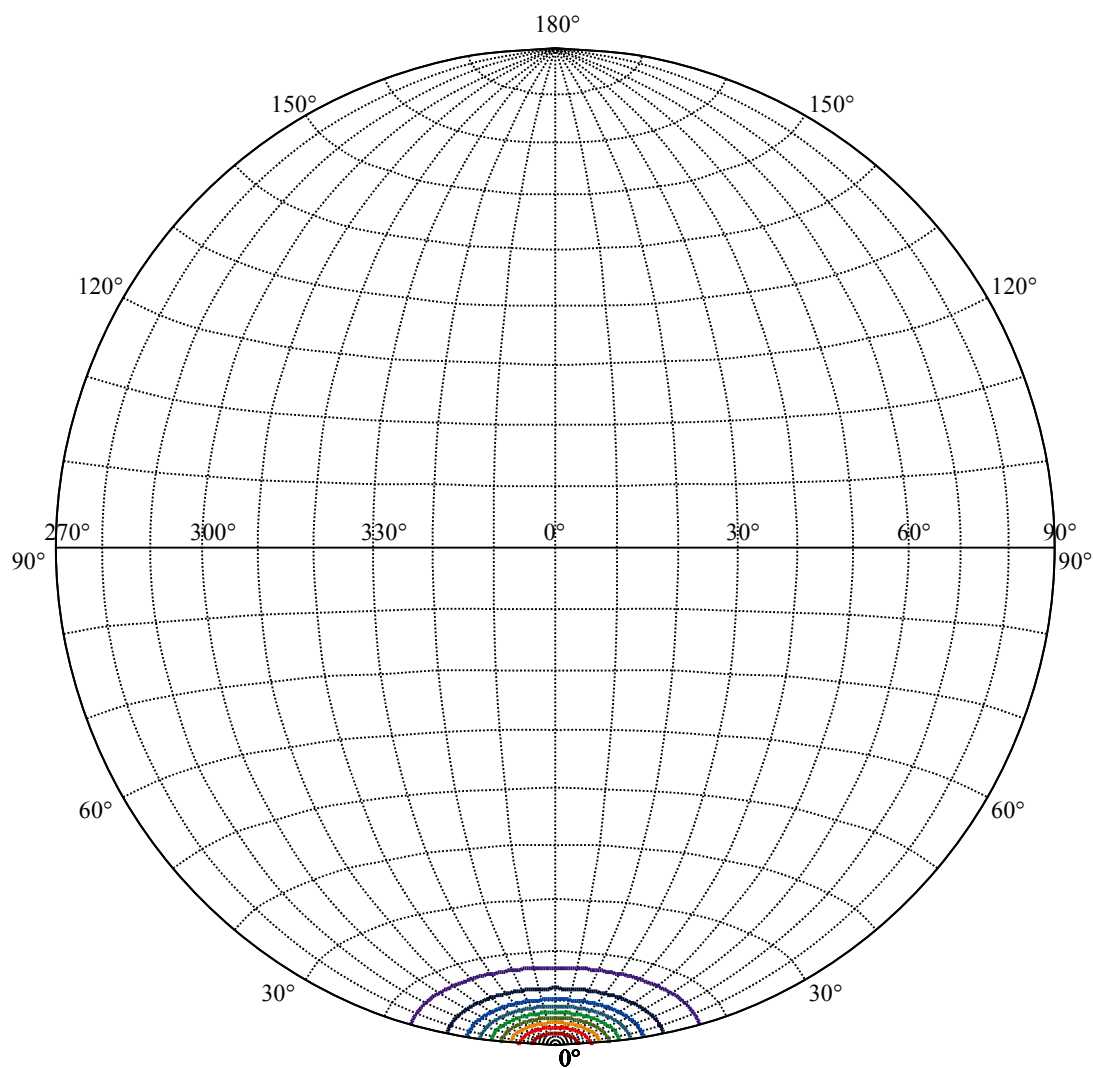
0-10	714.84
10-20	423.67
20-30	312.00
30-40	154.85
40-50	12.81
50-60	10.63
60-70	9.11
70-80	8.41
80-90	6.59
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00







(10%Imax) 1183.64	—
(20%Imax) 2367.29	—
(30%Imax) 3550.93	—
(40%Imax) 4734.58	—
(50%Imax) 5918.22	—
(60%Imax) 7101.86	—
(70%Imax) 8285.51	—
(80%Imax) 9469.15	—
(90%Imax) 10652.8	—



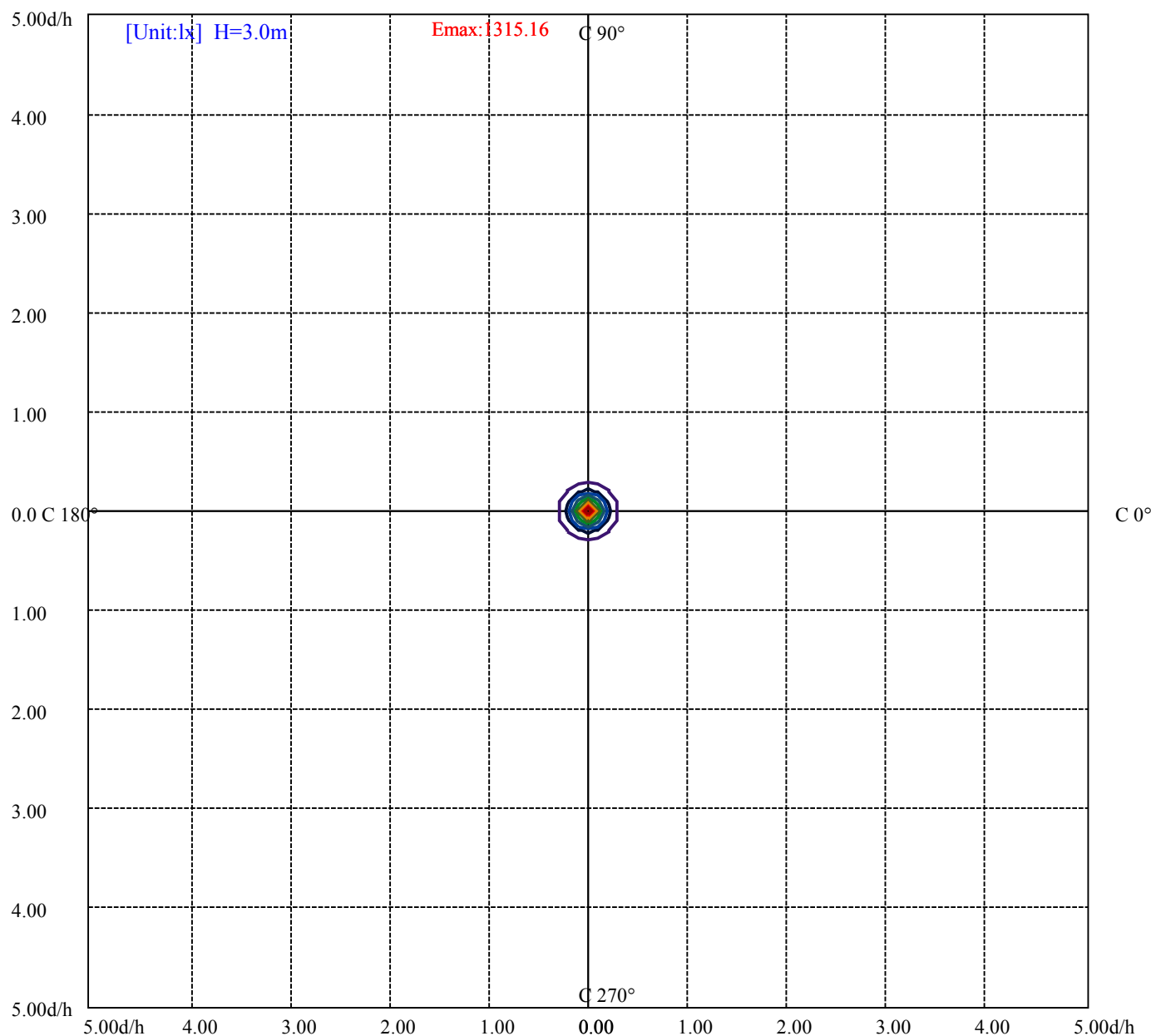
House

[Unit:cd]

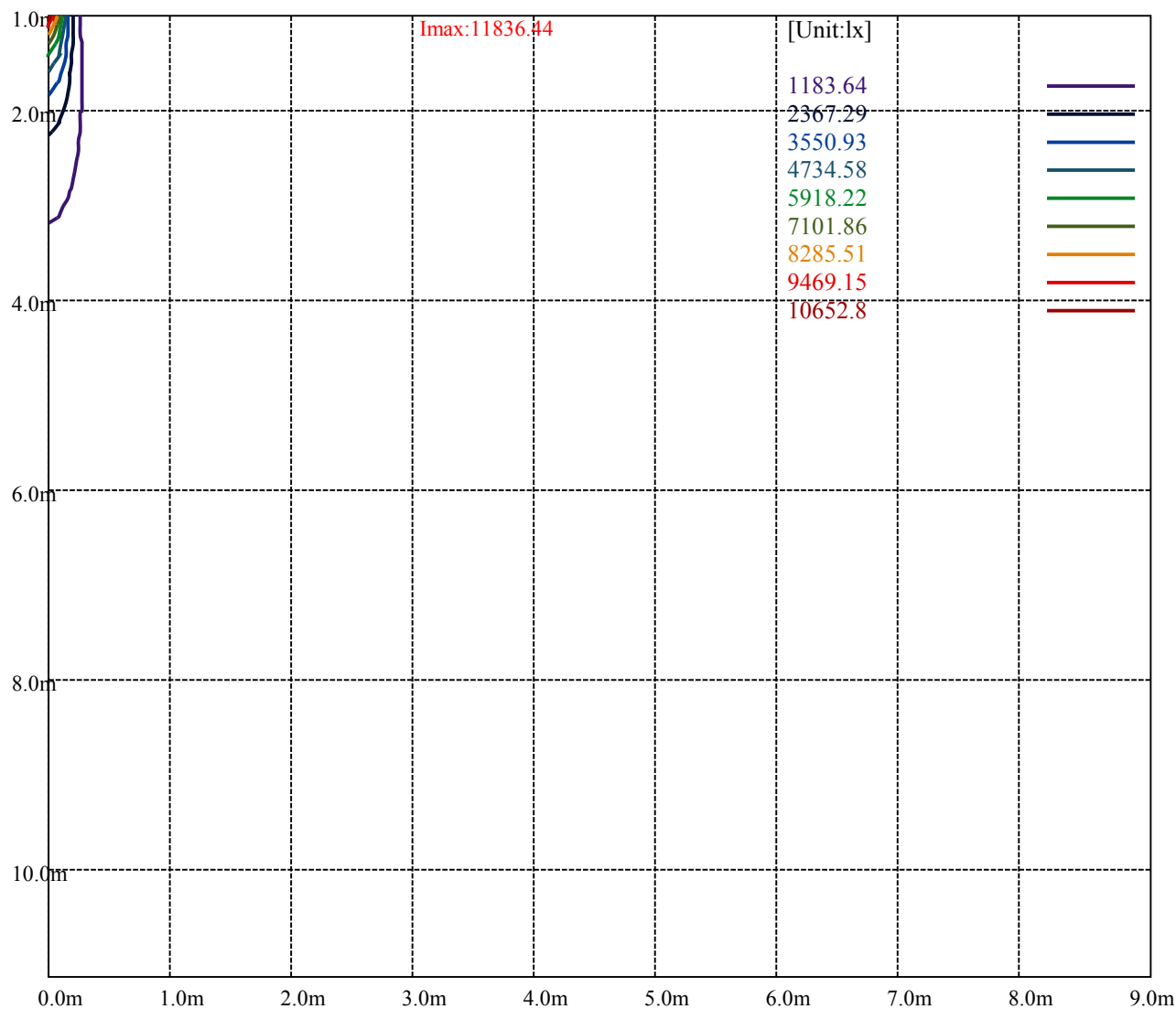
Road

Imax:11836.44

(10%Imax)	1183.64	—
(20%Imax)	2367.29	—
(30%Imax)	3550.93	—
(40%Imax)	4734.58	—
(50%Imax)	5918.22	—
(60%Imax)	7101.86	—
(70%Imax)	8285.51	—
(80%Imax)	9469.15	—
(90%Imax)	10652.8	—



(10%E _{max}) 131.5156	—
(20%E _{max}) 263.0311	—
(30%E _{max}) 394.5467	—
(40%E _{max}) 526.0623	—
(50%E _{max}) 657.5778	—
(60%E _{max}) 789.0933	—
(70%E _{max}) 920.6089	—
(80%E _{max}) 1052.125	—
(90%E _{max}) 1183.644	—



Luminance Table

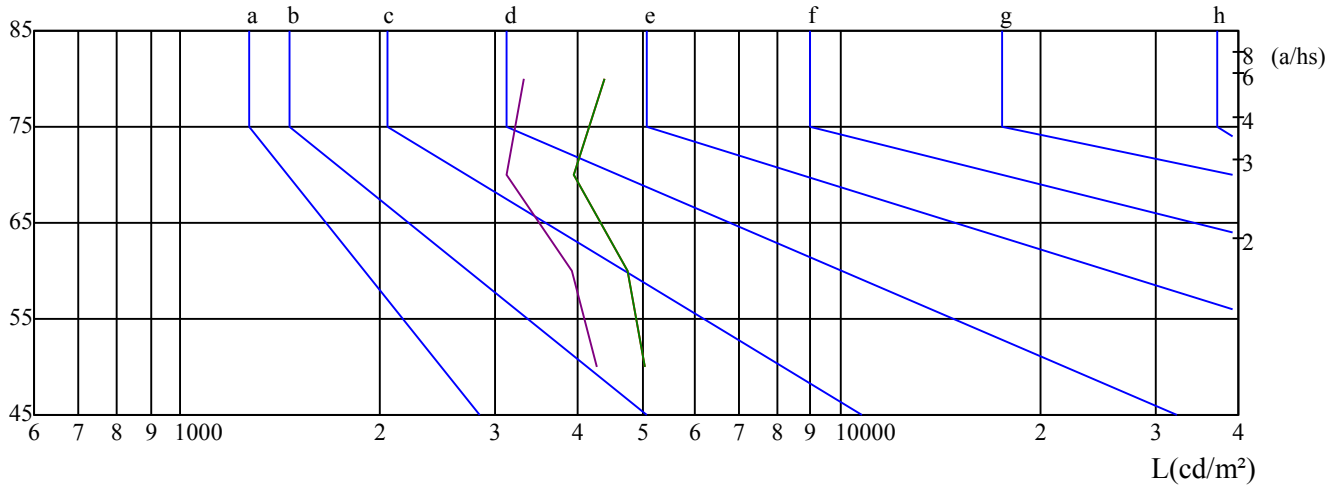
γ	45	50	55	60	65	70	75	80	85
C0	0	5043	0	4761	0	3943	0	4373	0
C45	0	4278	0	3911	0	3120	0	3301	0
C90	0	5043	0	4761	0	3943	0	4373	0

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1892	1892	1892	3106	3106	3106	9401	9401	9401

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

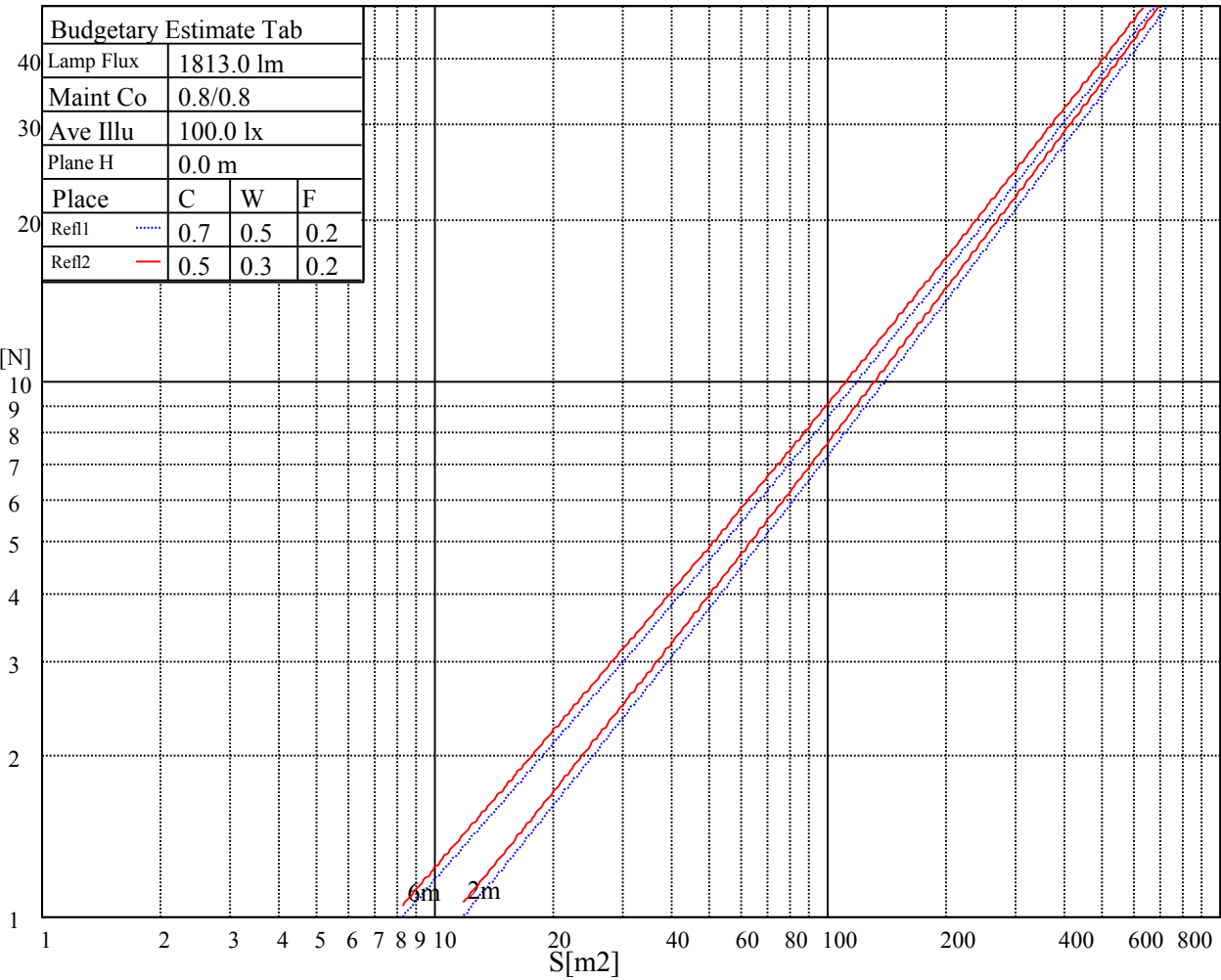
Luminance Limiting Curve

 $\gamma(^{\circ})$ 

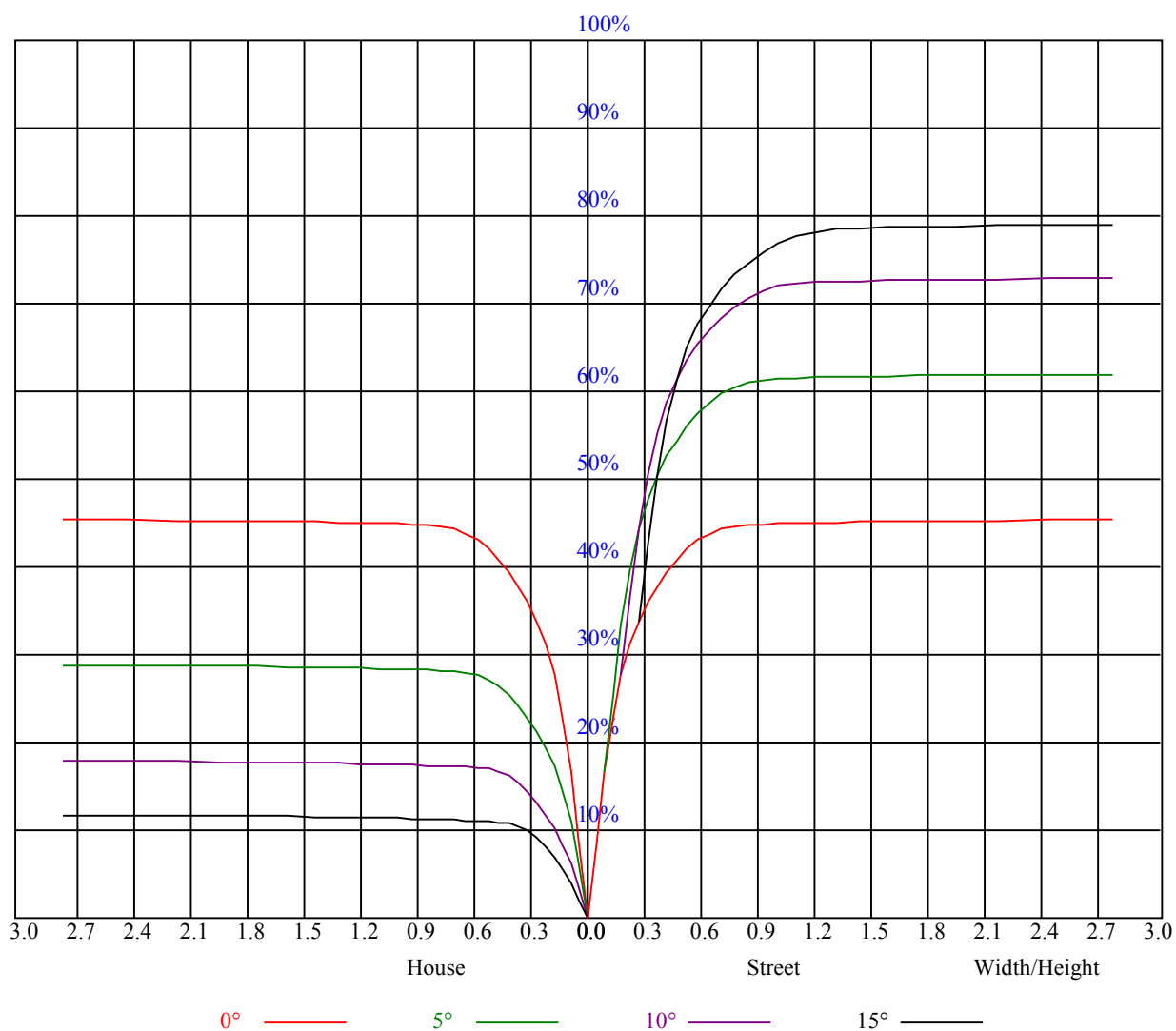
C0 ———

C45 ———

C90 ———



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	1.07	1.07	1.07	1.02	1.02	1.02	0.98	0.98	0.98	0.94	0.94	0.94	0.92
1	1.02	1.00	0.98	1.00	0.98	0.97	0.97	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87
2	0.97	0.94	0.91	0.96	0.93	0.90	0.93	0.90	0.88	0.90	0.88	0.87	0.88	0.86	0.85	0.83
3	0.93	0.89	0.86	0.91	0.88	0.85	0.89	0.86	0.84	0.87	0.85	0.83	0.85	0.83	0.82	0.80
4	0.89	0.85	0.82	0.88	0.84	0.81	0.86	0.83	0.80	0.84	0.82	0.80	0.83	0.80	0.79	0.77
5	0.85	0.81	0.78	0.85	0.81	0.78	0.83	0.80	0.77	0.82	0.79	0.77	0.80	0.78	0.76	0.75
6	0.82	0.78	0.75	0.82	0.78	0.75	0.80	0.77	0.74	0.79	0.76	0.74	0.78	0.76	0.74	0.73
7	0.80	0.75	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
8	0.77	0.73	0.70	0.77	0.73	0.70	0.76	0.72	0.70	0.75	0.72	0.70	0.74	0.71	0.69	0.68
9	0.75	0.71	0.68	0.74	0.71	0.68	0.74	0.70	0.68	0.73	0.70	0.68	0.72	0.70	0.67	0.67
10	0.73	0.69	0.66	0.72	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.66	0.71	0.68	0.66	0.65



Nata 1656-S

Intensity data(cd)

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C/γ(°)	0.0	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0
0.0	11842.63	11539.82	10031.28	7597.78	5764.41	3931.03	2802.37	1945.14	1403.94
45.0	11892.18	10807.57	8682.39	6298.45	4558.67	3072.15	2188.49	1534.42	1161.14
90.0	11727.01	10188.19	7721.11	5685.67	3844.04	2579.39	1847.14	1309.24	1002.58
135.0	11908.70	10730.49	8720.93	6303.96	4520.13	3050.12	2120.22	1508.55	1118.75
180.0	11842.63	10949.62	9105.78	6808.27	4744.21	3274.20	2296.40	1613.70	1178.76
225.0	11892.18	11837.13	10522.93	8283.24	6094.19	4178.78	2931.75	2003.50	1424.86
270.0	11677.46	12150.95	11413.19	9354.08	6970.14	4960.58	3430.01	2552.41	1620.31
315.0	11908.70	11837.13	10669.38	8388.94	6027.57	4334.59	2916.89	1978.18	1453.49
360.0	11842.63	11539.82	10031.28	7597.78	5764.41	3931.03	2802.37	1945.14	1403.94
C/γ(°)	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0
0.0	1100.03	916.69	801.62	728.40	684.90	650.22	622.69	558.27	431.09
45.0	940.36	807.13	731.15	685.45	650.77	622.69	586.35	475.69	333.09
90.0	820.23	715.62	647.24	613.22	583.71	557.78	482.51	358.31	227.11
135.0	900.72	780.15	711.88	665.63	635.90	611.13	559.92	448.71	296.75
180.0	951.21	807.79	723.83	672.18	636.62	612.01	574.57	466.60	339.75
225.0	1097.93	914.38	788.19	715.51	667.06	635.02	606.61	554.47	449.26
270.0	1215.09	945.32	792.81	702.52	646.36	606.17	569.83	512.58	426.69
315.0	1097.71	906.78	790.22	720.96	672.95	645.32	617.95	564.22	463.91
360.0	1100.03	916.69	801.62	728.40	684.90	650.22	622.69	558.27	431.09
C/γ(°)	36.0	38.0	40.0	42.0	44.0	46.0	48.0	50.0	52.0
0.0	285.19	142.10	44.60	22.74	14.20	10.79	10.13	9.69	9.36
45.0	185.98	67.94	26.76	18.22	12.88	12.28	11.67	11.23	10.85
90.0	111.87	41.95	28.19	20.21	17.34	16.57	16.41	16.63	17.18
135.0	165.72	57.64	25.88	19.10	14.59	13.93	13.16	12.61	12.83
180.0	195.67	78.13	27.14	18.33	11.18	10.13	9.69	9.36	9.19
225.0	303.14	165.88	56.21	26.59	17.40	12.55	11.67	11.07	10.52
270.0	317.12	183.01	94.09	46.80	31.27	22.68	18.94	17.01	16.02
315.0	315.14	175.19	63.42	26.87	20.21	14.92	14.09	13.27	12.66
360.0	285.19	142.10	44.60	22.74	14.20	10.79	10.13	9.69	9.36
C/γ(°)	54.0	56.0	58.0	60.0	62.0	64.0	66.0	68.0	70.0
0.0	9.14	8.97	8.92	8.86	8.64	8.48	8.31	8.20	8.04
45.0	10.13	9.47	8.92	8.64	8.42	8.31	8.20	8.04	7.93
90.0	16.24	14.31	12.33	10.74	9.47	8.81	8.48	8.37	8.37
135.0	13.87	15.14	15.69	14.70	12.50	10.30	8.92	8.26	8.04
180.0	9.03	8.97	9.03	9.03	9.14	9.36	9.36	9.03	8.53
225.0	10.13	9.91	9.80	10.02	10.19	10.19	9.52	8.59	8.09
270.0	15.53	15.53	15.69	15.53	14.04	11.73	9.80	8.86	8.53
315.0	12.00	11.51	11.40	11.07	10.46	9.80	8.92	8.37	8.09
360.0	9.14	8.97	8.92	8.86	8.64	8.48	8.31	8.20	8.04
C/γ(°)	72.0	74.0	76.0	78.0	80.0	82.0	84.0	86.0	88.0
0.0	7.98	7.82	7.76	7.71	7.60	7.54	7.54	7.49	7.38
45.0	7.87	7.76	7.71	7.65	7.60	7.54	7.54	7.49	7.27
90.0	8.37	8.31	8.26	8.15	7.98	7.93	7.82	7.38	7.21
135.0	7.93	7.87	7.76	7.71	7.65	7.60	7.54	7.49	7.27
180.0	8.20	8.04	7.98	7.87	7.82	7.76	7.76	7.71	7.49
225.0	7.93	7.82	7.71	7.60	7.54	7.54	7.49	7.43	7.38
270.0	8.37	8.31	8.31	8.26	8.15	8.04	7.93	7.71	7.49
315.0	7.98	7.93	7.82	7.71	7.65	7.60	7.54	7.43	7.32
360.0	7.98	7.82	7.76	7.71	7.60	7.54	7.54	7.49	7.38

Intensity data(cd)

Appendix Page: 16 Total:16

C/ γ (°)	90.0
0.0	7.21
45.0	7.21
90.0	7.21
135.0	7.21
180.0	7.21
225.0	7.27
270.0	7.27
315.0	7.27
360.0	7.21