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NATA

LumCAT: 4-2267-M
Luminaire: 92.70.131.00
Report No: NATA0100
Test No: GC2019022113
LampCAT: BMTC MA-1919 20W LES14
Lamp flux(lm): 1685.0
Number of Lamps: 1
Length(mm): 100
Phm Type: C

Voltage(V): 45.1000
Current(A): 0.3000
Power (W): 13.5300
PF: 0.0000
Ballast type: DC
Width(mm): 100
Height(mm): 0

Photometric Results

Lumens(lm): 1491.67
Efficiency(%): 88.53%
Lumens(lm)/Power(W): 111.64
Central intensity(cd): 3383.719
Maximum intensity(cd): 3383.719
Angle of maximum intensity: $C=0.0$ $\gamma=0.0$
Beam Angle(50%Imax): [C0/180]Total=34.5
[C90/270]Total=34.5
Field angle(10%Imax): [C0/180]Total=70.1
[C90/270]Total=70.1
Maximum s/h(1/2): C0_180=0.57 C90_270=0.57
Maximum s/h(1/4): C0_180=0.60 C90_270=0.60
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 89.64%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.384%

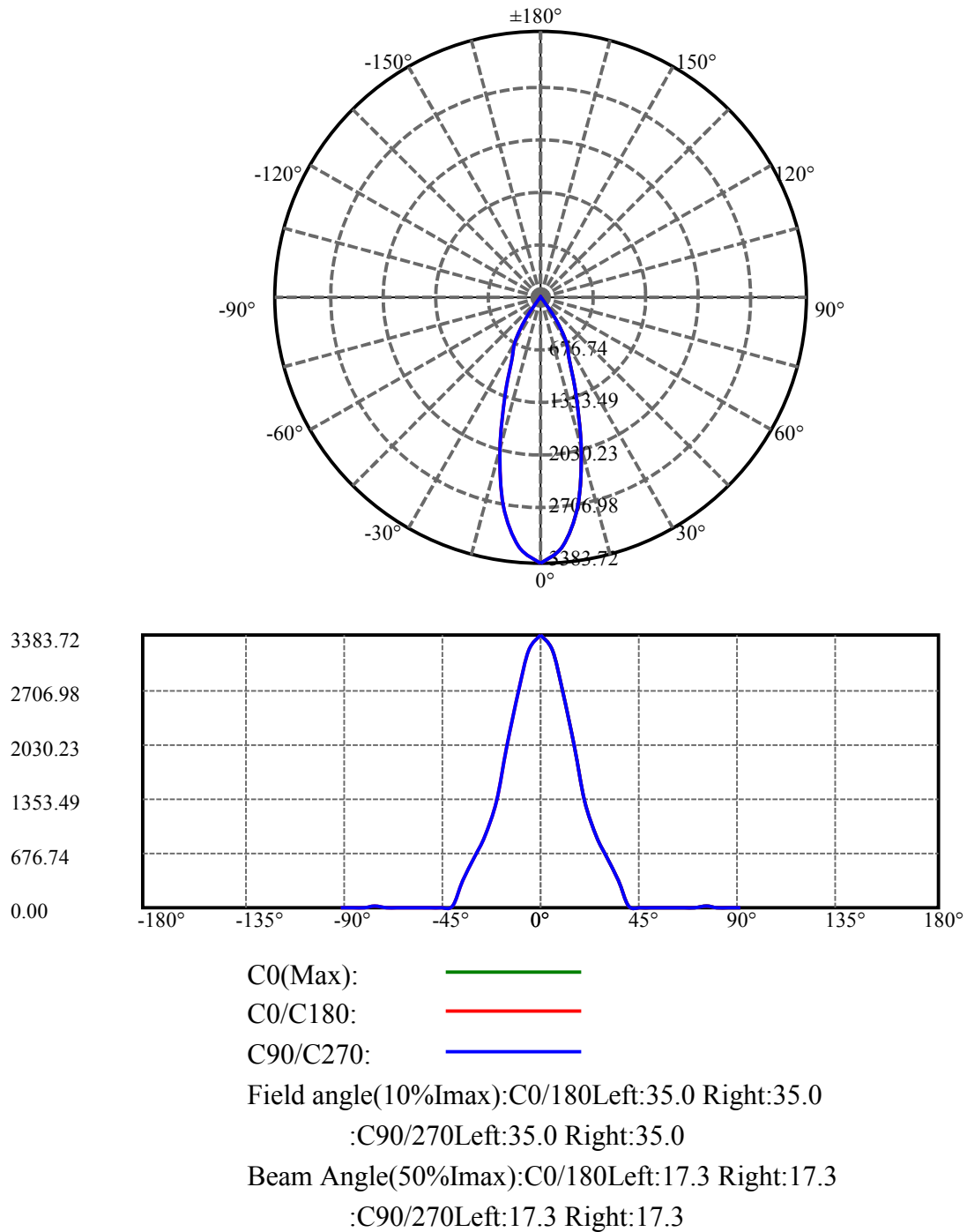
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	3383.719	20.235	20.235	1.201%	1.357%
5.0	3188.250	152.313	172.549	9.039%	11.568%
10.0	2682.422	255.321	427.87	15.153%	28.684%
15.0	1998.844	283.573	711.442	16.829%	47.695%
20.0	1320.848	247.625	959.067	14.696%	64.295%
25.0	888.673	205.864	1164.931	12.217%	78.096%
30.0	640.322	175.492	1340.423	10.415%	89.861%
35.0	341.438	107.348	1447.771	6.371%	97.057%
40.0	30.452	10.729	1458.5	.637%	97.777%
45.0	8.789	3.407	1461.907	.202%	98.005%
50.0	7.369	3.094	1465.001	.184%	98.212%
55.0	6.652	2.987	1467.987	.177%	98.413%
60.0	6.272	2.977	1470.965	.177%	98.612%
65.0	6.082	3.021	1473.986	.179%	98.815%
70.0	6.138	3.162	1477.148	.188%	99.027%
75.0	10.652	5.640	1482.788	.335%	99.405%
80.0	7.552	4.076	1486.864	.242%	99.678%
85.0	5.927	3.237	1490.101	.192%	99.895%
90.0	5.709	1.565	1491.665	.093%	100.000%

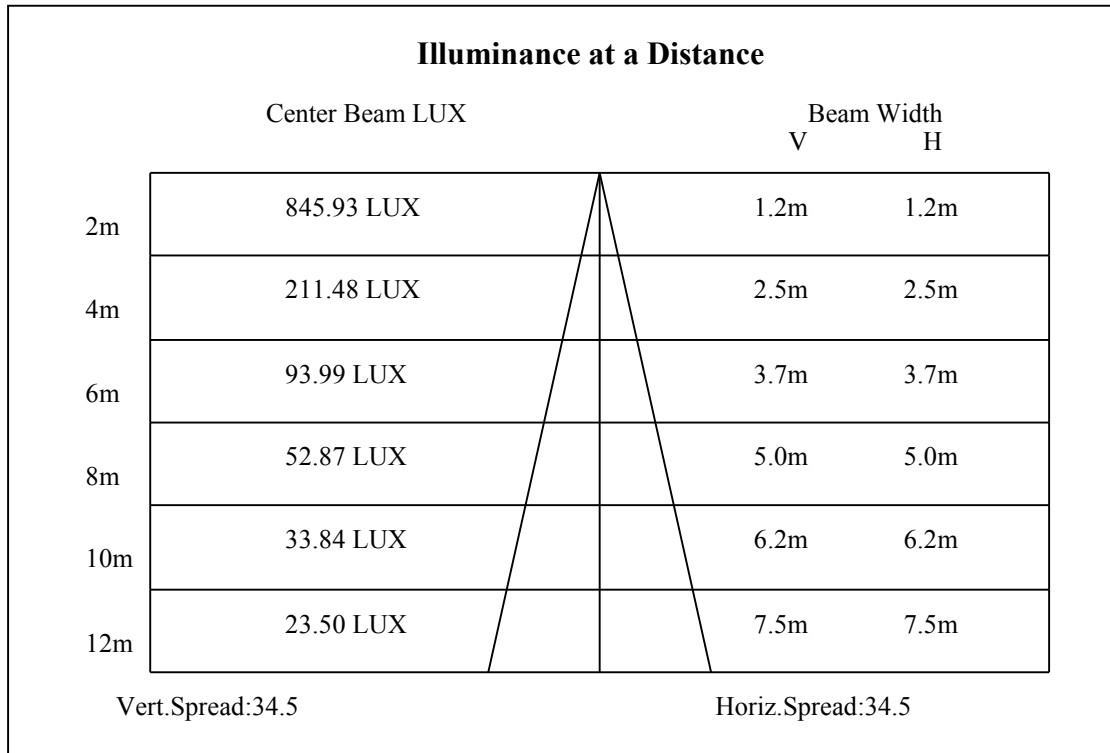
ZONAL LUMEN SUMMARY

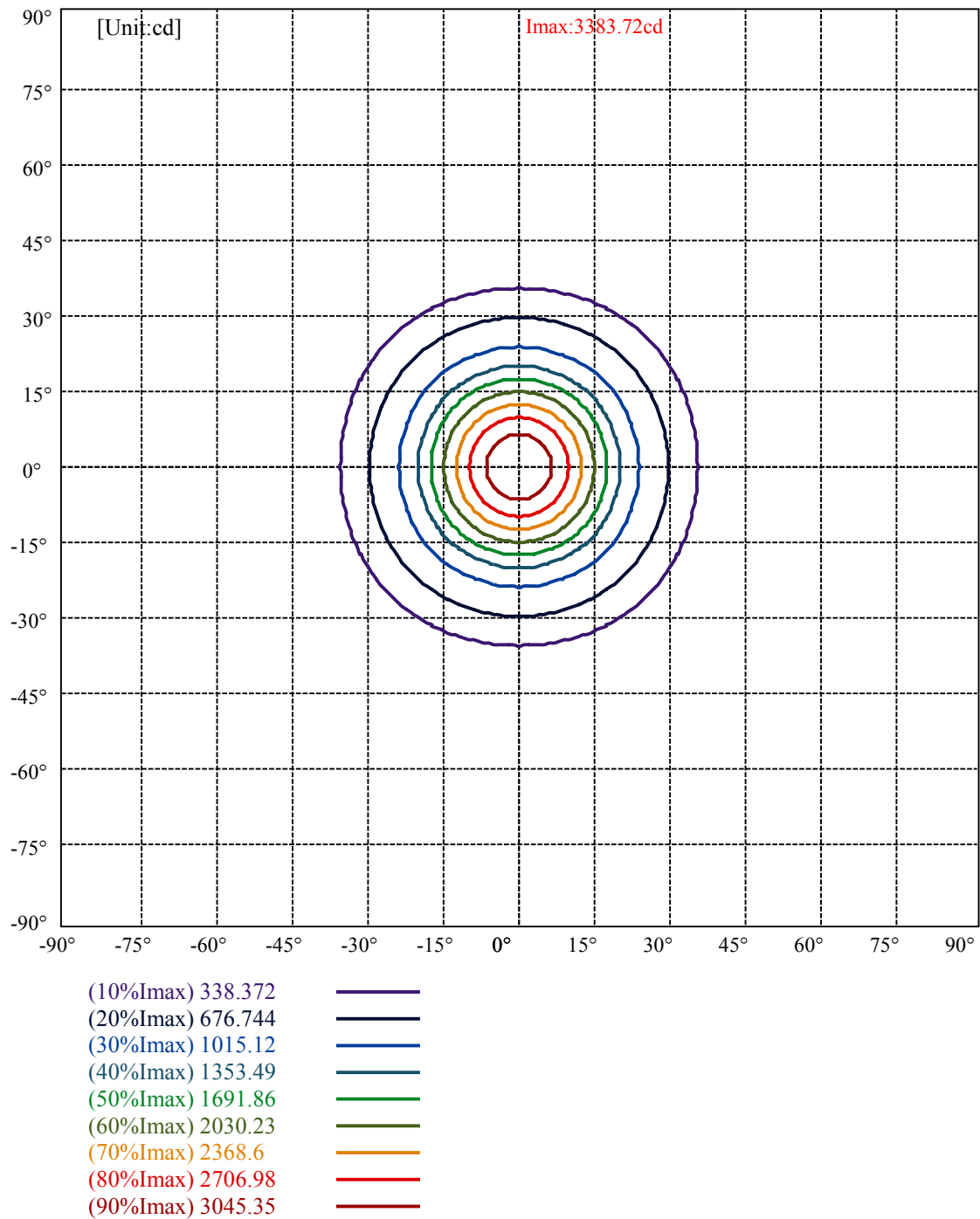
Zone	Lumens	%Lamp	%Fixt
0-30	1340.42	79.55%	89.86%
0-40	1458.50	86.56%	97.78%
0-60	1470.96	87.30%	98.61%
0-90	1490.10	88.43%	99.90%
0-120	1490.10	88.43%	99.90%
0-180	1491.67	88.53%	100.00%
60-90	22.11	1.31%	1.48%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-25.81	1193.33	70.82%	80.00%

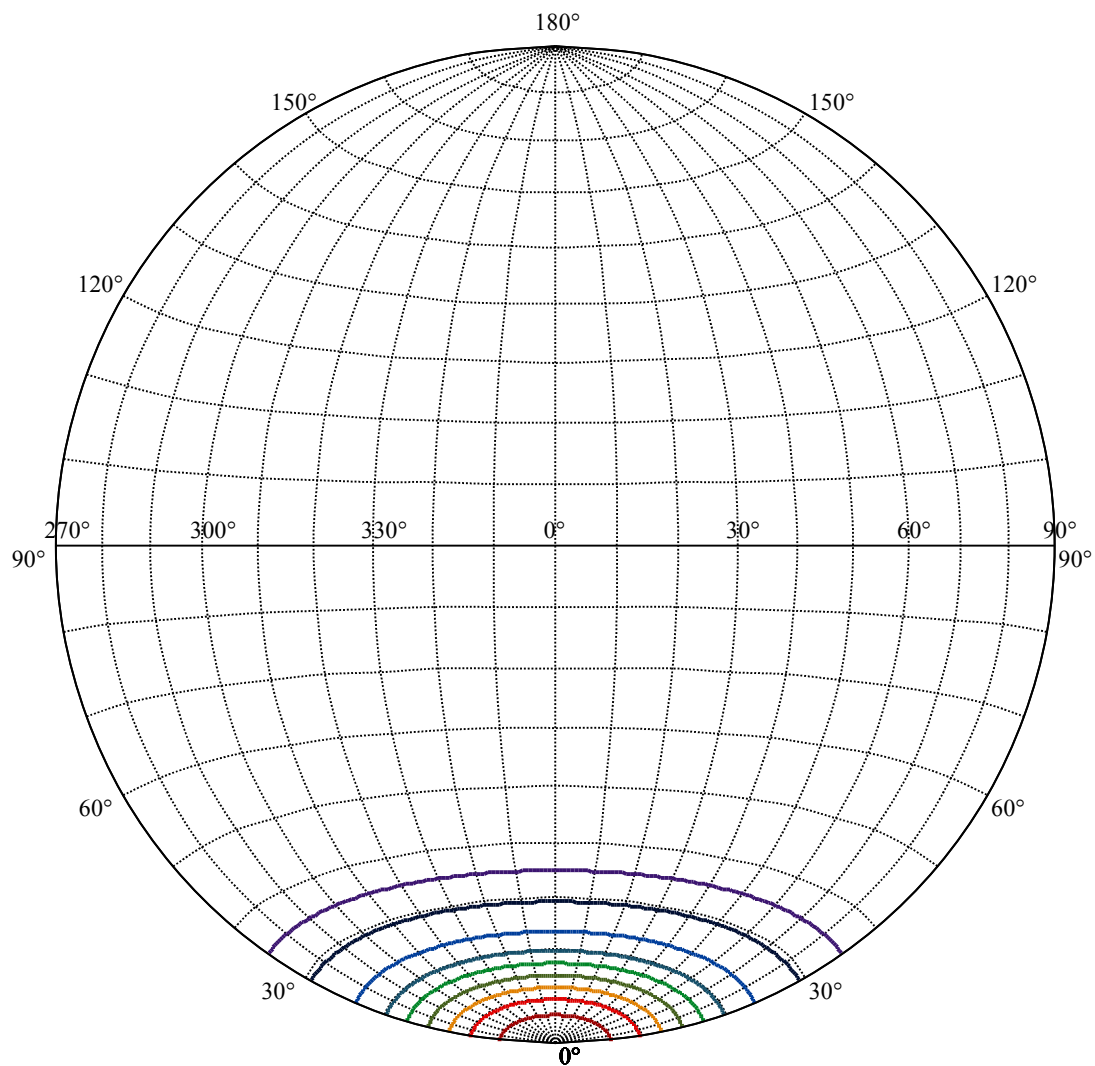
ZONAL LUMEN SUMMARY

0-10	427.87
10-20	531.20
20-30	381.36
30-40	118.08
40-50	6.50
50-60	5.96
60-70	6.18
70-80	9.72
80-90	3.24
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









House

[Unit:cd]

Road

Imax:3383.72

(10%Imax) 338.372

(20%Imax) 676.744

(30%Imax) 1015.12

(40%Imax) 1353.49

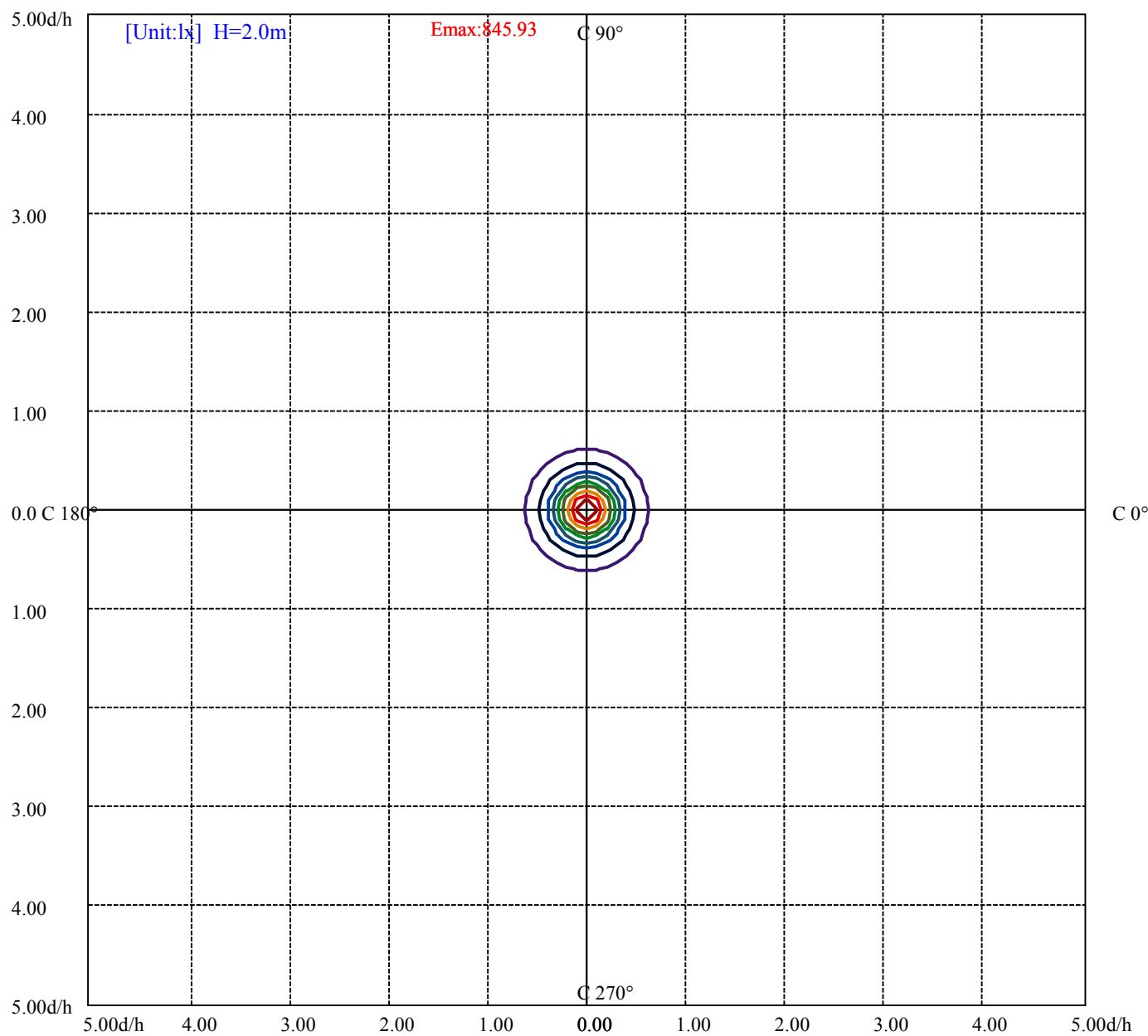
(50%Imax) 1691.86

(60%Imax) 2030.23

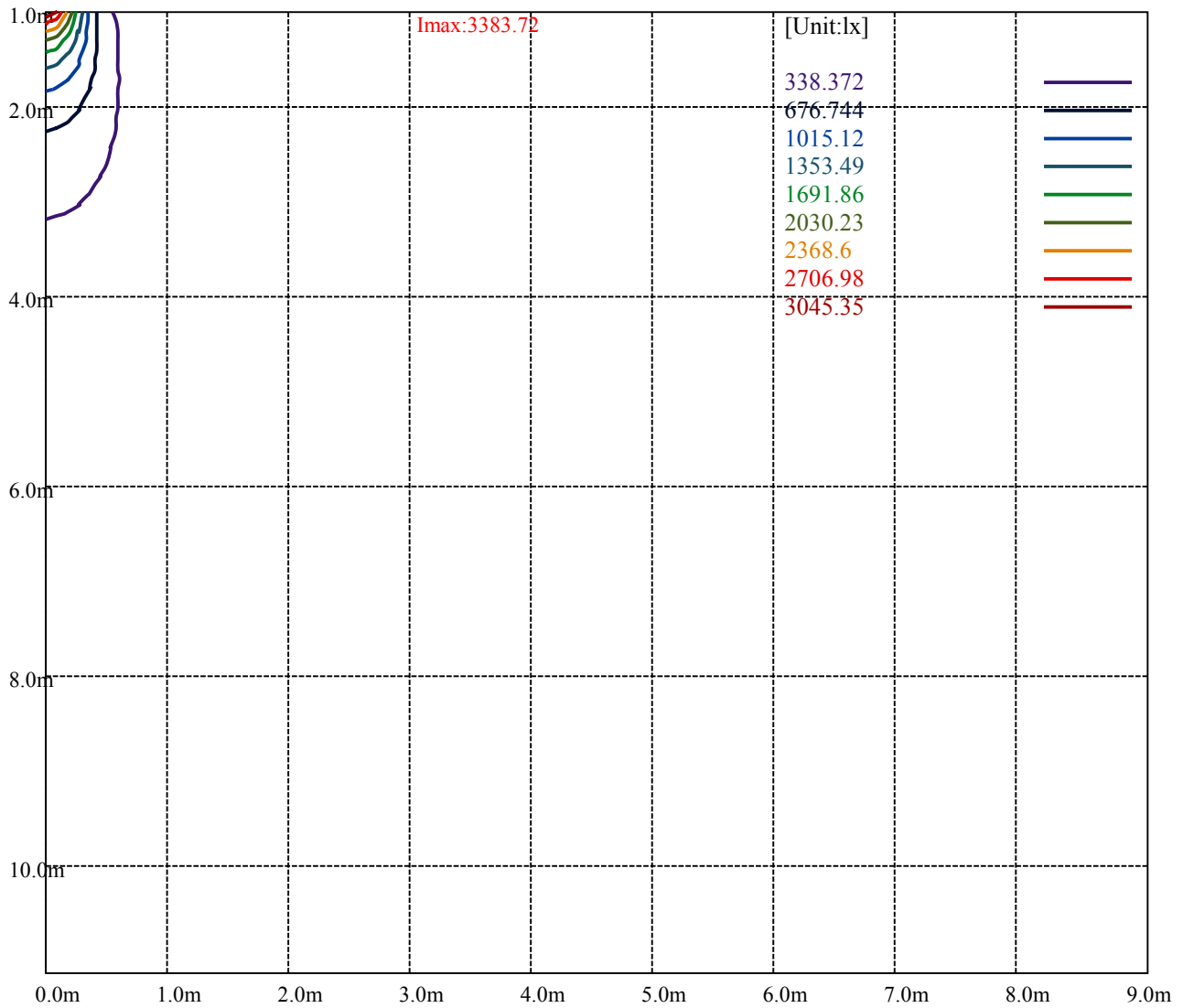
(70%Imax) 2368.6

(80%Imax) 2706.98

(90%Imax) 3045.35



(10%E _{max}) 84.59275	
(20%E _{max}) 169.1857	
(30%E _{max}) 253.7775	
(40%E _{max}) 338.3725	
(50%E _{max}) 422.965	
(60%E _{max}) 507.5575	
(70%E _{max}) 592.15	
(80%E _{max}) 676.7425	
(90%E _{max}) 761.335	



Luminance Table

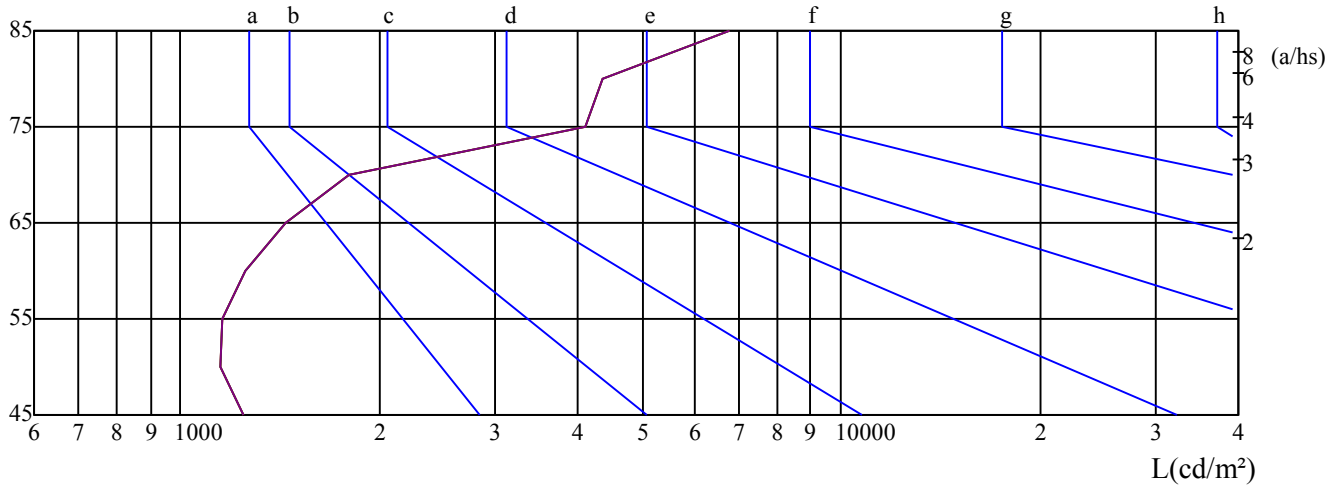
γ	45	50	55	60	65	70	75	80	85
C0	1243	1146	1160	1254	1439	1795	4116	4349	6801
C45	1243	1146	1160	1254	1439	1795	4116	4349	6801
C90	1243	1146	1160	1254	1439	1795	4116	4349	6801

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1439	1439	1439	4116	4116	4116	6801	6801	6801

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

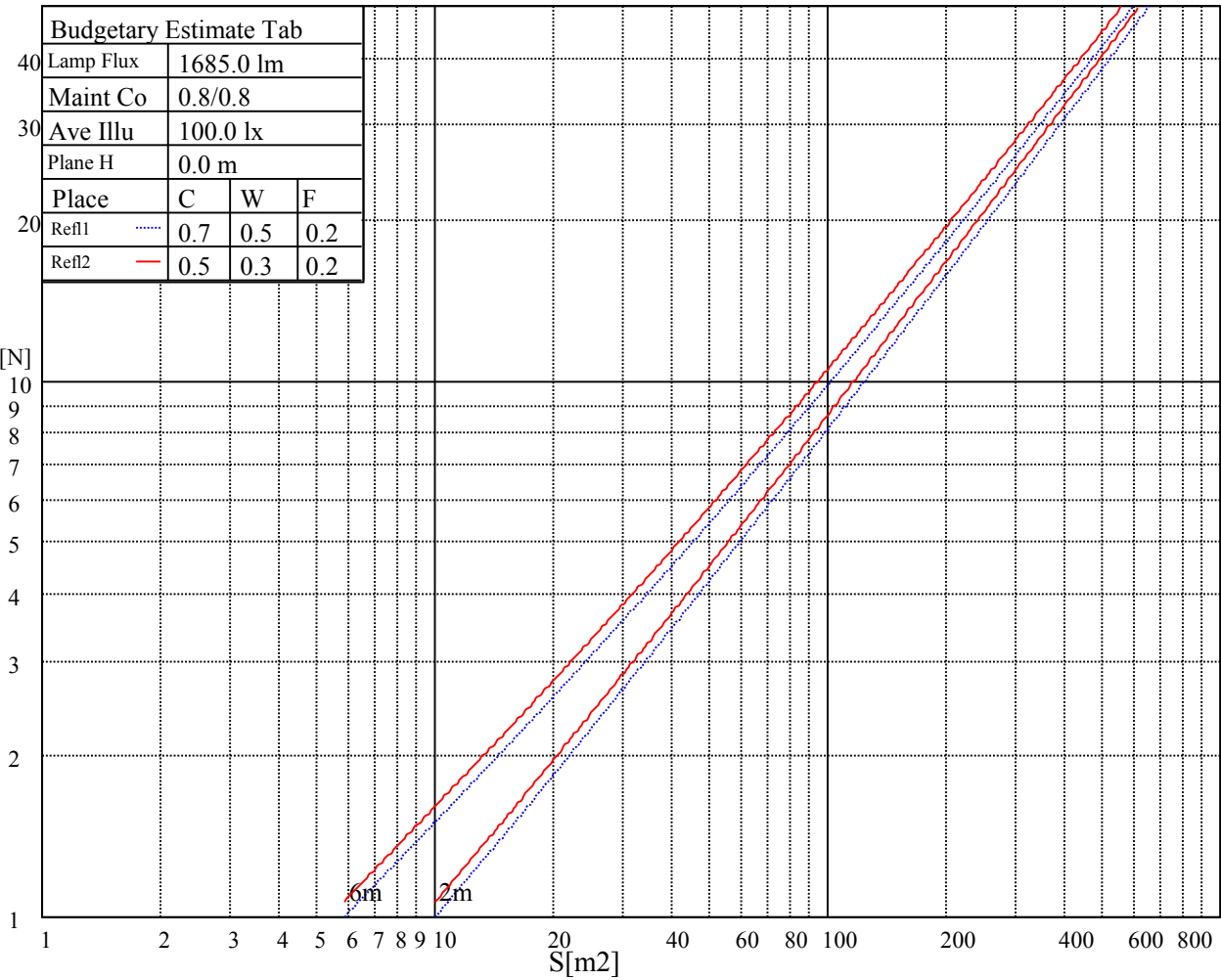
 $\gamma(^{\circ})$ 

C0 ———

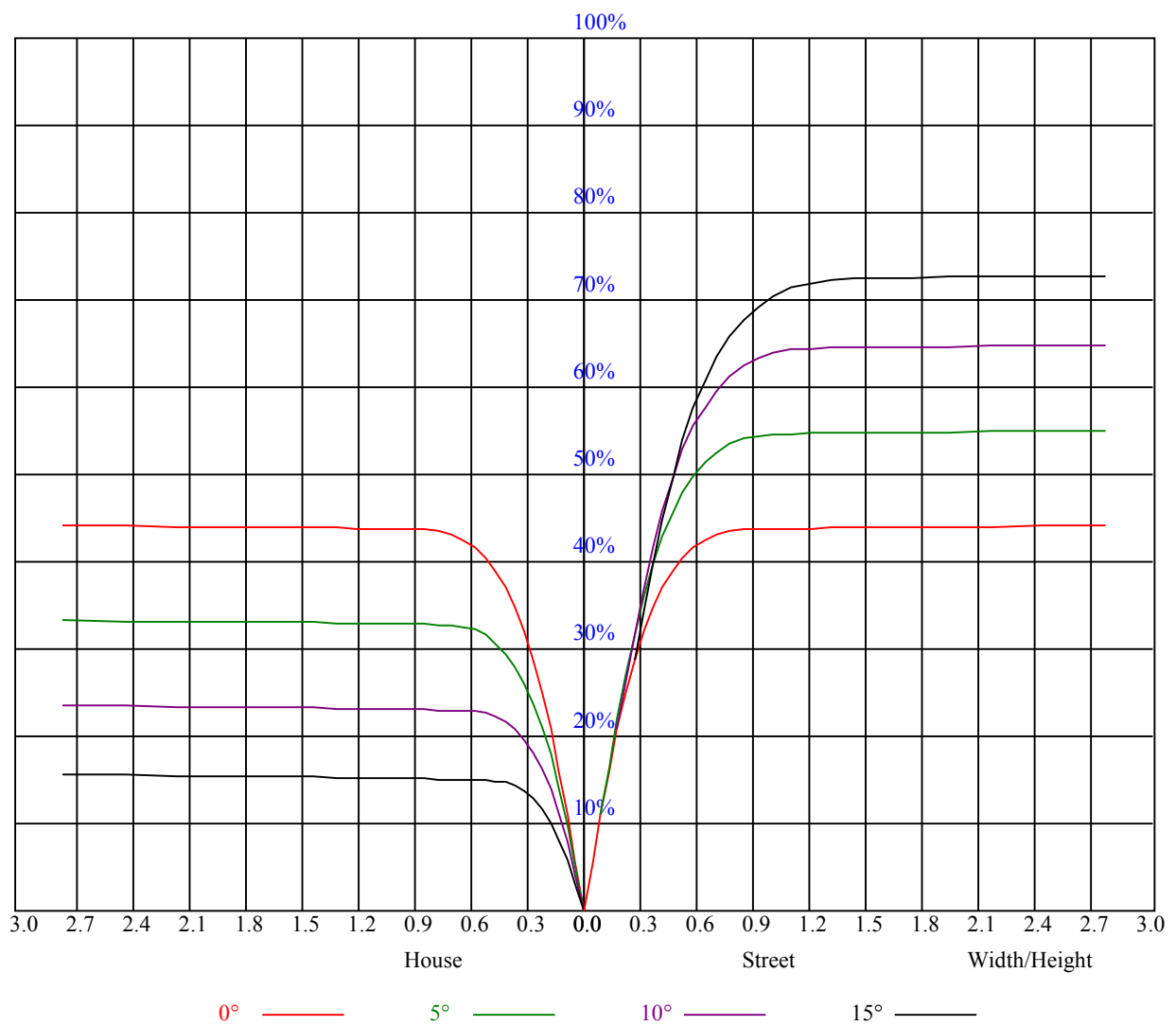
C45 ———

C90 ———

Illumination assessment according UGR											
Rf of Ceiling		70	70	50	50	30	70	70	50	50	30
Rf of Wall		50	30	50	30	30	50	30	50	30	30
Rf of Floor		20	20	20	20	20	20	20	20	20	20
Room dimensions		Viewed crosswise					Viewed endwise				
X	Y										
2H	2H	-0.30	0.62	0.07	0.93	1.25	-0.33	0.59	0.04	0.90	1.22
	3H	2.96	3.76	3.34	4.10	4.47	2.98	3.79	3.36	4.12	4.49
	4H	6.67	7.42	7.08	7.77	8.17	6.76	7.51	7.17	7.87	8.26
	6H	8.98	9.66	9.40	10.04	10.43	9.11	9.80	9.53	10.18	10.57
	8H	9.83	10.47	10.27	10.87	11.28	9.97	10.61	10.41	11.01	11.42
	12H	11.08	11.69	11.52	12.08	12.51	11.19	11.80	11.62	12.18	12.62
4H	2H	0.59	1.34	1.00	1.69	2.08	0.57	1.32	0.98	1.67	2.06
	3H	4.40	5.02	4.82	5.43	5.83	4.43	5.04	4.84	5.45	5.86
	4H	8.27	8.82	8.71	9.25	9.70	8.36	8.91	8.80	9.33	9.78
	6H	10.40	10.87	10.87	11.32	11.80	10.52	10.99	10.99	11.44	11.91
	8H	11.33	11.77	11.81	12.22	12.70	11.45	11.89	11.93	12.34	12.81
	12H	12.50	12.88	13.00	13.37	13.85	12.59	12.97	13.08	13.46	13.93
8H	4H	9.17	9.60	9.64	10.06	10.53	9.23	9.67	9.71	10.12	10.60
	6H	11.38	11.72	11.89	12.23	12.71	11.47	11.82	11.98	12.32	12.81
	8H	12.43	12.74	12.97	13.26	13.76	12.53	12.83	13.06	13.36	13.86
	12H	13.71	13.97	14.23	14.47	15.05	13.77	14.04	14.30	14.54	15.12
12H	4H	9.33	9.70	9.82	10.19	10.67	9.38	9.76	9.88	10.25	10.73
	6H	11.80	11.91	12.14	12.38	12.93	11.89	11.99	12.22	12.47	13.02
	8H	12.76	13.03	13.29	13.52	14.11	12.85	13.11	13.37	13.61	14.19
Variation with the observer position at spacings:											
S = 1.0H		5.5/-7.3					5.5/-7.3				
S = 1.5H		7.4/-4.4					7.4/-4.4				
S = 2.0H		8.7/-3.0					8.7/-3.0				
Standard tables:		BK3					BK3				
Uncorrected UGR		-2.0					-2.0				



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	1.07	1.07	1.07	1.04	1.04	1.04	1.00	1.00	1.00	0.95	0.95	0.95	0.91	0.91	0.91	0.90
1	0.99	0.96	0.94	0.97	0.95	0.93	0.93	0.92	0.90	0.90	0.89	0.87	0.87	0.86	0.85	0.83
2	0.93	0.90	0.87	0.92	0.89	0.86	0.89	0.86	0.84	0.86	0.84	0.82	0.84	0.82	0.81	0.79
3	0.89	0.85	0.81	0.87	0.84	0.81	0.85	0.82	0.80	0.83	0.80	0.78	0.81	0.79	0.77	0.76
4	0.84	0.80	0.77	0.83	0.79	0.76	0.82	0.78	0.76	0.80	0.77	0.75	0.78	0.76	0.74	0.73
5	0.81	0.76	0.73	0.80	0.76	0.73	0.78	0.75	0.72	0.77	0.74	0.71	0.76	0.73	0.71	0.70
6	0.77	0.73	0.70	0.77	0.72	0.69	0.75	0.72	0.69	0.74	0.71	0.68	0.73	0.70	0.68	0.67
7	0.74	0.70	0.67	0.74	0.69	0.66	0.73	0.69	0.66	0.72	0.68	0.66	0.71	0.68	0.65	0.64
8	0.71	0.67	0.64	0.71	0.67	0.64	0.70	0.66	0.64	0.69	0.66	0.63	0.68	0.65	0.63	0.62
9	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
10	0.66	0.62	0.59	0.66	0.62	0.59	0.65	0.62	0.59	0.65	0.61	0.59	0.64	0.61	0.59	0.58



Intensity data(cd)										Appendix Page: 15 Total:15	
C/ γ (°)	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0		
0.0	3384.00	3178.13	2671.31	2011.50	1401.19	919.13	666.56	361.13	28.35		
45.0	3391.31	3179.81	2696.63	1989.00	1366.88	905.63	646.31	347.63	34.14		
90.0	3382.31	3160.69	2601.56	1920.38	1118.87	833.01	616.61	307.13	19.80		
135.0	3377.25	3242.81	2803.50	2137.50	1465.31	938.25	663.19	392.63	48.94		
180.0	3384.00	3173.63	2697.75	1991.81	1254.94	879.36	622.74	312.81	24.75		
225.0	3391.31	3203.44	2668.50	2007.56	1370.81	856.18	636.47	331.76	22.95		
270.0	3382.31	3227.06	2750.63	2067.19	1490.63	933.75	663.19	379.13	45.28		
315.0	3377.25	3140.44	2569.50	1865.81	1098.17	844.09	607.50	299.31	19.41		
360.0	3384.00	3178.13	2671.31	2011.50	1401.19	919.13	666.56	361.13	28.35		
C/ γ (°)	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0		
0.0	9.28	7.54	6.75	6.47	6.41	6.41	11.81	10.46	6.02		
45.0	8.78	7.37	6.58	6.19	5.96	6.02	7.82	8.04	5.96		
90.0	8.38	7.20	6.47	6.08	6.02	6.08	12.26	7.14	5.96		
135.0	8.83	7.37	6.53	6.08	5.91	5.85	9.17	7.26	5.91		
180.0	8.49	7.14	6.41	6.02	5.79	5.91	10.35	5.91	5.85		
225.0	8.66	7.26	6.47	6.08	5.85	5.91	10.01	6.64	5.91		
270.0	9.00	7.43	6.75	6.41	6.24	6.08	9.45	8.66	5.96		
315.0	8.89	7.65	7.26	6.86	6.47	6.86	14.34	6.30	5.85		
360.0	9.28	7.54	6.75	6.47	6.41	6.41	11.81	10.46	6.02		
C/ γ (°)	90.0										
0.0	5.68										
45.0	5.74										
90.0	5.74										
135.0	5.68										
180.0	5.68										
225.0	5.74										
270.0	5.74										
315.0	5.68										
360.0	5.68										