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NATA

LumCAT: 4-2103-E

Luminaire:

Report No: NATA0100

Voltage(V): 220.0000

Test No:

Current(A): 0.0950

LampCAT: ParagonLED CBAC-88-36185-240V-30W

Power (W): 18.0000

Lamp flux(lm): 1472.0

PF: 0.8560

Number of Lamps: 1

Ballast type:

Length(mm): 100

Width(mm): 100

Phm Type: C

Height(mm): 0

Photometric Results

Lumens(lm): 1368.02

Efficiency(%): 92.94%

Lumens(lm)/Power(W): 76.43

Central intensity(cd): 5369.788

Maximum intensity(cd): 5369.788

Angle of maximum intensity: C=0.0 γ =0.0

Beam Angle(50%Imax): [C0/180]Total=23.3

[C90/270]Total=23.3

Field angle(10%Imax): [C0/180]Total=54.9

[C90/270]Total=54.9

Maximum s/h(1/2): C0_180=0.40 C90_270=0.40

Maximum s/h(1/4): C0_180=0.40 C90_270=0.40

Up flux rate of lamp(%): 0.00%

Down flux rate of lamp(%): 93.46%

Up flux rate of LUM(%): - -

Down flux rate of LUM(%): 100.00%

CIE Type : Direct lighting

Output flux ratio in π solid angle : 98.353%

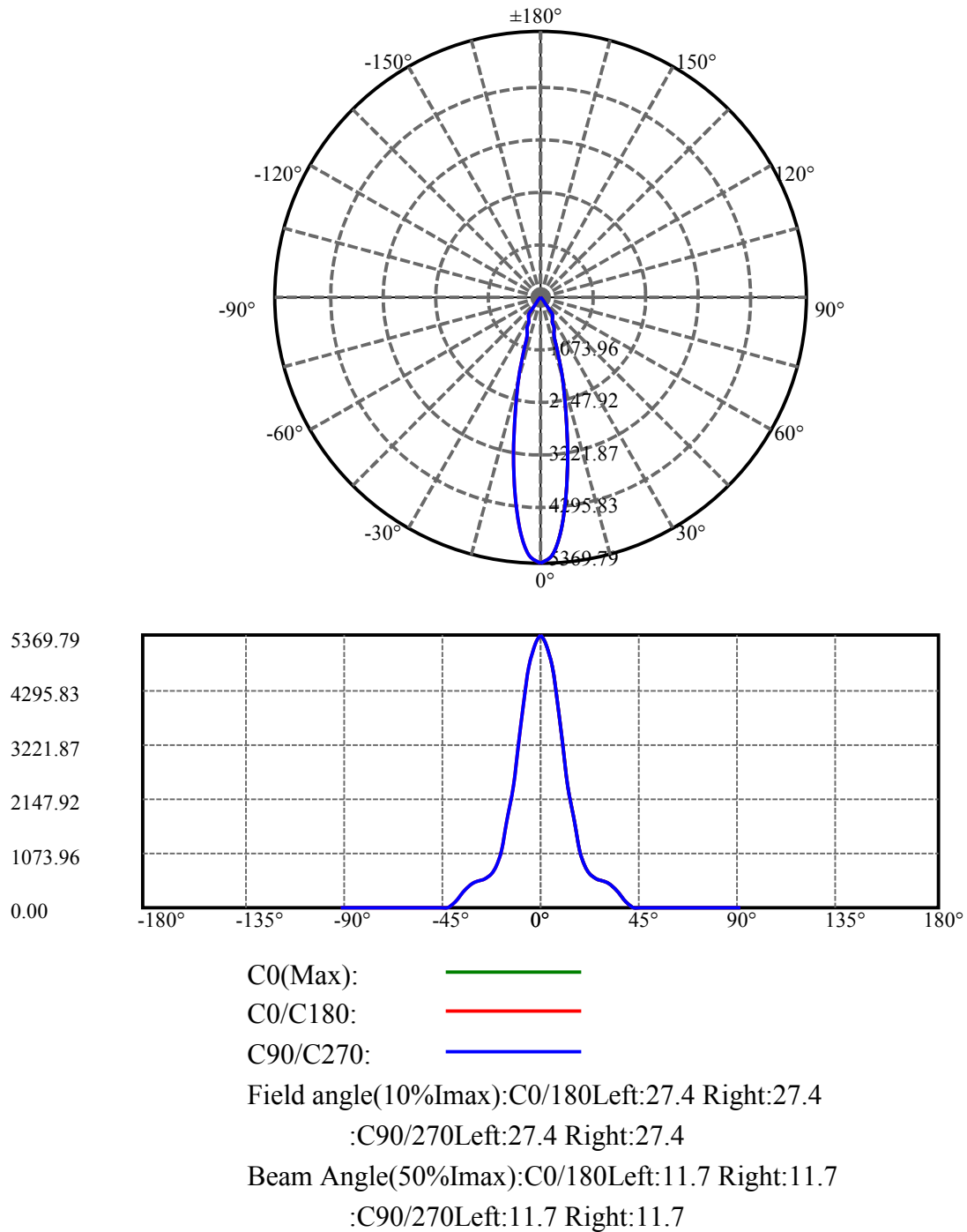
$\gamma(^{\circ})$	Average I(cd)	Zonal F(lm)	Sum F(lm)	Eff Flux(%)	Eff Sum(%)
0.0	5369.788	8.029	8.029	.545%	.587%
2.5	5204.839	62.237	70.266	4.228%	5.136%
5.0	4726.867	112.936	183.202	7.672%	13.392%
7.5	4047.678	144.833	328.035	9.839%	23.979%
10.0	3242.836	154.368	482.403	10.487%	35.263%
12.5	2405.978	142.755	625.158	9.698%	45.698%
15.0	1688.249	119.783	744.941	8.137%	54.454%
17.5	1145.971	94.467	839.408	6.418%	61.359%
20.0	839.569	78.717	918.125	5.348%	67.114%
22.5	672.211	70.519	988.644	4.791%	72.268%
25.0	582.524	67.488	1056.132	4.585%	77.202%
27.5	535.878	67.832	1123.964	4.608%	82.160%
30.0	502.335	68.853	1192.818	4.678%	87.193%
32.5	420.218	61.895	1254.712	4.205%	91.718%
35.0	301.269	47.371	1302.083	3.218%	95.180%
37.5	174.804	29.172	1331.255	1.982%	97.313%
40.0	58.910	10.381	1341.635	.705%	98.072%
42.5	16.558	3.067	1344.702	.208%	98.296%
45.0	6.331	1.227	1345.929	.083%	98.385%
47.5	5.850	1.182	1347.111	.080%	98.472%
50.0	5.588	1.174	1348.285	.080%	98.558%
52.5	5.423	1.179	1349.464	.080%	98.644%
55.0	5.285	1.187	1350.651	.081%	98.731%
57.5	5.189	1.200	1351.851	.082%	98.818%
60.0	5.093	1.209	1353.06	.082%	98.907%
62.5	5.038	1.225	1354.285	.083%	98.996%
65.0	5.051	1.255	1355.54	.085%	99.088%
67.5	5.010	1.269	1356.809	.086%	99.181%
70.0	4.955	1.276	1358.085	.087%	99.274%
72.5	4.955	1.295	1359.381	.088%	99.369%
75.0	4.955	1.312	1360.693	.089%	99.465%
77.5	4.914	1.315	1362.008	.089%	99.561%
80.0	4.928	1.330	1363.338	.090%	99.658%
82.5	4.900	1.332	1364.67	.090%	99.755%
85.0	4.914	1.342	1366.012	.091%	99.853%
87.5	4.886	1.338	1367.35	.091%	99.951%
90.0	4.859	0.666	1368.016	.045%	100.000%

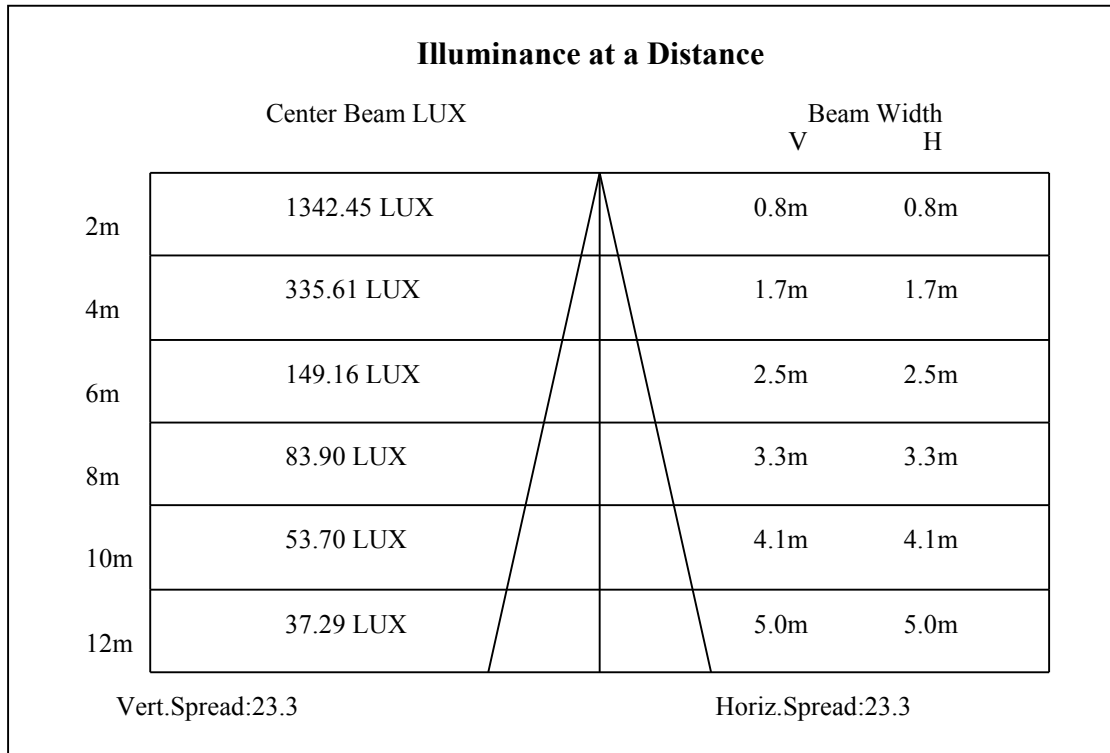
ZONAL LUMEN SUMMARY

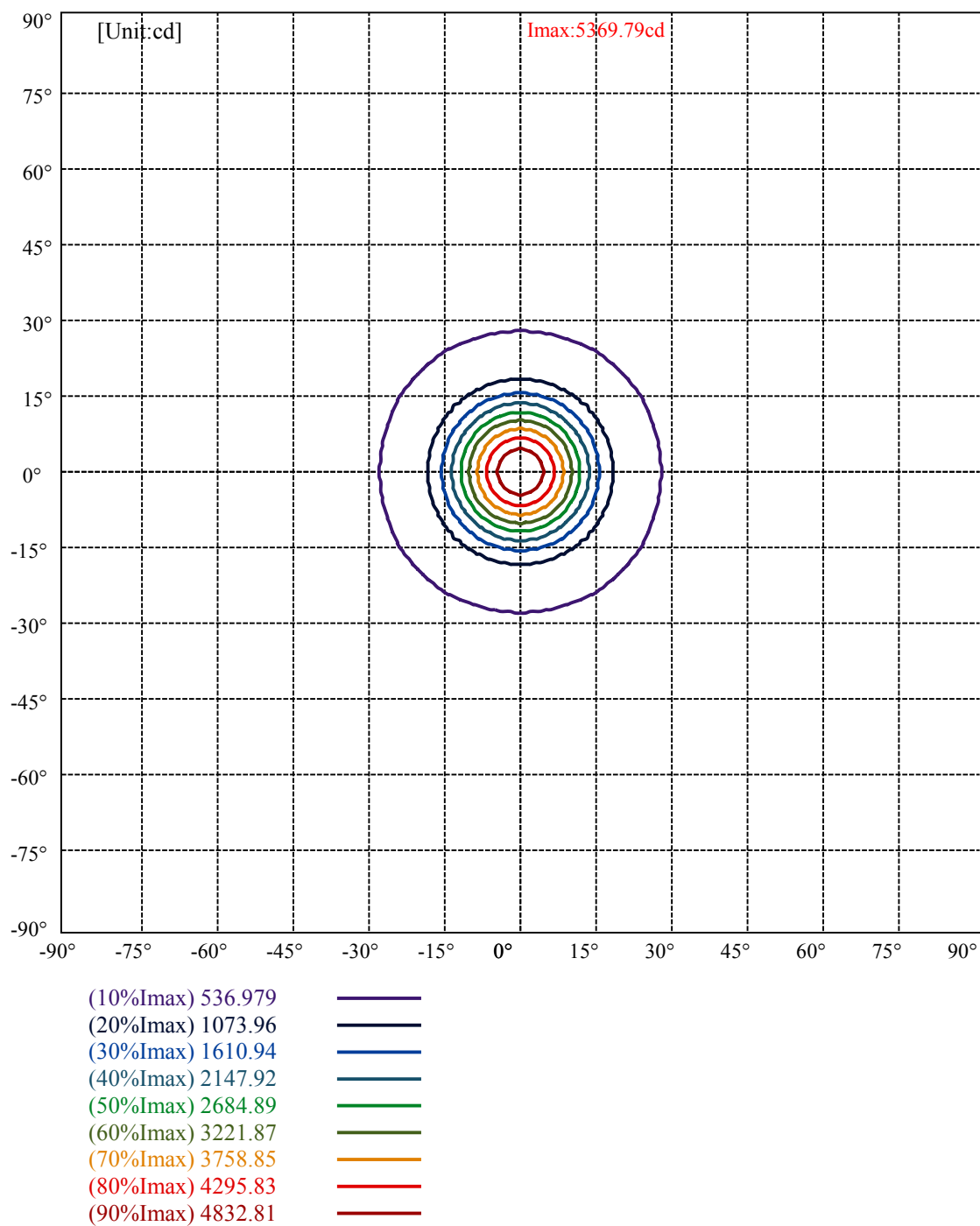
Zone	Lumens	%Lamp	%Fixt
0-30	1192.82	81.03%	87.19%
0-40	1341.64	91.14%	98.07%
0-60	1353.06	91.92%	98.91%
0-90	1367.35	92.89%	99.95%
0-120	1367.35	92.89%	99.95%
0-180	1368.02	92.94%	100.00%
60-90	15.50	1.05%	1.13%
90-120	0.00	0.00%	0.00%
90-130	0.00	0.00%	0.00%
90-150	0.00	0.00%	0.00%
90-180	0.00	0.00%	0.00%
0-26.41	1094.41	74.35%	80.00%

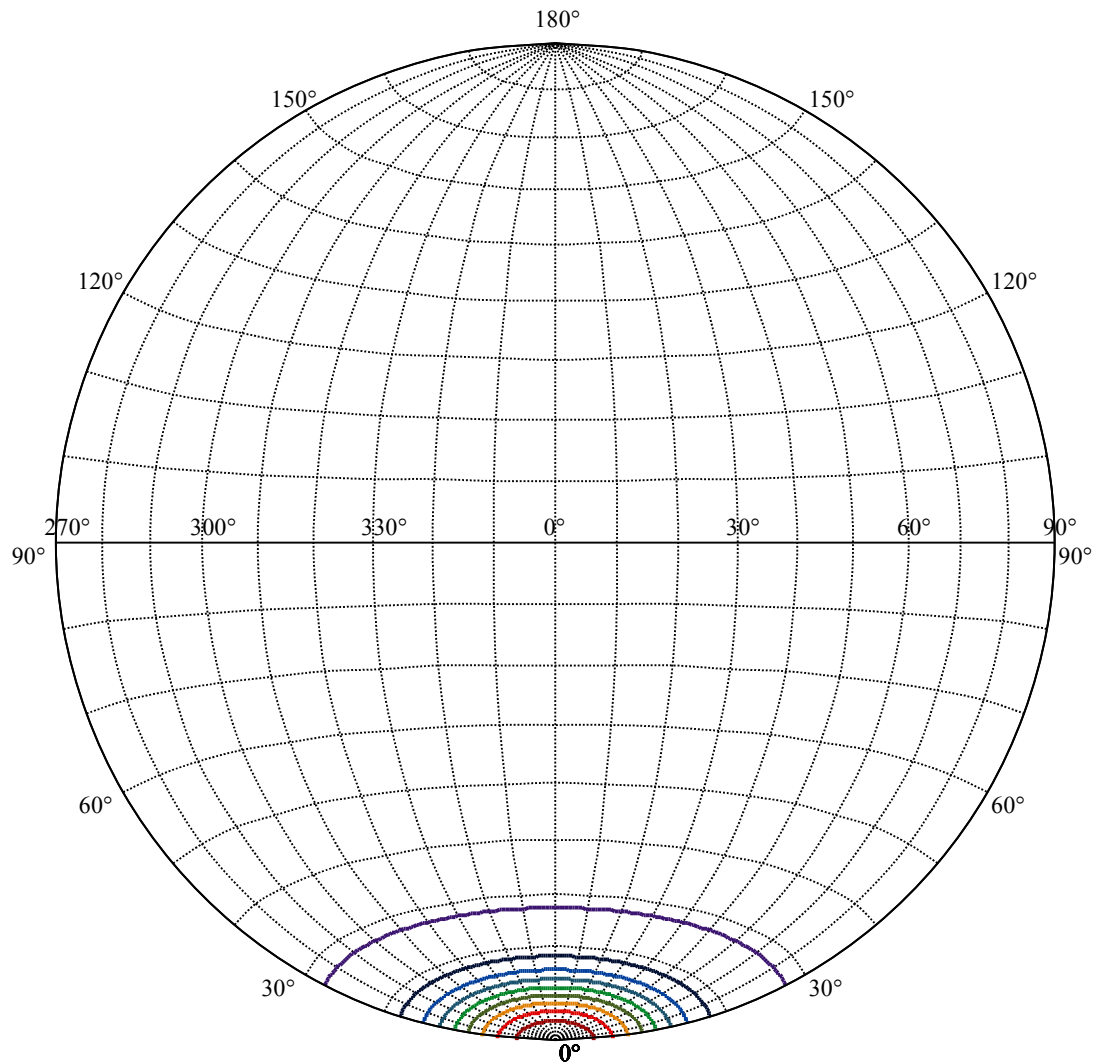
ZONAL LUMEN SUMMARY

0-10	482.40
10-20	435.72
20-30	274.69
30-40	148.82
40-50	6.65
50-60	4.78
60-70	5.03
70-80	5.25
80-90	4.01
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:5369.79

(10%Imax) 536.979

(20%Imax) 1073.96

(30%Imax) 1610.94

(40%Imax) 2147.92

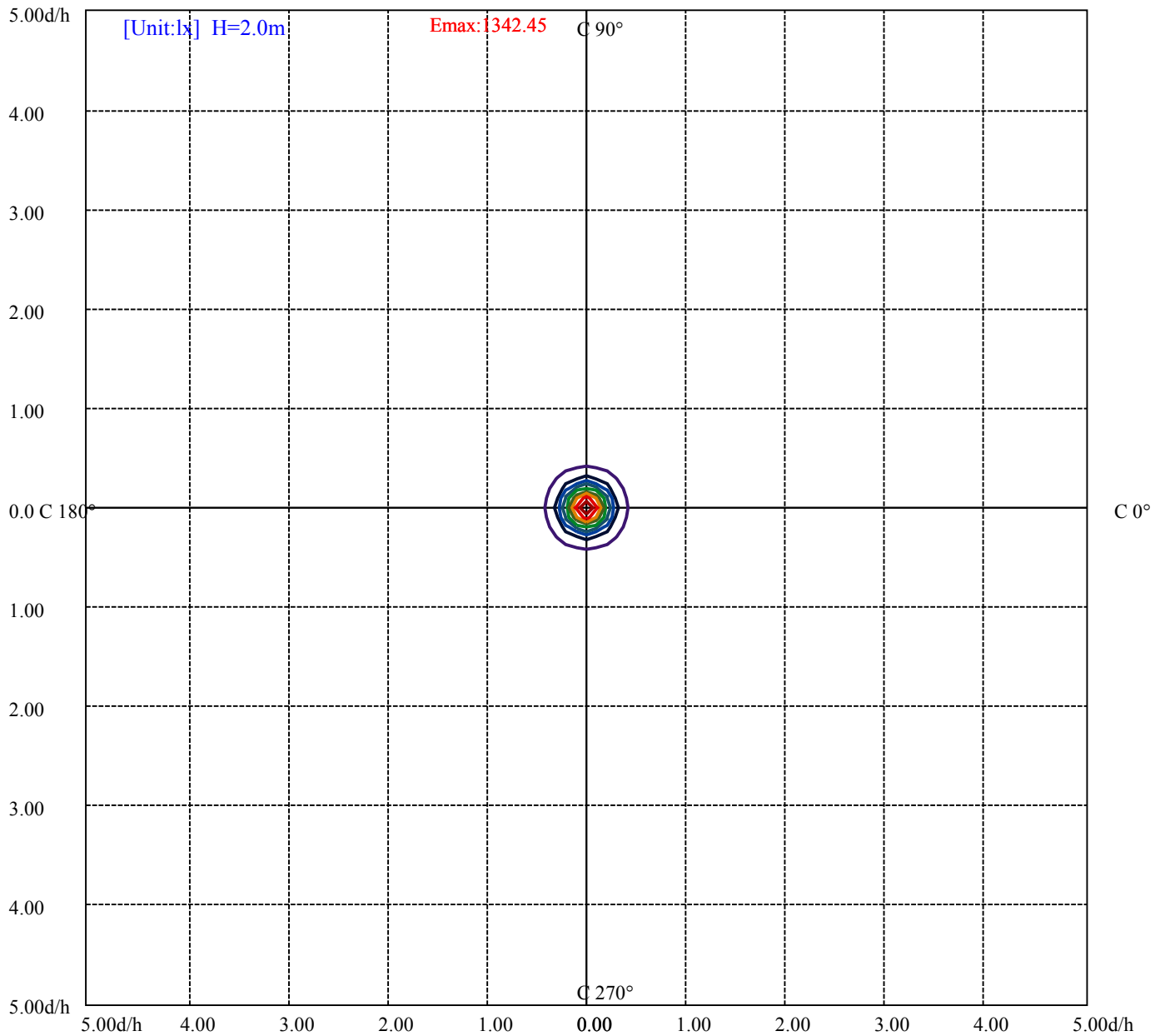
(50%Imax) 2684.89

(60%Imax) 3221.87

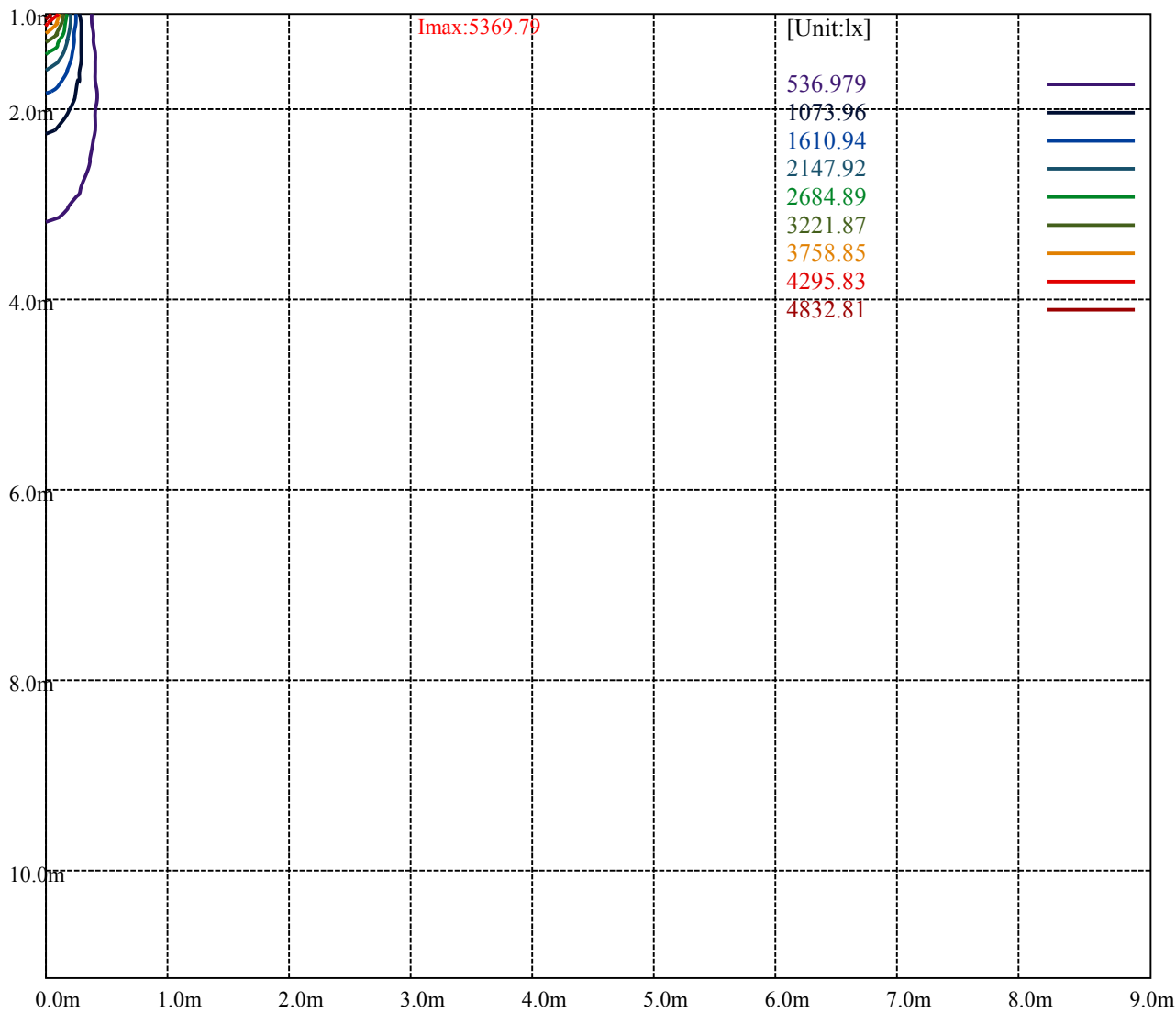
(70%Imax) 3758.85

(80%Imax) 4295.83

(90%Imax) 4832.81



(10%E _{max}) 134.2445	—
(20%E _{max}) 268.49	—
(30%E _{max}) 402.7325	—
(40%E _{max}) 536.9775	—
(50%E _{max}) 671.2225	—
(60%E _{max}) 805.4675	—
(70%E _{max}) 939.71	—
(80%E _{max}) 1073.955	—
(90%E _{max}) 1208.2	—



Luminance Table

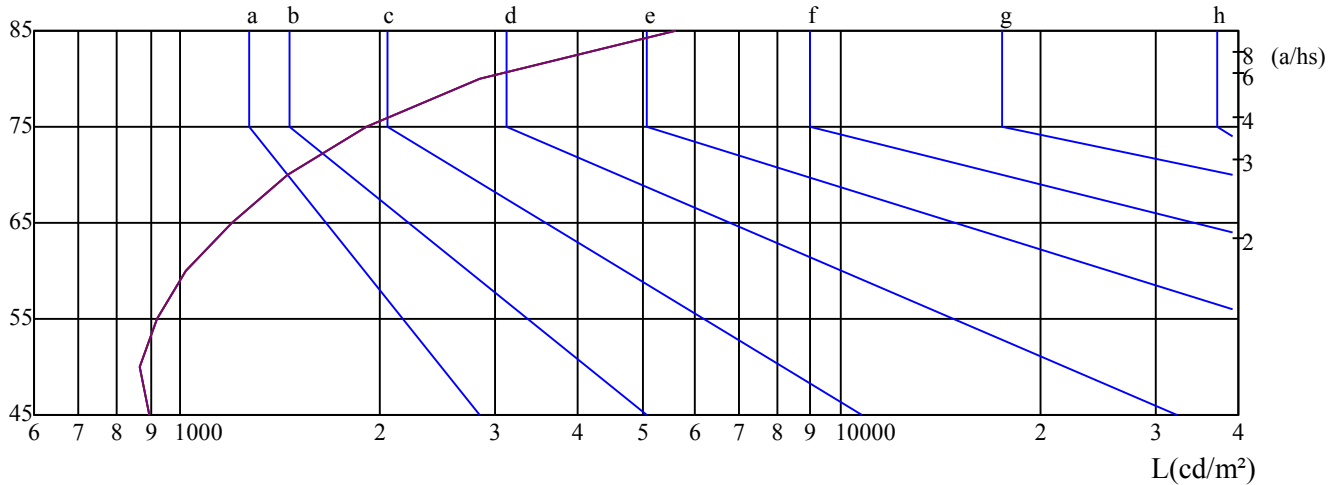
γ	45	50	55	60	65	70	75	80	85
C0	895	869	921	1019	1195	1449	1914	2838	5638
C45	895	869	921	1019	1195	1449	1914	2838	5638
C90	895	869	921	1019	1195	1449	1914	2838	5638

L(Hor)(65)	L(Ver)(65)	L45(65)	L(Hor)(75)	L(Ver)(75)	L45(75)	L(Hor)(85)	L(Ver)(85)	L45(85)
1195	1195	1195	1914	1914	1914	5638	5638	5638

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

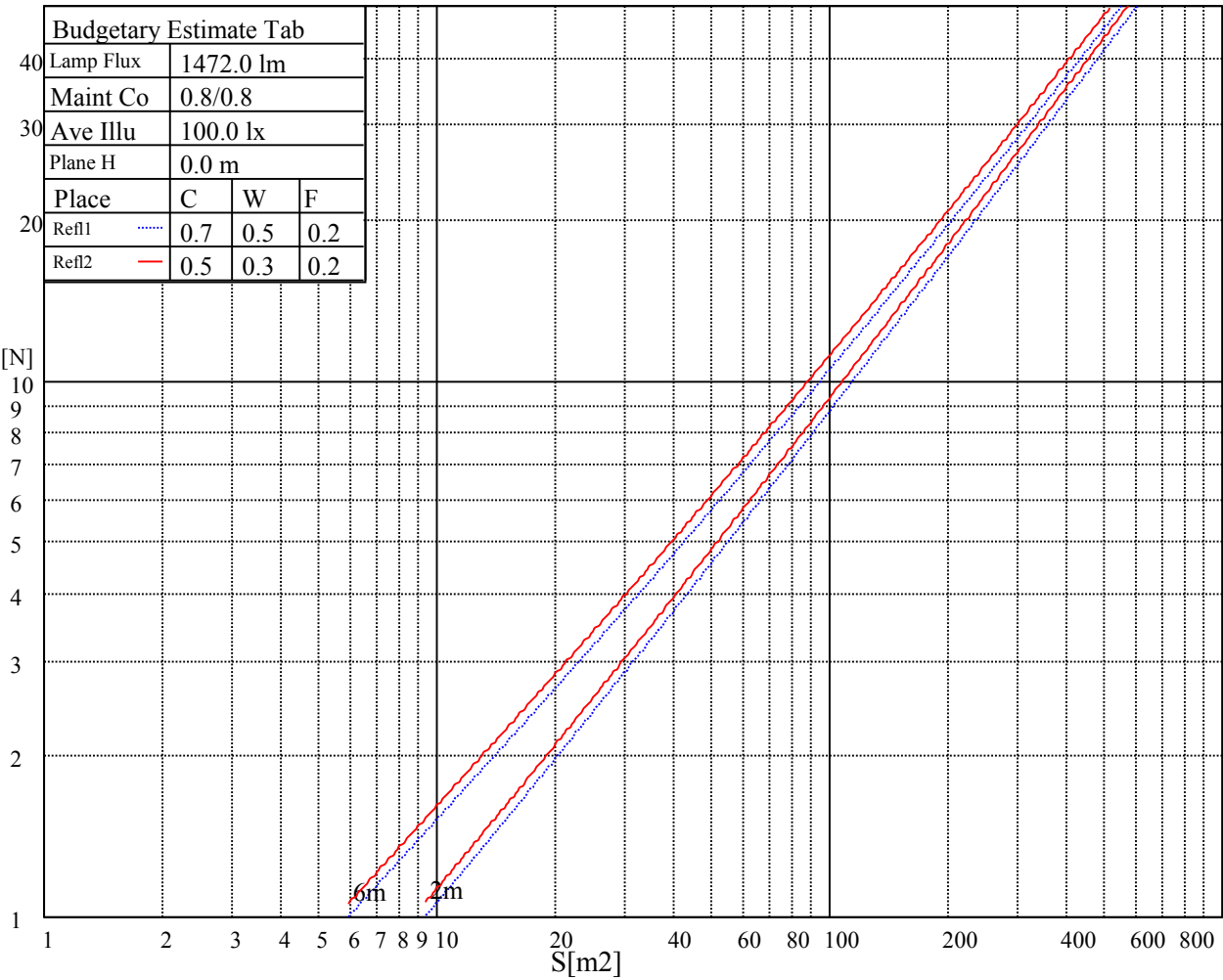
 $\gamma(^{\circ})$ 

C0 ———

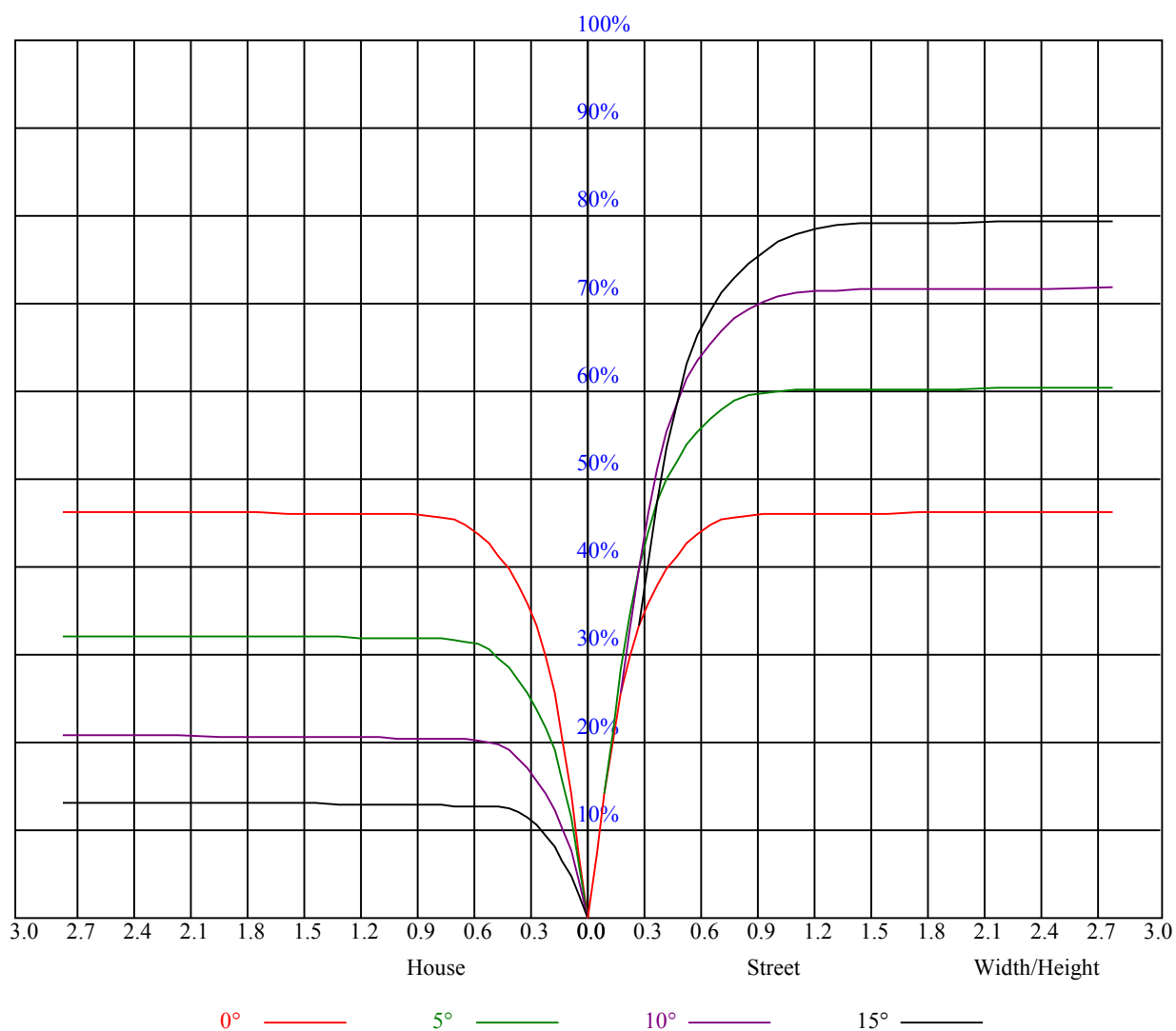
C45 ———

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	-1.22	-0.31	-0.85	0.00	0.32	-1.22	-0.31	-0.85	0.00	0.32
	3H	2.13	2.93	2.51	3.26	3.63	2.13	2.93	2.52	3.27	3.64
	4H	3.95	4.69	4.36	5.04	5.44	3.95	4.69	4.36	5.05	5.44
	6H	5.97	6.64	6.39	7.02	7.42	6.01	6.68	6.43	7.06	7.46
	8H	7.08	7.71	7.52	8.11	8.52	7.14	7.77	7.58	8.16	8.58
	12H	8.88	9.49	9.32	9.87	10.30	8.95	9.55	9.39	9.94	10.37
4H	2H	-0.24	0.49	0.16	0.85	1.24	-0.24	0.49	0.16	0.85	1.24
	3H	3.31	3.92	3.73	4.33	4.73	3.31	3.92	3.73	4.33	4.74
	4H	5.29	5.83	5.73	6.26	6.71	5.30	5.84	5.73	6.26	6.71
	6H	7.47	7.93	7.94	8.38	8.85	7.50	7.96	7.97	8.41	8.89
	8H	8.67	9.10	9.15	9.55	10.03	8.72	9.15	9.20	9.60	10.08
	12H	10.36	10.73	10.85	11.22	11.70	10.42	10.79	10.91	11.28	11.76
8H	4H	6.04	6.47	6.52	6.92	7.40	6.04	6.47	6.52	6.92	7.40
	6H	8.48	8.81	8.99	9.32	9.81	8.51	8.85	9.02	9.35	9.84
	8H	9.87	10.17	10.41	10.69	11.19	9.91	10.21	10.45	10.74	11.23
	12H	11.69	11.95	12.21	12.45	13.03	11.74	11.99	12.26	12.49	13.08
12H	4H	6.25	6.62	6.75	7.11	7.59	6.25	6.62	6.75	7.11	7.59
	6H	8.99	9.10	9.34	9.57	10.12	9.02	9.13	9.37	9.60	10.15
	8H	10.33	10.58	10.85	11.08	11.66	10.36	10.62	10.89	11.12	11.70
Variation with the observer position at spacings:											
S = 1.0H		5.7/-8.4					5.7/-8.4				
S = 1.5H		8.0/-6.4					8.0/-6.4				
S = 2.0H		9.5/-4.7					9.5/-4.7				
Standard tables:		BK2					BK2				
Uncorrected UGR		-3.4					-3.4				



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	1.11	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	1.04	1.02	1.00	1.02	1.00	0.98	0.98	0.97	0.95	0.95	0.94	0.93	0.92	0.91	0.90	0.88
2	0.99	0.95	0.93	0.97	0.94	0.92	0.94	0.92	0.90	0.91	0.90	0.88	0.89	0.87	0.86	0.85
3	0.94	0.90	0.87	0.93	0.89	0.86	0.90	0.87	0.85	0.88	0.86	0.84	0.86	0.84	0.82	0.81
4	0.90	0.86	0.82	0.89	0.85	0.82	0.87	0.84	0.81	0.85	0.82	0.80	0.83	0.81	0.79	0.78
5	0.86	0.82	0.79	0.85	0.81	0.78	0.84	0.80	0.78	0.82	0.79	0.77	0.81	0.78	0.76	0.75
6	0.83	0.78	0.75	0.82	0.78	0.75	0.81	0.77	0.74	0.79	0.76	0.74	0.78	0.76	0.73	0.72
7	0.80	0.75	0.72	0.79	0.75	0.72	0.78	0.74	0.72	0.77	0.74	0.71	0.76	0.73	0.71	0.70
8	0.77	0.72	0.70	0.76	0.72	0.69	0.75	0.72	0.69	0.75	0.71	0.69	0.74	0.71	0.69	0.68
9	0.74	0.70	0.67	0.74	0.70	0.67	0.73	0.69	0.67	0.72	0.69	0.67	0.72	0.69	0.66	0.65
10	0.72	0.68	0.65	0.72	0.68	0.65	0.71	0.67	0.65	0.70	0.67	0.65	0.70	0.67	0.64	0.64



NATA 4-2103-E

Appendix Page: 15 Total:15

Intensity data(cd)

C/γ(°)	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0
0.0	5414.25	5240.82	4742.28	4065.36	3233.74	2339.07	1580.94	1051.63	781.64
45.0	5388.92	5216.21	4739.25	4065.36	3257.58	2411.08	1676.36	1130.47	835.76
90.0	5274.40	5146.12	4686.68	3994.62	3222.45	2462.67	1819.34	1271.31	905.13
135.0	5401.58	5216.21	4739.25	4065.36	3257.58	2411.08	1676.36	1130.47	835.76
180.0	5414.25	5240.82	4742.28	4065.36	3233.74	2339.07	1580.94	1051.63	781.64
225.0	5388.92	5216.21	4739.25	4065.36	3257.58	2411.08	1676.36	1130.47	835.76
270.0	5274.40	5146.12	4686.68	3994.62	3222.45	2462.67	1819.34	1271.31	905.13
315.0	5401.58	5216.21	4739.25	4065.36	3257.58	2411.08	1676.36	1130.47	835.76
360.0	5414.25	5240.82	4742.28	4065.36	3233.74	2339.07	1580.94	1051.63	781.64
C/γ(°)	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5
0.0	634.86	558.05	521.00	497.99	447.00	318.61	173.04	40.58	7.98
45.0	666.46	580.85	535.81	507.62	425.92	303.64	162.20	54.67	17.56
90.0	721.07	610.36	550.89	496.11	382.04	279.19	201.78	85.72	23.12
135.0	666.46	580.85	535.81	507.62	425.92	303.64	162.20	54.67	17.56
180.0	634.86	558.05	521.00	497.99	447.00	318.61	173.04	40.58	7.98
225.0	666.46	580.85	535.81	507.62	425.92	303.64	162.20	54.67	17.56
270.0	721.07	610.36	550.89	496.11	382.04	279.19	201.78	85.72	23.12
315.0	666.46	580.85	535.81	507.62	425.92	303.64	162.20	54.67	17.56
360.0	634.86	558.05	521.00	497.99	447.00	318.61	173.04	40.58	7.98
C/γ(°)	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0
0.0	6.22	5.84	5.62	5.51	5.29	5.23	5.12	5.07	5.07
45.0	6.22	5.84	5.56	5.40	5.29	5.18	5.07	5.01	5.07
90.0	6.66	5.89	5.62	5.40	5.29	5.18	5.12	5.07	5.01
135.0	6.22	5.84	5.56	5.40	5.29	5.18	5.07	5.01	5.07
180.0	6.22	5.84	5.62	5.51	5.29	5.23	5.12	5.07	5.07
225.0	6.22	5.84	5.56	5.40	5.29	5.18	5.07	5.01	5.07
270.0	6.66	5.89	5.62	5.40	5.29	5.18	5.12	5.07	5.01
315.0	6.22	5.84	5.56	5.40	5.29	5.18	5.07	5.01	5.07
360.0	6.22	5.84	5.62	5.51	5.29	5.23	5.12	5.07	5.07
C/γ(°)	67.5	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5
0.0	5.07	4.96	4.96	4.96	4.96	5.01	4.90	4.96	4.96
45.0	5.01	4.96	4.96	4.96	4.90	4.90	4.90	4.90	4.84
90.0	4.96	4.96	4.96	4.96	4.90	4.90	4.90	4.90	4.90
135.0	5.01	4.96	4.96	4.96	4.90	4.90	4.90	4.90	4.84
180.0	5.07	4.96	4.96	4.96	4.96	5.01	4.90	4.96	4.96
225.0	5.01	4.96	4.96	4.96	4.90	4.90	4.90	4.90	4.84
270.0	4.96	4.96	4.96	4.96	4.90	4.90	4.90	4.90	4.90
315.0	5.01	4.96	4.96	4.96	4.90	4.90	4.90	4.90	4.84
360.0	5.07	4.96	4.96	4.96	4.96	5.01	4.90	4.96	4.96
C/γ(°)	90.0								
0.0	4.90								
45.0	4.84								
90.0	4.84								
135.0	4.84								
180.0	4.90								
225.0	4.84								
270.0	4.84								
315.0	4.84								
360.0	4.90								