



Spectra Lux

2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca



Lab Code: 200899-0

Moving Mirror Goniophotometer Test Report

Standard(s): IES LM-63, IES LM-79, ANSI C82.77

Customer ANDlight, 1951 Franklin St., Vancouver, British Columbia , Canada, V5L 0C7

General Information		Lamp Details: CY4449		Driver Details: CY2019	
DUT Lab ID	SRIS 2832-4	Seasoning	0 Hour	Type	LED Power Supply
Lamp Type	LED/SSL	Test Product	BUT-60-P-41	Manufacturer	Meanwell
Current Mode	AC	Manufacturer	EPISTAR	Catalog No.	IDLV-45-12
Test Report	S2008142-R1	Lamp Catalog No.	OMNICHIP (320404-xx-300-12-4.4)	Maximum Power	45 W
Test Date	14 August 2020	Drive Current	30 mA	Input Voltage	120.00 V
Report Date	20 November 2020	Nominal Color	4100 K	Operating Frequency	60 Hz
Ambient	24.5 °C	Burning Position	Junction Axial	Input Power	23.23 W

Luminaire Data

General Information		Optics		Aperture (feet)	
Manufacturer	ANDlight	Reflector	None	X	-1.9583
Name	BUTTON	Housing	Aluminum Body c/w Nylon Rope	Y	-1.9583
Catalog No.	BUT-60-P-41	Lens	Opalin Acrylic Diffuser	Z	0.0000

Stabilization Time: 1 hour

Approved Signatory: Chrisnel Blot

Signature:



Luminaire Test Method

Precise installation and alignment of the luminaire to the rotation axis of the photometer is governed by a servomotor controlled via a microcontroller. A laser is used to validate the luminaire positioning. Before photometric measurements are taken, luminaire is operated long enough to reach stabilization and temperature equilibrium.

All movement commands issued to the photometer axes are mediated by the software to ensure the motion is within the limits of operation. The photometric detector used is a silicon detector corrected to closely match the spectral luminous efficiency photopic curve with a quality index less than 1.5%. Proper shielding is incorporated to the photometric test bench such that only the light from the unit under test is measured.

Luminous intensity measurements are performed at a distance great enough so that the inverse-square law applies. During each measurement the computer records the luminous intensity associated to the corresponding angles of radiation, as well as input electrical operational parameters and temperature measurements. Candela values are reported in IES format as per LM-63.

Equipment, reference standards are traceable to National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).





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Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Power Supply	iRDC	CIF-3000A	974998	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	27E116584	2020/07/22	2021/09/22
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.

Photometric Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Photometer	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Photodetector	INPHORA	IPR-PDET 19	110802	2019/09/05	2020/09/05

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504176	2020/07/16	2021/07/16

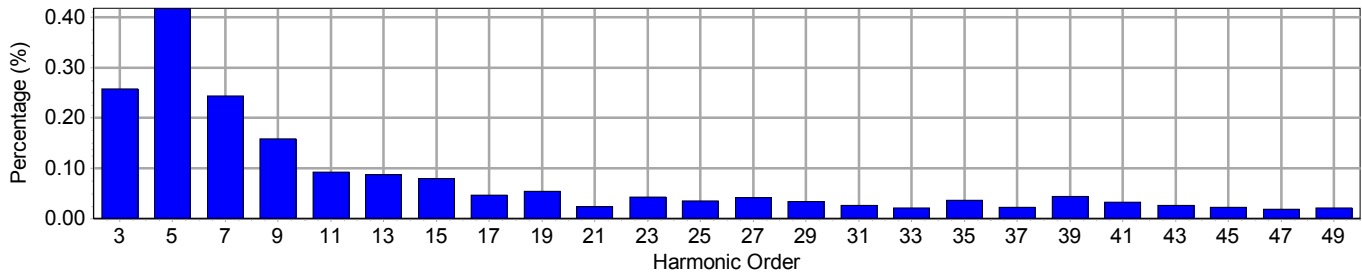


Electrical Measurements

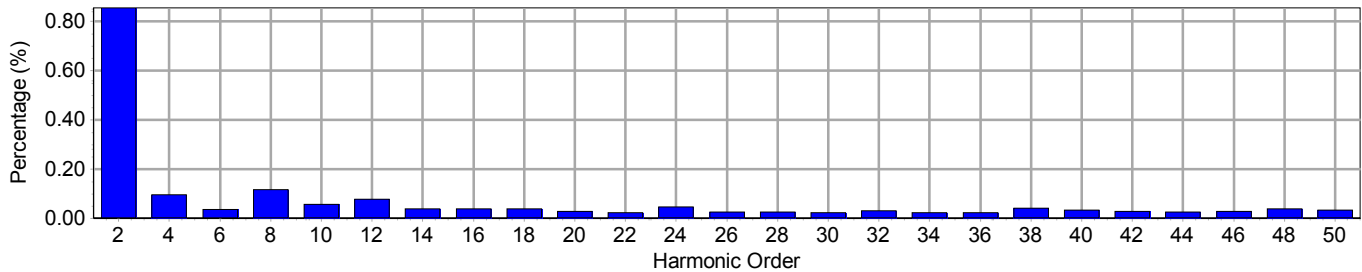
Input

Frequency	60 Hz	Active Power	23.23 W	THDV [ANSI]	1.07 %
Voltage	120.1 V(rms)	Apparent Power	23.86 VA	THDA [ANSI]	7.41 %
Current	0.1986 A(rms)	Power Factor	0.974	Max. Harmonic At	3rd order

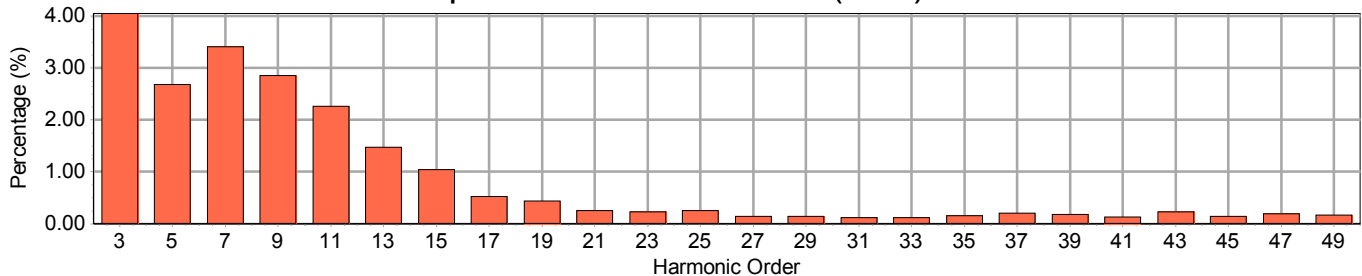
Input Voltage Harmonics (Odd)



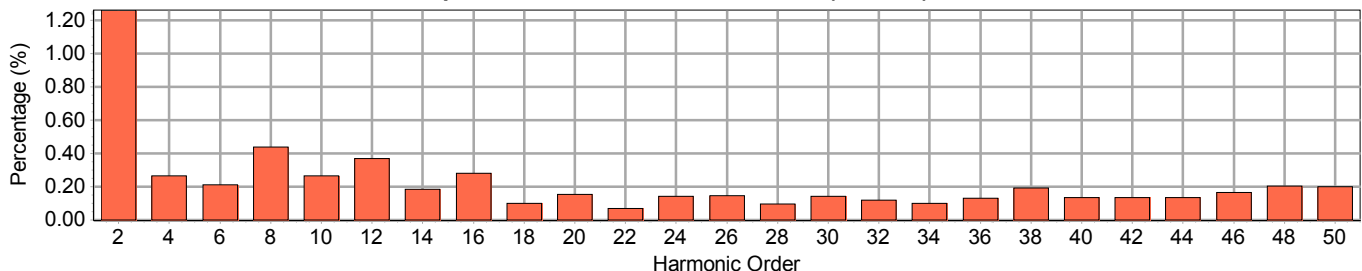
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.856	1.265
3	180	0.258	4.050	4	240	0.094	0.267
5	300	0.419	2.683	6	360	0.035	0.212
7	420	0.244	3.406	8	480	0.115	0.442
9	540	0.158	2.855	10	600	0.057	0.268
11	660	0.092	2.262	12	720	0.076	0.372
13	780	0.088	1.472	14	840	0.037	0.185
15	900	0.080	1.035	16	960	0.038	0.281
17	1020	0.046	0.523	18	1080	0.037	0.103
19	1140	0.054	0.435	20	1200	0.028	0.156
21	1260	0.023	0.257	22	1320	0.023	0.069
23	1380	0.042	0.233	24	1440	0.047	0.145
25	1500	0.035	0.255	26	1560	0.025	0.148
27	1620	0.042	0.144	28	1680	0.025	0.097
29	1740	0.033	0.140	30	1800	0.022	0.144
31	1860	0.026	0.115	32	1920	0.029	0.123
33	1980	0.021	0.115	34	2040	0.022	0.101
35	2100	0.036	0.160	36	2160	0.023	0.132
37	2220	0.023	0.207	38	2280	0.039	0.194
39	2340	0.044	0.181	40	2400	0.034	0.136
41	2460	0.033	0.130	42	2520	0.027	0.137
43	2580	0.026	0.232	44	2640	0.026	0.138
45	2700	0.023	0.139	46	2760	0.028	0.167
47	2820	0.018	0.193	48	2880	0.037	0.207
49	2940	0.021	0.172	50	3000	0.032	0.203



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Photometric Report: S2008142-R1

Prepared for: ANDlight · Test Date: 14 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-P-41

Coefficients of Utilization - Zonal Cavity Method

RCR	RC				0.9				0.8				0.7				0.5			0.1			0
	RW	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.7	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0.5	0.3	0.1	0
0		121	121	121	121	118	118	118	118	114	114	114	114	108	108	108	96	96	96	96	96	96	94
1		111	106	101	97	107	103	99	95	104	100	96	93	95	91	89	85	83	81	85	83	81	79
2		101	92	85	79	98	90	83	77	95	87	81	76	83	78	73	75	71	68	75	71	68	66
3		92	81	72	65	89	79	70	64	86	77	69	63	73	66	61	66	61	58	66	61	58	55
4		84	71	62	55	81	70	61	54	79	68	60	53	65	58	52	59	54	49	59	54	49	47
5		78	64	54	47	75	62	53	47	72	61	52	46	58	50	45	53	47	43	53	47	43	41
6		71	57	48	41	69	56	47	41	67	55	46	40	52	45	39	48	42	38	48	42	38	35
7		66	52	42	36	64	51	42	36	62	49	41	35	47	40	35	44	38	33	44	38	33	31
8		62	47	38	32	59	46	38	32	58	45	37	31	43	36	31	40	34	30	40	34	30	28
9		57	43	34	29	56	42	34	29	54	41	34	28	40	33	28	37	31	27	37	31	27	25
10		54	40	31	26	52	39	31	26	50	38	31	26	37	30	25	34	29	24	34	29	24	23

Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0 - 10	45	3.12	3.12
10 - 20	127	8.87	8.87
20 - 30	193	13.49	13.49
30 - 40	236	16.53	16.53
40 - 50	244	17.05	17.05
50 - 60	221	15.43	15.43
60 - 70	167	11.68	11.68
70 - 80	89	6.21	6.21
80 - 90	21	1.49	1.49
90 - 120	31	2.20	2.20
90 - 130	46	3.20	3.20
90 - 150	72	5.07	5.07
90 - 180	88	6.13	6.13
0 - 180	1429	100.00	100.00

Average Luminance (Cd/m²)

Angle	0 Degree	45 Degree	90 Degree
45.0	1712	1724	1522
55.0	1623	1632	1476
65.0	1278	1261	1602
75.0	1248	1270	1080
85.0	656	696	602

Luminaire Luminous Flux: 1429

Measured Input Power: 23.23 W

Total Luminaire Efficiency: N/A

Luminaire Luminous Efficacy: 61.5 lm/W

Luminaire Spacing Criterion (0 Degree): 1.2865

Luminaire Spacing Criterion (90 Degree): 1.1688

Category: Up and Down

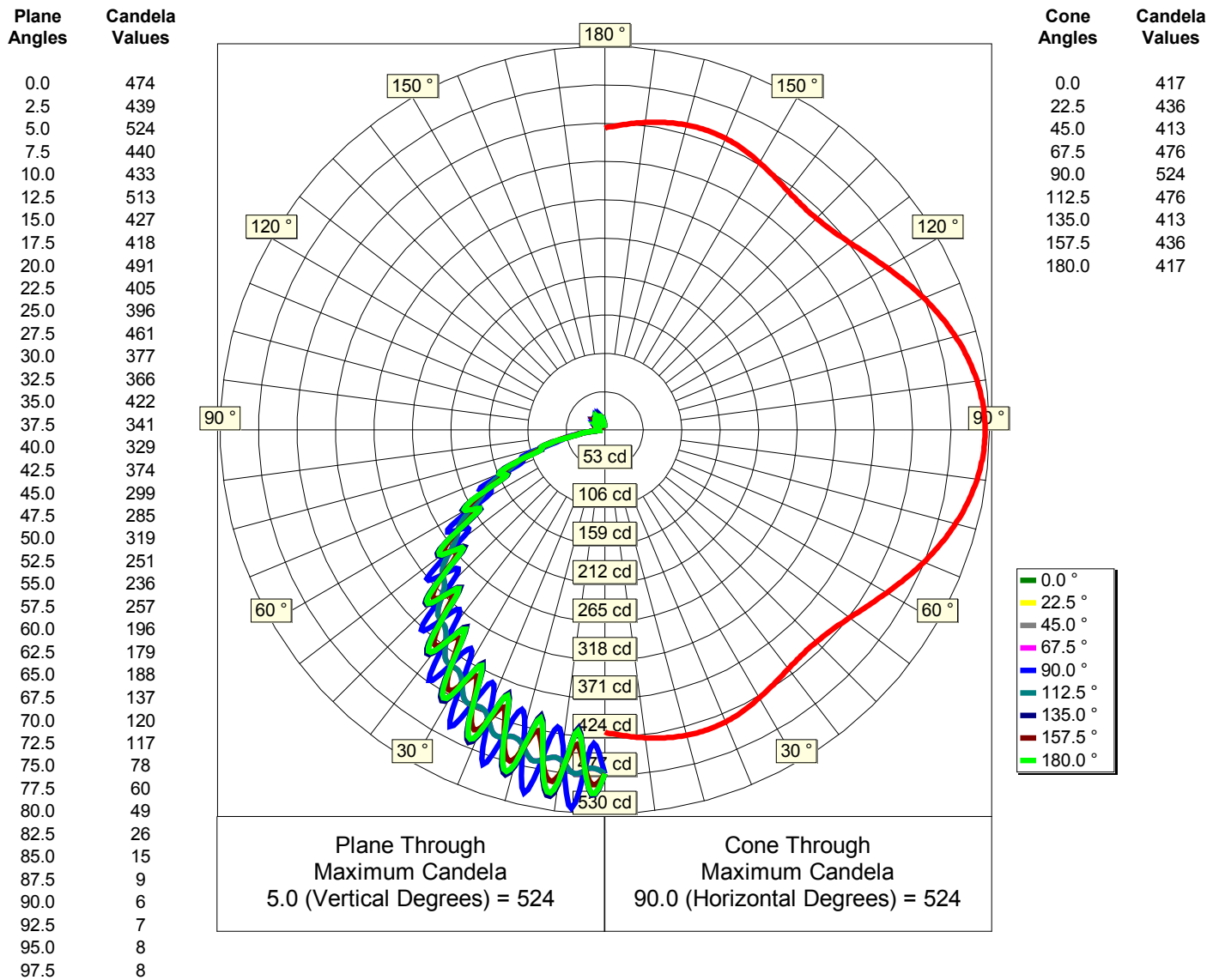


Photometric Report: S2008142-R1

Prepared for: ANDlight · Test Date: 14 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-P-41

Luminous Intensity - Polar Curve for each Plane(1)



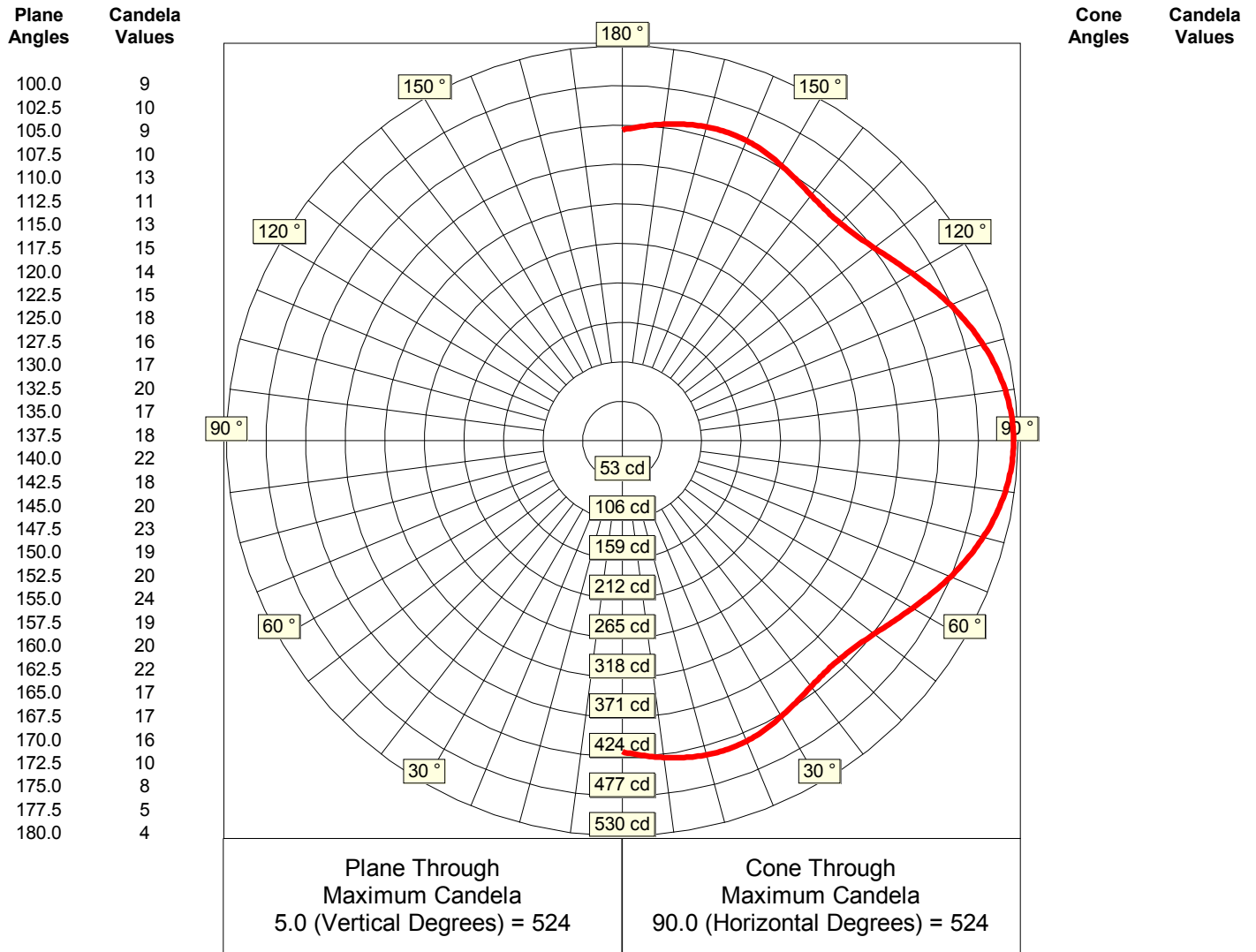


Photometric Report: S2008142-R1

Prepared for: ANDlight · Test Date: 14 August 2020

Luminaire: BUTTON · Lumcat: BUT-60-P-41

Luminous Intensity - Polar Curve for each Plane(2)





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IES File Headers

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IESNA:LM-63
[ISSUEDATE]      14 August 2020
[TESTLAB]        Spectra Lux
[TEST]           S2008142-R1
[MANUFAC]        ANDlight
[LUMCAT]          BUT-60-P-41
[LUMINAIRE]       BUTTON
[LAMP]           EPISTAR OMNICHIP(320404-xx-300-12-4.4)LEDs c/w Meanwell Driver IDLV-45-12 @ 120.00V
[_BURNING]        Vertical Base Up (1,429 Luminaire Lumens)
[_REFLECTOR]      None
[_LENS]           Opalin Acrylic Diffuser
[_HOUSING]        Aluminum Body c/w Nylon Rope
[_NOMINAL COLOR]  4100 K
[_DRIVE CURRENT]  30 mA
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Candela Table

Lateral Angles

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
V e r t i c a l	0.0	474	474	474	474	474	474	474	474
	2.5	495	485	497	467	439	467	497	485
	5.0	417	436	413	476	524	476	413	436
	7.5	490	480	493	459	440	459	493	480
	10.0	485	477	488	460	433	460	488	477
	12.5	407	426	404	466	513	466	404	426
	15.0	476	467	480	446	427	446	480	467
	17.5	468	460	470	444	418	444	470	460
	20.0	390	407	387	447	491	447	387	407
	22.5	453	444	457	424	405	424	457	444
	25.0	441	434	444	420	396	420	444	434
	27.5	366	382	363	418	461	418	363	382
	30.0	422	414	426	395	377	395	426	414
	32.5	407	400	409	387	366	387	409	400
	35.0	335	350	332	383	422	383	332	350
	37.5	384	375	386	358	341	358	386	375
	40.0	364	359	367	348	329	348	367	359
	42.5	297	311	295	340	374	340	295	311
A n g l e s	45.0	337	329	339	314	299	314	339	329
	47.5	315	311	317	301	285	301	317	311
	50.0	254	265	251	290	319	290	251	265
	52.5	283	277	285	264	251	264	285	277
	55.0	259	256	260	248	236	248	260	256
	57.5	204	214	202	233	257	233	202	214
	60.0	222	217	224	206	196	206	224	217
	62.5	197	194	198	188	179	188	194	197
	65.0	150	157	148	171	188	171	148	157
	67.5	157	153	158	145	137	145	153	157
	70.0	131	130	132	125	120	125	130	131
	72.5	94	98	93	107	117	107	98	94
	75.0	90	88	91	83	78	83	91	88
	77.5	67	67	67	63	60	63	67	67
	80.0	40	43	40	46	49	46	43	40
	82.5	30	31	32	28	26	28	31	30
	85.0	16	17	17	15	15	15	17	16
	87.5	7	9	8	9	9	9	9	7
	90.0	6	7	8	7	6	7	7	6



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Lateral Angles

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0
V e r t i c a l	92.5	6	8	7	7	7	7	8	6
	95.0	6	7	7	8	8	8	7	6
	97.5	8	8	9	8	8	8	9	8
	100.0	8	9	9	8	9	8	9	8
	102.5	8	8	8	10	10	8	8	8
	105.0	10	10	11	10	9	10	11	10
	107.5	10	11	11	11	10	11	11	10
	110.0	9	10	10	12	13	12	10	9
	112.5	12	12	13	12	11	12	13	12
	115.0	13	13	13	13	13	13	13	13
	117.5	11	12	12	14	15	14	12	11
	120.0	14	15	16	14	14	16	15	14
	122.5	15	15	16	15	15	16	15	15
	125.0	13	15	15	17	18	15	15	13
	127.5	17	17	18	17	16	17	18	17
	130.0	17	17	18	18	17	18	17	17
	132.5	15	17	16	19	20	16	17	15
	135.0	19	19	20	19	17	19	19	19
	137.5	19	19	20	19	18	19	19	19
A n g l e s	140.0	16	18	17	20	22	17	18	16
	142.5	20	21	22	20	18	20	22	20
	145.0	20	20	21	20	20	21	20	20
	147.5	17	18	18	21	23	18	18	17
	150.0	21	21	22	21	19	21	21	21
	152.5	20	20	21	21	20	21	20	20
	155.0	17	18	18	21	24	18	18	17
	157.5	20	20	22	20	19	20	20	20
	160.0	19	19	20	20	20	20	19	19
	162.5	16	17	16	20	22	16	17	16
	165.0	18	18	18	18	17	18	18	18
	167.5	16	15	16	16	17	16	15	16
	170.0	12	12	12	14	16	14	12	12
	172.5	11	12	12	11	10	11	12	11
	175.0	8	9	9	8	8	8	9	8
	177.5	4	5	4	5	5	4	5	4
	180.0	4	4	4	4	4	4	4	4