



Les Industries Spectralux Inc. Spectralux Industries Inc.

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

ISO/IEC 17025
NVLAP
NVLAP LAB CODE: 200899-0

Moving Mirror Goniophotometer Test Report

Standard(s): IESNA LM-15-03, ANSI C82.77-2002

Customer Artemide Manufacturing N-A LTD, 11105 Renaude-Lapointe, Montreal, Québec, Canada, H1J2T4

General Information		Lamp Details		Ballast Details	
Test Report	S1410063-R1	Description	Coated 75W FLU T5	Type	Commercial
Test Date	6 October 2014	Base	Mini Bipin	Description	54FLU-CF213
Report Date	31 October 2014	Standard Designation	N/A	Manufacturer	Advance
Ambient	24.7 °C	Rated Lumens	7000	Catalog No.	ICN-2S54-N
Humidity	33.7 %	Test Position	Horizontal	Voltage	120.00 V
Lamp Type	Fluorescent	Quantity	1	Power Factor	0.9900

Luminaire Data

General Information		Optics		Aperture (feet)	
Manufacturer	Artemide	Reflector	White Polymer Reflector	X	4.0000
Name	SQUARE	Housing	Extruded Aluminum	Y	0.2500
Catalog No.	USC-RA904B00HOC1A	Lens	Diffuse Flat Acrylic Top and Bottom	Z	0.0000

SKT Position:

Tested By: Jean-Paul Ojeil

Approved Signatory: Chrisnel Blot

Signature:



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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	91L236541	2014/03/25	2015/04/16
Output Power Meter	Yokogawa	WT210	91L239798	2014/03/25	2015/04/15

Photometric Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Photometer	Gigahertz-Optik	X11	4502	2014/05/06	2015/09/17
Photodetector	INPHORA	IPR-PDET 19	110802	2014/05/16	2015/05/16

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504178	2014/04/16	2016/04/16



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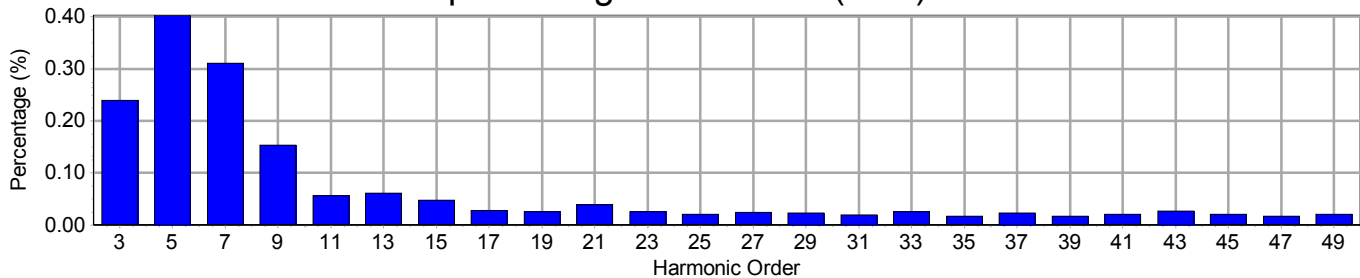
NVLAP LAB CODE: 200899-0

Electrical Measurements

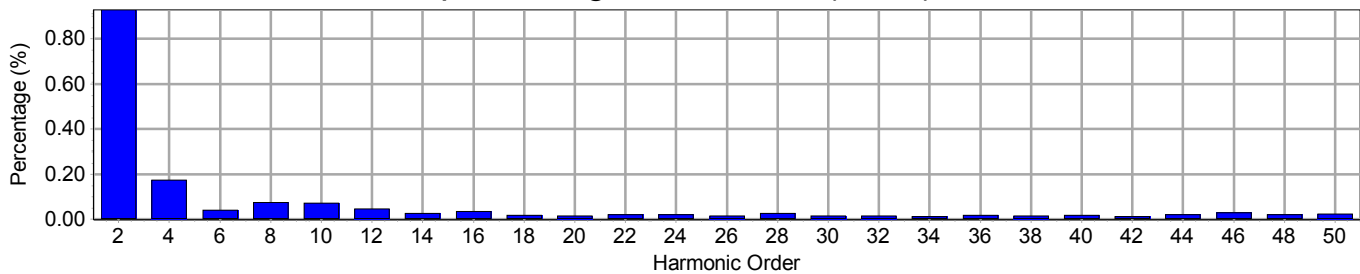
Input

Frequency	60 Hz	Active Power	78.36 W	THDV [ANSI]	1.13 %
Voltage	120.4 V(rms)	Apparent Power	78.67 VA	THDA [ANSI]	7.56 %
Current	0.6536 A(rms)	Power Factor	0.996	Max. Harmonic At	5th order

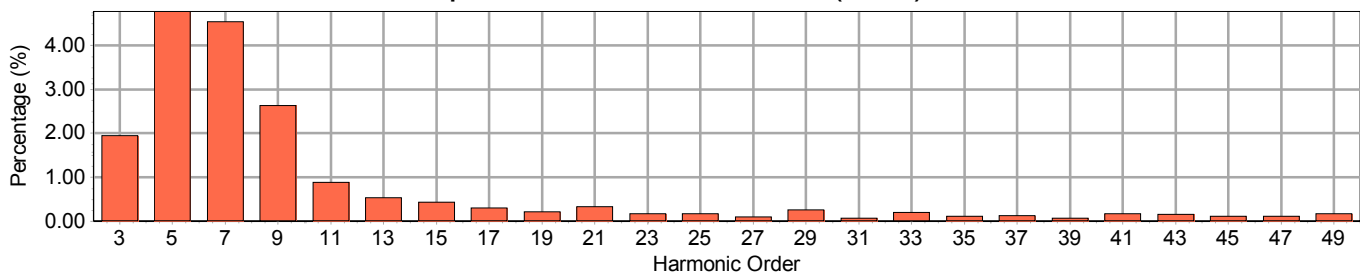
Input Voltage Harmonics (Odd)



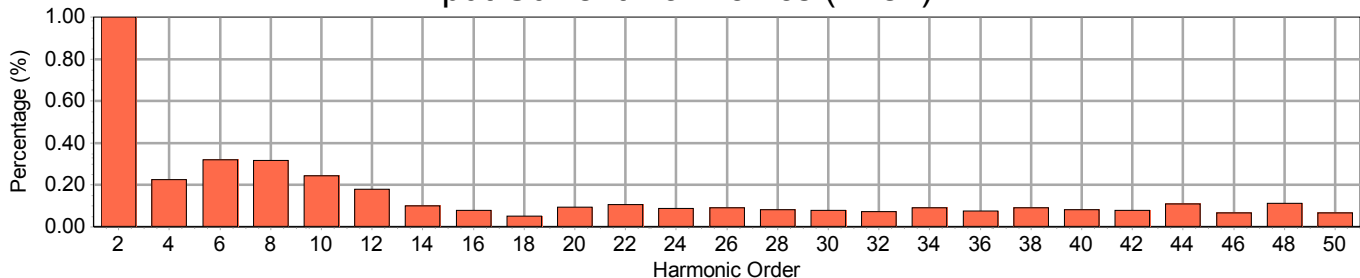
Input Voltage Harmonics (Even)



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	0.930	1.003
3	180	0.240	1.942	4	240	0.175	0.225
5	300	0.404	4.778	6	360	0.043	0.318
7	420	0.311	4.536	8	480	0.074	0.316
9	540	0.153	2.629	10	600	0.073	0.242
11	660	0.055	0.875	12	720	0.048	0.180
13	780	0.061	0.533	14	840	0.026	0.098
15	900	0.047	0.435	16	960	0.034	0.078
17	1020	0.028	0.305	18	1080	0.018	0.052
19	1140	0.025	0.208	20	1200	0.016	0.094
21	1260	0.039	0.323	22	1320	0.022	0.106
23	1380	0.025	0.170	24	1440	0.021	0.087
25	1500	0.020	0.164	26	1560	0.017	0.089
27	1620	0.024	0.093	28	1680	0.026	0.080
29	1740	0.022	0.255	30	1800	0.017	0.078
31	1860	0.019	0.071	32	1920	0.016	0.071
33	1980	0.025	0.191	34	2040	0.013	0.089
35	2100	0.017	0.108	36	2160	0.018	0.076
37	2220	0.023	0.122	38	2280	0.015	0.089
39	2340	0.016	0.070	40	2400	0.019	0.081
41	2460	0.021	0.165	42	2520	0.012	0.079
43	2580	0.026	0.149	44	2640	0.022	0.110
45	2700	0.020	0.107	46	2760	0.029	0.066
47	2820	0.016	0.108	48	2880	0.021	0.112
49	2940	0.020	0.172	50	3000	0.023	0.065



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NVLAP LAB CODE: 200899-0

Photometric Report: S1410063-R1

Prepared for: Artemide Manufacturing N-A LTD · Test Date: 06 October 2014

Luminaire: SQUARE · Lumcat: USC-RA904B00HOC1A

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		80	80	80	80	76	76	76	76	72	72	72	72	64	64	64	51	51	51				48
1		73	70	67	64	69	66	63	61	65	63	60	58	56	55	53	45	44	43				41
2		67	61	56	52	63	58	54	50	60	55	51	48	50	47	44	40	38	37				34
3		61	54	48	44	58	51	46	42	54	49	44	40	44	40	37	36	33	31				29
4		56	48	42	37	53	45	40	36	50	43	38	35	39	35	32	32	29	27				25
5		52	43	36	32	49	41	35	31	46	39	34	30	35	31	28	29	26	24				22
6		48	38	32	28	45	37	31	27	43	35	30	26	32	28	24	26	23	21				19
7		44	35	29	25	42	33	28	24	39	32	27	23	29	25	22	24	21	19				17
8		41	32	26	22	39	30	25	21	37	29	24	21	27	22	19	22	19	17				15
9		38	29	23	20	36	28	23	19	34	27	22	19	24	20	17	20	18	15				14
10		36	27	21	18	34	26	21	17	32	25	20	17	23	19	16	19	16	14				13

Zonal Lumen Summary

Average Luminance (Cd/m²)

Zone	Lumens	% Lamp	% Luminaire	Angle	0 Degree	45 Degree	90 Degree
0 - 10	130	1.85	2.74				
10 - 20	368	5.26	7.80	0.0	14967	14967	14967
20 - 30	541	7.74	11.47				
30 - 40	617	8.81	13.06	45.0	12853	11654	10595
40 - 50	591	8.44	12.50				
50 - 60	490	7.00	10.38	55.0	11348	10227	9414
60 - 70	348	4.97	7.36				
70 - 80	201	2.87	4.25	65.0	9783	8897	8194
80 - 90	78	1.11	1.64				
90 - 120	334	4.77	7.07	75.0	8274	7837	7427
90 - 130	537	7.68	11.38				
90 - 150	990	14.14	20.95	85.0	7217	8514	9406
90 - 180	1360	19.43	28.79				
0 - 180	4723	67.47	100.00				

Total Lamp Lumens: 7000

Total Luminaire Efficiency: 67.47%

Luminaire Spacing Criterion (0 Degree): 1.2447

Luminaire Spacing Criterion (90 Degree): 1.0965

CIE Type: Direct



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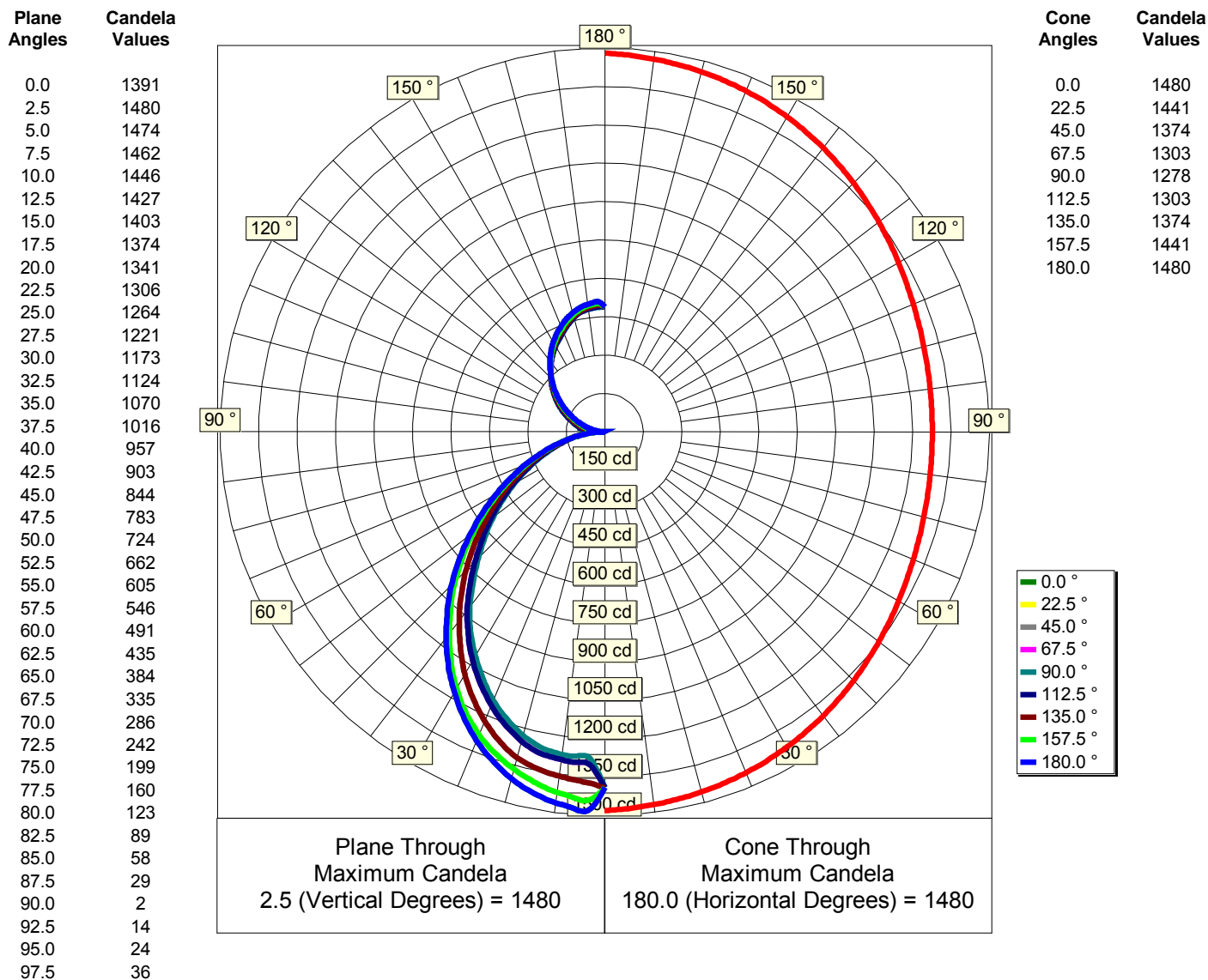
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Photometric Report: S1410063-R1

Prepared for: Artemide Manufacturing N-A LTD · Test Date: 06 October 2014

Luminaire: SQUARE · Lumcat: USC-RA904B00HOC1A

Luminous Intensity - Polar Curve for each Plane(1)





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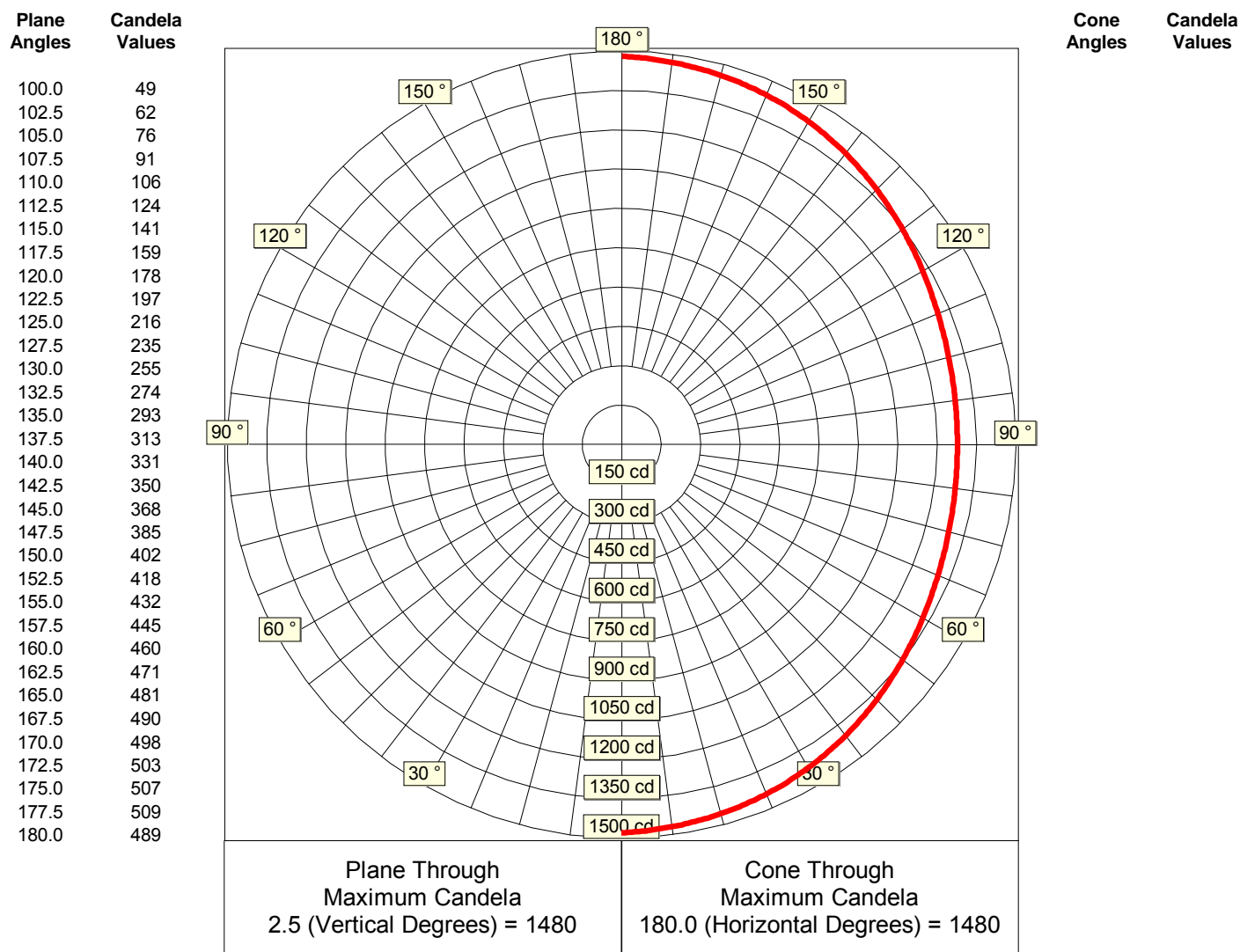
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Photometric Report: S1410063-R1

Prepared for: Artemide Manufacturing N-A LTD · Test Date: 06 October 2014

Luminaire: SQUARE · Lumcat: USC-RA904B00HOC1A

Luminous Intensity - Polar Curve for each Plane(2)





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IES File Headers

IESNA:LM-63-2002
[ISSUEDATE] 06 October 2014
[TESTLAB] Spectra Lux Industries Inc.
[TEST] S1410063-R1
[MANUFAC] Artemide
[LUMCAT] USC-RA904B00HOC1A
[LUMINAIRE] SQUARE
[LAMP] (1) 75W FLU T5 Coated c/w Advance Ballast ICN-2S54-N @ 120.00V
[_LAMPDETAILS] Standard: N/A Voltage=0V LCL=N/A
[_BURNING] Horizontal (7,000 Lumens)
[_REFLECTOR] White Polymer Reflector
[_LENS] Diffuse Flat Acrylic Top and Bottom
[_HOUSING] Extruded Aluminum
[_SKTPOSITION]
[DISTRIBUTION] Direct Type - Downlight

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	1391	1391	1391	1391	1391	1391	1391	1391
	2.5	1480	1441	1374	1303	1278	1303	1374	1441
	5.0	1474	1433	1365	1296	1272	1296	1365	1433
	7.5	1462	1421	1357	1292	1271	1292	1357	1421
	10.0	1446	1406	1349	1286	1265	1286	1349	1406
	12.5	1427	1387	1336	1274	1250	1274	1336	1387
	15.0	1403	1365	1319	1252	1228	1252	1319	1365
	17.5	1374	1341	1292	1223	1200	1223	1292	1341
	20.0	1341	1313	1259	1192	1170	1192	1259	1313
	22.5	1306	1280	1223	1156	1136	1156	1223	1280
	25.0	1264	1243	1182	1116	1095	1116	1243	1264
	27.5	1221	1203	1139	1075	1053	1075	1203	1221
	30.0	1173	1156	1091	1030	1009	1030	1156	1173
	32.5	1124	1106	1040	983	964	983	1106	1124
	35.0	1070	1050	986	931	917	931	1050	1070
	37.5	1016	996	931	882	864	882	996	1016
	40.0	957	937	877	824	806	824	937	957
	42.5	903	884	821	768	750	768	884	903
	45.0	844	825	766	714	696	714	825	844
A n g l e s	47.5	783	764	706	659	643	659	764	783
	50.0	724	705	652	611	596	611	705	724
	52.5	662	645	597	560	548	560	645	662
	55.0	605	588	545	513	502	513	588	605
	57.5	546	531	494	464	453	464	531	546
	60.0	491	478	445	417	408	417	478	491
	62.5	435	424	395	370	362	370	424	435
	65.0	384	374	349	328	322	328	374	384
	67.5	335	326	307	288	282	288	326	335
	70.0	286	280	263	250	246	250	280	286
	72.5	242	238	225	215	211	215	238	242
	75.0	199	197	188	181	179	181	197	199
	77.5	160	160	154	150	150	150	160	160
	80.0	123	125	122	121	121	121	125	123
	82.5	89	92	94	95	96	94	92	89
	85.0	58	63	69	74	76	69	63	58
	87.5	29	37	48	56	59	48	37	29
	90.0	2	22	42	55	59	42	22	2



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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	14	33	53	65	70	65	53	33	14
	95.0	24	43	62	76	80	76	62	43	24
	97.5	36	53	73	85	89	85	73	53	36
	100.0	49	64	83	96	100	96	83	64	49
	102.5	62	77	95	106	110	106	95	77	62
	105.0	76	90	107	118	122	118	107	90	76
	107.5	91	104	123	131	134	131	123	104	91
	110.0	106	120	134	144	147	144	134	120	106
	112.5	124	135	148	158	162	158	148	135	124
	115.0	141	152	165	173	176	173	165	152	141
	117.5	159	168	181	188	190	188	181	168	159
	120.0	178	186	197	204	205	204	197	186	178
	122.5	197	204	213	218	221	218	213	204	197
	125.0	216	221	230	234	236	234	230	221	216
	127.5	235	240	246	250	251	250	246	240	235
	130.0	255	258	264	265	267	265	264	258	255
	132.5	274	276	280	281	281	281	280	276	274
	135.0	293	293	297	296	297	296	297	293	293
A n g l e s	137.5	313	311	313	312	311	312	313	311	313
	140.0	331	328	329	326	327	326	329	328	331
	142.5	350	346	345	343	343	343	345	346	350
	145.0	368	363	361	358	357	358	361	363	368
	147.5	385	380	376	372	372	372	376	380	385
	150.0	402	395	391	386	385	386	391	395	402
	152.5	418	410	404	399	397	399	404	410	418
	155.0	432	423	416	410	408	410	416	423	432
	157.5	445	437	429	423	422	423	429	437	445
	160.0	460	450	443	437	436	437	443	450	460
	162.5	471	462	456	450	449	450	456	462	471
	165.0	481	474	467	464	462	464	467	474	481
	167.5	490	483	477	473	473	473	477	483	490
	170.0	498	491	485	481	479	481	485	491	498
	172.5	503	497	490	484	483	484	490	497	503
	175.0	507	500	494	488	486	488	494	500	507
	177.5	509	502	496	490	487	490	496	502	509
	180.0	489	489	489	489	489	489	489	489	489