



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	S1410072-R1	Description	Coated 104W FLU T5	Type	Commercial
Test Date	7 October 2014	Base	Mini Bipin	Description	80FLU-CF214
Report Date	31 October 2014	Standard Designation	N/A	Manufacturer	Advance
Ambient	24.3 °C	Rated Lumens	9000	Catalog No.	ICN-SS80-T
Humidity	39.1 %	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	5.0000
Name	SQUARE	Housing	Extruded Aluminum	Y	0.2500
Catalog No.	USC-RA905B00HOC1A	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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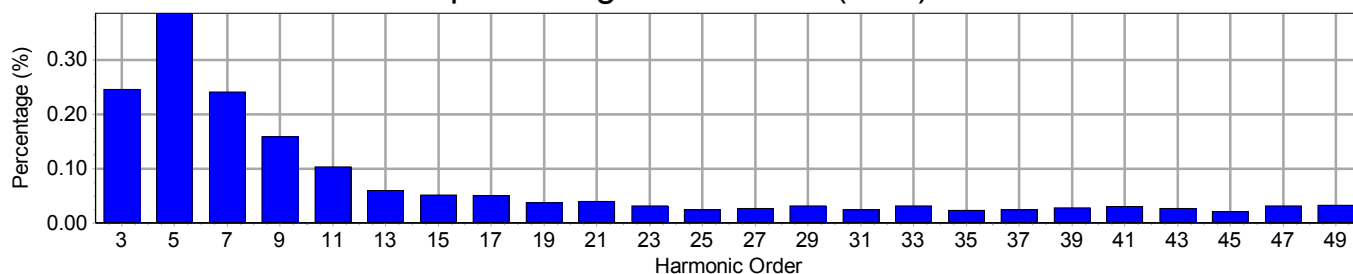
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Electrical Measurements

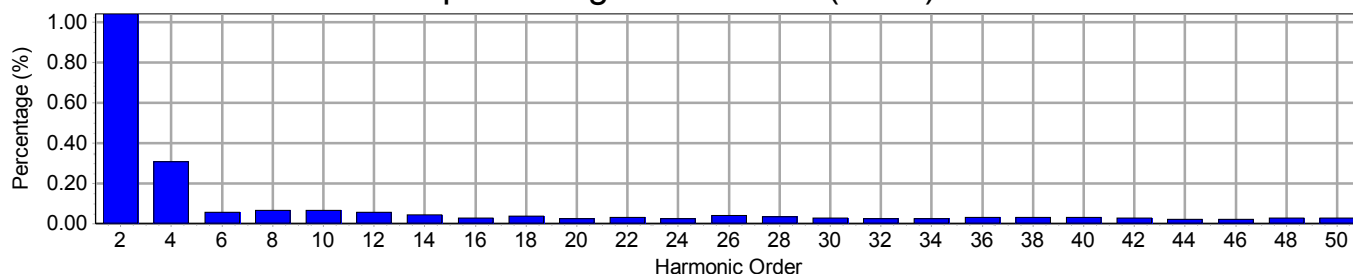
Input

Frequency	60 Hz	Active Power	102.58 W	THDV [ANSI]	1.24 %
Voltage	120.3 V(rms)	Apparent Power	102.71 VA	THDA [ANSI]	7.10 %
Current	0.8537 A(rms)	Power Factor	0.999	Max. Harmonic At	5th order

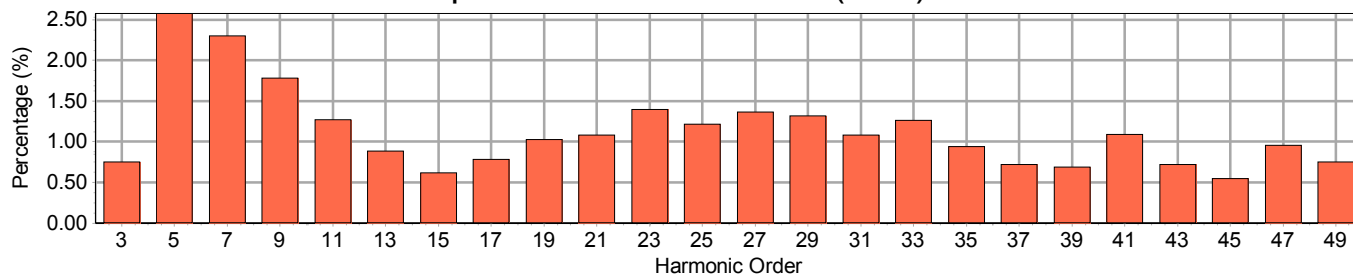
Input Voltage Harmonics (Odd)



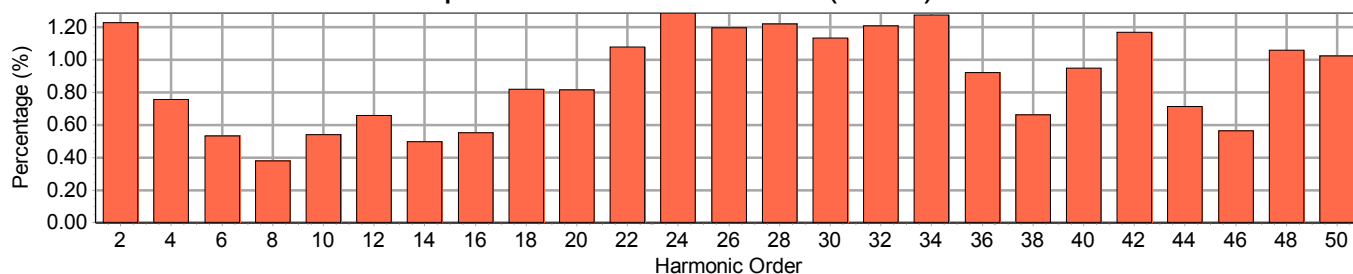
Input Voltage Harmonics (Even)



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	1.043	1.228
3	180	0.246	0.753	4	240	0.307	0.757
5	300	0.387	2.580	6	360	0.054	0.532
7	420	0.241	2.297	8	480	0.064	0.378
9	540	0.159	1.785	10	600	0.066	0.541
11	660	0.103	1.270	12	720	0.057	0.660
13	780	0.060	0.887	14	840	0.043	0.496
15	900	0.051	0.620	16	960	0.027	0.551
17	1020	0.050	0.783	18	1080	0.036	0.819
19	1140	0.038	1.027	20	1200	0.024	0.815
21	1260	0.039	1.078	22	1320	0.031	1.080
23	1380	0.031	1.394	24	1440	0.025	1.290
25	1500	0.024	1.219	26	1560	0.041	1.198
27	1620	0.026	1.366	28	1680	0.033	1.221
29	1740	0.032	1.318	30	1800	0.027	1.134
31	1860	0.024	1.085	32	1920	0.024	1.208
33	1980	0.031	1.265	34	2040	0.024	1.277
35	2100	0.022	0.942	36	2160	0.029	0.922
37	2220	0.024	0.718	38	2280	0.030	0.665
39	2340	0.028	0.685	40	2400	0.029	0.950
41	2460	0.031	1.090	42	2520	0.028	1.169
43	2580	0.026	0.722	44	2640	0.020	0.712
45	2700	0.021	0.548	46	2760	0.022	0.564
47	2820	0.031	0.954	48	2880	0.027	1.061
49	2940	0.032	0.749	50	3000	0.027	1.023



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Photometric Report: S1410072-R1

Prepared for: Artemide Manufacturing N-A LTD · Test Date: 07 October 2014

Luminaire: SQUARE · Lumcat: USC-RA905B00HOC1A

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
0		74	74	74	74	70	70	70	70	66	66	66	66	59	59	59	48	48	48	45
1		67	64	61	59	64	61	58	56	60	58	56	54	52	50	49	42	41	40	38
2		61	56	52	48	58	53	49	46	55	51	47	44	46	43	41	37	35	34	32
3		56	49	44	40	53	47	42	38	50	45	40	37	40	37	34	33	31	29	27
4		51	44	38	34	49	42	37	33	46	40	35	32	36	32	29	30	27	25	23
5		47	39	33	29	45	37	32	28	42	36	31	27	32	28	25	27	24	22	20
6		44	35	29	25	41	34	28	25	39	32	27	24	29	25	22	24	22	19	18
7		40	32	26	22	38	30	25	22	36	29	24	21	27	23	20	22	19	17	16
8		38	29	24	20	36	28	23	19	34	27	22	19	24	20	18	20	18	16	14
9		35	26	21	18	33	25	21	17	32	24	20	17	22	19	16	19	16	14	13
10		33	24	19	16	31	23	19	16	30	22	18	15	21	17	14	18	15	13	12

Zonal Lumen Summary

Average Luminance (Cd/m²)

Zone	Lumens	% Lamp	% Luminaire	Angle	0 Degree	45 Degree	90 Degree
0 - 10	151	1.68	2.71				
10 - 20	431	4.78	7.72	0.0	13935	13935	13935
20 - 30	637	7.08	11.43				
30 - 40	732	8.13	13.12	45.0	12776	11065	9695
40 - 50	709	7.87	12.70				
50 - 60	597	6.64	10.71	55.0	11453	9909	8729
60 - 70	432	4.80	7.74				
70 - 80	256	2.85	4.59	65.0	10037	8788	7759
80 - 90	106	1.17	1.89				
90 - 120	415	4.61	7.44	75.0	8673	7972	7313
90 - 130	641	7.12	11.48				
90 - 150	1134	12.60	20.33	85.0	8144	9343	9595
90 - 180	1527	16.97	27.39				
0 - 180	5578	61.97	100.00				

Total Lamp Lumens: 9000

Total Luminaire Efficiency: 61.97%

Luminaire Spacing Criterion (0 Degree): 1.2988

Luminaire Spacing Criterion (90 Degree): 1.0686

CIE Type: Direct



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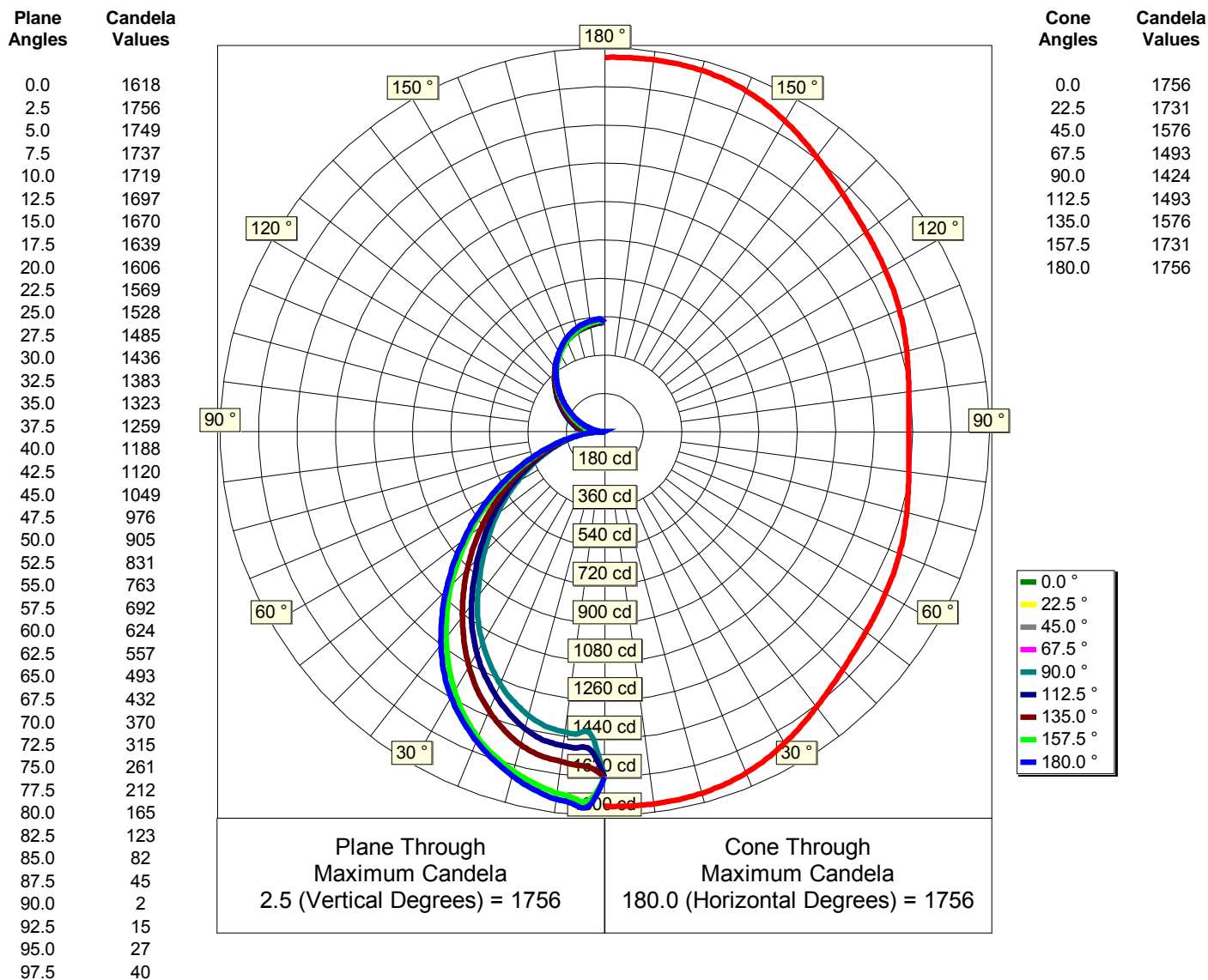
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Photometric Report: S1410072-R1

Prepared for: Artemide Manufacturing N-A LTD · Test Date: 07 October 2014

Luminaire: SQUARE · Lumcat: USC-RA905B00HOC1A

Luminous Intensity - Polar Curve for each Plane(1)





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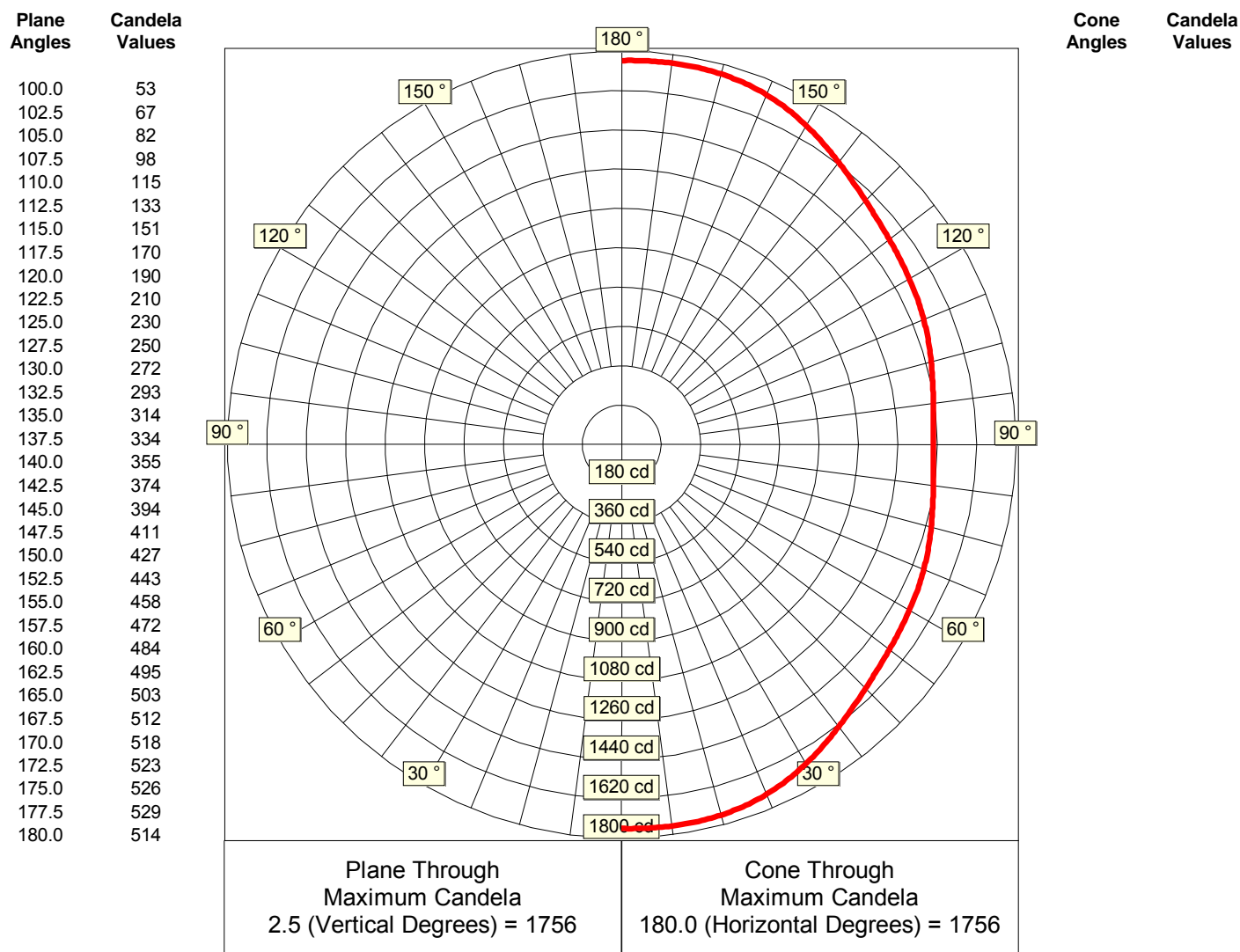
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Photometric Report: S1410072-R1

Prepared for: Artemide Manufacturing N-A LTD · Test Date: 07 October 2014

Luminaire: SQUARE · Lumcat: USC-RA905B00HOC1A

Luminous Intensity - Polar Curve for each Plane(2)





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IES File Headers

IESNA:LM-63-2002
[ISSUEDATE] 07 October 2014
[TESTLAB] Spectra Lux Industries Inc.
[TEST] S1410072-R1
[MANUFAC] Artemide
[LUMCAT] USC-RA905B00HOC1A
[LUMINAIRE] SQUARE
[LAMP] (1) 104W FLU T5 Coated c/w Advance Ballast ICN-SS80-T @ 120.00V
[_LAMPDETAILS] Standard: N/A Voltage=0V LCL=N/A
[_BURNING] Horizontal (9,000 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	1618	1618	1618	1618	1618	1618	1618	1618
	2.5	1756	1731	1576	1493	1424	1493	1576	1731
	5.0	1749	1722	1568	1487	1420	1487	1568	1722
	7.5	1737	1709	1559	1485	1420	1485	1559	1709
	10.0	1719	1691	1553	1479	1413	1479	1553	1691
	12.5	1697	1670	1540	1465	1399	1465	1540	1670
	15.0	1670	1647	1519	1441	1376	1441	1519	1647
	17.5	1639	1619	1490	1409	1348	1409	1490	1619
	20.0	1606	1588	1454	1375	1316	1375	1454	1588
	22.5	1569	1551	1415	1337	1279	1337	1415	1551
	25.0	1528	1507	1371	1293	1236	1293	1371	1507
	27.5	1485	1459	1324	1248	1191	1248	1324	1459
	30.0	1436	1404	1270	1197	1142	1197	1270	1404
	32.5	1383	1345	1214	1144	1093	1144	1214	1345
	35.0	1323	1282	1153	1086	1038	1086	1153	1282
	37.5	1259	1219	1094	1025	978	1025	1094	1219
	40.0	1188	1152	1033	960	912	960	1033	1152
	42.5	1120	1086	971	896	855	896	971	1086
	45.0	1049	1017	909	841	796	841	909	1017
A n g l e s	47.5	976	942	847	780	739	780	847	942
	50.0	905	875	785	723	687	723	785	875
	52.5	831	802	721	668	634	668	721	802
	55.0	763	736	660	613	581	613	660	736
	57.5	692	668	599	557	528	557	668	692
	60.0	624	603	542	503	477	503	603	624
	62.5	557	537	485	449	427	449	537	557
	65.0	493	477	431	399	381	399	477	493
	67.5	432	418	381	354	337	354	418	432
	70.0	370	360	330	309	295	309	360	370
	72.5	315	309	284	268	257	268	309	315
	75.0	261	258	240	227	220	227	258	261
	77.5	212	211	199	192	185	192	211	212
	80.0	165	167	161	157	152	157	167	165
	82.5	123	128	127	127	124	127	128	123
	85.0	82	90	95	98	97	95	90	82
	87.5	45	57	68	74	75	68	57	45
	90.0	2	37	61	75	79	61	37	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	15	52	76	87	89	87	76	52	15
	95.0	27	65	92	105	107	105	92	65	27
	97.5	40	75	106	119	123	119	106	75	40
	100.0	53	86	118	133	135	133	118	86	53
	102.5	67	98	128	144	148	144	128	98	67
	105.0	82	111	141	156	160	156	141	111	82
	107.5	98	125	153	169	171	169	153	125	98
	110.0	115	139	166	180	184	180	166	139	115
	112.5	133	154	180	193	196	193	180	154	133
	115.0	151	169	194	206	208	206	194	169	151
	117.5	170	185	208	219	222	219	208	185	170
	120.0	190	203	224	234	236	234	224	203	190
	122.5	210	221	240	249	252	249	240	221	210
	125.0	230	239	257	266	268	266	257	239	230
	127.5	250	258	274	282	284	282	274	258	250
	130.0	272	277	291	297	299	297	291	277	272
	132.5	293	295	309	314	314	314	309	295	293
	135.0	314	315	326	330	331	330	326	315	314
	137.5	334	333	343	346	346	346	343	333	334
	140.0	355	351	360	363	364	363	360	351	355
A n g l e s	142.5	374	369	377	381	381	381	377	369	374
	145.0	394	387	394	396	397	396	394	387	394
	147.5	411	403	409	412	411	412	409	403	411
	150.0	427	419	424	426	426	426	424	419	427
	152.5	443	434	438	439	438	439	438	434	443
	155.0	458	447	449	450	450	450	449	447	458
	157.5	472	460	461	462	461	462	460	460	472
	160.0	484	472	472	472	472	472	472	472	484
	162.5	495	482	481	480	479	480	481	482	495
	165.0	503	491	489	488	487	488	489	491	503
167.5	512	500	496	495	493	495	496	500	512	
170.0	518	507	502	500	498	500	502	507	518	
172.5	523	513	508	504	503	504	508	513	523	
175.0	526	518	512	509	507	509	512	518	526	
177.5	529	521	516	512	511	512	516	521	529	
180.0	514	514	514	514	514	514	514	514	514	