



# 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](http://www.spectralux.ca)

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

## Moving Mirror Goniophotometer Test Report

**Standard(s):** IESNA LM-15-03, IES LM-79-08, ANSI C82.77-2002

**Customer** Arancia Lighting Inc, 6048 Route 132 , Ste-Catherine , Québec, Canada, J5C2B1

General Information		SSL Details	Driver Details	
<b>Test Report</b>	S1709085-R1	<b>Description</b>	Clusters of Osram Sylvania LEDs	<b>Type</b> Commercial
<b>Test Date</b>	8 September 2017	<b>Serial Number</b>	2849-3	<b>Description</b> 120SSL-CY1376
<b>Report Date</b>	8 September 2017	<b>Photometric Method</b>	Absolute	<b>Manufacturer</b> HATCH
<b>Ambient</b>	24.8 °C	<b>Lamp Lumens</b>	-1	<b>Catalog No.</b> (4) XAC34-1050P- UNV-1
<b>Humidity</b>	39.4 %	<b>Test Position</b>	VBV /VBD	<b>Voltage</b> 120.00 V
<b>Lamp Type</b>	SSL	<b>Nominal Color</b>	4000K	<b>Power Factor</b> 0.9000

### Luminaire Data

General Information		Optics	Aperture (feet)	
<b>Manufacturer</b>	Arancia Lighting Inc	<b>Reflector</b>	None	<b>X</b> 0.1667
<b>Name</b>	Mini Jack	<b>Housing</b>	Aluminum Sheet Metal	<b>Y</b> 3.8333
<b>Catalog No.</b>	P90-04-2LC	<b>Lens</b>	Frosted Acrylic	<b>Z</b> 0.0000

Lamp Stabilization Time: 1 hour 10 minutes

**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	KIKUSUI	SPEC 77766A	1450001	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	91L236539	2017/05/05	2018/05/05
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	2016/10/05	2017/10/05

## Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	051202970	2016/10/20	2017/10/20



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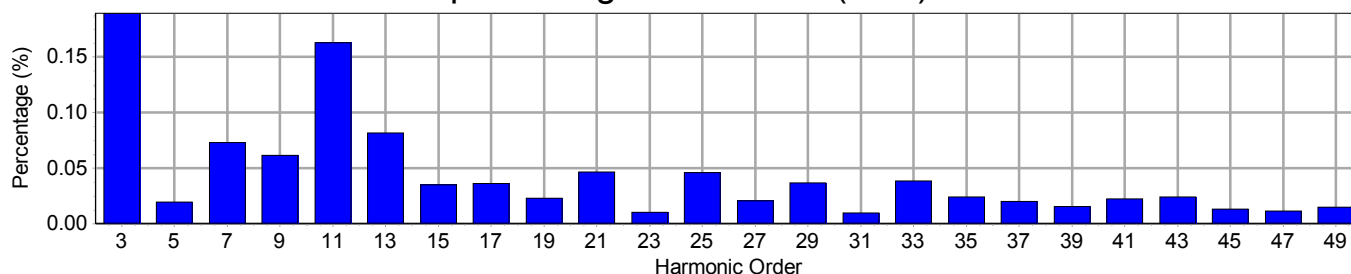
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## Electrical Measurements

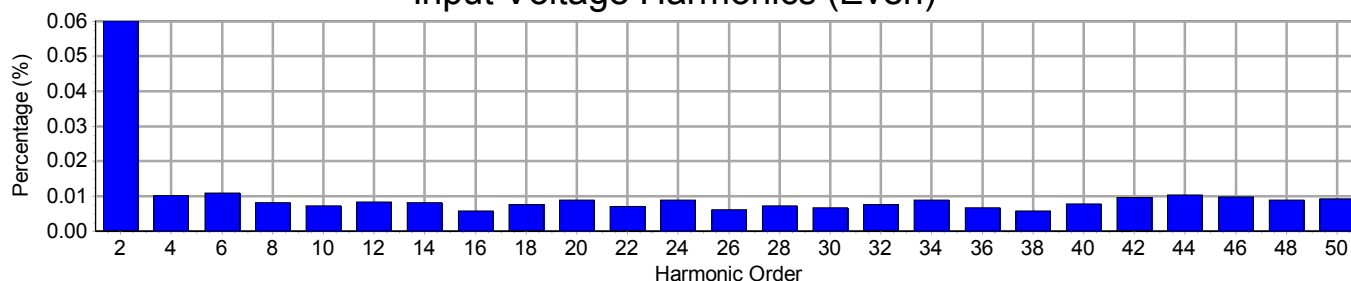
### Input

Frequency	60 Hz	Active Power	118.54 W	THDV [ANSI]	0.31 %
Voltage	119.6 V(rms)	Apparent Power	118.89 VA	THDA [ANSI]	7.07 %
Current	0.9941 A(rms)	Power Factor	0.997	Max. Harmonic At	7th order

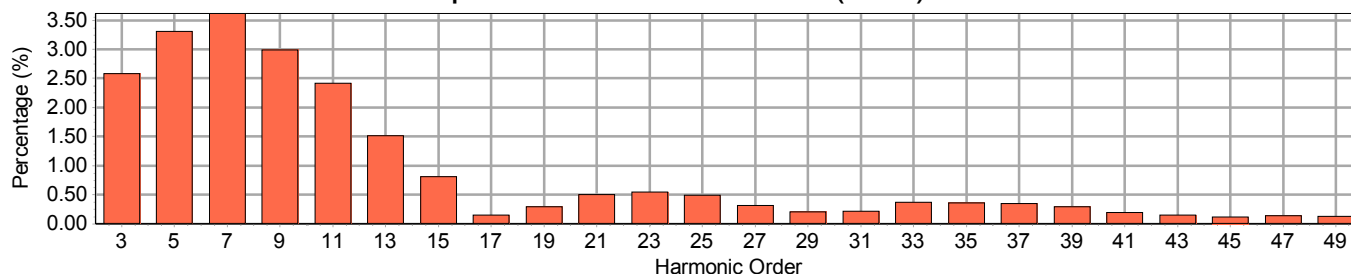
### Input Voltage Harmonics (Odd)



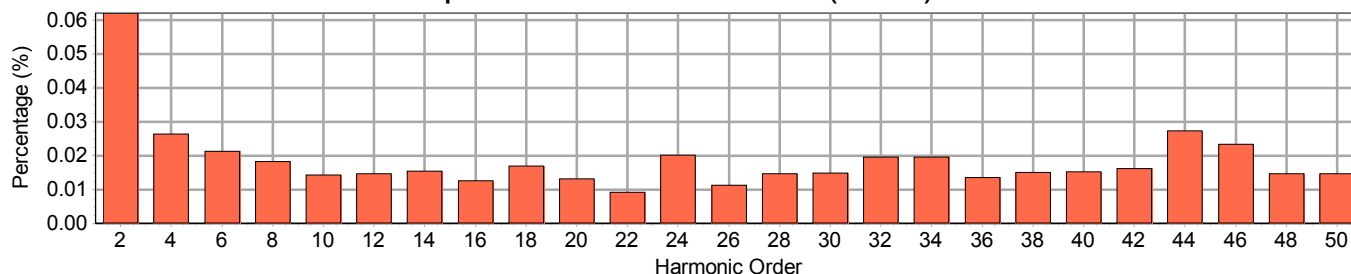
### Input Voltage Harmonics (Even)



### 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	0.060	0.062
3	180	0.189	2.584	4	240	0.010	0.026
5	300	0.019	3.306	6	360	0.011	0.021
7	420	0.073	3.621	8	480	0.008	0.018
9	540	0.062	2.992	10	600	0.007	0.014
11	660	0.163	2.421	12	720	0.008	0.015
13	780	0.081	1.518	14	840	0.008	0.016
15	900	0.035	0.806	16	960	0.006	0.013
17	1020	0.036	0.145	18	1080	0.008	0.017
19	1140	0.023	0.290	20	1200	0.009	0.013
21	1260	0.047	0.497	22	1320	0.007	0.009
23	1380	0.010	0.540	24	1440	0.009	0.020
25	1500	0.046	0.487	26	1560	0.006	0.011
27	1620	0.021	0.312	28	1680	0.007	0.015
29	1740	0.037	0.206	30	1800	0.007	0.015
31	1860	0.010	0.219	32	1920	0.008	0.020
33	1980	0.038	0.370	34	2040	0.009	0.020
35	2100	0.024	0.354	36	2160	0.007	0.014
37	2220	0.020	0.347	38	2280	0.006	0.015
39	2340	0.015	0.297	40	2400	0.008	0.015
41	2460	0.022	0.191	42	2520	0.010	0.016
43	2580	0.024	0.151	44	2640	0.010	0.027
45	2700	0.013	0.112	46	2760	0.010	0.023
47	2820	0.011	0.135	48	2880	0.009	0.015
49	2940	0.015	0.131	50	3000	0.009	0.015



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## Photometric Report: S1709085-R1

Prepared for: Arancia Lighting Inc · Test Date: 08 September 2017

Luminaire: Mini Jack · Lumcat: P90-04-2LC

### Coefficients of Utilization - Zonal Cavity Method

RCR	RC RW	0.9				0.8				0.7				0.5			0.1			0
		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		115	115	115	115	105	105	105	105	95	95	95	95	77	77	77	46	46	46	39
1		105	100	96	92	96	92	88	84	87	83	80	77	68	66	64	41	40	40	34
2		96	88	81	75	87	80	74	69	79	73	68	64	60	57	53	37	35	34	29
3		88	77	69	63	80	71	64	58	72	65	59	54	53	49	45	33	31	29	25
4		80	68	60	53	73	63	55	49	66	57	51	46	47	43	39	29	27	25	21
5		74	61	52	45	67	56	48	42	61	51	45	39	43	37	34	27	24	22	19
6		68	55	46	39	62	50	42	37	56	46	39	34	38	33	29	24	22	20	17
7		63	49	41	35	57	45	38	32	52	42	35	30	35	30	26	22	20	18	15
8		58	45	36	30	53	41	34	29	48	38	31	27	32	27	23	20	18	16	13
9		54	41	33	27	49	38	30	25	45	35	28	24	29	24	21	19	16	14	12
10		51	37	29	24	46	35	28	23	42	32	26	21	27	22	19	18	15	13	11

### Zonal Lumen Summary

Zone	Lumens	% Lamp	% Luminaire
0 - 10	122	1.69	1.69
10 - 20	342	4.71	4.71
20 - 30	487	6.72	6.72
30 - 40	537	7.41	7.41
40 - 50	501	6.92	6.92
50 - 60	402	5.55	5.55
60 - 70	272	3.76	3.76
70 - 80	141	1.95	1.95
80 - 90	37	0.51	0.51
90 - 120	815	11.25	11.25
90 - 130	1474	20.34	20.34
90 - 150	3063	42.27	42.27
90 - 180	4405	60.78	60.78
0 - 180	7247	100.00	100.00

### Average Luminance (Cd/m²)

Angle	0 Degree	45 Degree	90 Degree
45.0	9401	7702	6261
55.0	8510	6542	4868
65.0	7555	5290	3648
75.0	6698	3916	2547
85.0	6922	2119	1050

Luminaire Luminous Flux: 7247

Measured Input Power: 118.54 W

Total Luminaire Efficiency: N/A

Luminaire Luminous Efficacy: 61.1 lm/W

Luminaire Spacing Criterion (0 Degree): 1.2237

Luminaire Spacing Criterion (90 Degree): 1.0399

CIE Type: Direct/Indirect



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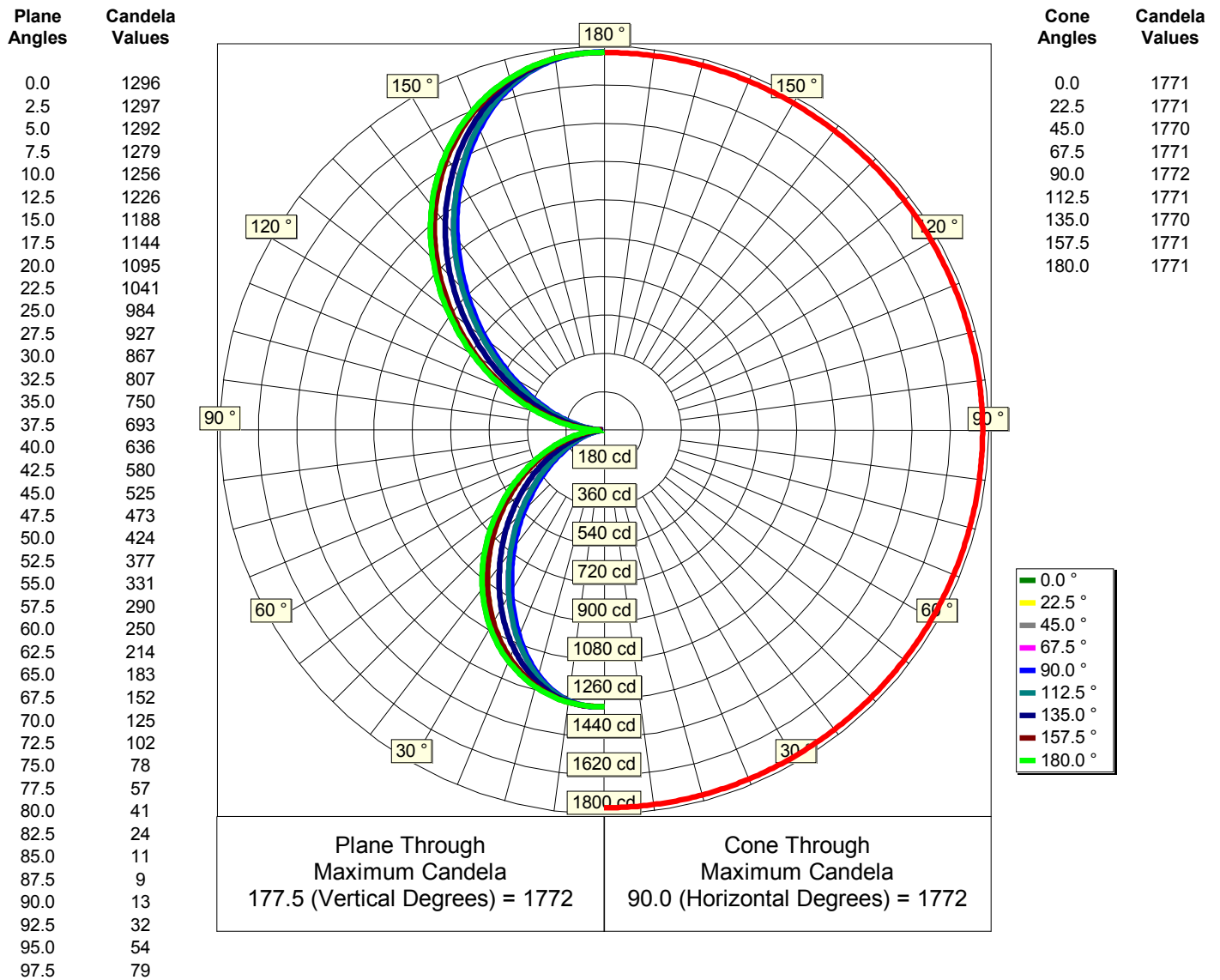
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## Photometric Report: S1709085-R1

Prepared for: Arancia Lighting Inc · Test Date: 08 September 2017

Luminaire: Mini Jack · Lumcat: P90-04-2LC

### Luminous Intensity - Polar Curve for each Plane(1)





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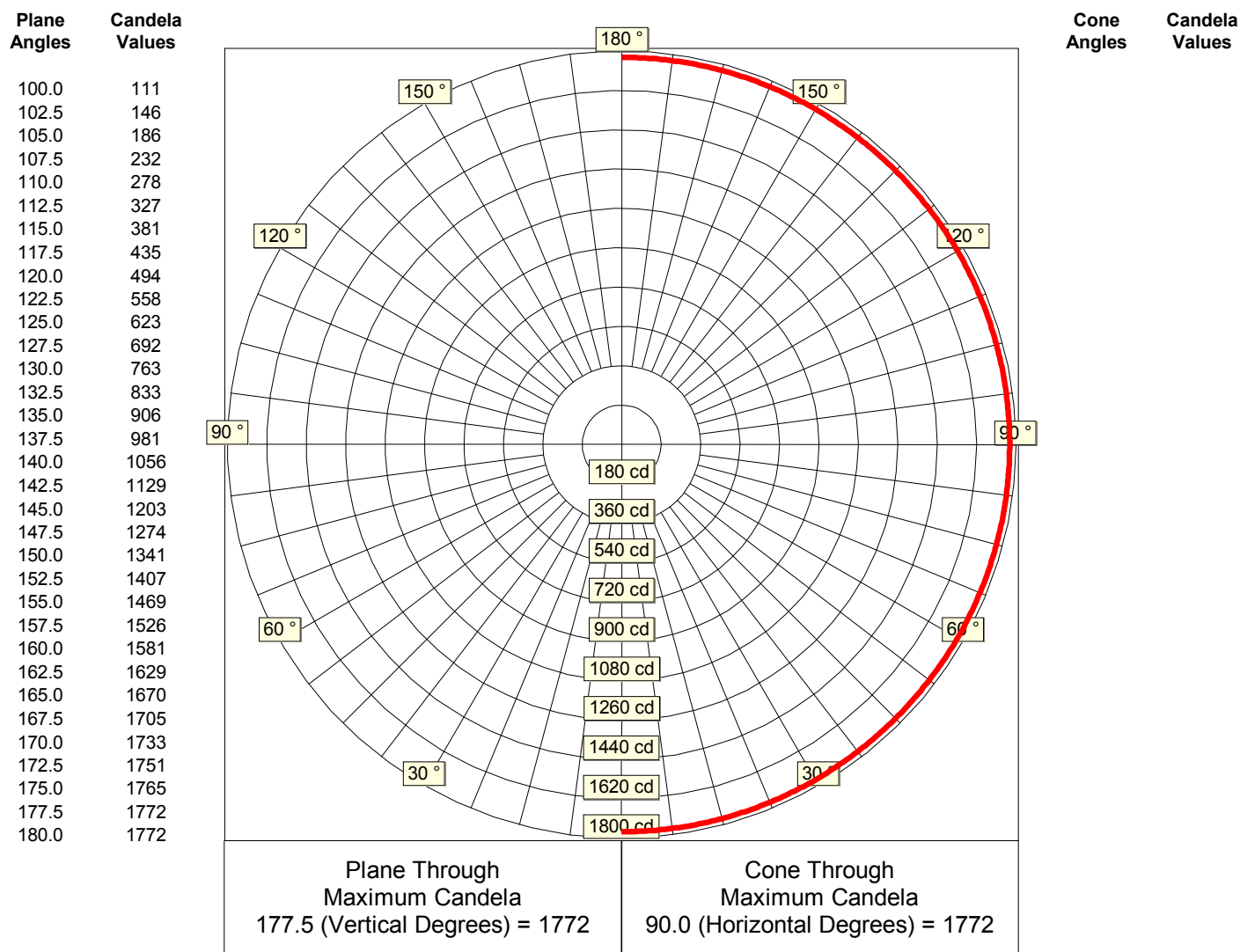
NVLAP LAB CODE: 200899-0

## Photometric Report: S1709085-R1

Prepared for: Arancia Lighting Inc · Test Date: 08 September 2017

Luminaire: Mini Jack · Lumcat: P90-04-2LC

### Luminous Intensity - Polar Curve for each Plane(2)







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## IES File Headers

IESNA:LM-63-2002  
[ISSUEDATE] 08 September 2017  
[TESTLAB] Spectra Lux Industries Inc.  
[TEST] S1709085-R1  
[MANUFAC] Arancia Lighting Inc  
[LUMCAT] P90-04-2LC  
[LUMINAIRE] Mini Jack  
[LAMP] Clusters of Osram Sylvania LEDs c/w HATCH Driver (4) XAC34-1050P-UNV-1 @ 120.00V  
[\_BURNING] Vertical Base Down and Up (7,247 Luminaire Lumens)  
[\_REFLECTOR] None  
[\_LENS] Frosted Acrylic  
[\_HOUSING] Aluminum Sheet Metal  
[\_DISTRIBUTION] Direct/Indirect Type

## 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	1296	1296	1296	1296	1296	1296	1296	1296
	2.5	1297	1296	1297	1297	1297	1297	1296	1297
	5.0	1293	1294	1294	1293	1292	1293	1294	1293
	7.5	1287	1287	1284	1280	1279	1280	1284	1287
	10.0	1277	1275	1269	1260	1256	1260	1269	1277
	12.5	1262	1260	1247	1232	1226	1232	1247	1262
	15.0	1246	1240	1219	1197	1188	1197	1219	1246
	17.5	1225	1215	1187	1156	1144	1156	1187	1225
	20.0	1199	1187	1149	1110	1095	1110	1149	1199
	22.5	1172	1155	1108	1060	1041	1060	1108	1172
	25.0	1141	1119	1063	1007	984	1007	1063	1141
	27.5	1105	1080	1014	951	927	951	1014	1105
	30.0	1068	1039	964	894	867	894	1039	1068
	32.5	1027	993	912	836	807	836	912	1027
	35.0	983	947	858	779	750	779	858	983
	37.5	937	899	804	723	693	723	804	937
	40.0	890	849	751	668	636	668	751	890
	42.5	840	798	699	613	580	613	699	840
A n g l e s	45.0	789	747	646	559	525	559	646	789
	47.5	737	696	596	506	473	506	596	737
	50.0	685	644	545	455	424	455	545	685
	52.5	632	593	495	407	377	407	495	632
	55.0	579	543	445	361	331	361	445	579
	57.5	527	493	398	316	290	316	398	527
	60.0	476	445	352	275	250	275	352	476
	62.5	427	399	308	236	214	236	308	427
	65.0	379	352	265	201	183	201	265	379
	67.5	333	308	225	170	152	170	225	333
	70.0	288	265	187	139	125	139	187	288
	72.5	246	222	152	112	102	112	152	246
	75.0	206	182	120	89	78	89	120	206
	77.5	169	144	91	65	57	65	91	169
	80.0	133	105	65	45	41	45	105	133
	82.5	101	74	42	28	24	28	74	101
	85.0	72	45	22	12	11	12	45	72
	87.5	43	18	8	8	9	8	18	43
	90.0	29	16	15	14	13	14	16	29



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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	69	51	33	32	32	33	51	69
	95.0	110	95	63	57	54	57	95	110
	97.5	157	141	103	85	79	85	141	157
	100.0	208	190	144	118	111	118	190	208
	102.5	259	244	190	159	146	159	244	259
	105.0	317	300	240	201	186	201	300	317
	107.5	377	358	290	247	232	247	358	377
	110.0	439	421	345	297	278	297	421	439
	112.5	505	484	406	348	327	348	484	505
	115.0	573	550	467	402	381	402	550	573
	117.5	640	619	531	462	435	462	619	640
	120.0	711	686	598	522	494	522	686	711
	122.5	783	755	664	587	558	587	755	783
	125.0	854	826	732	656	623	656	826	854
	127.5	926	896	803	724	692	724	896	926
	130.0	997	966	875	793	763	793	966	997
	132.5	1067	1036	946	865	833	865	1036	1067
	135.0	1135	1105	1018	938	906	938	1105	1135
A n g l e s	137.5	1202	1171	1088	1011	981	1011	1171	1202
	140.0	1265	1238	1155	1086	1056	1086	1238	1265
	142.5	1326	1301	1222	1158	1129	1158	1301	1326
	145.0	1384	1359	1288	1228	1203	1228	1359	1384
	147.5	1438	1417	1351	1297	1274	1297	1417	1438
	150.0	1489	1471	1412	1363	1341	1363	1471	1489
	152.5	1537	1520	1471	1425	1407	1425	1520	1537
	155.0	1580	1566	1523	1486	1469	1486	1566	1580
	157.5	1618	1607	1573	1541	1526	1541	1607	1618
	160.0	1652	1642	1618	1592	1581	1592	1642	1652
	162.5	1682	1676	1655	1638	1629	1638	1676	1682
	165.0	1708	1704	1689	1677	1670	1677	1704	1708
	167.5	1729	1725	1717	1708	1705	1708	1725	1729
	170.0	1746	1745	1738	1735	1733	1735	1745	1746
	172.5	1758	1759	1755	1754	1751	1754	1759	1758
	175.0	1767	1766	1767	1765	1765	1767	1766	1767
	177.5	1771	1771	1770	1771	1772	1770	1771	1771
	180.0	1772	1772	1772	1772	1772	1772	1772	1772