



# 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 LAB CODE: 200899-0

## Moving Mirror Goniophotometer Test Report

**Standard(s):** IESNA LM-35-02, IES LM-79-08, ANSI C82.77-2002

**Customer** Lumenpulse, 1751 Richardson, suite 1505, Montréal, Québec, Canada, H3K 1G6

General Information		SSL Details	Driver Details	
<b>Test Report</b>	S1512091-R1	<b>Description</b>	61W White 3500K SSL	<b>Type</b> Commercial
<b>Test Date</b>	9 December 2015	<b>Serial Number</b>	SRIS 2220	<b>Description</b> 61SSL-CY963
<b>Report Date</b>	17 December 2015	<b>Photometric Method</b>	Absolute	<b>Manufacturer</b> Mean Well
<b>Ambient</b>	25.4°C	<b>Lamp Lumens</b>	-1	<b>Catalog No.</b> LPF-60-24
<b>Humidity</b>	21.6 %	<b>Test Position</b>	Axial	<b>Voltage Tap</b> 120.00 V
<b>Lamp Type</b>	SSL	<b>Comments</b>	Clusters of 48 Cree XPE2 LED's	<b>Power Factor</b> 0.9900

### Floodlight Data

General Information		Optics	Aperture (feet)	
<b>Manufacturer</b>	Lumenpulse	<b>Reflector</b>	48 Collimators	<b>X</b> 4.000
<b>Name</b>	LUMENFACADE	<b>Housing</b>	Extruded Aluminum	<b>Y</b> 0.1667
<b>Catalog No.</b>	LOGI-HO-120/277-48-35K -10x60-SI-NO	<b>Lens</b>	Polycarbonate	<b>Z</b> 0.0000

Lamp Stabilization Time: 1 hour 15 minutes

**Tested By:** Marc Viwonou Sena

**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	Elgar	CW801	30527	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	27E116584	2014/10/30	2016/10/30
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	2015/10/05	2016/10/05

## 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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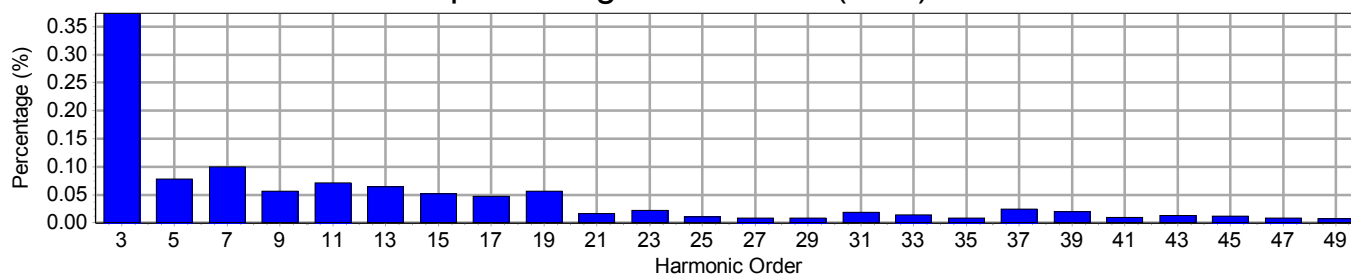
NVLAP LAB CODE: 200899-0

## Electrical Measurements

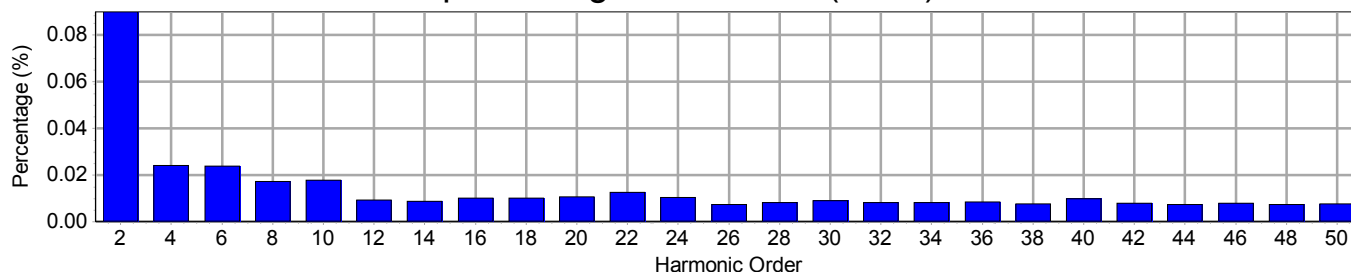
### Input

Frequency	60 Hz	Active Power	61.42 W	THDV [ANSI]	0.44 %
Voltage	120.1 V(rms)	Apparent Power	61.74 VA	THDA [ANSI]	5.50 %
Current	0.5142 A(rms)	Power Factor	0.995	Max. Harmonic At	5th order

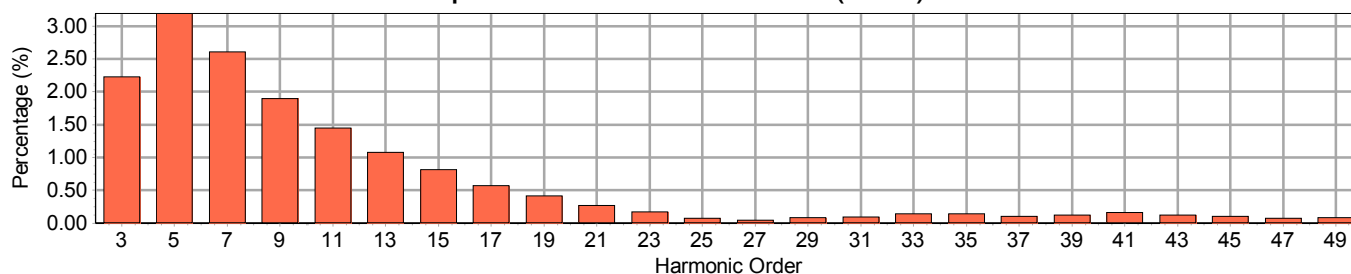
### Input Voltage Harmonics (Odd)



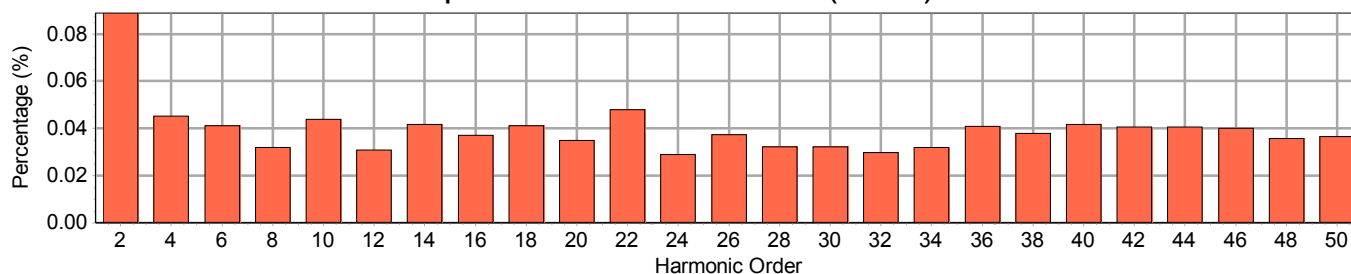
### Input Voltage Harmonics (Even)



### 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	0.090	0.089
3	180	0.374	2.230	4	240	0.024	0.045
5	300	0.078	3.198	6	360	0.024	0.041
7	420	0.100	2.613	8	480	0.017	0.032
9	540	0.056	1.899	10	600	0.018	0.044
11	660	0.071	1.446	12	720	0.009	0.031
13	780	0.065	1.074	14	840	0.009	0.042
15	900	0.052	0.814	16	960	0.010	0.037
17	1020	0.047	0.573	18	1080	0.010	0.041
19	1140	0.057	0.417	20	1200	0.011	0.035
21	1260	0.017	0.267	22	1320	0.012	0.048
23	1380	0.022	0.174	24	1440	0.010	0.029
25	1500	0.011	0.076	26	1560	0.007	0.037
27	1620	0.008	0.045	28	1680	0.008	0.032
29	1740	0.008	0.082	30	1800	0.009	0.032
31	1860	0.018	0.097	32	1920	0.008	0.030
33	1980	0.014	0.138	34	2040	0.008	0.032
35	2100	0.009	0.141	36	2160	0.008	0.041
37	2220	0.025	0.107	38	2280	0.008	0.038
39	2340	0.020	0.118	40	2400	0.010	0.042
41	2460	0.010	0.160	42	2520	0.008	0.041
43	2580	0.013	0.122	44	2640	0.007	0.041
45	2700	0.012	0.104	46	2760	0.008	0.040
47	2820	0.008	0.076	48	2880	0.007	0.036
49	2940	0.007	0.081	50	3000	0.008	0.037



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**NVLAP**  
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## Photometric Report: S1512091-R1

Prepared for: Lumenpulse · Test Date: 09 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-HO-120/277-48-35K-10x60-SI-NO

### Photometric Floodlight Characteristics

Nominal SSL Power	61.00 W	
Measured Input Voltage	120.06 V	<b>Notes</b>
Test SSL Current	0.300 A	1) Floodlight tested in accordance to IES LM-35-1989 at a distance great enough so that the inverse-square law applies.
Floodlight Luminous Flux	3184	
Measured Input Power	61.42 W	
Floodlight Luminous Efficacy	51.8 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	13086	
Maximum Candela Location	0.0 H, 0.0 V	3) Results are valid for the tested material only.
Horizontal Beam Angle (50%)	64.0 °	
Vertical Beam Angle (50%)	9.5 °	4) All data published in this report are based on absolute photometry.
Horizontal Field Angle (10%)	92.0 °	
Vertical Field Angle (10%)	23.5 °	5) The original electronic file or paper report cannot be edited in whole or in part without written consent of Spectralux Industries Inc.
IES/NEMA Type Classification	5Hx2V	
Beam Lumens (50%)	1484	
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	2579	
Field Efficiency (10%)	N/A	
Spill Lumens	606	
Total Floodlight Lumens	3184	
Total Floodlight Efficiency	N/A	



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## Photometric Report: S1512091-R1

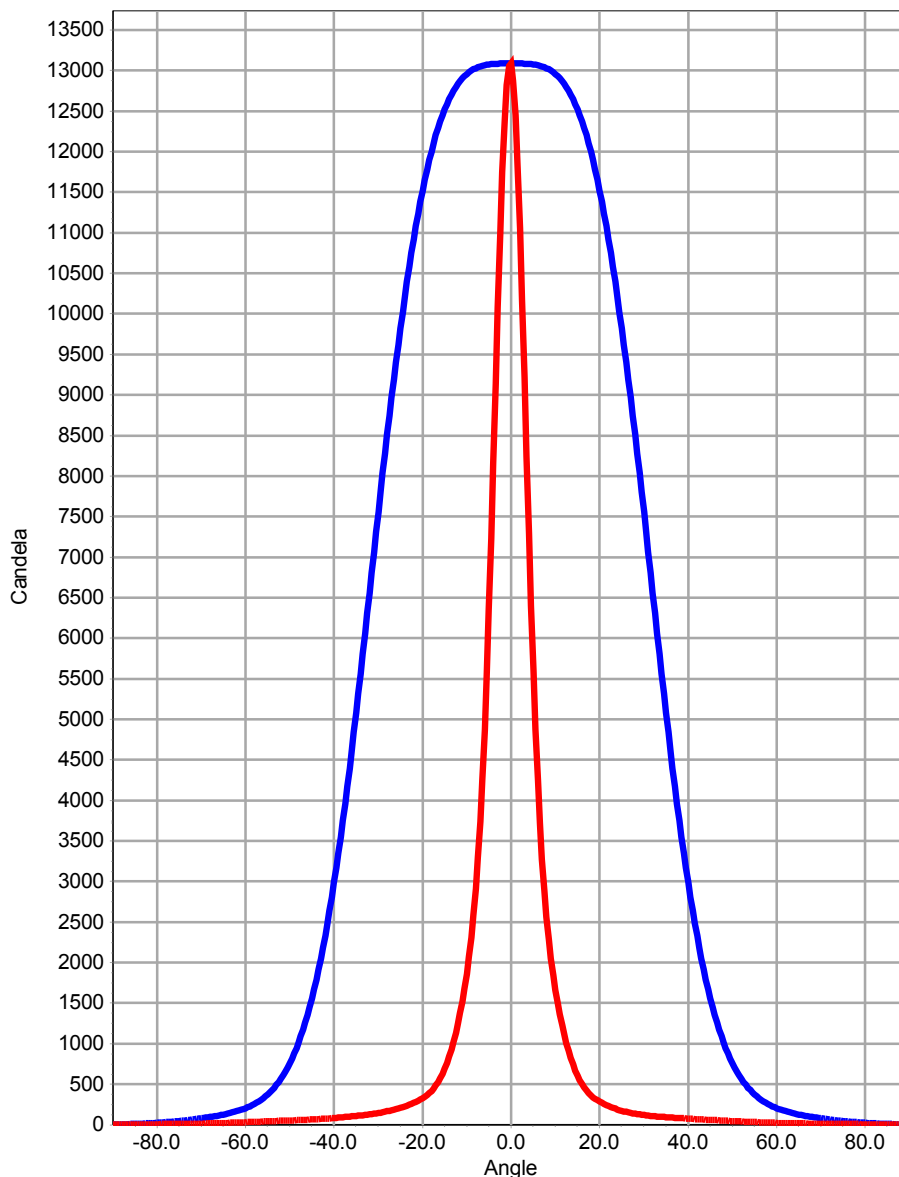
Prepared for: Lumenpulse · Test Date: 09 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-HO-120/277-48-35K-10x60-SI-NO

### Maximum Candela Trace (Max. Location: 0.0 H, 0.0 V)

Horizontal  
Angles

Horizontal Angles	Candela
-90.0	3
-85.0	10
-80.0	25
-75.0	47
-70.0	79
-65.0	126
-60.0	205
-55.0	373
-50.0	757
-45.0	1556
-40.0	2984
-35.0	5078
-30.0	7556
-25.0	9819
-20.0	11523
-15.0	12522
-10.0	12958
-5.0	13076
0.0	13086
5.0	13076
10.0	12958
15.0	12522
20.0	11523
25.0	9819
30.0	7556
35.0	5078
40.0	2984
45.0	1556
50.0	757
55.0	373
60.0	205
65.0	126
70.0	79
75.0	47
80.0	25
85.0	10
90.0	3



Vertical  
Angles

Vertical Angles	Candela
-90.0	2
-85.0	5
-80.0	7
-75.0	11
-70.0	15
-65.0	21
-60.0	31
-55.0	42
-50.0	53
-45.0	65
-40.0	83
-35.0	108
-30.0	145
-25.0	208
-20.0	329
-15.0	689
-10.0	1860
-5.0	6358
0.0	13086
5.0	5596
10.0	1659
15.0	606
20.0	284
25.0	173
30.0	119
35.0	94
40.0	76
45.0	60
50.0	45
55.0	33
60.0	24
65.0	17
70.0	13
75.0	11
80.0	7
85.0	4
90.0	2

— Horizontal — Vertical



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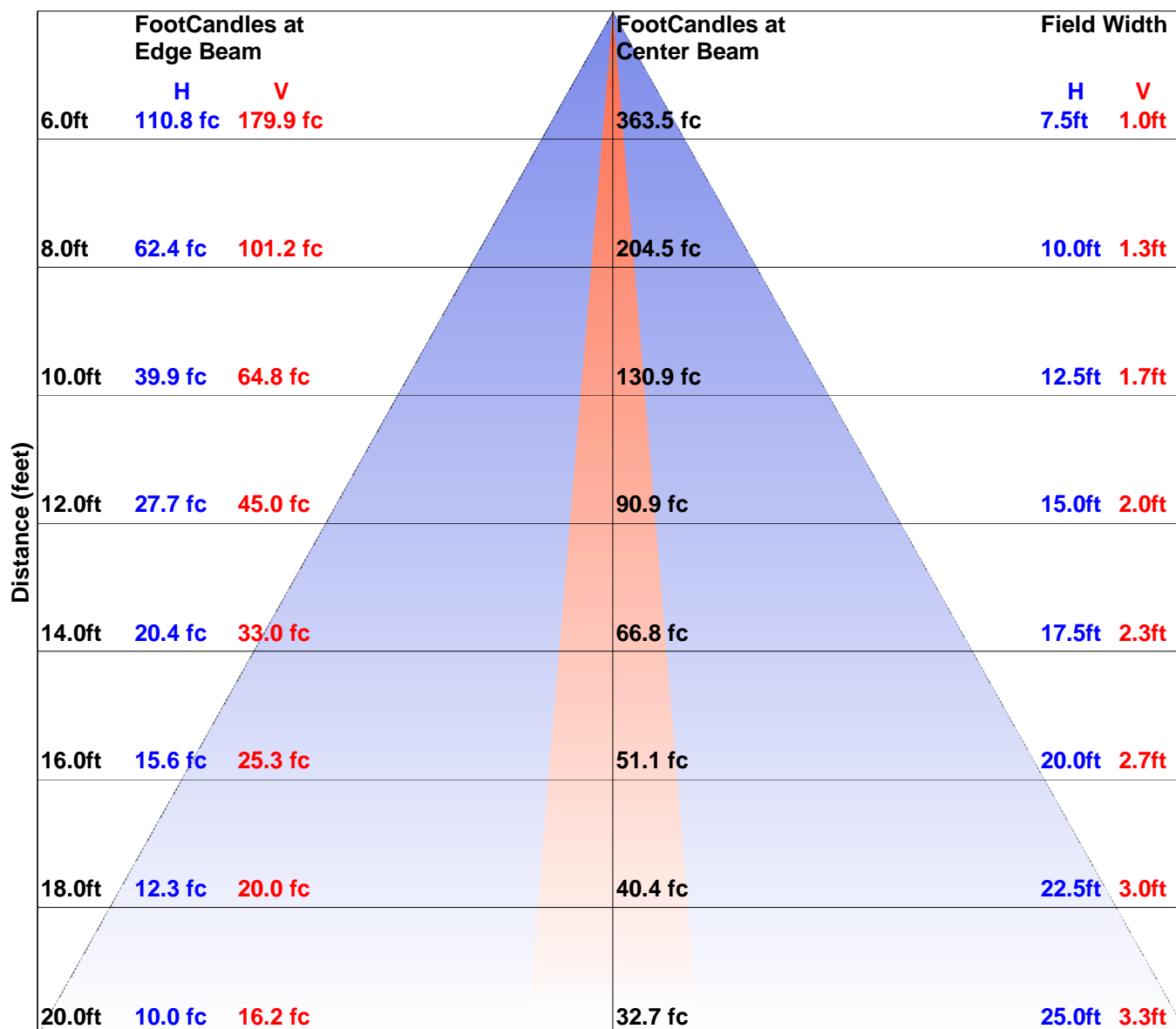
NVLAP LAB CODE: 200899-0

## Photometric Report: S1512091-R1

Prepared for: Lumenpulse · Test Date: 09 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-HO-120/277-48-35K-10x60-SI-NO

### Downlight Beam



— Horizontal (64.0 °) — Vertical (9.5 °)





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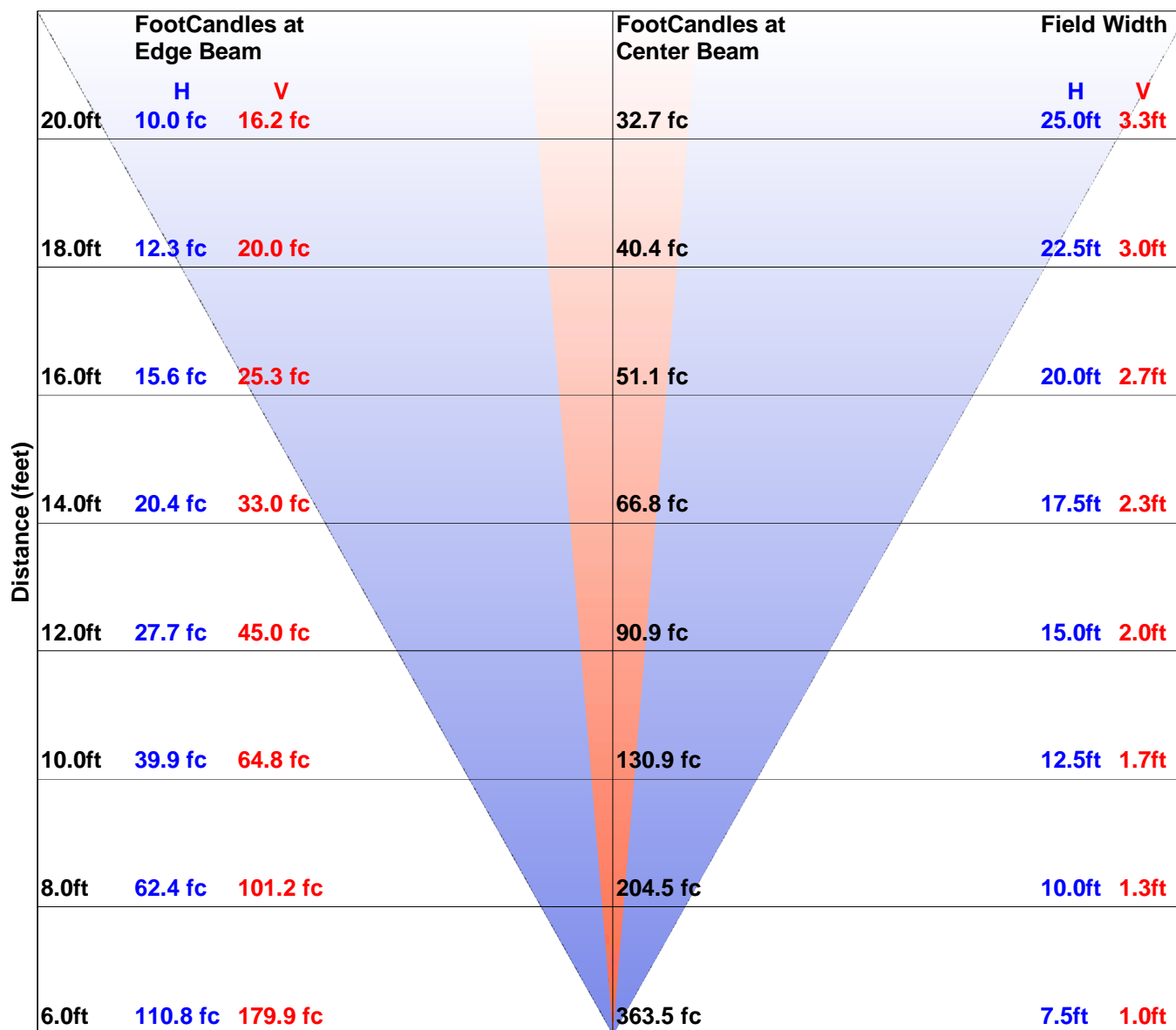
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## Photometric Report: S1512091-R1

Prepared for: Lumenpulse · Test Date: 09 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-HO-120/277-48-35K-10x60-SI-NO

### Uplight Beam



— Horizontal (64.0 °) — Vertical (9.5 °)



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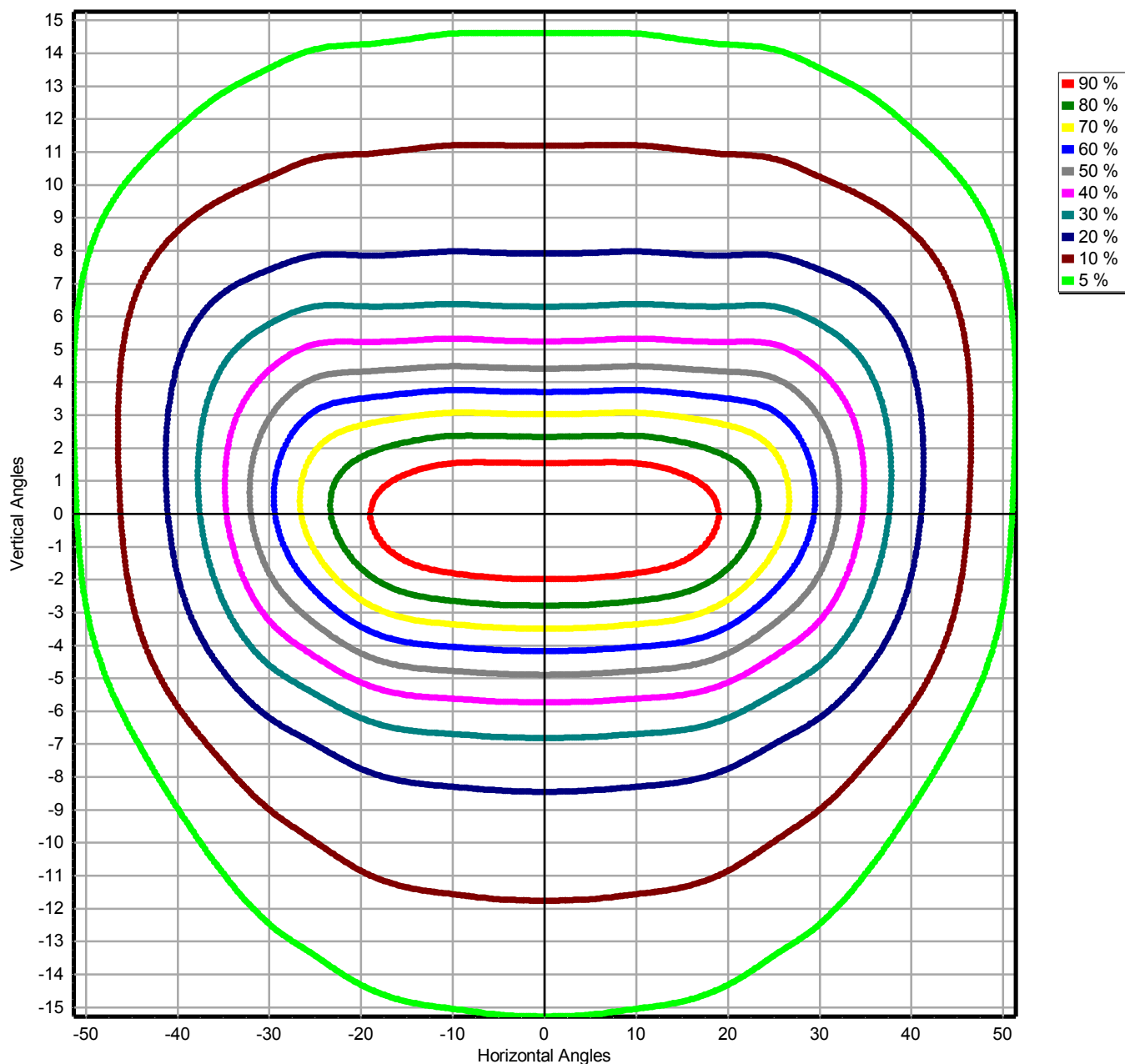
NVLAP LAB CODE: 200899-0

## Photometric Report: S1512091-R1

Prepared for: Lumenpulse · Test Date: 09 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-HO-120/277-48-35K-10x60-SI-NO

### ISO Candela Diagram





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## IES File Headers

IESNA:LM-63-2002  
[ISSUEDATE] 09 December 2015  
[TESTLAB] Spectra Lux Industries Inc.  
[TEST] S1512091-R1  
[MANUFAC] Lumenpulse  
[LUMCAT] LOGI-HO-120/277-48-35K-10x60-SI-NO  
[LUMINAIRE] LUMENFACADE  
[LAMP] (Clusters of 48 Cree XPE2 LED's) 61W SSL c/w Driver LPF-60-24 @ 120.00V  
[\_BURNING] Axial (3,184 Luminaire Lumens)  
[\_REFLECTOR] 48 Collimators  
[\_LENS] Polycarbonate  
[\_HOUSING] Extruded Aluminum  
[DISTRIBUTION] NEMA 5Hx2V (Max. CP at 0.0H,0.0V)  
[MORE] (Based on IES LM-35-1989)

## Candela Table

### Horizontal Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
V e r t i c a l	-90.0	2	3	4	4	4	5	4	4
	-85.0	5	5	4	6	6	5	5	6
	-75.0	11	11	12	12	13	13	13	11
	-65.0	21	23	22	22	21	20	19	19
	-55.0	42	41	41	40	41	38	37	34
	-45.0	65	64	63	63	61	58	58	52
	-35.0	108	107	105	102	99	94	90	76
	-25.0	208	206	202	197	186	175	160	127
	-20.0	329	326	319	310	294	267	242	175
	-15.0	689	682	660	634	575	492	418	265
	-12.5	1131	1118	1087	1041	942	788	651	361
	-12.0	1249	1238	1200	1153	1042	872	715	390
	-11.5	1377	1364	1324	1272	1151	962	789	422
	-11.0	1517	1502	1461	1403	1271	1062	870	457
	-10.5	1677	1662	1615	1553	1404	1173	957	498
	-10.0	1860	1841	1791	1724	1558	1300	1058	541
	-9.5	2070	2050	1994	1920	1737	1443	1174	591
	-9.0	2307	2287	2227	2148	1940	1610	1307	649
A n g l e s	-8.5	2585	2562	2494	2407	2178	1803	1462	716
	-8.0	2908	2882	2808	2714	2458	2029	1646	794
	-7.5	3293	3264	3182	3082	2789	2300	1861	886
	-7.0	3740	3709	3619	3509	3180	2619	2119	995
	-6.5	4261	4228	4129	4005	3632	2991	2421	1122
	-6.0	4865	4831	4715	4577	4149	3414	2758	1265
	-5.5	5572	5531	5402	5242	4748	3901	3143	1423
	-5.0	6358	6312	6166	5977	5410	4440	3564	1590
	-4.5	7229	7179	7014	6796	6143	5035	4019	1768
	-4.0	8168	8114	7933	7674	6927	5671	4499	1948
	-3.5	9137	9081	8885	8585	7745	6336	4991	2124
	-3.0	10086	10030	9827	9482	8555	7005	5476	2292
	-2.5	10975	10921	10713	10333	9333	7661	5946	2446
	-2.0	11748	11700	11500	11089	10039	8271	6387	2585
	-1.5	12377	12336	12149	11719	10640	8820	6783	2711
	-1.0	12820	12791	12621	12179	11104	9275	7120	2819
	-0.5	13060	13042	12896	12454	11405	9614	7384	2909



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## Horizontal Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	
V e r t i c a l	0.0	13086	13076	12958	12522	11523	9819	7556	5078	2984
	0.5	12878	12882	12792	12366	11440	9864	7614	5152	3032
	1.0	12446	12461	12404	11999	11164	9744	7567	5165	3059
	1.5	11834	11860	11829	11456	10722	9483	7416	5127	3067
	2.0	11055	11092	11089	10754	10135	9091	7175	5032	3050
	2.5	10177	10219	10242	9950	9446	8596	6858	4889	3010
	3.0	9220	9265	9308	9058	8668	8015	6471	4698	2946
	3.5	8240	8292	8350	8148	7862	7380	6037	4471	2860
	4.0	7287	7338	7409	7246	7050	6719	5581	4214	2754
	4.5	6400	6449	6524	6405	6279	6067	5115	3943	2634
	5.0	5596	5644	5717	5624	5548	5434	4640	3652	2495
	5.5	4877	4919	4987	4914	4873	4821	4173	3349	2341
	6.0	4253	4288	4350	4289	4264	4254	3723	3046	2178
	6.5	3718	3749	3800	3748	3731	3738	3302	2747	2007
	7.0	3268	3293	3334	3284	3266	3279	2918	2460	1834
	7.5	2884	2905	2936	2889	2867	2873	2566	2188	1662
	8.0	2563	2579	2603	2555	2528	2524	2257	1940	1496
A n g l e s	8.5	2284	2297	2315	2268	2235	2220	1987	1713	1337
	9.0	2050	2059	2071	2024	1988	1964	1754	1515	1193
	9.5	1842	1850	1857	1813	1773	1743	1551	1340	1061
	10.0	1659	1665	1669	1627	1589	1553	1383	1192	946
	10.5	1499	1503	1505	1467	1429	1394	1236	1064	846
	11.0	1360	1364	1364	1327	1291	1255	1111	953	759
	11.5	1231	1235	1233	1198	1163	1130	999	857	682
	12.0	1115	1119	1115	1084	1049	1018	900	772	616
	12.5	1009	1011	1009	977	946	917	812	697	559
	15.0	606	607	604	583	564	548	491	431	357
	20.0	284	284	283	276	269	260	242	220	191
	25.0	173	174	173	169	166	162	154	144	131
35.0	94	95	94	93	92	91	88	84	79	
45.0	60	59	58	58	55	54	51	48	47	
55.0	33	35	34	33	32	31	30	30	28	
65.0	17	18	19	17	17	18	16	15	14	
75.0	11	11	11	10	10	10	9	8	9	
85.0	4	3	3	4	3	3	4	6	5	
90.0	2	2	4	3	3	3	4	3	3	



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## Horizontal Angles

	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
V e r t i c a l  A n g l e s	-90.0	5	5	4	6	7	6	6	6
	-85.0	6	6	5	7	7	6	6	7
	-75.0	12	11	10	11	9	7	7	6
	-65.0	18	17	15	14	12	13	10	7
	-55.0	31	27	23	20	18	14	11	7
	-45.0	48	43	38	32	26	19	15	7
	-35.0	70	63	54	47	39	29	20	8
	-25.0	108	92	77	64	51	38	26	10
	-20.0	144	117	94	75	59	45	31	9
	-15.0	203	154	118	90	68	50	34	9
	-12.5	258	187	136	100	75	55	36	10
	-12.0	274	194	139	103	76	54	36	10
	-11.5	291	204	145	105	76	54	36	10
	-11.0	312	214	150	108	80	56	37	9
	-10.5	334	223	155	111	81	57	37	10
	-10.0	359	238	162	114	81	57	37	11
	-9.5	386	252	168	118	83	59	39	10
	-9.0	419	267	175	122	86	60	39	11
	-8.5	455	287	184	125	87	61	39	12
	-8.0	499	306	194	129	91	63	41	9
	-7.5	547	330	204	135	93	64	42	10
	-7.0	604	359	217	141	94	64	41	11
	-6.5	672	388	229	145	98	67	43	10
	-6.0	747	422	242	151	99	67	42	10
	-5.5	830	460	258	157	102	69	43	12
	-5.0	916	497	273	163	106	71	45	11
	-4.5	1004	534	288	169	108	70	43	11
	-4.0	1093	573	303	175	110	73	44	11
	-3.5	1179	609	316	180	113	74	45	11
	-3.0	1257	641	328	185	116	73	45	10
	-2.5	1328	670	339	190	116	76	45	11
	-2.0	1389	694	349	194	119	76	47	10
	-1.5	1443	714	356	198	122	77	46	11
	-1.0	1488	731	363	200	122	77	46	10
	-0.5	1526	745	368	202	124	79	48	10
	0.0	1556	757	373	205	126	79	47	10
	0.5	1578	765	378	206	126	78	47	11
	1.0	1597	774	381	208	126	80	49	10
	1.5	1609	782	384	209	128	80	47	10
	2.0	1614	787	388	211	128	80	48	11
	2.5	1615	792	390	213	128	81	49	10
	3.0	1605	794	391	214	129	81	48	10
	3.5	1587	795	394	213	128	81	48	11
	4.0	1561	793	394	214	130	82	49	10
	4.5	1523	788	395	215	129	81	47	10
	5.0	1476	777	395	215	129	79	47	10
	5.5	1420	762	392	215	129	82	48	10
	6.0	1353	744	388	215	129	81	48	10
	6.5	1279	720	384	212	128	80	47	10
	7.0	1200	691	376	211	128	81	47	11
	7.5	1112	660	368	209	127	79	46	11
	8.0	1024	625	356	205	125	78	46	9
	8.5	937	587	343	202	125	79	46	10
	9.0	851	548	330	197	123	78	45	9



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Tel.: (514) 332-0082 Fax: (514) 332-3590 [www.spectralux.ca](http://www.spectralux.ca)

ISO/IEC 17025



NVLAP LAB CODE: 200899-0

## Horizontal Angles

	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	
V e r t i c a l	9.5	769	509	315	190	120	76	46	25	10
	10.0	696	469	297	186	118	77	45	25	10
	10.5	628	432	281	178	116	75	43	24	10
	11.0	567	396	265	171	112	73	44	24	9
	11.5	513	364	247	164	108	72	44	23	10
	12.0	467	335	232	156	105	71	42	22	10
	12.5	426	309	218	149	102	68	42	23	9
	15.0	282	216	161	119	85	60	38	21	9
	20.0	163	134	108	85	65	46	31	19	9
	25.0	117	100	83	69	54	40	27	16	8
	35.0	73	64	55	46	37	27	21	14	7
	45.0	43	40	34	29	24	20	15	11	7
	55.0	24	23	19	18	17	14	10	8	6
	65.0	14	13	14	11	10	10	9	8	6
	75.0	9	10	8	10	7	7	6	6	6
	85.0	5	5	4	5	5	5	5	5	4
	90.0	4	4	4	5	5	5	4	5	5

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## Horizontal Angles

	90.0
V e r t i c a l	-90.0 4
	-85.0 5
	-75.0 5
	-65.0 6
	-55.0 5
	-45.0 5
	-35.0 5
	-25.0 5
	-20.0 5
	-15.0 4
	-12.5 4
	-12.0 3
	-11.5 4
	-11.0 4
	-10.5 3
	-10.0 4
	-9.5 4
	-9.0 4
	-8.5 5
	-8.0 5
A n g l e s	-7.5 3
	-7.0 5
	-6.5 4
	-6.0 4
	-5.5 4
	-5.0 4
	-4.5 4
	-4.0 5
	-3.5 4
	-3.0 3
	-2.5 4
	-2.0 4
	-1.5 3
	-1.0 4
	-0.5 3
	0.0 3
	0.5 5
	1.0 5
	1.5 4
	2.0 4
	2.5 4
	3.0 4
	3.5 5
	4.0 3
	4.5 3
	5.0 3
	5.5 4
	6.0 3
	6.5 5
	7.0 4
	7.5 2
	8.0 4
	8.5 3
	9.0 4



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Horizontal Angles

	90.0
	9.5
	10.0
	10.5
	11.0
	11.5
	12.0
	12.5
	15.0
	20.0
V e r t i c a l	25.0
	35.0
	45.0
	55.0
	65.0
	75.0
	85.0
	90.0
A n g l e s	