



# 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-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>	S1512105-R1	<b>Description</b>	20W White 4000K SSL	<b>Type</b> Commercial
<b>Test Date</b>	10 December 2015	<b>Serial Number</b>	SRIS 2228	<b>Description</b> 20SSL-CY938
<b>Report Date</b>	21 December 2015	<b>Photometric Method</b>	Absolute	<b>Manufacturer</b> Magtech Industries
<b>Ambient</b>	25.4°C	<b>Lamp Lumens</b>	-1	<b>Catalog No.</b> 20-3871
<b>Humidity</b>	27.5 %	<b>Test Position</b>	Axial	<b>Voltage Tap</b> 120.00 V
<b>Lamp Type</b>	SSL	<b>Comments</b>	Clusters of 24 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> 4.0000
<b>Name</b>	LUMENFACADE	<b>Housing</b>	Extruded Aluminum	<b>Y</b> 0.1667
<b>Catalog No.</b>	LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO	<b>Lens</b>	Polycarbonate	<b>Z</b> 0.0000

Lamp Stabilization Time: 45 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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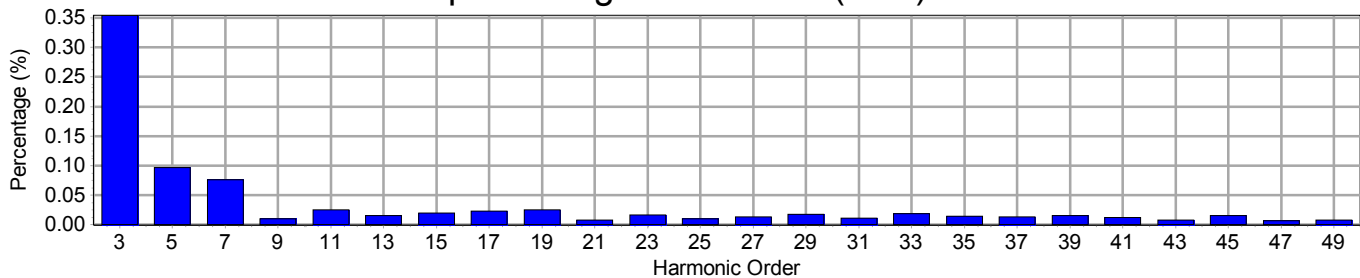
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## Electrical Measurements

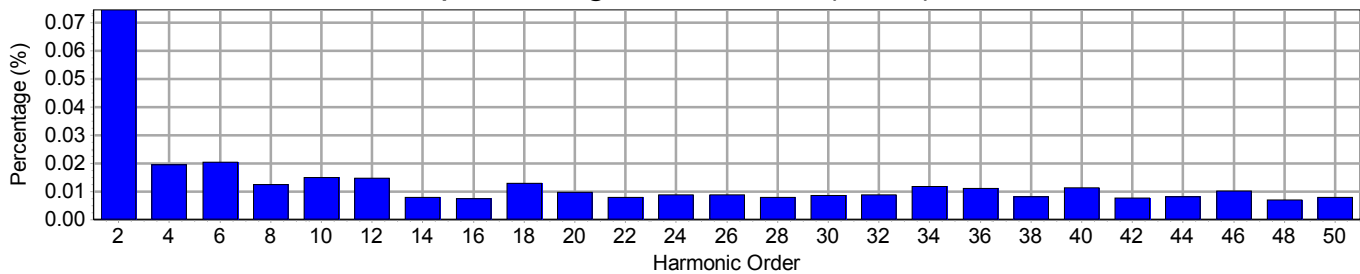
### Input

Frequency	60 Hz	Active Power	18.29 W	THDV [ANSI]	0.39 %
Voltage	120.6 V(rms)	Apparent Power	18.41 VA	THDA [ANSI]	8.06 %
Current	0.1526 A(rms)	Power Factor	0.994	Max. Harmonic At	3rd order

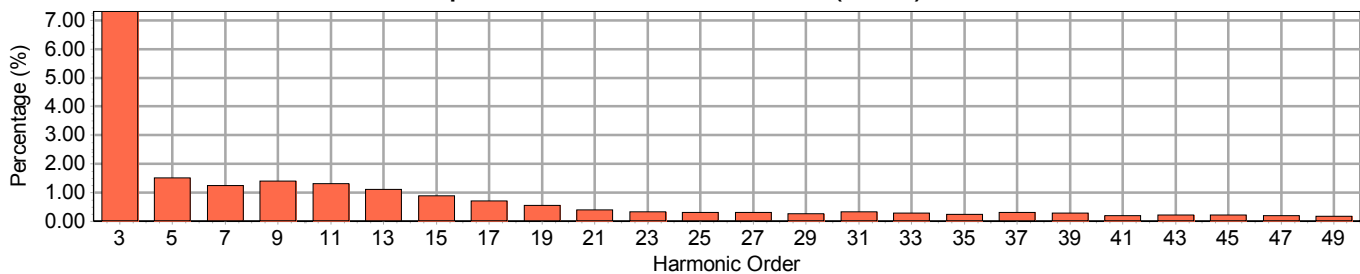
### Input Voltage Harmonics (Odd)



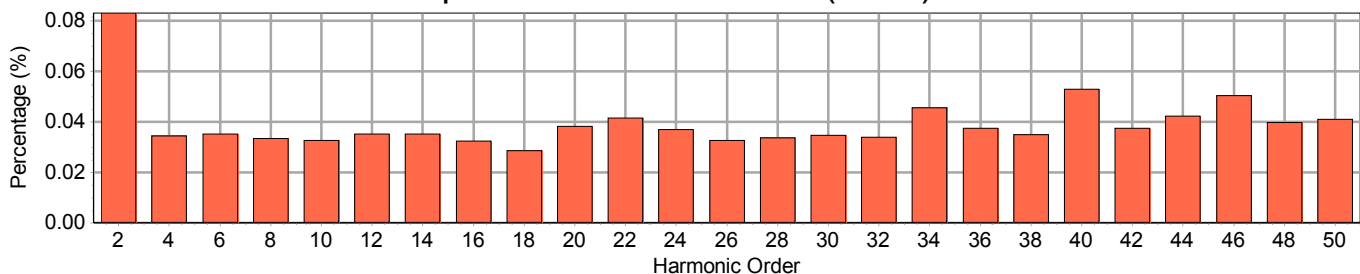
### Input Voltage Harmonics (Even)



### 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	0.075	0.083
3	180	0.355	7.323	4	240	0.019	0.034
5	300	0.097	1.512	6	360	0.020	0.035
7	420	0.076	1.250	8	480	0.013	0.033
9	540	0.010	1.387	10	600	0.015	0.032
11	660	0.026	1.309	12	720	0.015	0.035
13	780	0.016	1.114	14	840	0.008	0.035
15	900	0.020	0.890	16	960	0.007	0.032
17	1020	0.023	0.706	18	1080	0.013	0.028
19	1140	0.025	0.551	20	1200	0.010	0.038
21	1260	0.009	0.392	22	1320	0.008	0.041
23	1380	0.017	0.321	24	1440	0.009	0.037
25	1500	0.010	0.294	26	1560	0.009	0.033
27	1620	0.014	0.303	28	1680	0.008	0.034
29	1740	0.018	0.257	30	1800	0.008	0.034
31	1860	0.011	0.329	32	1920	0.009	0.034
33	1980	0.019	0.288	34	2040	0.012	0.045
35	2100	0.015	0.230	36	2160	0.011	0.037
37	2220	0.014	0.296	38	2280	0.008	0.035
39	2340	0.016	0.269	40	2400	0.011	0.053
41	2460	0.013	0.197	42	2520	0.008	0.037
43	2580	0.009	0.222	44	2640	0.008	0.042
45	2700	0.016	0.222	46	2760	0.010	0.050
47	2820	0.007	0.199	48	2880	0.007	0.040
49	2940	0.008	0.168	50	3000	0.008	0.041



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## Photometric Report: S1512105-R1

Prepared for: Lumenpulse · Test Date: 10 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO

### Photometric Floodlight Characteristics

Nominal SSL Power	20.00 W	
Measured Input Voltage	120.61 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	1055	
Measured Input Power	18.29 W	
Floodlight Luminous Efficacy	57.7 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	3873	
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%)	11.0 °	4) All data published in this report are based on absolute photometry.
Horizontal Field Angle (10%)	94.0 °	
Vertical Field Angle (10%)	25.0 °	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%)	502	
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	851	
Field Efficiency (10%)	N/A	
Spill Lumens	204	
Total Floodlight Lumens	1055	
Total Floodlight Efficiency	N/A	



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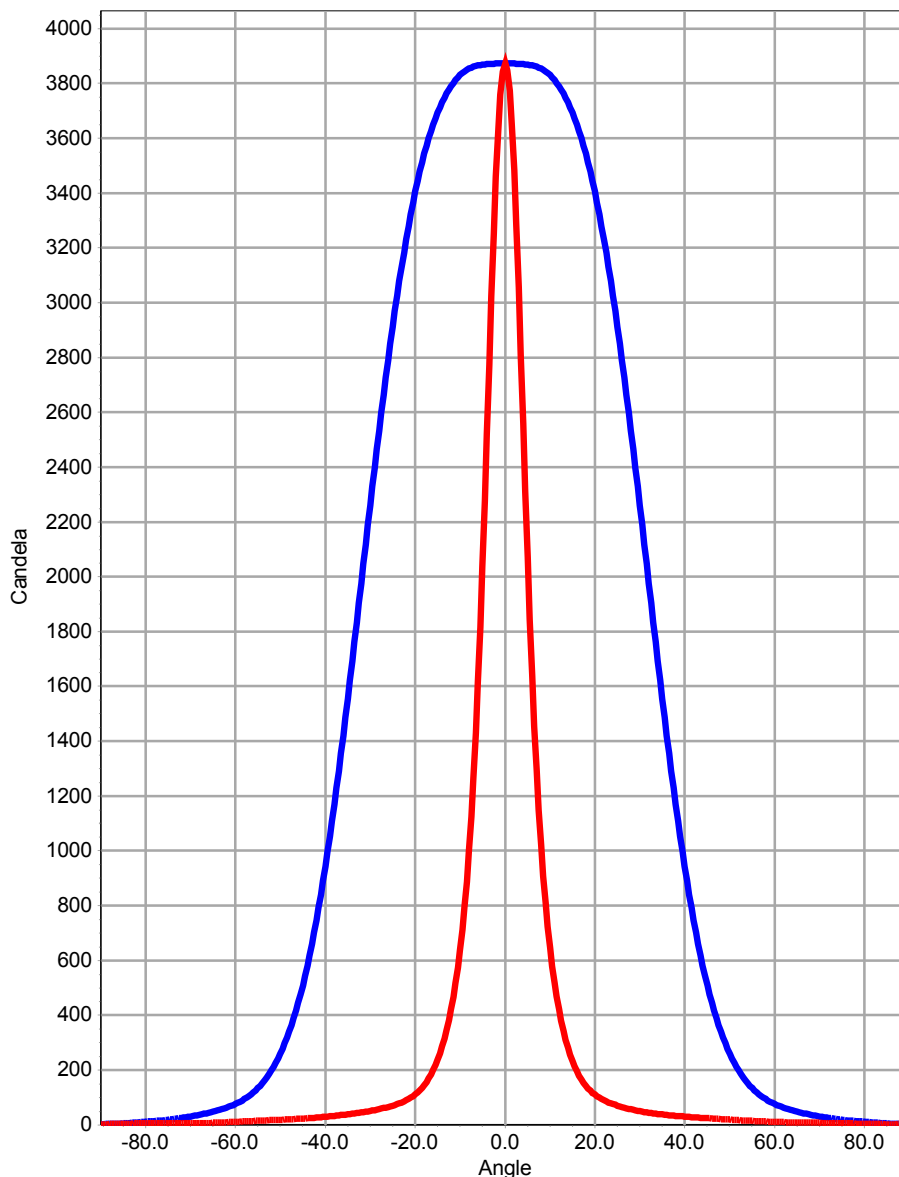
## Photometric Report: S1512105-R1

Prepared for: Lumenpulse · Test Date: 10 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO

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

Horizontal Angles	Candela
-90.0	2
-85.0	5
-80.0	11
-75.0	18
-70.0	30
-65.0	48
-60.0	76
-55.0	133
-50.0	259
-45.0	509
-40.0	942
-35.0	1554
-30.0	2259
-25.0	2911
-20.0	3405
-15.0	3693
-10.0	3831
-5.0	3869
0.0	3873
5.0	3869
10.0	3831
15.0	3693
20.0	3405
25.0	2911
30.0	2259
35.0	1554
40.0	942
45.0	509
50.0	259
55.0	133
60.0	76
65.0	48
70.0	30
75.0	18
80.0	11
85.0	5
90.0	2



Vertical Angles	Candela
-90.0	1
-85.0	4
-80.0	5
-75.0	5
-70.0	6
-65.0	7
-60.0	11
-55.0	15
-50.0	18
-45.0	23
-40.0	29
-35.0	38
-30.0	50
-25.0	70
-20.0	110
-15.0	238
-10.0	637
-5.0	2039
0.0	3873
5.0	2070
10.0	646
15.0	234
20.0	110
25.0	70
30.0	50
35.0	38
40.0	30
45.0	24
50.0	19
55.0	14
60.0	10
65.0	8
70.0	7
75.0	6
80.0	4
85.0	2
90.0	3

— Horizontal — Vertical



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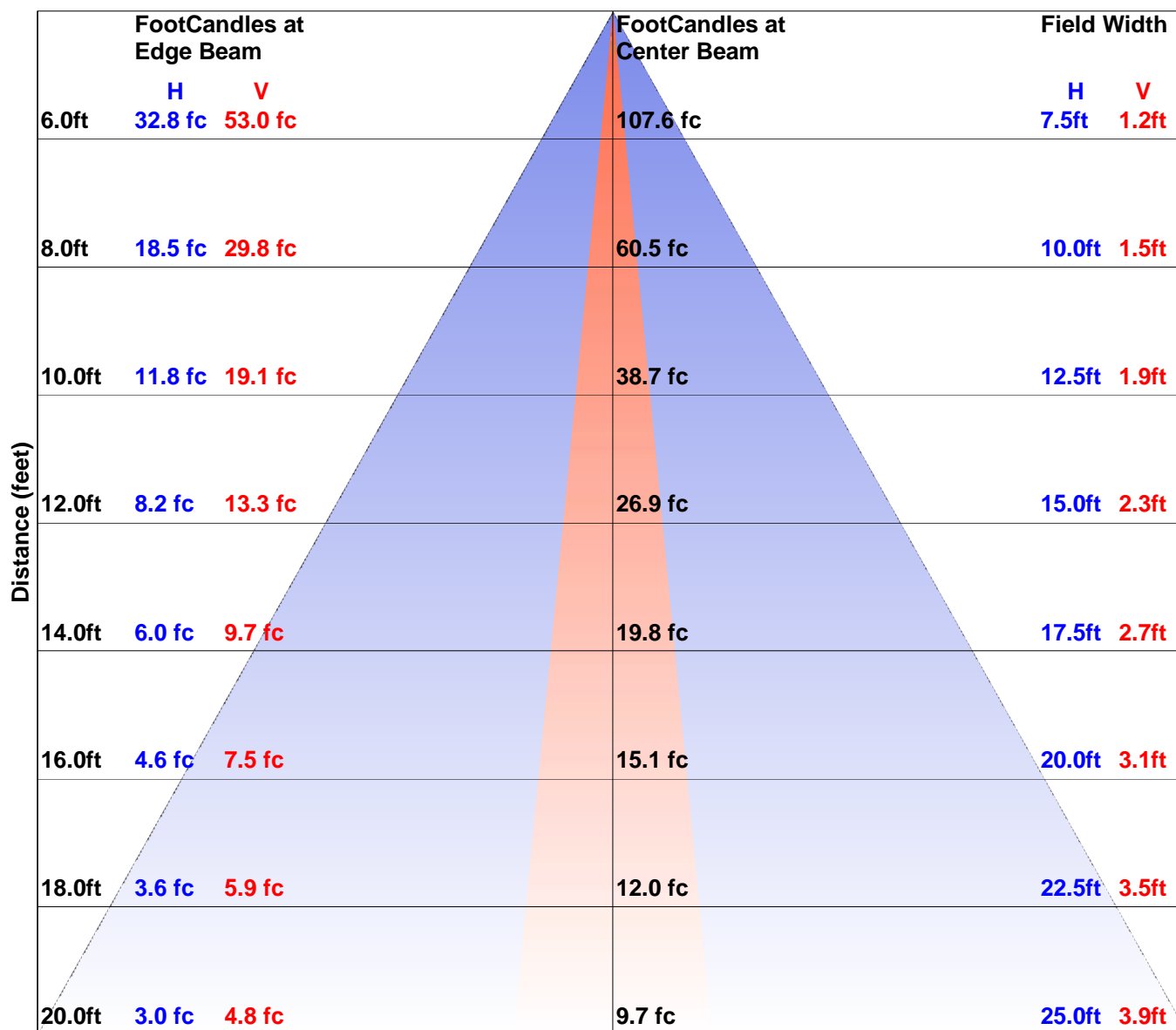
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## Photometric Report: S1512105-R1

Prepared for: Lumenpulse · Test Date: 10 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO

### Downlight Beam



— Horizontal (64.0 °) — Vertical (11.0 °)





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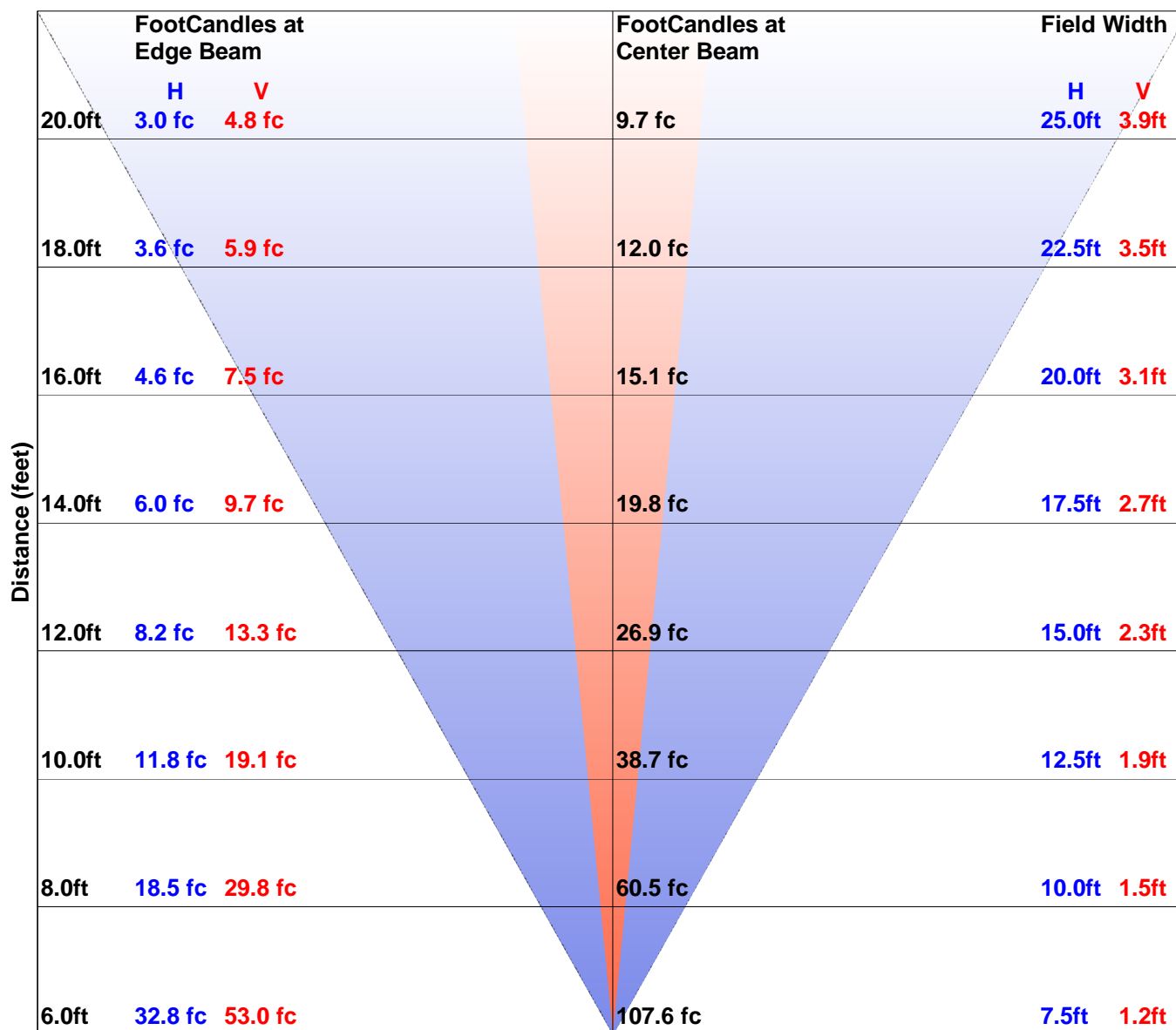
NVLAP LAB CODE: 200899-0

## Photometric Report: S1512105-R1

Prepared for: Lumenpulse · Test Date: 10 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO

### Uplight Beam



— Horizontal (64.0 °) — Vertical (11.0 °)



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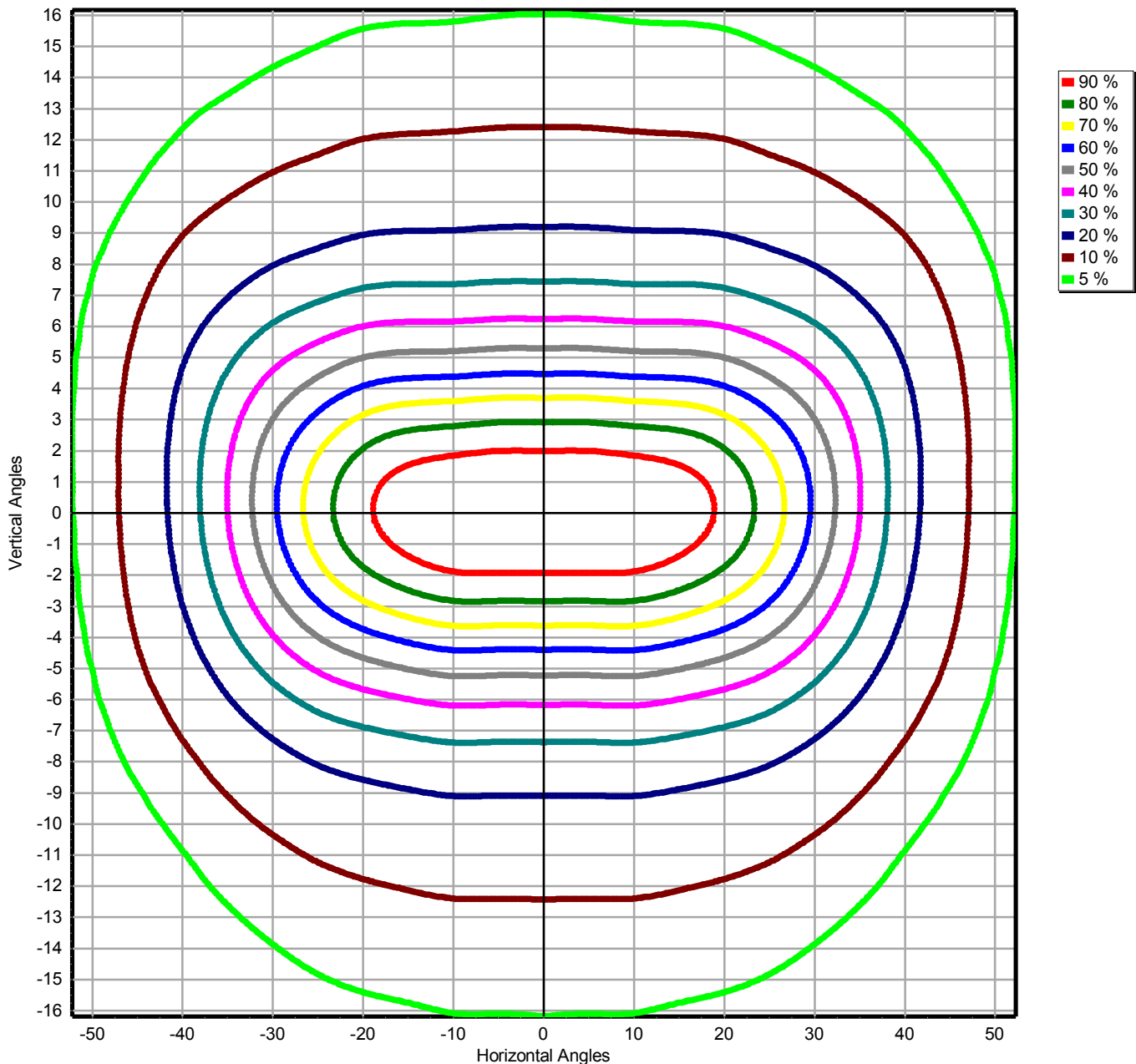
NVLAP LAB CODE: 200899-0

## Photometric Report: S1512105-R1

Prepared for: Lumenpulse · Test Date: 10 December 2015

Floodlight: LUMENFACADE · Lumcat: LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO

### ISO Candela Diagram





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## IES File Headers

IESNA:LM-63-2002  
[ISSUEDATE] 10 December 2015  
[TESTLAB] Spectra Lux Industries Inc.  
[TEST] S1512105-R1  
[MANUFAC] Lumenpulse  
[LUMCAT] LOGI-ASHRAE-120/277-48-40K-10x60-SI-NO  
[LUMINAIRE] LUMENFACADE  
[LAMP] (Clusters of 24 Cree XPE2 LED's) 20W SSL c/w Driver 20-3871 @ 120.00V  
[\_BURNING] Axial (1,055 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	1	2	2	3	2	3	3	2	3
	-85.0	4	2	2	3	3	3	4	4	4
	-75.0	5	5	6	5	4	7	7	6	6
	-65.0	7	10	9	9	9	8	8	7	7
	-55.0	15	14	14	16	13	14	13	12	11
	-45.0	23	24	23	22	22	22	20	20	18
	-35.0	38	37	36	36	34	34	32	29	27
	-25.0	70	70	69	67	66	61	58	52	47
	-20.0	110	111	110	107	102	94	86	75	63
	-15.0	238	236	235	223	208	188	160	131	104
	-12.5	382	381	379	361	334	299	251	198	147
	-12.0	422	420	419	397	370	331	277	217	160
	-11.5	466	465	464	441	409	366	306	238	173
	-11.0	517	514	514	489	455	406	338	263	189
	-10.5	574	571	572	543	504	451	375	290	207
	-10.0	637	635	636	604	563	504	419	321	227
	-9.5	711	707	708	677	629	563	466	357	250
	-9.0	792	789	792	754	703	631	519	396	275
A n g l e s	-8.5	887	885	888	847	788	708	583	442	305
	-8.0	998	993	1001	954	889	795	654	493	334
	-7.5	1125	1122	1128	1075	1000	895	734	551	372
	-7.0	1265	1264	1273	1214	1129	1008	825	613	411
	-6.5	1431	1427	1437	1371	1274	1136	923	683	451
	-6.0	1614	1609	1621	1543	1432	1274	1031	757	496
	-5.5	1816	1811	1824	1737	1609	1425	1150	837	542
	-5.0	2039	2033	2044	1946	1798	1585	1271	919	589
	-4.5	2275	2270	2279	2169	2000	1755	1397	1003	638
	-4.0	2520	2516	2524	2403	2209	1930	1529	1088	685
	-3.5	2774	2767	2773	2640	2423	2106	1657	1170	729
	-3.0	3023	3014	3015	2872	2634	2279	1782	1249	773
	-2.5	3252	3246	3242	3092	2833	2442	1903	1323	813
	-2.0	3460	3452	3441	3288	3012	2588	2008	1390	848
	-1.5	3630	3624	3606	3451	3167	2713	2102	1448	879
	-1.0	3759	3754	3728	3577	3285	2812	2177	1495	907
	-0.5	3843	3836	3804	3661	3367	2878	2229	1531	926



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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	3873	3869	3831	3693	3405	2911	2259	1554	942
	0.5	3848	3846	3802	3677	3397	2906	2264	1560	950
	1.0	3773	3771	3722	3610	3346	2866	2241	1555	951
	1.5	3651	3650	3599	3498	3253	2792	2199	1535	947
	2.0	3483	3484	3430	3347	3122	2689	2132	1500	936
	2.5	3284	3284	3230	3161	2961	2560	2045	1455	917
	3.0	3055	3056	3002	2947	2774	2408	1942	1398	893
	3.5	2809	2811	2760	2718	2571	2244	1829	1331	865
	4.0	2559	2561	2512	2483	2359	2069	1703	1258	830
	4.5	2310	2313	2267	2247	2146	1891	1574	1178	790
	5.0	2070	2071	2031	2017	1935	1716	1443	1094	748
	5.5	1844	1846	1809	1803	1736	1548	1314	1008	701
	6.0	1639	1643	1609	1604	1552	1389	1189	925	654
	6.5	1454	1455	1428	1426	1379	1241	1071	841	606
	7.0	1293	1292	1267	1266	1228	1106	959	762	557
	7.5	1147	1146	1125	1124	1091	985	859	688	511
	8.0	1020	1020	1001	998	970	876	767	618	465
	8.5	907	909	889	887	860	777	682	554	421
	9.0	810	810	792	787	764	690	607	495	381
	9.5	723	721	705	700	678	612	540	443	344
A n g l e s	10.0	646	645	630	626	604	546	481	397	310
	10.5	578	577	563	558	540	487	429	355	280
	11.0	518	518	506	500	483	435	384	318	253
	11.5	468	467	455	450	432	389	345	287	229
	12.0	421	420	410	404	389	351	310	259	206
	12.5	380	378	370	363	349	314	278	234	189
	15.0	234	231	225	222	214	194	173	148	123
	20.0	110	109	107	105	103	96	88	79	70
	25.0	70	70	68	68	64	62	60	54	48
	35.0	38	36	37	37	36	35	34	32	31
	45.0	24	23	24	23	21	21	20	19	17
	55.0	14	13	14	13	13	12	11	12	11
	65.0	8	8	8	7	8	7	7	7	8
	75.0	6	6	4	5	3	4	5	4	5
	85.0	2	4	2	2	2	3	3	5	3
	90.0	3	3	2	2	2	3	3	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	4	1	4	4	3	2	2	3
	-85.0	3	3	4	3	4	4	3	3
	-75.0	5	6	5	5	4	4	4	4
	-65.0	8	6	7	6	5	5	4	4
	-55.0	10	10	10	9	7	6	5	3
	-45.0	17	17	13	12	10	7	5	5
	-35.0	26	22	19	17	15	12	10	6
	-25.0	40	34	30	24	20	14	10	7
	-20.0	55	43	37	29	23	18	13	8
	-15.0	81	62	46	37	27	20	14	10
	-12.5	108	77	56	43	31	23	16	9
	-12.0	116	83	58	43	31	22	15	9
	-11.5	125	87	61	44	31	22	15	8
	-11.0	136	91	63	46	34	24	17	10
	-10.5	145	98	67	47	34	23	16	10
	-10.0	157	104	69	49	35	23	15	9
	-9.5	172	111	74	50	36	25	17	10
	-9.0	186	120	76	52	36	24	16	10
	-8.5	203	126	80	53	37	24	16	10
	-8.0	222	135	85	57	38	26	16	10
	-7.5	241	146	89	57	38	26	17	10
	-7.0	263	155	92	59	39	26	17	10
	-6.5	285	164	97	61	40	28	17	11
	-6.0	306	177	101	63	41	27	18	10
	-5.5	332	186	105	64	41	27	16	9
	-5.0	356	195	110	67	43	28	18	11
	-4.5	377	206	114	67	44	28	17	10
	-4.0	400	215	116	69	44	27	17	9
	-3.5	420	223	120	71	44	30	18	10
	-3.0	438	232	122	72	45	29	18	11
	-2.5	457	238	126	72	46	29	18	10
	-2.0	472	243	127	74	45	30	19	11
	-1.5	484	249	130	74	47	30	18	11
	-1.0	495	253	131	75	47	30	18	10
	-0.5	503	255	132	77	46	30	18	11
	0.0	509	259	133	76	48	30	18	11
	0.5	514	261	135	76	47	30	18	10
	1.0	515	260	135	77	47	31	18	10
	1.5	514	261	136	76	48	31	19	10
	2.0	512	262	136	76	48	30	19	10
	2.5	506	260	135	78	48	30	19	10
	3.0	497	259	135	76	48	31	18	11
	3.5	486	256	135	76	48	31	18	9
	4.0	472	251	133	77	47	30	19	10
	4.5	456	246	132	74	48	31	18	11
	5.0	438	241	130	74	46	30	18	10
	5.5	417	232	127	74	46	30	18	10
	6.0	397	226	125	72	47	30	18	10
	6.5	374	217	121	72	45	29	17	10
	7.0	349	205	118	71	44	29	19	10
	7.5	325	196	113	69	44	30	18	10
	8.0	302	186	110	66	44	29	17	10
	8.5	276	173	106	65	42	29	18	9
	9.0	255	163	100	63	43	28	18	10



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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	233	152	97	61	41	28	17	9	5
	10.0	213	142	91	59	40	27	18	9	5
	10.5	195	133	86	56	39	27	17	10	5
	11.0	179	123	82	54	40	25	16	9	5
	11.5	163	113	78	54	37	26	17	10	5
	12.0	150	106	73	51	37	27	16	9	5
	12.5	139	100	70	49	35	24	16	9	4
	15.0	96	74	54	41	31	24	14	8	4
	20.0	58	49	40	31	25	18	13	9	5
	25.0	44	38	32	26	20	16	10	8	4
	35.0	26	25	21	18	14	10	9	7	5
	45.0	17	14	12	12	9	8	7	6	4
	55.0	11	9	8	7	5	6	5	5	2
	65.0	6	7	6	5	6	5	4	4	3
	75.0	5	4	4	4	5	2	4	4	2
	85.0	3	4	3	4	3	4	4	3	3
	90.0	3	2	3	4	4	2	4	4	3

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## Horizontal Angles

	90.0
V e r t i c a l	-90.0 3
	-85.0 4
	-75.0 2
	-65.0 4
	-55.0 4
	-45.0 3
	-35.0 4
	-25.0 3
	-20.0 3
	-15.0 2
	-12.5 3
	-12.0 3
	-11.5 3
	-11.0 3
	-10.5 3
	-10.0 3
	-9.5 3
	-9.0 3
	-8.5 3
	-8.0 3
A n g l e s	-7.5 2
	-7.0 3
	-6.5 2
	-6.0 2
	-5.5 3
	-5.0 3
	-4.5 1
	-4.0 3
	-3.5 3
	-3.0 2
	-2.5 3
	-2.0 3
	-1.5 2
	-1.0 2
	-0.5 3
	0.0 2
	0.5 3
	1.0 2
	1.5 2
	2.0 3
	2.5 2
	3.0 1
	3.5 2
	4.0 3
	4.5 2
	5.0 2
	5.5 2
	6.0 2
	6.5 3
	7.0 3
	7.5 2
	8.0 2
	8.5 3
	9.0 2



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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
	25.0
	35.0
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