



# 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>	S1606303-R1	<b>Description</b>	72W White 4000K SSL	<b>Type</b>	Commercial
<b>Test Date</b>	30 June 2016	<b>Serial Number</b>	SRIS 2438	<b>Description</b>	71SSL-CY1101
<b>Report Date</b>	15 September 2016	<b>Photometric Method</b>	Absolute	<b>Manufacturer</b>	Mean Well
<b>Ambient</b>	25.2 °C	<b>Lamp Lumens</b>	-1	<b>Catalog No.</b>	LPF-60-24
<b>Humidity</b>	39.9 %	<b>Test Position</b>	Axial	<b>Voltage Tap</b>	120.00 V
<b>Lamp Type</b>	SSL	<b>Comments</b>	Clusters of 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 Acrylic	<b>X</b>	4.0000
<b>Name</b>	LUMENFACADE	<b>Housing</b>	Extruded Aluminum	<b>Y</b>	0.1667
<b>Catalog No.</b>	LOG-HO-120-48-40K- 35x35-SI-NO	<b>Lens</b>	Glass/Polycarbonate	<b>Z</b>	0.0000

Lamp Stabilization Time: 55 minutes

**Tested By: George Hedrei**

**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	91L236539	2016/05/05	2017/05/05
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	2015/10/05	2016/10/05

## Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	051202970	2014/10/24	2016/10/24



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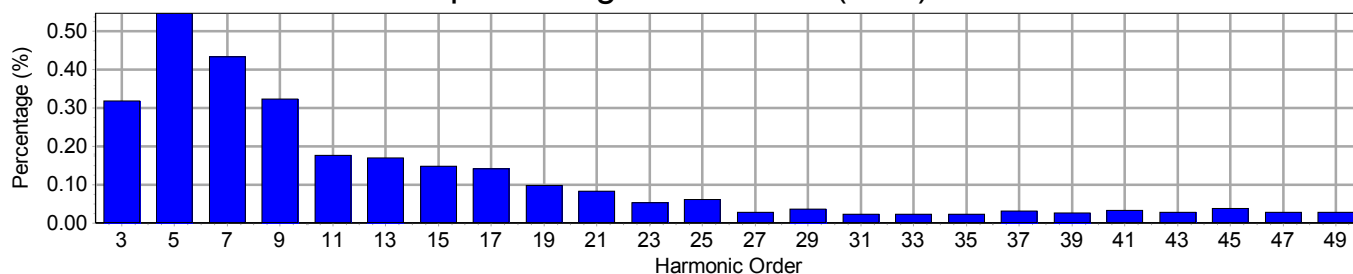
NVLAP LAB CODE: 200899-0

## Electrical Measurements

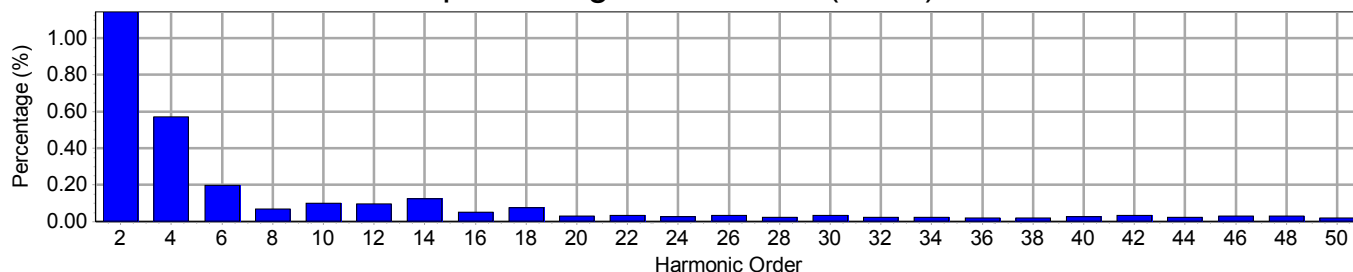
### Input

Frequency	60 Hz	Active Power	62.04 W	THDV [ANSI]	1.60 %
Voltage	120.1 V(rms)	Apparent Power	62.61 VA	THDA [ANSI]	4.39 %
Current	0.5214 A(rms)	Power Factor	0.991	Max. Harmonic At	5th order

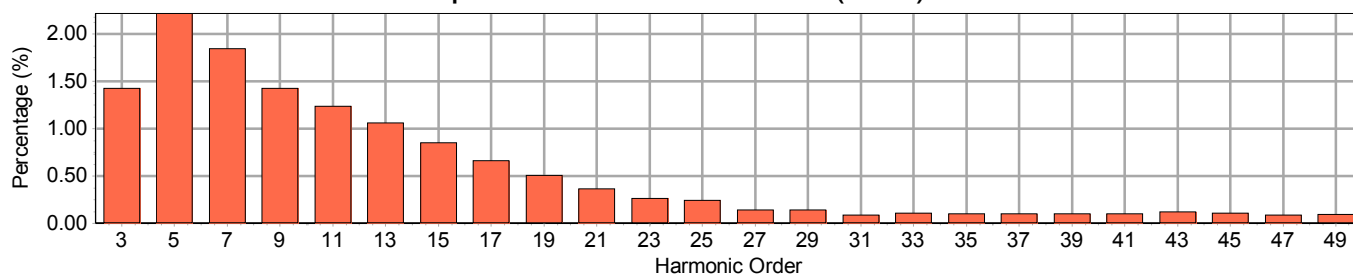
### Input Voltage Harmonics (Odd)



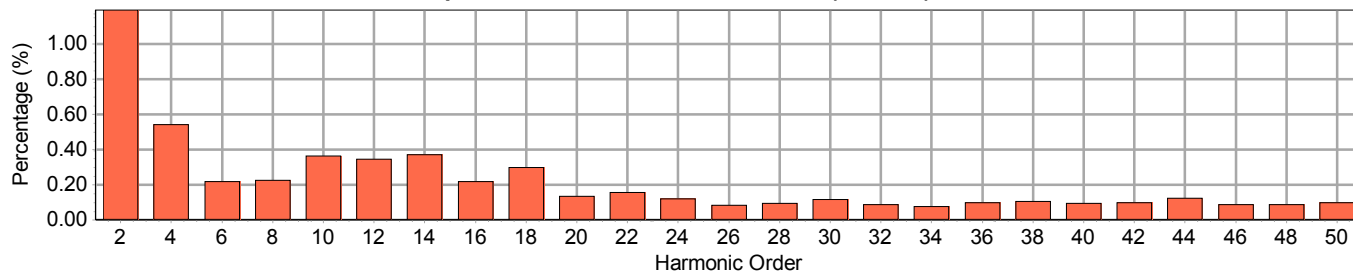
### Input Voltage Harmonics (Even)



### 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	1.145	1.197
3	180	0.317	1.429	4	240	0.571	0.541
5	300	0.547	2.222	6	360	0.199	0.219
7	420	0.432	1.849	8	480	0.068	0.224
9	540	0.322	1.425	10	600	0.101	0.364
11	660	0.175	1.239	12	720	0.096	0.345
13	780	0.170	1.058	14	840	0.125	0.371
15	900	0.147	0.849	16	960	0.050	0.215
17	1020	0.142	0.657	18	1080	0.074	0.297
19	1140	0.097	0.503	20	1200	0.030	0.135
21	1260	0.083	0.362	22	1320	0.033	0.153
23	1380	0.053	0.260	24	1440	0.028	0.119
25	1500	0.060	0.241	26	1560	0.032	0.081
27	1620	0.028	0.139	28	1680	0.022	0.093
29	1740	0.036	0.140	30	1800	0.032	0.113
31	1860	0.022	0.085	32	1920	0.021	0.087
33	1980	0.023	0.103	34	2040	0.021	0.074
35	2100	0.023	0.095	36	2160	0.019	0.097
37	2220	0.030	0.097	38	2280	0.021	0.102
39	2340	0.025	0.095	40	2400	0.025	0.094
41	2460	0.032	0.099	42	2520	0.033	0.097
43	2580	0.028	0.117	44	2640	0.023	0.121
45	2700	0.037	0.105	46	2760	0.030	0.085
47	2820	0.027	0.084	48	2880	0.030	0.086
49	2940	0.028	0.090	50	3000	0.020	0.098



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## Photometric Report: S1606303-R1

Prepared for: Lumenpulse · Test Date: 30 June 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-35x35-SI-NO

### Photometric Floodlight Characteristics

Nominal SSL Power	72.00 W	
Measured Input Voltage	120.07 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	3921	
Measured Input Power	62.04 W	
Floodlight Luminous Efficacy	63.2 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	9999	
Maximum Candela Location	0.0 H, 0.0 V	3) Results are valid for the tested material only.
Horizontal Beam Angle (50%)	33.0 °	
Vertical Beam Angle (50%)	36.0 °	
Horizontal Field Angle (10%)	59.0 °	4) All data published in this report are based on absolute photometry.
Vertical Field Angle (10%)	60.0 °	
IES/NEMA Type Classification	4Hx4V	
Beam Lumens (50%)	2077	5) The original electronic file or paper report cannot be edited in whole or in part without written consent of Spectralux Industries Inc.
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	3445	
Field Efficiency (10%)	N/A	
Spill Lumens	476	
Total Floodlight Lumens	3921	
Total Floodlight Efficiency	N/A	



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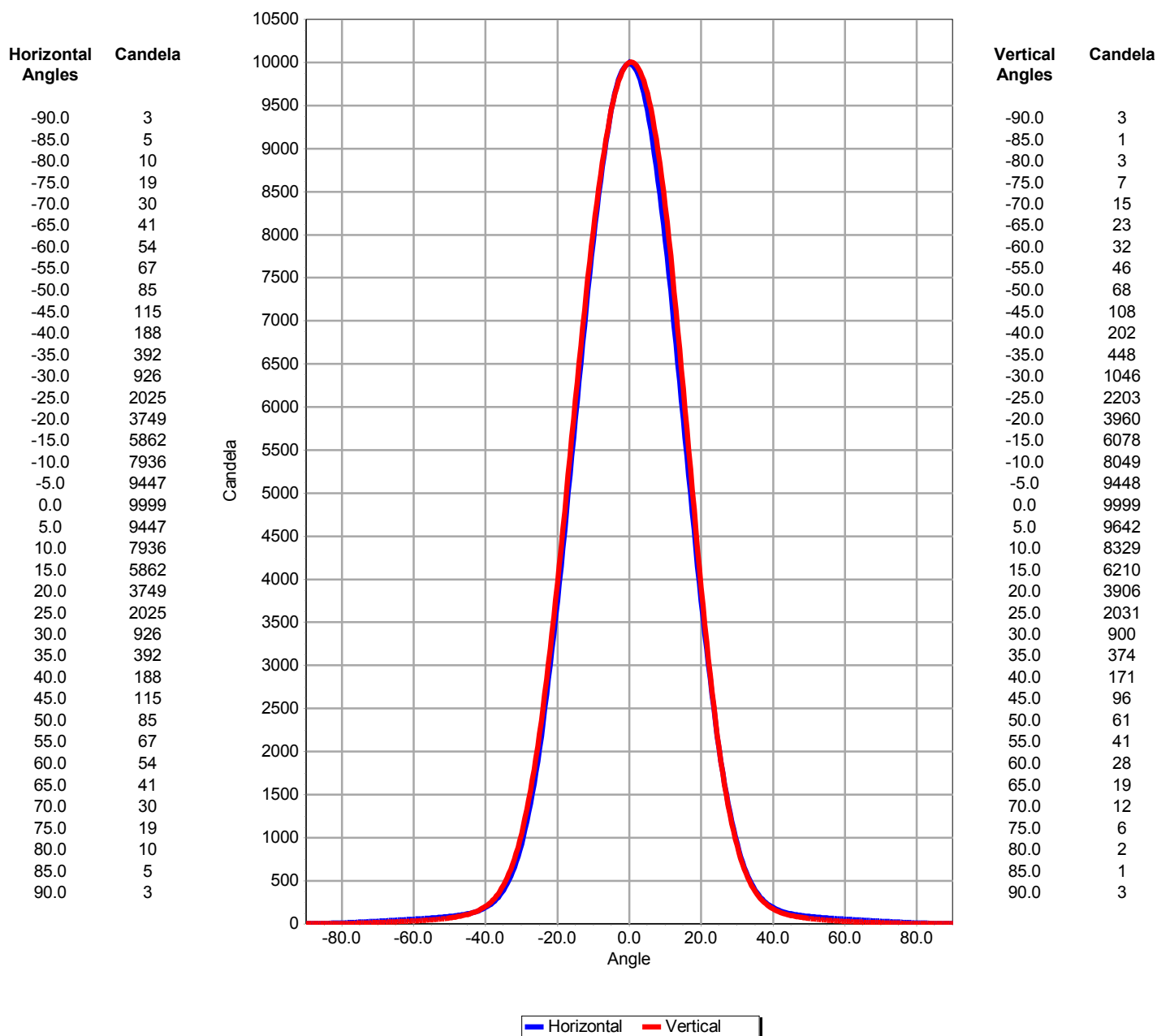
NVLAP LAB CODE: 200899-0

## Photometric Report: S1606303-R1

Prepared for: Lumenpulse · Test Date: 30 June 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-35x35-SI-NO

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





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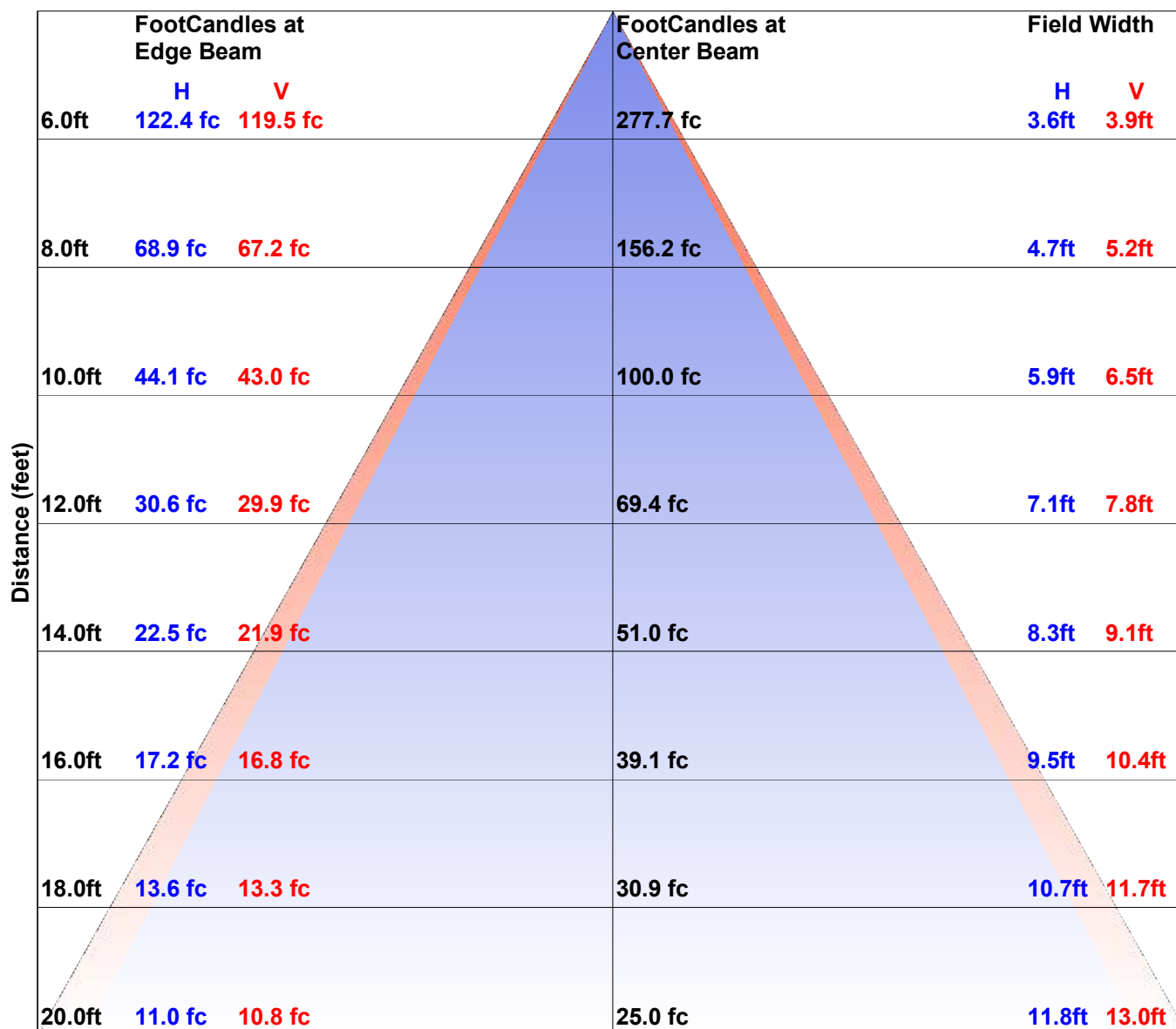
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## Photometric Report: S1606303-R1

Prepared for: Lumenpulse · Test Date: 30 June 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-35x35-SI-NO

### Downlight Beam



— Horizontal (33.0 °) — Vertical (36.0 °)





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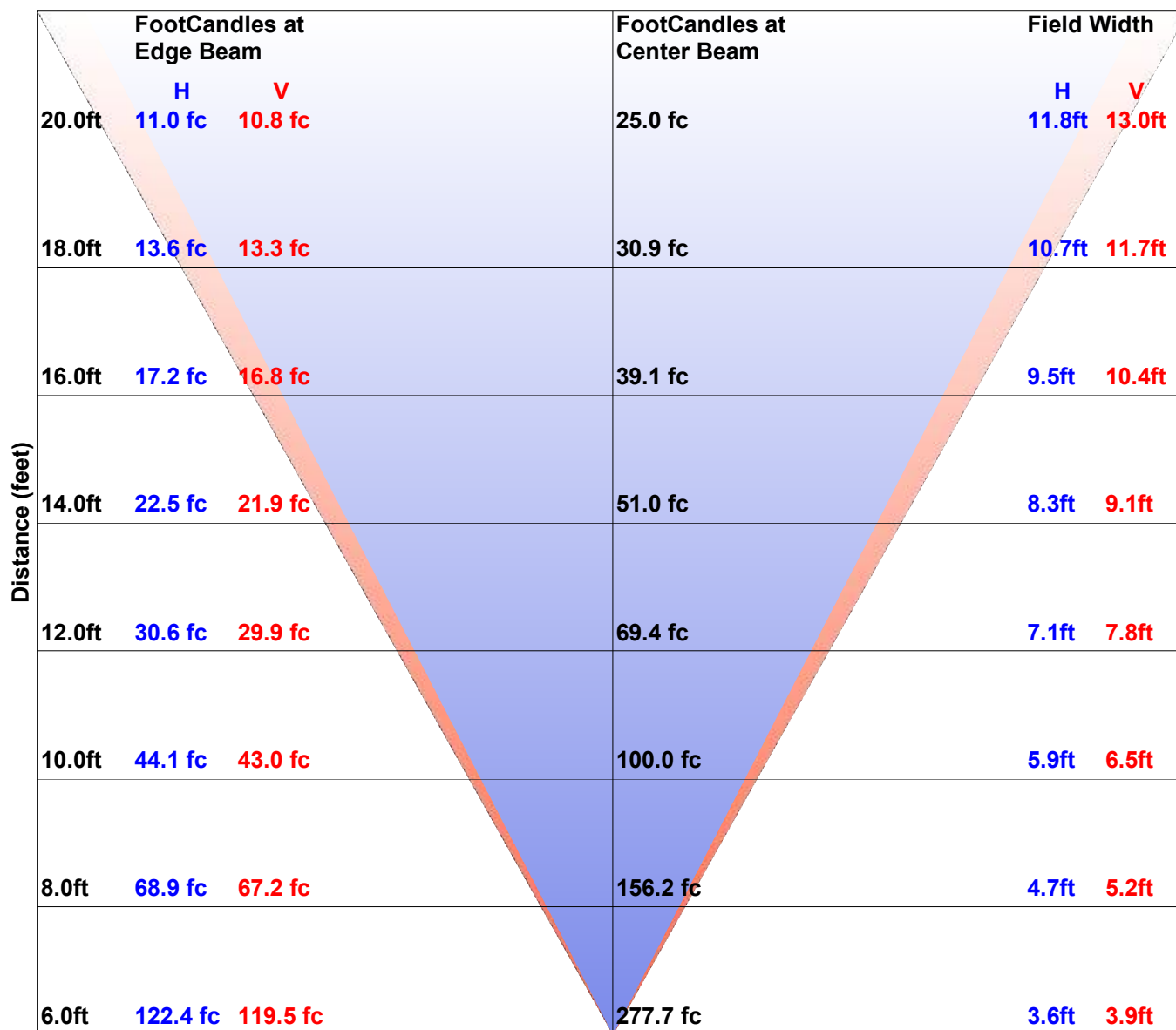
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## Photometric Report: S1606303-R1

Prepared for: Lumenpulse · Test Date: 30 June 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-35x35-SI-NO

### Uplight Beam



— Horizontal (33.0 °) — Vertical (36.0 °)



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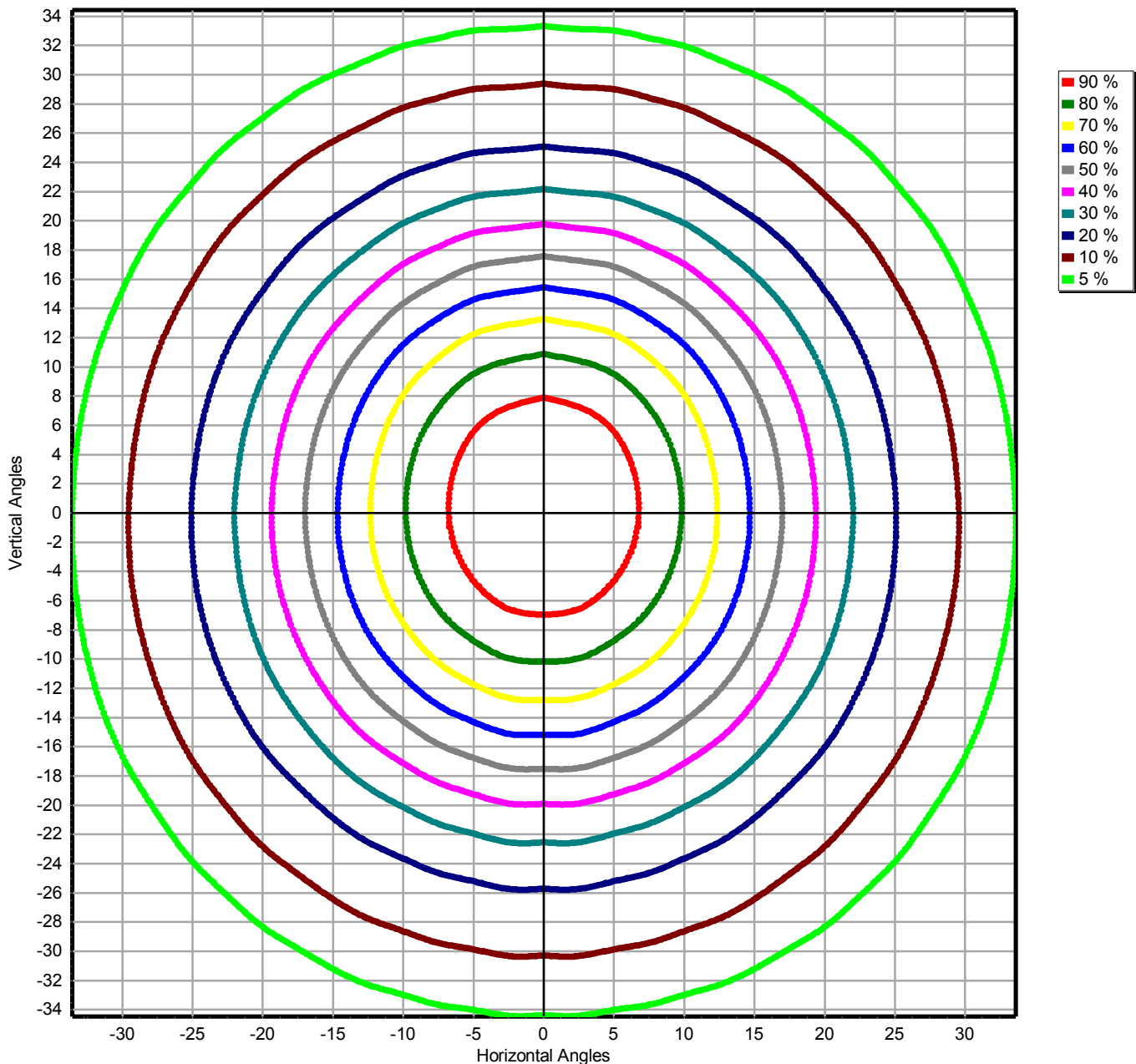
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**Photometric Report: S1606303-R1**

Prepared for: Lumenpulse · Test Date: 30 June 2016

Floodlight: LUMENFACADE · Lumcat: LOG-HO-120-48-40K-35x35-SI-NO

**ISO Candela Diagram**





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## IES File Headers

```
IESNA:LM-63-2002
[ISSUEDATE] 30 June 2016
[TESTLAB] Spectra Lux Industries Inc.
[TEST] S1606303-R1
[MANUFAC] Lumenpulse
[LUMCAT] LOG-HO-120-48-40K-35x35-SI-NO
[LUMINAIRE] LUMENFACADE
[LAMP] Clusters of CREE XPE2 LED's - 72W SSL c/w Mean Well Driver LPF-60-24 @ 120.00V
[_BURNING] Axial (3,921 Luminaire Lumens)
[_REFLECTOR] 48 Collimators Acrylic
[_LENS] Glass/Polycarbonate
[_HOUSING] Extruded Aluminum
[DISTRIBUTION] NEMA 4Hx4V (Max. CP at 0.0H,0.0V)
[MORE] (Based on IES LM-35-1989)
```

## Candela Table

### Horizontal Angles

	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0
V e r t i c a l	-90.0	3	3	3	3	3	3	3	3
	-87.5	1	1	1	1	1	1	1	1
	-85.0	1	1	1	1	2	2	2	2
	-82.5	2	2	2	2	2	2	2	2
	-80.0	3	3	3	3	3	3	3	3
	-77.5	5	5	5	5	5	5	5	5
	-75.0	7	8	7	7	7	7	7	7
	-72.5	11	11	11	11	10	10	10	10
	-70.0	15	15	14	14	14	14	14	13
	-67.5	18	19	18	18	18	18	17	17
A n g l e s	-65.0	23	23	23	23	22	22	21	21
	-62.5	28	28	27	27	27	26	26	25
	-60.0	32	33	32	32	32	31	30	30
	-57.5	39	39	39	38	37	37	36	36
	-55.0	46	47	46	46	44	44	42	41
	-52.5	56	56	55	55	53	52	50	49
	-50.0	68	69	67	67	64	62	60	58
	-47.5	85	86	83	82	80	78	75	69
	-45.0	108	110	106	104	100	97	92	83
	-42.5	145	146	140	137	129	124	115	100
	-40.0	202	204	194	187	174	164	150	124
	-37.5	295	299	281	269	246	228	203	160
	-35.0	448	452	423	401	361	329	285	212
	-32.5	688	694	645	607	540	484	412	289
	-30.0	1046	1053	978	913	807	715	599	401
	-27.5	1548	1553	1443	1343	1183	1038	861	558
	-25.0	2203	2206	2055	1907	1679	1467	1212	768
	-22.5	3013	3011	2814	2609	2301	2008	1658	1040
	-20.0	3960	3951	3708	3438	3042	2654	2197	1373
	-17.5	5002	4983	4694	4357	3871	3381	2809	1759
	-15.0	6078	6044	5718	5313	4739	4148	3458	2177
	-12.5	7116	7066	6707	6239	5588	4897	4100	2596
	-10.0	8049	7982	7598	7077	6358	5576	4687	2983
	-7.5	8840	8753	8350	7783	7009	6150	5182	3312
	-5.0	9448	9343	8930	8323	7509	6585	5557	3558



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## Horizontal Angles

	0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	
V e r t i c a l	-2.5	9840	9716	9298	8662	7820	6850	5785	4710	3703
	0.0	9999	9860	9447	8789	7936	6939	5862	4782	3749
	2.5	9934	9783	9381	8714	7865	6858	5783	4703	3676
	5.0	9642	9481	9099	8434	7604	6607	5559	4511	3510
	7.5	9110	8938	8585	7935	7144	6179	5183	4194	3245
	10.0	8329	8152	7837	7217	6485	5578	4663	3761	2891
	12.5	7336	7162	6892	6320	5666	4843	4033	3242	2476
	15.0	6210	6046	5823	5317	4755	4039	3351	2685	2039
	17.5	5041	4894	4718	4292	3829	3232	2674	2138	1618
	20.0	3906	3782	3649	3309	2946	2475	2045	1636	1237
	22.5	2884	2784	2691	2435	2167	1815	1501	1205	915
	25.0	2031	1956	1896	1714	1528	1279	1064	861	660
	27.5	1372	1320	1284	1162	1040	875	735	602	470
	30.0	900	865	845	767	692	588	501	419	335
	32.5	580	558	547	501	457	394	343	294	243
	35.0	374	362	356	330	305	269	239	211	180
	37.5	248	240	238	223	210	189	172	156	138
	40.0	171	167	166	158	151	139	129	120	109
	42.5	124	122	122	117	113	106	101	95	89
	45.0	96	94	94	91	89	85	81	78	73
A n g l e s	47.5	76	75	75	73	72	69	67	65	62
	50.0	61	61	61	60	59	57	56	54	52
	52.5	50	50	50	49	49	47	46	45	43
	55.0	41	40	41	40	40	39	38	38	37
	57.5	33	33	34	33	33	32	32	31	30
	60.0	28	27	28	27	27	27	26	26	25
	62.5	23	22	23	23	22	22	22	22	21
	65.0	19	19	19	19	19	18	18	18	17
	67.5	15	15	15	15	15	15	15	15	14
	70.0	12	12	12	12	12	12	11	12	11
	72.5	9	9	9	9	9	9	8	8	7
	75.0	6	6	6	6	6	6	5	5	5
	77.5	4	4	4	4	3	3	3	4	3
	80.0	2	2	2	2	2	2	2	2	2
	82.5	1	1	2	1	2	1	1	2	2
85.0	1	0	1	1	1	1	1	1	1	
87.5	0	0	0	1	1	1	1	1	1	
90.0	3	3	3	3	3	3	3	3	3	



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## Horizontal Angles

	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5
V e r t i c a l	-90.0	3	3	3	3	3	3	3	3
	-87.5	1	2	2	3	3	4	4	5
	-85.0	2	2	2	3	3	4	4	5
	-82.5	3	3	3	3	4	4	5	5
	-80.0	3	4	4	4	4	5	5	6
	-77.5	5	5	5	5	6	6	6	6
	-75.0	7	7	7	7	7	7	8	8
	-72.5	10	10	10	10	9	10	9	9
	-70.0	13	13	13	13	13	12	12	11
	-67.5	17	17	16	16	16	15	14	14
	-65.0	20	20	20	20	19	18	17	17
	-62.5	25	24	24	23	23	22	21	20
	-60.0	29	29	28	27	27	26	25	23
	-57.5	34	34	32	32	31	30	29	26
	-55.0	40	39	38	37	36	34	33	30
	-52.5	47	46	44	43	41	39	38	34
	-50.0	55	54	51	49	47	45	43	38
	-47.5	65	63	59	57	54	51	48	43
	-45.0	77	74	69	65	61	58	54	48
	-42.5	92	86	80	75	69	65	61	53
A n g l e s	-40.0	112	103	93	86	79	73	68	59
	-37.5	140	125	110	100	90	82	75	64
	-35.0	178	155	132	117	102	92	83	69
	-32.5	235	196	162	138	118	104	92	75
	-30.0	316	255	201	166	138	117	102	81
	-27.5	428	335	255	203	161	133	113	87
	-25.0	579	441	325	250	192	153	126	93
	-22.5	775	579	416	309	228	176	140	100
	-20.0	1017	750	529	383	273	203	157	107
	-17.5	1301	951	663	468	326	234	176	114
	-15.0	1613	1172	810	563	383	268	195	121
	-12.5	1930	1398	963	661	442	302	215	128
	-10.0	2226	1610	1107	752	498	334	232	134
	-7.5	2479	1791	1231	831	545	361	247	138
	-5.0	2670	1927	1326	890	580	381	258	141
	-2.5	2784	2004	1380	922	600	391	264	143
	0.0	2838	2025	1397	926	602	392	264	142
	2.5	2762	1977	1362	904	589	384	260	141
	5.0	2633	1878	1294	858	561	368	251	139
	7.5	2430	1725	1190	788	520	344	238	135
	10.0	2161	1528	1057	703	468	314	221	129
	12.5	1848	1304	906	606	411	282	202	123
	15.0	1523	1074	753	509	352	247	183	117
	17.5	1211	857	609	419	297	216	165	110
	20.0	932	666	482	340	249	187	147	103
	22.5	698	507	376	274	208	162	132	96
	25.0	513	381	292	221	175	141	119	90
	27.5	374	287	229	179	148	124	106	84
	30.0	275	219	181	148	126	109	96	77
	32.5	206	171	147	125	109	96	87	72
	35.0	158	136	121	106	95	86	78	66
	37.5	125	111	101	91	83	76	70	60
	40.0	101	92	86	79	73	68	63	55
	42.5	84	78	74	68	64	60	56	49



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

## Horizontal Angles

	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5	
V e r t i c a l	45.0	71	66	63	59	56	53	50	47	44
	47.5	60	57	54	51	49	47	44	42	39
	50.0	50	48	47	44	43	41	39	37	35
	52.5	43	41	40	38	36	35	34	32	30
	55.0	36	35	34	32	31	30	29	28	26
	57.5	30	29	29	27	27	26	25	24	22
	60.0	25	24	24	23	22	22	21	20	19
	62.5	21	20	20	19	18	18	17	16	15
	65.0	17	17	16	15	15	14	14	13	13
	67.5	14	13	12	12	12	11	11	11	11
	70.0	10	10	10	9	9	9	9	9	9
	72.5	7	7	7	7	7	7	7	7	7
	75.0	5	5	5	5	6	6	6	6	6
	77.5	3	4	4	4	4	5	5	5	5
	80.0	2	3	3	3	4	4	4	5	5
	82.5	2	2	2	3	3	4	4	4	5
85.0	1	2	2	3	3	3	4	4	4	
87.5	1	1	2	2	3	3	3	4	4	
90.0	3	3	3	3	3	3	3	3	3	
A n g l e s										



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NVLAP LAB CODE: 200899-0

## Horizontal Angles

	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0
<b>V e r t i c a l</b>	-90.0	3	3	3	3	3	3	3	3
	-87.5	5	5	5	5	5	5	5	5
	-85.0	5	5	5	5	5	5	5	5
	-82.5	5	5	6	6	6	6	5	5
	-80.0	6	6	6	6	6	6	5	5
	-77.5	7	7	7	7	6	6	6	5
	-75.0	7	7	7	7	7	7	6	6
	-72.5	9	9	8	8	7	7	6	6
	-70.0	11	11	10	9	8	8	7	6
	-67.5	13	12	12	11	9	9	8	7
	-65.0	16	15	14	13	11	10	8	7
	-62.5	18	18	16	15	12	11	10	8
	-60.0	22	20	19	18	14	13	11	10
	-57.5	25	23	22	20	16	15	12	11
	-55.0	28	27	25	23	21	19	14	12
	-52.5	32	30	28	26	21	19	16	14
	-50.0	36	34	31	29	23	21	18	15
	-47.5	40	38	35	32	29	26	23	20
	-45.0	45	42	39	35	32	29	26	22
	-42.5	50	46	42	39	35	32	28	24
<b>A n g l e s</b>	-40.0	54	50	46	42	38	34	31	27
	-37.5	59	54	50	46	41	37	33	29
	-35.0	64	59	54	49	45	40	36	31
	-32.5	68	63	57	52	48	43	38	33
	-30.0	73	67	61	56	50	45	41	36
	-27.5	78	71	64	58	53	48	43	37
	-25.0	83	75	67	61	56	50	45	39
	-22.5	87	78	71	64	58	52	47	41
	-20.0	93	82	74	66	60	54	48	43
	-17.5	97	86	76	68	62	56	50	44
	-15.0	102	89	79	71	63	57	51	45
	-12.5	107	92	81	72	65	58	52	46
	-10.0	110	94	82	73	66	59	53	46
	-7.5	112	96	84	74	66	59	53	47
	-5.0	114	97	85	75	67	60	54	47
	-2.5	115	98	85	75	67	60	53	47
	0.0	115	97	85	75	67	60	54	48
	2.5	114	97	84	75	67	60	53	47
	5.0	113	96	84	74	67	60	53	47
	7.5	110	95	83	74	66	59	53	47
	10.0	108	92	82	73	65	58	52	46
	12.5	104	90	79	71	64	57	51	45
	15.0	99	87	77	69	62	56	50	44
	17.5	95	83	75	67	61	55	48	43
	20.0	90	80	72	65	59	53	47	41
	22.5	85	76	69	63	56	51	45	40
	25.0	81	72	66	60	54	49	43	38
	27.5	76	69	62	57	51	46	41	36
	30.0	71	65	59	54	49	44	39	34
	32.5	66	60	56	50	46	41	36	32
	35.0	61	56	51	47	43	38	34	29
	37.5	56	52	47	44	39	35	31	27
	40.0	51	47	44	40	36	33	29	25
	42.5	46	43	40	36	33	30	26	22



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

## Horizontal Angles

	45.0	47.5	50.0	52.5	55.0	57.5	60.0	62.5	65.0
45.0	41	39	36	33	30	27	24	21	18
47.5	37	34	32	29	27	24	21	18	16
50.0	33	31	28	26	24	21	19	16	14
52.5	29	27	25	23	21	19	17	14	12
55.0	25	23	22	20	18	16	14	12	11
57.5	21	20	18	17	15	14	12	11	9
60.0	18	17	16	15	13	12	11	9	8
62.5	15	14	14	12	11	11	9	8	7
65.0	12	12	11	10	10	9	8	7	6
67.5	10	10	9	9	8	8	7	7	6
70.0	9	8	8	8	8	7	7	6	6
72.5	7	8	7	7	7	6	6	6	5
75.0	6	6	6	7	6	6	6	6	5
77.5	6	6	6	6	6	6	6	5	5
80.0	5	6	5	6	6	5	5	5	5
82.5	5	5	5	5	5	5	5	5	5
85.0	5	5	5	5	5	5	5	5	4
87.5	5	5	5	5	5	5	5	4	4
90.0	3	3	3	3	3	3	3	3	3

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NVLAP LAB CODE: 200899-0

## Horizontal Angles

	67.5	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5
V e r t i c a l	-90.0	3	3	3	3	3	3	3	3
	-87.5	4	4	4	4	3	3	3	3
	-85.0	5	4	4	4	4	3	3	3
	-82.5	5	4	4	4	4	3	3	3
	-80.0	5	4	4	4	4	3	3	3
	-77.5	5	5	4	4	4	3	3	3
	-75.0	5	5	4	4	4	3	3	3
	-72.5	6	5	5	4	4	3	3	3
	-70.0	6	6	5	4	4	3	3	3
	-67.5	6	5	5	4	4	3	3	3
	-65.0	7	6	5	5	4	3	3	3
	-62.5	7	6	6	5	4	3	3	3
	-60.0	8	7	6	5	4	4	3	3
	-57.5	9	7	6	5	4	3	3	3
	-55.0	10	8	7	6	5	4	3	3
	-52.5	11	9	7	6	5	4	3	3
	-50.0	13	10	8	6	5	4	3	3
	-47.5	14	12	9	7	5	4	3	3
	-45.0	16	12	10	8	6	4	3	3
	-42.5	17	14	11	8	6	5	3	3
A n g l e s	-40.0	19	15	12	9	7	5	4	3
	-37.5	21	17	13	10	7	5	4	3
	-35.0	22	19	14	11	8	6	4	3
	-32.5	24	20	16	12	9	6	4	3
	-30.0	26	21	17	13	9	6	5	3
	-27.5	28	23	18	14	10	7	4	3
	-25.0	29	24	20	15	11	8	5	4
	-22.5	31	25	20	16	11	8	5	4
	-20.0	32	27	21	17	12	8	5	4
	-17.5	33	27	22	17	13	9	6	4
	-15.0	34	29	23	18	13	9	6	4
	-12.5	35	29	23	19	14	10	6	4
	-10.0	35	29	24	19	14	10	7	4
	-7.5	36	30	24	19	14	10	7	5
	-5.0	36	30	24	19	15	10	7	4
	-2.5	36	30	25	19	14	10	7	5
	0.0	36	30	24	19	14	10	7	5
	2.5	36	30	24	19	15	10	7	4
	5.0	35	30	24	19	14	10	7	5
	7.5	35	30	24	19	14	10	7	4
	10.0	35	29	23	19	14	10	6	4
	12.5	34	28	23	18	13	9	6	4
	15.0	33	28	22	17	13	9	6	4
	17.5	32	27	21	17	12	9	5	4
	20.0	31	26	21	16	12	8	5	4
	22.5	30	24	19	15	11	7	5	4
	25.0	28	23	18	14	10	7	5	4
	27.5	26	22	17	13	9	6	5	4
	30.0	25	20	16	12	8	6	4	3
	32.5	23	19	15	11	8	6	4	3
	35.0	21	17	14	10	7	5	4	3
	37.5	20	16	12	9	7	5	4	3
	40.0	18	14	11	9	6	5	4	3
	42.5	16	13	10	8	6	4	4	3



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

## Horizontal Angles

	67.5	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5	
V e r t i c a l	45.0	15	12	9	7	5	4	4	3	3
	47.5	13	11	8	7	5	4	4	3	3
	50.0	12	9	8	6	5	4	4	3	3
	52.5	10	8	6	5	4	4	4	3	3
	55.0	9	7	6	5	4	4	3	3	3
	57.5	8	6	6	5	4	4	4	3	3
	60.0	7	6	5	4	4	4	3	3	3
	62.5	6	6	5	5	4	4	3	3	3
	65.0	6	5	5	4	4	3	3	3	3
	67.5	6	5	4	4	4	3	3	3	3
	70.0	5	5	4	4	4	3	3	3	3
	72.5	5	5	4	4	4	3	3	3	3
	75.0	5	5	4	4	3	3	3	3	3
	77.5	5	4	4	4	3	3	3	3	3
	80.0	4	4	4	3	3	3	3	3	3
	82.5	4	4	4	3	3	3	3	2	3
	85.0	4	4	4	3	3	3	3	3	3
	87.5	4	4	4	3	3	3	3	3	3
	90.0	3	3	3	3	3	3	3	3	3
A n g l e s										



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## Horizontal Angles

	90.0
V e r t i c a l	-90.0 3
	-87.5 3
	-85.0 3
	-82.5 3
	-80.0 3
	-77.5 3
	-75.0 3
	-72.5 3
	-70.0 3
	-67.5 3
	-65.0 3
	-62.5 3
	-60.0 3
	-57.5 3
	-55.0 3
	-52.5 2
	-50.0 2
	-47.5 2
	-45.0 2
	-42.5 2
A n g l e s	-40.0 3
	-37.5 2
	-35.0 2
	-32.5 3
	-30.0 2
	-27.5 3
	-25.0 3
	-22.5 3
	-20.0 3
	-17.5 3
	-15.0 3
	-12.5 3
	-10.0 3
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	0.0 3
	2.5 3
	5.0 3
	7.5 3
	10.0 3
	12.5 3
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	27.5 3
	30.0 3
	32.5 3
	35.0 3
	37.5 3
	40.0 3
	42.5 3



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**NVLAP**<sup>®</sup>  
NVLAP LAB CODE: 200899-0

Horizontal Angles

	90.0
	45.0
	47.5
	50.0
	52.5
	55.0
	57.5
	60.0
	62.5
	65.0
	67.5
	70.0
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