



# 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>	S1609161-R1	<b>Description</b>	34W White 4000K SSL	<b>Type</b> Commercial
<b>Test Date</b>	16 September 2016	<b>Serial Number</b>	SRIS-2567	<b>Description</b> 34SSL-CY825
<b>Report Date</b>	21 September 2016	<b>Photometric Method</b>	Absolute	<b>Manufacturer</b> MEAN WELL USA inc.
<b>Ambient</b>	24.2 °C	<b>Lamp Lumens</b>	-1	<b>Catalog No.</b> LPF-40-24
<b>Humidity</b>	38.6 %	<b>Test Position</b>	Axial	<b>Voltage Tap</b> 120.00 V
<b>Lamp Type</b>	SSL	<b>Comments</b>	Cluster 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>	None	<b>X</b> 0.1667
<b>Name</b>	LUMENFACADE	<b>Housing</b>	Extruded Aluminum	<b>Y</b> 4.0000
<b>Catalog No.</b>	LOG-RO-120-48-40K- 10x10-SI-NO	<b>Lens</b>	Glass Lens with Polycarbonate Diffuser	<b>Z</b> 0.0000

Lamp Stabilization Time: 1 hour 10 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	974997	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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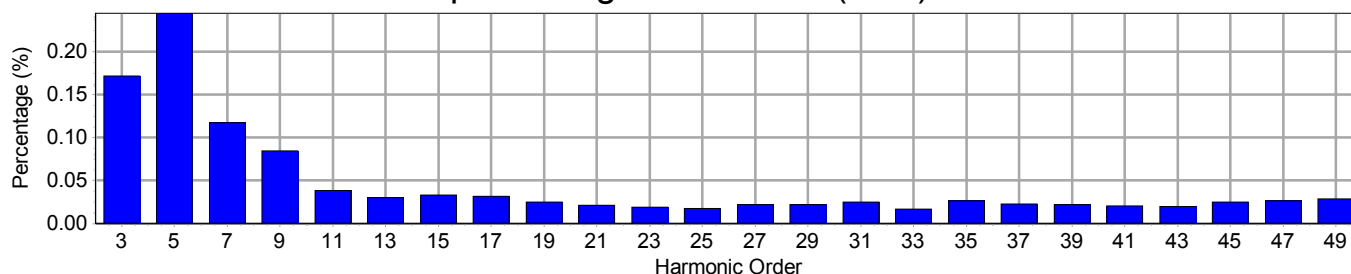
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## Electrical Measurements

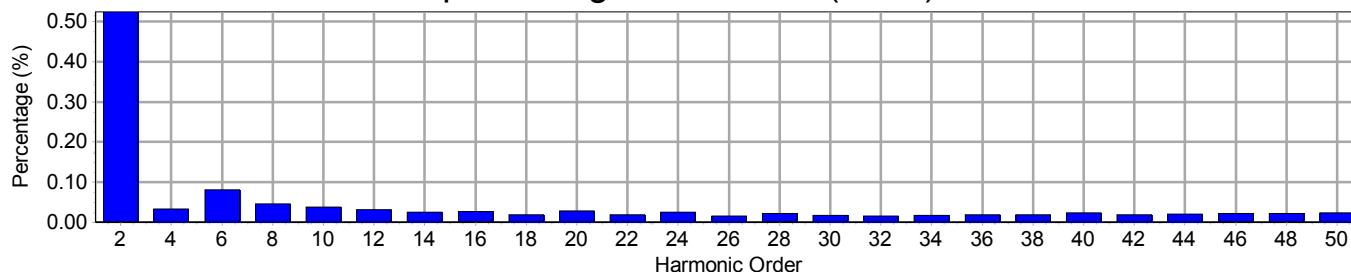
### Input

Frequency	60 Hz	Active Power	31.24 W	THDV [ANSI]	0.64 %
Voltage	120.8 V(rms)	Apparent Power	32.04 VA	THDA [ANSI]	7.83 %
Current	0.2653 A(rms)	Power Factor	0.975	Max. Harmonic At	3rd order

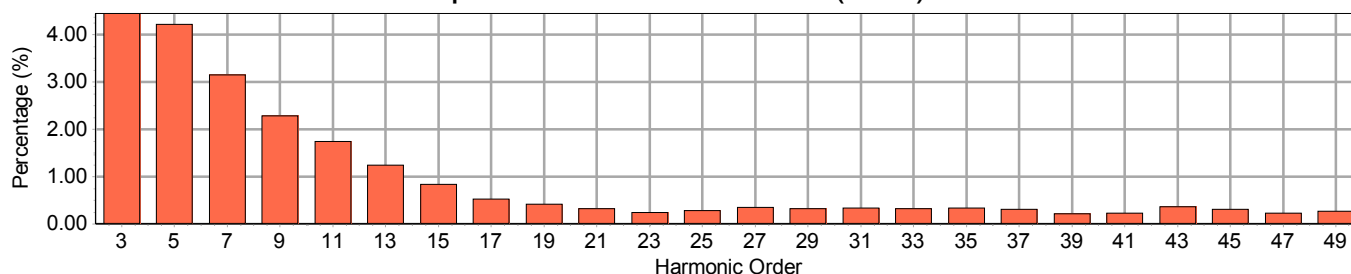
### Input Voltage Harmonics (Odd)



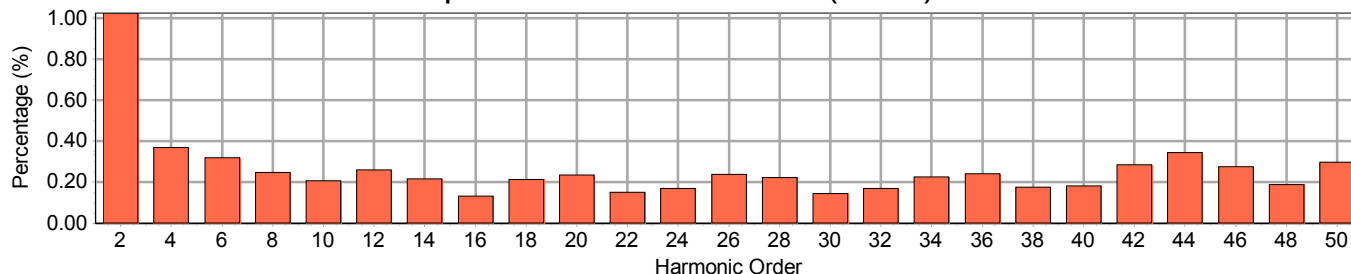
### Input Voltage Harmonics (Even)



### 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	0.525	1.026
3	180	0.172	4.455	4	240	0.033	0.369
5	300	0.245	4.214	6	360	0.080	0.319
7	420	0.117	3.152	8	480	0.045	0.248
9	540	0.084	2.287	10	600	0.038	0.208
11	660	0.038	1.735	12	720	0.030	0.259
13	780	0.030	1.232	14	840	0.025	0.218
15	900	0.033	0.839	16	960	0.026	0.132
17	1020	0.032	0.525	18	1080	0.019	0.214
19	1140	0.025	0.408	20	1200	0.028	0.235
21	1260	0.021	0.321	22	1320	0.019	0.152
23	1380	0.019	0.233	24	1440	0.024	0.169
25	1500	0.017	0.278	26	1560	0.015	0.237
27	1620	0.022	0.339	28	1680	0.021	0.223
29	1740	0.022	0.316	30	1800	0.017	0.146
31	1860	0.025	0.335	32	1920	0.015	0.171
33	1980	0.016	0.317	34	2040	0.017	0.225
35	2100	0.027	0.330	36	2160	0.018	0.241
37	2220	0.023	0.308	38	2280	0.019	0.177
39	2340	0.022	0.210	40	2400	0.022	0.181
41	2460	0.020	0.217	42	2520	0.018	0.284
43	2580	0.020	0.355	44	2640	0.019	0.344
45	2700	0.025	0.311	46	2760	0.022	0.276
47	2820	0.026	0.225	48	2880	0.022	0.187
49	2940	0.029	0.259	50	3000	0.023	0.297



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## Photometric Report: S1609161-R1

Prepared for: Lumenpulse · Test Date: 16 September 2016

Floodlight: LUMENFACADE · Lumcat: LOG-RO-120-48-40K-10x10-SI-NO

### Photometric Floodlight Characteristics

Nominal SSL Power	34.00 W	
Measured Input Voltage	120.79 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	1884	
Measured Input Power	31.24 W	
Floodlight Luminous Efficacy	60.3 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	19173	
Maximum Candela Location	0.0 H, 0.5 V	3) Results are valid for the tested material only.
Horizontal Beam Angle (50%)	16.0 °	
Vertical Beam Angle (50%)	15.0 °	4) All data published in this report are based on absolute photometry.
Horizontal Field Angle (10%)	31.0 °	
Vertical Field Angle (10%)	29.0 °	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	3Hx3V	
Beam Lumens (50%)	763	
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	1481	
Field Efficiency (10%)	N/A	
Spill Lumens	403	
Total Floodlight Lumens	1884	
Total Floodlight Efficiency	N/A	



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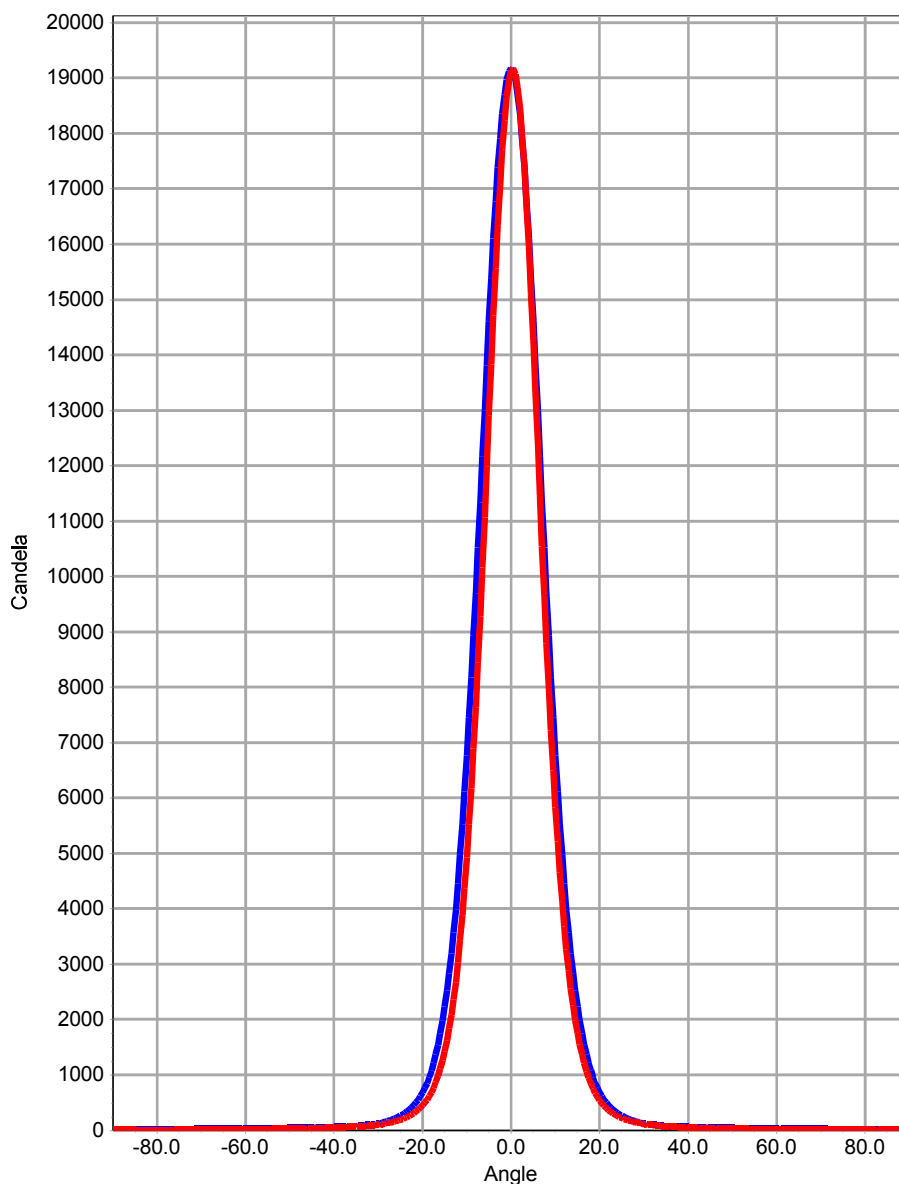
## Photometric Report: S1609161-R1

Prepared for: Lumenpulse · Test Date: 16 September 2016

Floodlight: LUMENFACADE · Lumcat: LOG-RO-120-48-40K-10x10-SI-NO

### Maximum Candela Trace (Max. Location: 0.0 H, 0.5 V)

Horizontal Angles	Candela
-90.0	3
-85.0	4
-80.0	5
-75.0	9
-70.0	13
-65.0	19
-60.0	24
-55.0	29
-50.0	36
-45.0	45
-40.0	58
-35.0	80
-30.0	127
-25.0	266
-20.0	685
-15.0	2233
-10.0	6762
-5.0	14617
0.0	19173
5.0	14617
10.0	6762
15.0	2233
20.0	685
25.0	266
30.0	127
35.0	80
40.0	58
45.0	45
50.0	36
55.0	29
60.0	24
65.0	19
70.0	13
75.0	9
80.0	5
85.0	4
90.0	3



Vertical Angles	Candela
-90.0	8
-85.0	0
-80.0	0
-75.0	1
-70.0	3
-65.0	5
-60.0	8
-55.0	11
-50.0	16
-45.0	26
-40.0	44
-35.0	68
-30.0	102
-25.0	193
-20.0	453
-15.0	1430
-10.0	4928
-5.0	12917
0.0	19138
5.0	14224
10.0	5834
15.0	1765
20.0	542
25.0	223
30.0	114
35.0	72
40.0	45
45.0	26
50.0	16
55.0	11
60.0	7
65.0	5
70.0	4
75.0	3
80.0	1
85.0	1
90.0	6



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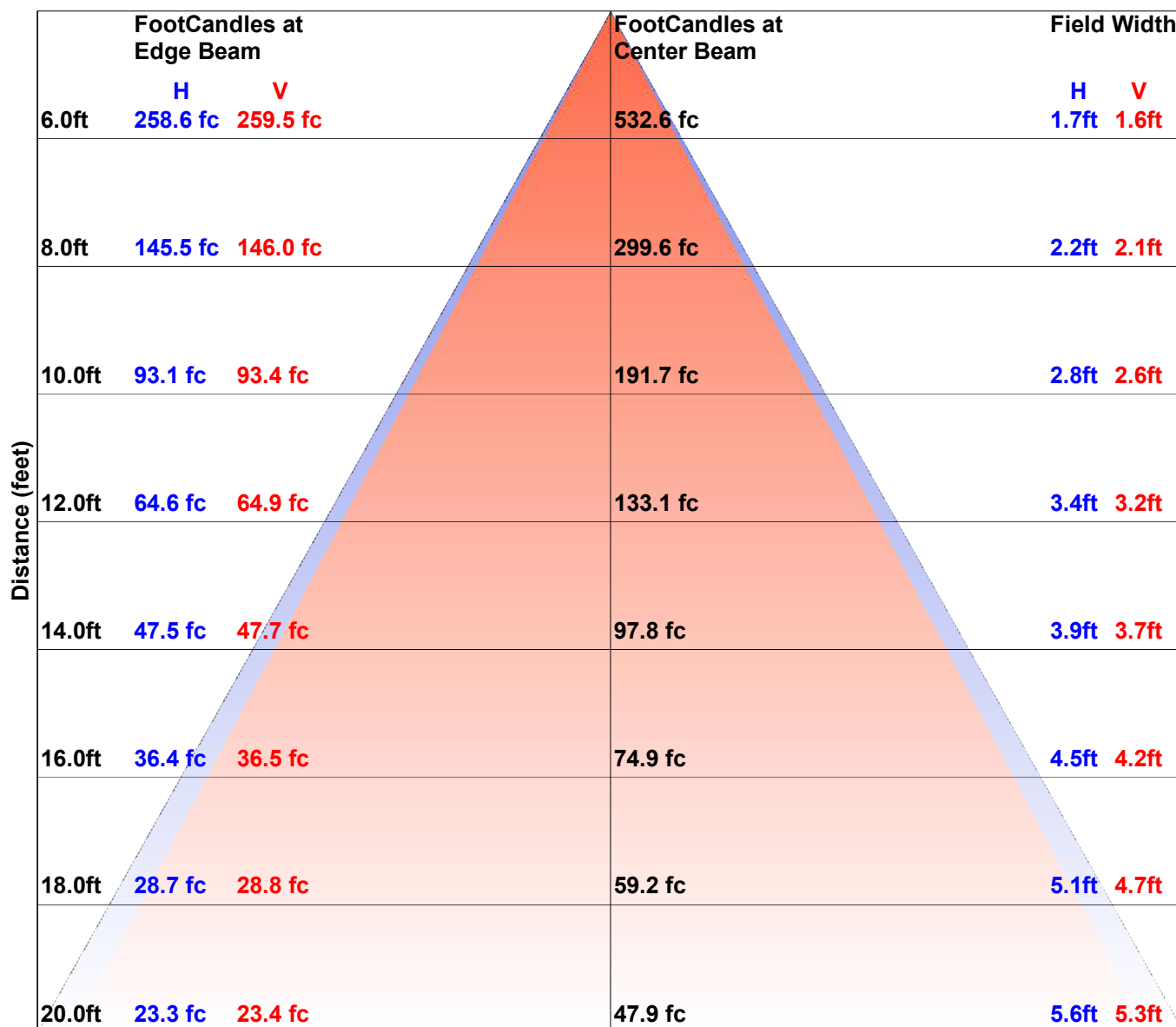
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## Photometric Report: S1609161-R1

Prepared for: Lumenpulse · Test Date: 16 September 2016

Floodlight: LUMENFACADE · Lumcat: LOG-RO-120-48-40K-10x10-SI-NO

### Downlight Beam



— Horizontal (16.0 °) — Vertical (15.0 °)





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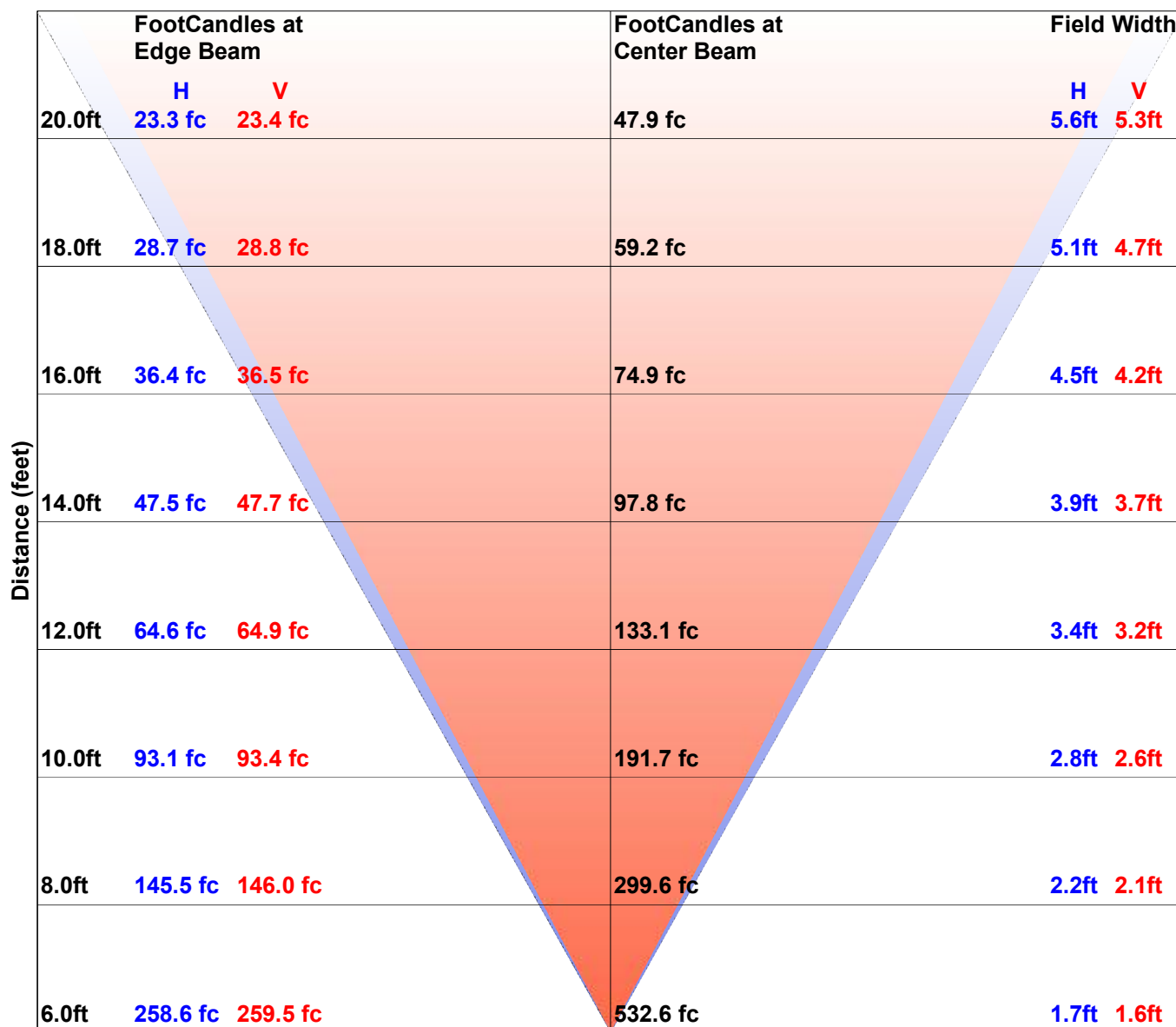
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Prepared for: Lumenpulse · Test Date: 16 September 2016

Floodlight: LUMENFACADE · Lumcat: LOG-RO-120-48-40K-10x10-SI-NO

### Uplight Beam



— Horizontal (16.0 °) — Vertical (15.0 °)



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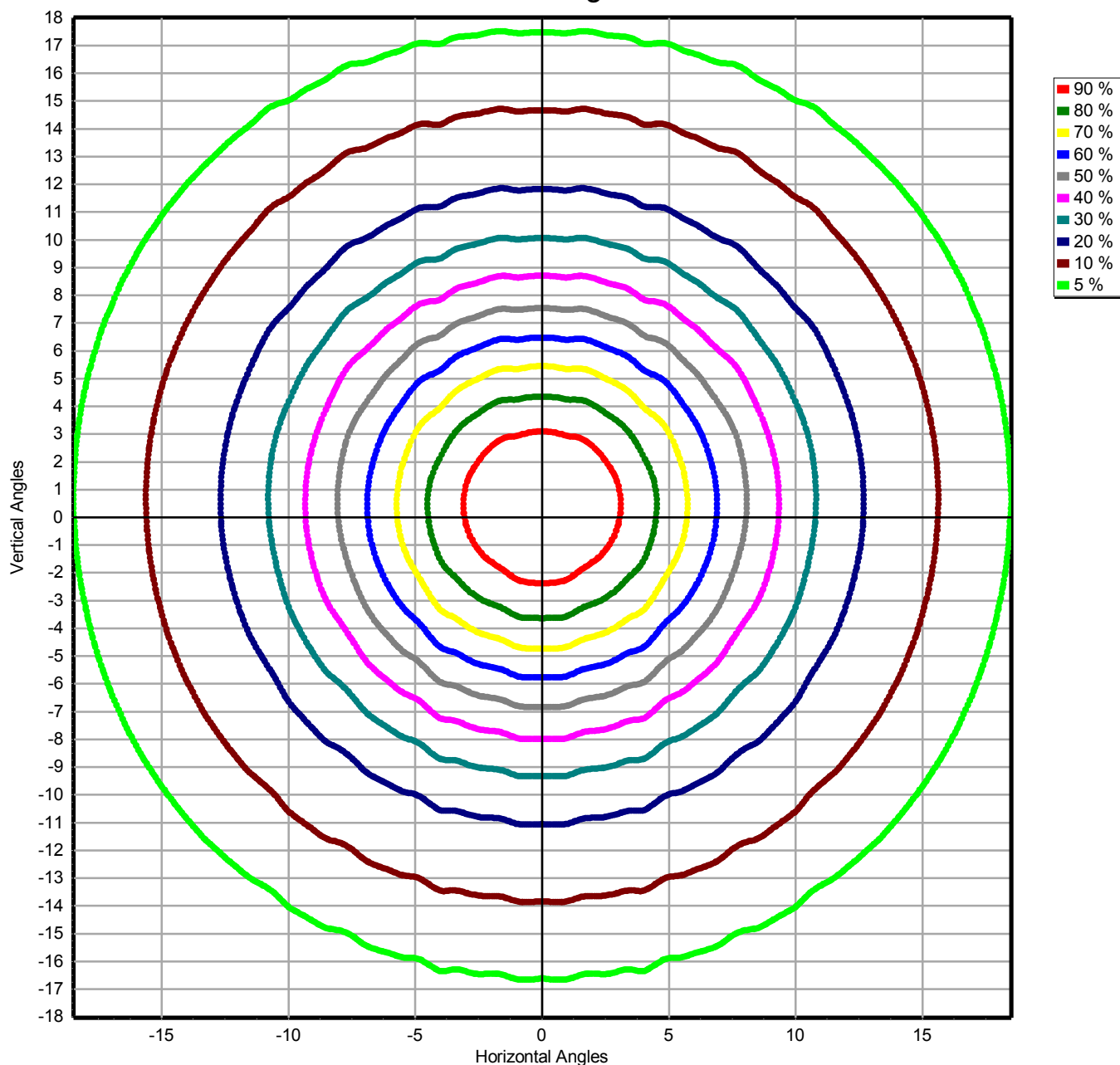
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## Photometric Report: S1609161-R1

Prepared for: Lumenpulse · Test Date: 16 September 2016

Floodlight: LUMENFACADE · Lumcat: LOG-RO-120-48-40K-10x10-SI-NO

### ISO Candela Diagram





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## IES File Headers

IESNA:LM-63-2002  
[ISSUEDATE] 16 September 2016  
[TESTLAB] Spectra Lux Industries Inc.  
[TEST] S1609161-R1  
[MANUFAC] Lumenpulse  
[LUMCAT] LOG-RO-120-48-40K-10x10-SI-NO  
[LUMINAIRE] LUMENFACADE  
[LAMP] Cluster of 24 CREE XPE2 LED's c/w MEAN WELL USA inc. Driver LPF-40-24 @ 120.00V  
[\_BURNING] Axial (1,884 Luminaire Lumens)  
[\_REFLECTOR] None  
[\_LENS] Glass Lens with Polycarbonate Diffuser  
[\_HOUSING] Extruded Aluminum  
[DISTRIBUTION] NEMA 3Hx3V (Max. CP at 0.0H,0.5V)  
[MORE] (Based on IES LM-35-1989)

## Candela Table

### Horizontal Angles

	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
V e r t i c a l  A n g l e s	-90.0	8	8	8	8	8	8	8	8
	-85.0	0	1	1	1	1	1	1	1
	-75.0	1	2	3	3	2	1	2	3
	-65.0	5	4	6	5	4	5	6	4
	-55.0	11	11	10	11	11	10	9	11
	-45.0	26	27	26	27	25	26	26	26
	-35.0	68	67	66	66	65	67	66	67
	-25.0	193	195	194	189	190	188	188	189
	-20.0	453	457	454	442	438	439	433	432
	-15.0	1430	1442	1436	1383	1366	1368	1335	1308
	-12.5	2681	2692	2677	2576	2542	2534	2468	2410
	-12.0	3036	3050	3033	2918	2876	2867	2790	2721
	-11.5	3436	3447	3429	3300	3252	3236	3150	3070
	-11.0	3886	3897	3873	3727	3671	3650	3551	3459
	-10.5	4379	4388	4363	4200	4133	4109	3995	3888
	-10.0	4928	4937	4906	4722	4647	4613	4484	4362
	-9.5	5526	5532	5498	5297	5211	5166	5020	4881
	-9.0	6181	6186	6145	5921	5823	5770	5607	5444
A n g l e s	-8.5	6890	6889	6844	6600	6488	6423	6238	6053
	-8.0	7645	7642	7590	7325	7198	7119	6913	6706
	-7.5	8448	8446	8388	8098	7957	7863	7632	7400
	-7.0	9287	9283	9219	8910	8752	8639	8385	8124
	-6.5	10167	10160	10086	9758	9586	9451	9172	8885
	-6.0	11069	11060	10982	10634	10441	10288	9982	9664
	-5.5	11994	11983	11893	11528	11318	11141	10810	10459
	-5.0	12917	12900	12803	12428	12198	11994	11638	11259
	-4.5	13830	13813	13708	13320	13075	12844	12460	12051
	-4.0	14713	14696	14583	14188	13924	13669	13262	12819
	-3.5	15562	15539	15421	15023	14741	14460	14027	13557
	-3.0	16351	16326	16198	15804	15508	15201	14746	14246
	-2.5	17074	17047	16909	16521	16208	15876	15404	14876
	-2.0	17708	17674	17534	17158	16833	16471	15984	15436
	-1.5	18243	18207	18061	17699	17363	16982	16480	15909
	-1.0	18665	18628	18476	18135	17791	17388	16875	16288
	-0.5	18967	18922	18769	18453	18104	17680	17159	16562



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## Horizontal Angles

	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	
V e r t i c a l	0.0	19138	19092	18935	18646	18295	17857	17333	16728	16089
	0.5	19173	19126	18968	18707	18356	17905	17386	16777	16107
	1.0	19069	19019	18859	18634	18286	17824	17311	16705	16013
	1.5	18832	18780	18624	18429	18089	17623	17118	16519	15806
	2.0	18465	18412	18257	18097	17764	17298	16810	16219	15497
	2.5	17982	17928	17775	17649	17327	16863	16391	15819	15089
	3.0	17386	17336	17187	17095	16785	16329	15875	15323	14591
	3.5	16699	16650	16505	16443	16148	15701	15271	14742	14019
	4.0	15928	15878	15743	15711	15432	14996	14591	14090	13380
	4.5	15099	15052	14921	14912	14654	14236	13854	13382	12692
A n g l e s	5.0	14224	14175	14055	14068	13826	13428	13076	12628	11962
	5.5	13316	13269	13155	13189	12964	12588	12262	11849	11213
	6.0	12389	12347	12242	12292	12087	11732	11433	11052	10443
	6.5	11463	11423	11327	11386	11199	10870	10597	10246	9675
	7.0	10547	10511	10423	10495	10327	10017	9772	9453	8921
	7.5	9659	9625	9545	9622	9469	9189	8966	8676	8182
	8.0	8805	8775	8702	8783	8646	8390	8191	7928	7473
	8.5	7991	7960	7895	7980	7857	7625	7448	7213	6797
	9.0	7224	7198	7138	7221	7114	6904	6746	6538	6158
	9.5	6501	6478	6426	6507	6412	6226	6087	5901	5555
	10.0	5834	5814	5767	5846	5764	5595	5475	5310	5001
	10.5	5217	5200	5160	5235	5162	5013	4906	4763	4485
	11.0	4658	4642	4605	4675	4612	4481	4390	4263	4016
	11.5	4144	4128	4097	4165	4112	3994	3915	3805	3587
	12.0	3683	3671	3643	3703	3657	3556	3485	3392	3197
	12.5	3265	3254	3229	3286	3245	3157	3099	3014	2842
	15.0	1765	1761	1750	1784	1766	1720	1694	1656	1569
	20.0	542	542	539	549	546	534	532	523	500
	25.0	223	220	222	225	224	219	219	217	213
	35.0	72	73	73	73	73	74	73	72	72
45.0	26	27	29	28	25	26	27	27	27	
55.0	11	9	9	9	11	10	8	10	10	
65.0	5	5	3	4	5	4	4	4	4	
75.0	3	2	3	3	2	3	2	1	2	
85.0	1	1	1	1	1	2	1	1	1	
90.0	6	6	6	6	6	6	6	6	6	



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## Horizontal Angles

	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
V e r t i c a l  A n g l e s	-90.0	8	8	8	8	8	8	8	8
	-85.0	1	2	2	0	1	1	1	1
	-75.0	2	3	3	3	2	3	2	2
	-65.0	5	4	4	4	4	5	5	3
	-55.0	10	10	11	11	10	8	11	11
	-45.0	26	26	26	25	26	26	24	25
	-35.0	66	64	64	66	64	65	62	62
	-25.0	182	178	179	176	175	172	167	164
	-20.0	414	399	400	389	383	373	354	344
	-15.0	1243	1180	1169	1129	1094	1048	974	934
	-12.5	2265	2139	2104	2017	1941	1846	1702	1614
	-12.0	2555	2407	2367	2265	2176	2065	1902	1800
	-11.5	2876	2708	2657	2542	2437	2310	2123	2007
	-11.0	3234	3044	2982	2847	2728	2581	2369	2235
	-10.5	3630	3413	3337	3183	3043	2876	2639	2485
	-10.0	4063	3818	3731	3552	3393	3202	2933	2757
	-9.5	4537	4264	4158	3953	3770	3555	3255	3053
	-9.0	5056	4748	4623	4391	4180	3935	3599	3373
	-8.5	5614	5271	5124	4862	4622	4348	3973	3718
	-8.0	6207	5829	5656	5361	5092	4782	4371	4081
	-7.5	6843	6422	6223	5893	5588	5243	4790	4468
	-7.0	7503	7047	6815	6446	6107	5724	5230	4871
	-6.5	8192	7696	7430	7023	6646	6223	5686	5290
	-6.0	8905	8366	8063	7615	7196	6734	6155	5719
	-5.5	9629	9051	8710	8222	7761	7256	6634	6157
	-5.0	10352	9736	9351	8823	8321	7774	7113	6595
	-4.5	11073	10420	9993	9421	8876	8288	7587	7029
	-4.0	11772	11085	10613	10002	9419	8787	8051	7451
	-3.5	12442	11725	11206	10559	9933	9263	8495	7857
	-3.0	13069	12327	11763	11080	10415	9707	8911	8237
	-2.5	13642	12878	12273	11555	10854	10117	9295	8585
	-2.0	14149	13370	12722	11979	11244	10474	9641	8900
	-1.5	14583	13792	13106	12334	11572	10780	9934	9167
	-1.0	14929	14135	13414	12623	11837	11028	10177	9389
	-0.5	15178	14389	13636	12832	12028	11203	10358	9555
	0.0	15333	14553	13771	12960	12141	11312	10476	9660
	0.5	15380	14617	13814	13001	12176	11346	10526	9706
	1.0	15317	14579	13758	12951	12124	11302	10507	9690
	1.5	15152	14440	13613	12814	11992	11185	10418	9608
	2.0	14885	14203	13377	12596	11786	10997	10262	9466
	2.5	14522	13878	13056	12301	11507	10741	10046	9268
	3.0	14075	13467	12661	11929	11158	10422	9769	9017
	3.5	13549	12982	12199	11497	10754	10051	9442	8718
	4.0	12958	12434	11673	11010	10298	9632	9068	8379
	4.5	12316	11833	11105	10477	9802	9175	8657	8003
	5.0	11636	11195	10501	9914	9276	8690	8220	7602
	5.5	10924	10524	9868	9327	8728	8183	7758	7182
	6.0	10200	9840	9225	8722	8166	7664	7283	6749
	6.5	9469	9147	8576	8114	7601	7141	6802	6307
	7.0	8745	8460	7931	7511	7041	6620	6321	5868
	7.5	8039	7785	7300	6919	6490	6110	5845	5433
	8.0	7357	7135	6692	6348	5958	5617	5388	5012
	8.5	6701	6507	6105	5799	5448	5138	4943	4605
	9.0	6084	5914	5552	5278	4963	4689	4517	4215



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

## Horizontal Angles

	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5
9.5	5500	5354	5028	4786	4507	4262	4116	3846	3499
10.0	4956	4832	4541	4327	4080	3862	3737	3500	3186
10.5	4456	4349	4089	3899	3681	3490	3385	3173	2891
11.0	3994	3905	3673	3507	3318	3149	3060	2872	2622
11.5	3572	3496	3291	3148	2981	2831	2760	2595	2370
12.0	3189	3125	2945	2820	2673	2544	2482	2339	2141
12.5	2842	2789	2630	2522	2394	2282	2232	2107	1930
15.0	1576	1559	1475	1424	1363	1308	1291	1230	1136
20.0	505	507	485	472	461	449	448	432	410
25.0	213	214	208	206	204	198	199	196	189
35.0	71	73	71	70	69	72	69	69	68
45.0	28	27	27	28	26	27	27	25	26
55.0	9	9	8	9	10	12	9	10	10
65.0	4	6	4	4	5	5	4	5	4
75.0	1	2	3	2	3	3	1	2	3
85.0	1	1	0	1	1	1	1	1	1
90.0	6	6	6	6	6	6	6	6	6

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## Horizontal Angles

	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	15.0
V e r t i c a l  A n g l e s	-90.0	8	8	8	8	8	8	8	8
	-85.0	0	1	1	1	2	1	1	2
	-75.0	3	2	3	3	2	1	2	3
	-65.0	4	5	4	5	4	5	4	5
	-55.0	10	9	10	10	9	10	9	10
	-45.0	25	25	27	25	24	25	24	23
	-35.0	62	60	61	60	59	59	57	54
	-25.0	161	157	155	149	147	146	139	124
	-20.0	334	322	313	294	285	278	259	213
	-15.0	874	829	787	726	684	658	586	429
	-12.5	1484	1392	1310	1192	1111	1055	984	630
	-12.0	1647	1544	1449	1317	1224	1160	1079	681
	-11.5	1829	1709	1602	1451	1346	1273	1181	735
	-11.0	2030	1893	1770	1600	1482	1397	1294	792
	-10.5	2246	2090	1951	1762	1627	1531	1414	853
	-10.0	2481	2305	2147	1935	1784	1676	1542	917
	-9.5	2738	2538	2359	2122	1954	1827	1682	986
	-9.0	3012	2786	2585	2323	2131	1991	1828	1057
	-8.5	3304	3052	2827	2537	2325	2166	1983	1132
	-8.0	3615	3334	3080	2762	2527	2347	2146	1208
	-7.5	3941	3628	3348	3000	2738	2538	2315	1286
	-7.0	4279	3934	3623	3243	2959	2736	2487	1366
	-6.5	4630	4253	3910	3497	3185	2937	2669	1448
	-6.0	4989	4573	4199	3754	3415	3143	2850	1530
	-5.5	5349	4901	4493	4017	3649	3352	3032	1612
	-5.0	5710	5227	4785	4279	3881	3556	3215	1691
	-4.5	6067	5547	5072	4535	4109	3760	3393	1770
	-4.0	6411	5855	5349	4787	4335	3956	3563	1845
	-3.5	6740	6153	5614	5026	4547	4141	3728	1915
	-3.0	7047	6427	5858	5250	4745	4316	3881	1982
	-2.5	7325	6679	6082	5455	4929	4476	4020	2042
	-2.0	7574	6903	6282	5639	5094	4616	4146	2095
	-1.5	7785	7091	6451	5797	5234	4736	4251	2141
	-1.0	7953	7244	6584	5927	5351	4836	4338	2178
	-0.5	8077	7356	6684	6026	5438	4907	4402	2207
	0.0	8154	7424	6742	6089	5498	4952	4443	2225
	0.5	8177	7447	6762	6118	5525	4975	4460	2233
	1.0	8151	7423	6741	6111	5519	4962	4453	2231
	1.5	8072	7352	6676	6065	5480	4923	4419	2217
	2.0	7943	7242	6576	5986	5412	4860	4362	2194
	2.5	7771	7087	6437	5874	5312	4766	4283	2162
	3.0	7556	6891	6263	5728	5186	4650	4182	2120
	3.5	7300	6667	6060	5556	5035	4513	4061	2069
	4.0	7015	6410	5830	5360	4860	4355	3926	2012
	4.5	6701	6127	5578	5138	4666	4181	3770	1946
	5.0	6366	5828	5308	4904	4459	3996	3608	1876
	5.5	6018	5513	5028	4658	4238	3800	3436	1802
	6.0	5657	5189	4736	4399	4009	3596	3256	1724
	6.5	5290	4861	4441	4137	3775	3389	3074	1641
	7.0	4929	4534	4147	3874	3540	3180	2891	1561
	7.5	4568	4210	3856	3611	3306	2973	2705	1476
	8.0	4220	3894	3572	3355	3078	2771	2526	1395
	8.5	3884	3590	3299	3107	2854	2572	2351	1314
	9.0	3562	3297	3035	2866	2638	2382	2180	1233



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

## Horizontal Angles

	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	15.0
9.5	3255	3022	2784	2638	2433	2199	2018	1845	1157
10.0	2969	2762	2550	2421	2237	2025	1863	1706	1083
10.5	2699	2514	2327	2215	2052	1861	1713	1574	1009
11.0	2450	2289	2121	2024	1878	1708	1576	1450	942
11.5	2221	2078	1930	1847	1716	1563	1446	1333	877
12.0	2008	1882	1752	1680	1567	1428	1324	1226	815
12.5	1812	1703	1588	1527	1427	1303	1212	1123	756
15.0	1078	1021	962	936	885	817	768	721	515
20.0	394	383	367	364	351	331	319	306	246
25.0	186	182	177	177	173	167	163	159	140
35.0	67	67	66	67	67	64	65	63	59
45.0	26	24	24	25	25	25	24	25	23
55.0	11	9	10	10	9	10	9	10	10
65.0	2	4	6	4	4	4	5	4	4
75.0	2	0	2	4	3	3	4	2	2
85.0	1	1	1	1	1	2	1	2	2
90.0	6	6	6	6	6	6	6	6	6

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## Horizontal Angles

	20.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0
V e r t i c a l  A n g l e s	-90.0	8	8	8	8	8	8	8	8
	-85.0	2	1	2	4	4	3	2	4
	-75.0	1	3	4	4	5	4	3	2
	-65.0	5	4	4	6	4	4	3	3
	-55.0	9	8	7	7	6	4	2	3
	-45.0	21	19	16	12	9	4	3	3
	-35.0	47	40	29	21	14	6	4	3
	-25.0	97	74	47	32	21	12	4	3
	-20.0	141	99	56	35	24	14	7	3
	-15.0	230	134	65	38	25	16	7	4
	-12.5	296	158	69	42	28	17	9	3
	-12.0	312	163	69	40	26	17	8	5
	-11.5	329	167	71	41	28	18	8	4
	-11.0	345	174	72	43	28	17	9	2
	-10.5	362	177	73	42	27	17	8	4
	-10.0	380	183	73	41	29	17	9	3
	-9.5	397	186	74	43	28	17	9	4
	-9.0	416	191	74	42	28	16	9	5
	-8.5	436	195	75	43	29	19	8	4
	-8.0	453	201	76	44	28	17	10	4
	-7.5	473	205	76	43	27	16	8	3
	-7.0	491	210	77	43	29	18	9	3
	-6.5	509	213	76	44	29	18	10	4
	-6.0	528	218	76	42	29	18	9	5
	-5.5	547	222	77	43	30	19	9	4
	-5.0	564	225	78	45	29	19	9	4
	-4.5	580	229	78	43	28	17	8	4
	-4.0	596	231	78	45	29	19	9	4
	-3.5	609	235	78	45	29	19	10	4
	-3.0	623	237	79	43	29	18	7	4
	-2.5	637	240	79	44	29	19	9	5
	-2.0	646	243	79	44	30	18	9	5
	-1.5	657	245	79	45	29	19	9	4
	-1.0	666	245	79	44	30	18	10	4
	-0.5	668	246	79	45	29	17	8	4
	0.0	675	247	79	45	29	19	8	4
	0.5	685	266	80	45	29	19	9	4
	1.0	677	259	79	45	29	17	9	4
	1.5	674	247	78	45	28	19	8	3
	2.0	670	246	80	43	30	19	9	4
	2.5	662	246	79	45	29	17	9	4
	3.0	657	243	78	45	29	18	8	4
	3.5	646	242	78	43	30	18	8	4
	4.0	634	239	78	44	31	16	9	5
	4.5	623	237	78	44	28	18	8	4
	5.0	609	233	78	42	28	18	10	5
	5.5	590	230	77	43	30	17	9	5
	6.0	576	226	76	43	27	18	8	4
	6.5	559	223	76	42	29	19	10	4
	7.0	538	219	75	43	28	17	9	5
	7.5	523	215	74	42	28	17	8	4
	8.0	503	210	75	42	29	18	10	4
	8.5	483	206	74	42	28	17	8	5
	9.0	464	201	73	41	26	17	8	4



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## Horizontal Angles

	20.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	
V e r t i c a l	9.5	445	196	73	40	28	17	9	4	3
	10.0	425	191	72	41	27	16	9	4	3
	10.5	407	187	71	40	26	18	8	5	3
	11.0	389	182	72	39	28	17	9	5	3
	11.5	370	177	70	41	28	16	9	4	2
	12.0	355	173	68	40	26	17	8	4	4
	12.5	337	167	70	39	27	15	8	5	4
	15.0	261	145	64	39	24	16	6	4	3
	20.0	157	105	56	35	23	14	6	3	3
	25.0	104	80	49	32	20	12	5	3	3
	35.0	52	44	33	22	15	7	5	3	3
	45.0	21	18	14	12	8	4	2	4	3
	55.0	8	8	8	8	7	3	2	4	4
	65.0	4	3	4	5	5	4	2	4	4
	75.0	1	1	2	3	4	3	1	3	3
	85.0	1	2	3	3	4	3	2	3	3
	90.0	6	6	6	6	6	6	6	6	6

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