

Report of Test

LLIA000676-001A

Catalog Number: ML3WL-D-MO-K40-4-X-LOH-X-X-UNV

Pendant mounted, extruded aluminum housing, white inner reflector, white plastic enclosure.

144 white LEDs, four Osram PrevaLED Bar boards with 36 LEDs each.

One Osram Optotronic OTi 30/120-277/1A0 DIM L LED driver.

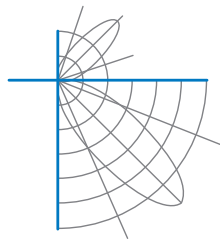
120.0Vac, 60.0Hz, 0.1442A, 17.19W, 0.994PF, 5.31%THD(i)



Performance Summary

Total Light Output	1713 lm
Luminaire Power	17.2 W
Luminous Efficacy	99.6 lm/W

PREPARED FOR : Precision Architectural Lighting, 4830 Timber Creek Drive, Houston, TX



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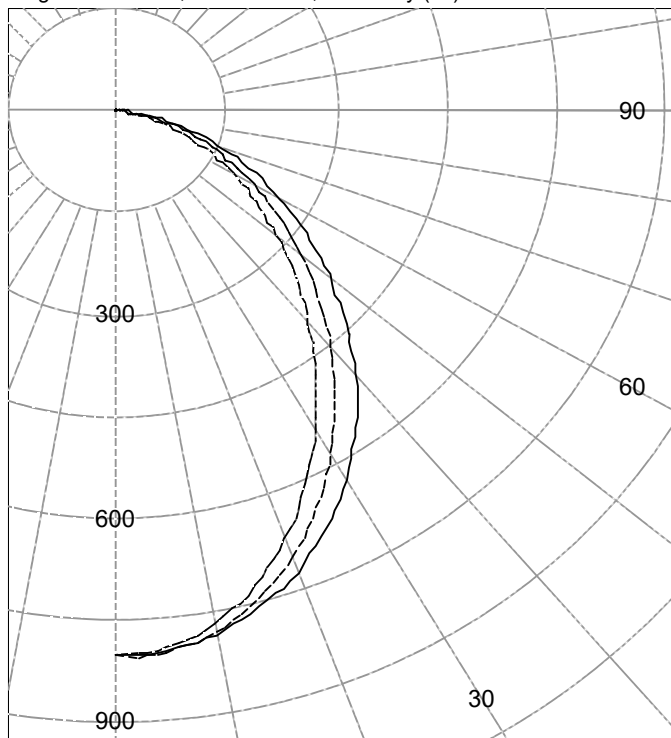
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Legend: C0-Solid, C45-Dashed, C90-Grey (cd)



INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	804	804	804	804	804	
5.0	799	795	801	798	793	75
10.0	783	777	779	773	767	
15.0	758	749	745	733	726	209
20.0	722	711	699	680	671	
25.0	678	664	644	620	609	295
30.0	626	609	583	554	542	
35.0	569	549	518	486	473	324
40.0	506	486	453	419	406	
45.0	441	422	389	355	344	301
50.0	377	360	328	296	285	
55.0	315	300	270	241	232	243
60.0	256	244	216	192	183	
65.0	199	189	166	145	138	166
70.0	146	138	120	103	96	
75.0	98	92	78	65	60	83
80.0	55	51	41	32	29	
85.0	21	18	11	7	6	16
90.0	0	0	0	0	0	

AVERAGE LUMINANCE (cd / m²)

Gamma	C0	C45	C90
45.0	6294	5552	4902
55.0	5536	4746	4086
65.0	4758	3960	3284
75.0	3805	3024	2340
85.0	2423	1291	694

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	579	N / A	33.8
0-40	903	N / A	52.7
0-60	1447	N / A	84.5
0-90	1713	N / A	100.0
40-90	809	N / A	47.3
60-90	266	N / A	15.5
90-180	0	N / A	0.0
0-180	1713	N / A	100.0

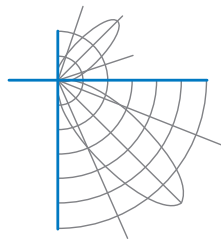
Total Light Output = 1,713 lm

Spacing Criterion: 0-180 1.2
Spacing Criterion: 90-270 1.1

Signed:

Michael L. Grather
Authorized Signatory

Date of test 29-Nov-2016
Date of report 30-Nov-2016



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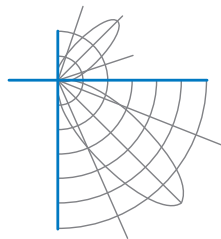
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120.0Vac, 60.0Hz, 0.1442A, 17.19W, 0.994PF, 5.31%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	804	804	804	804	804
2.5	803	799	806	804	800
5.0	799	795	801	798	793
7.5	792	787	792	787	782
10.0	783	777	779	773	767
12.5	772	765	764	755	748
15.0	758	749	745	733	726
17.5	741	731	723	708	700
20.0	722	711	699	680	671
22.5	701	688	673	651	641
25.0	678	664	644	620	609
27.5	653	637	614	587	576
30.0	626	609	583	554	542
32.5	598	580	551	520	507
35.0	569	549	518	486	473
37.5	538	518	486	452	440
40.0	506	486	453	419	406
42.5	474	454	421	386	375
45.0	441	422	389	355	344
47.5	409	391	358	325	314
50.0	377	360	328	296	285
52.5	345	330	298	268	258
55.0	315	300	270	241	232
57.5	285	272	242	216	207
60.0	256	244	216	192	183
62.5	227	216	190	168	160
65.0	199	189	166	145	138
67.5	172	163	142	123	116
70.0	146	138	120	103	96
72.5	121	114	98	83	78
75.0	98	92	78	65	60
77.5	75	71	59	48	44
80.0	55	51	41	32	29
82.5	37	34	25	18	16
85.0	21	18	11	7	6
87.5	8	5	1	0	0
90.0	0	0	0	0	0



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Coefficients Of Utilization - Zonal Cavity Method

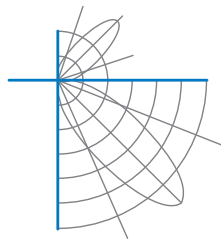
Effective Floor Cavity Reflectance 0.20

RC RW	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86
2	101	93	87	82	98	91	86	81	88	83	79	85	81	77	82	78	75	73
3	93	83	75	69	90	81	74	69	78	72	67	76	71	66	73	69	65	63
4	85	74	66	60	83	73	65	59	70	64	58	68	62	58	66	61	57	55
5	79	67	58	52	77	66	58	52	64	57	51	62	56	51	60	54	50	48
6	73	61	52	46	71	60	52	46	58	51	45	56	50	45	55	49	45	43
7	68	55	47	41	66	54	47	41	53	46	41	52	45	40	50	44	40	38
8	64	51	43	37	62	50	42	37	49	42	37	47	41	36	46	41	36	34
9	60	47	39	34	58	46	39	33	45	38	33	44	38	33	43	37	33	31
10	56	43	36	31	55	43	36	31	42	35	30	41	35	30	40	34	30	29

For absolute test reports, CUs are expressed as a percentage of total lumen output. Calculations were based on published IES procedures, and are based on the zonal cavity method. Basic assumptions: 1) Room surfaces are lambertian reflectors. 2) Incident flux on each surface is uniformly distributed. 3) The room is spectrally neutral. When luminaires are not evenly distributed throughout the room, or do not exhibit lateral symmetry, CU values may differ from actual performance.

Circle of Light Plot

Height(ft)	Illuminance at Nadir (fc)	Beam Width (across 50% Nadir Illum)	
		0-180	90-270
6.0	22.3	7.00	6.24
8.0	12.6	9.33	8.32
10.0	8.0	11.66	10.40
12.0	5.6	13.99	12.48
14.0	4.1	16.32	14.56
16.0	3.1	18.66	16.64



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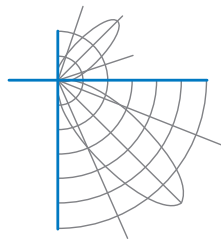
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Test Distance 9.5 m
Test Temperature 24.5 °C

Notes

The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.

Tested in accordance with the applicable sections of publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2011, ANSI C82.77:2002.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

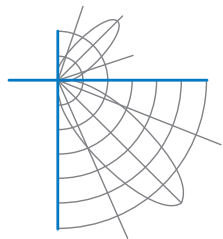
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE Gamma coordinate system as defined in CIE publication number 121.

This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.

This report must not be used by the customer to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the Federal Government.



Report of Test

LLIA000676-001B

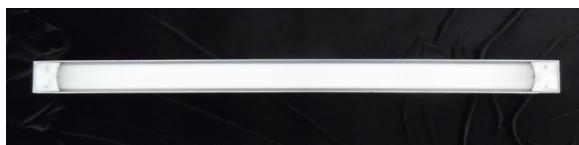
Integrating Sphere Report

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Performance Summary

Voltage	120.0 Vac
Current	0.1441 A
Power	17.18 W
Frequency	60.00 Hz
Power Factor	0.994
Current THD	5.4 %
Total Luminous Flux	1767.5 lm
Efficacy	102.9 lm/W
Chromaticity (x,y)	(0.3810, 0.3790)
(u',v')	(0.2246, 0.5026)
Duv	0.0009
CCT	4002 K
CRI (Ra)	83
R9	14

Prepared For:

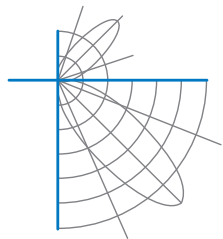
Precision Architectural Lighting

4830 Timber Creek Drive

Houston, TX 77017, USA

Test date: 11/28/2016

Report date: 11/30/2016



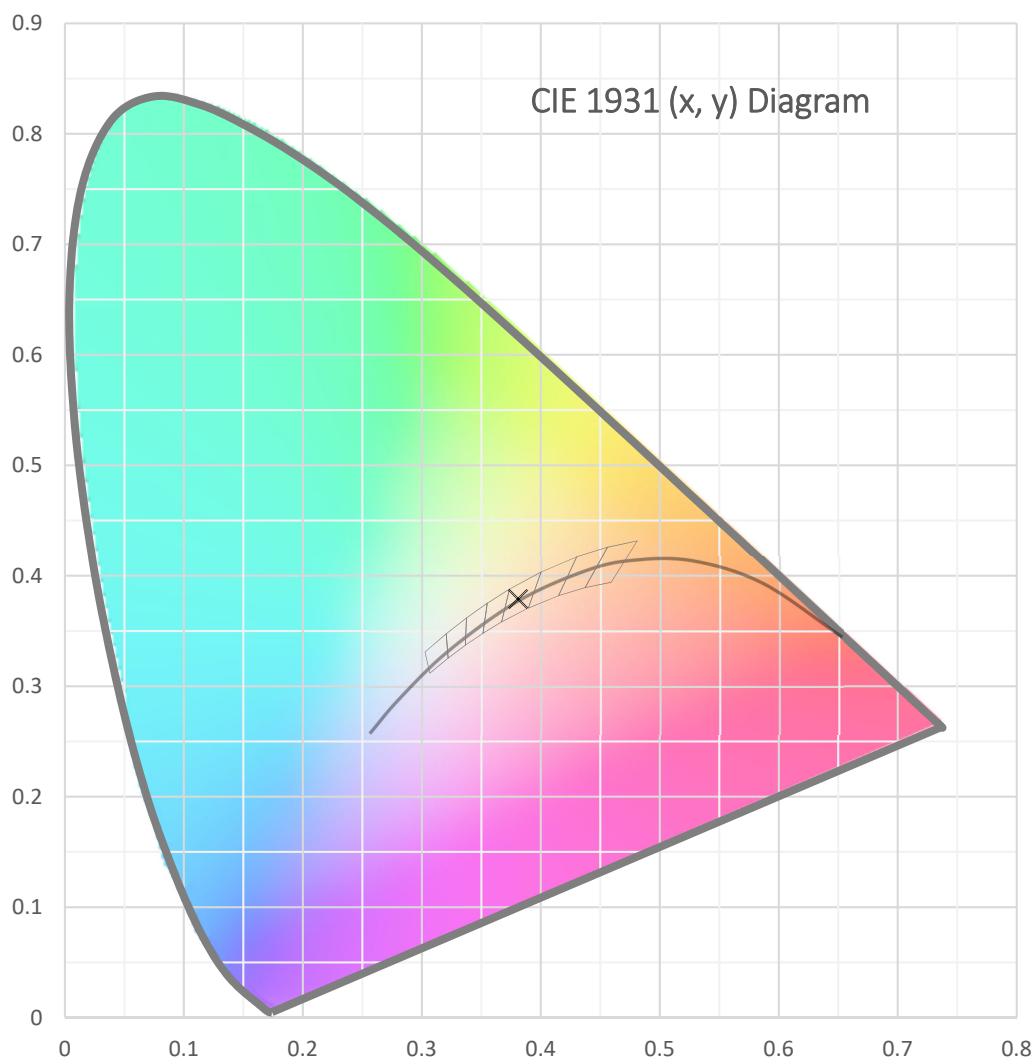
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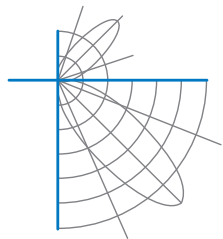
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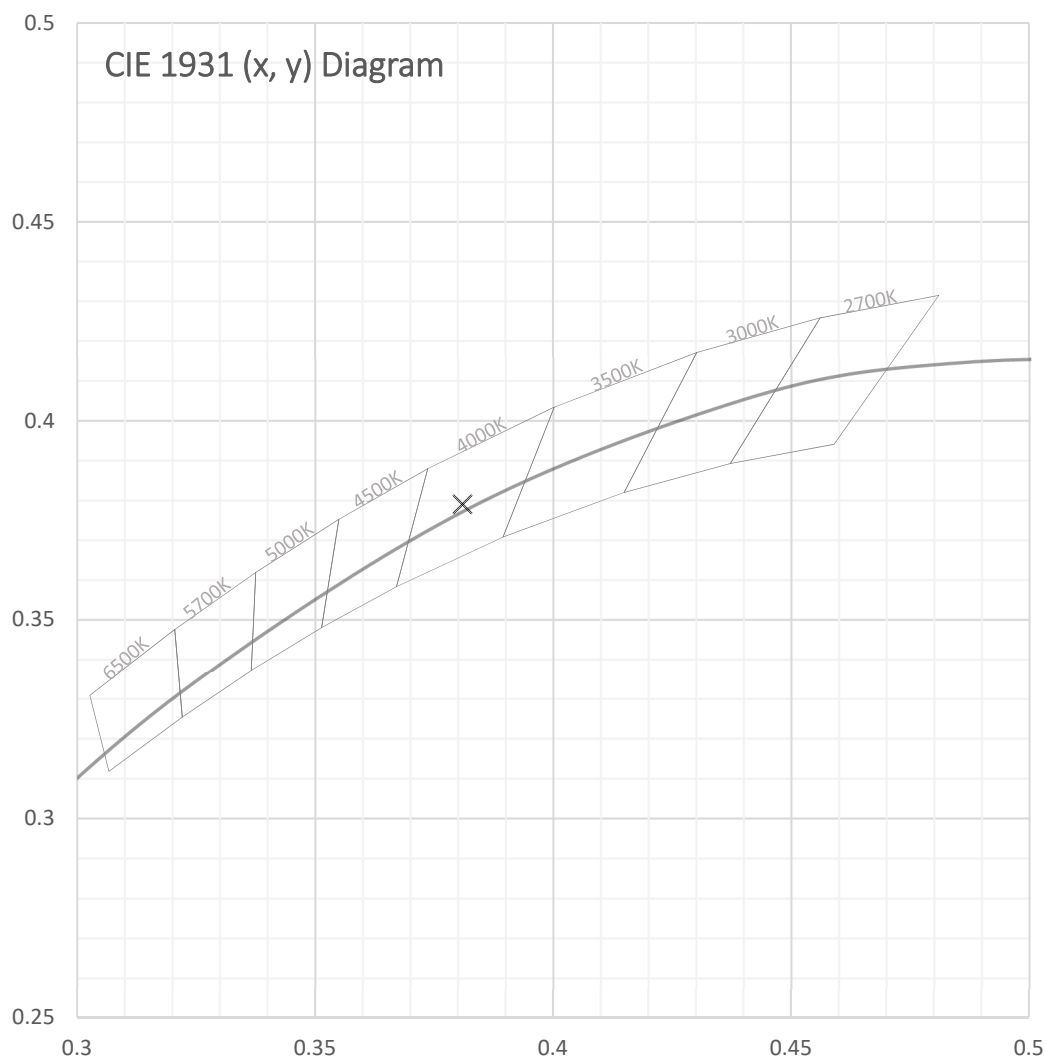
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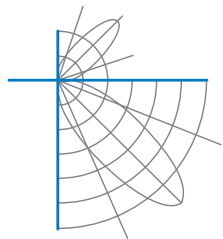
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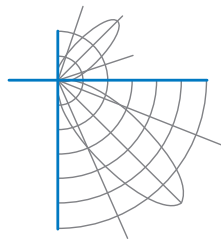
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Spectral Data

Total Radiant Flux	5.455 W
Total Luminous Flux	1767.5 Lm
Chromaticity CIE 1931 (x, y)	(0.3810, 0.3790)
Chromaticity CIE 1976 (u', v')	(0.2246, 0.5026)
Correlated Color Temperature (CCT)	4002 K
Color Rendering Index (Ra)	83
R1	82
R2	89
R3	94
R4	81
R5	81
R6	84
R7	87
R8	67
R9	14
R10	73
R11	79
R12	58
R13	84
R14	97
Distance from Planckian Locus (Duv)	0.0009
Scotopic/Photopic Ratio *	1.681

Electrical Data

Voltage	120.0 Vac
Current	0.1441 A
Power	17.18 W
Frequency	60.00 Hz
Power Factor	0.994
Current THD	5.4 %



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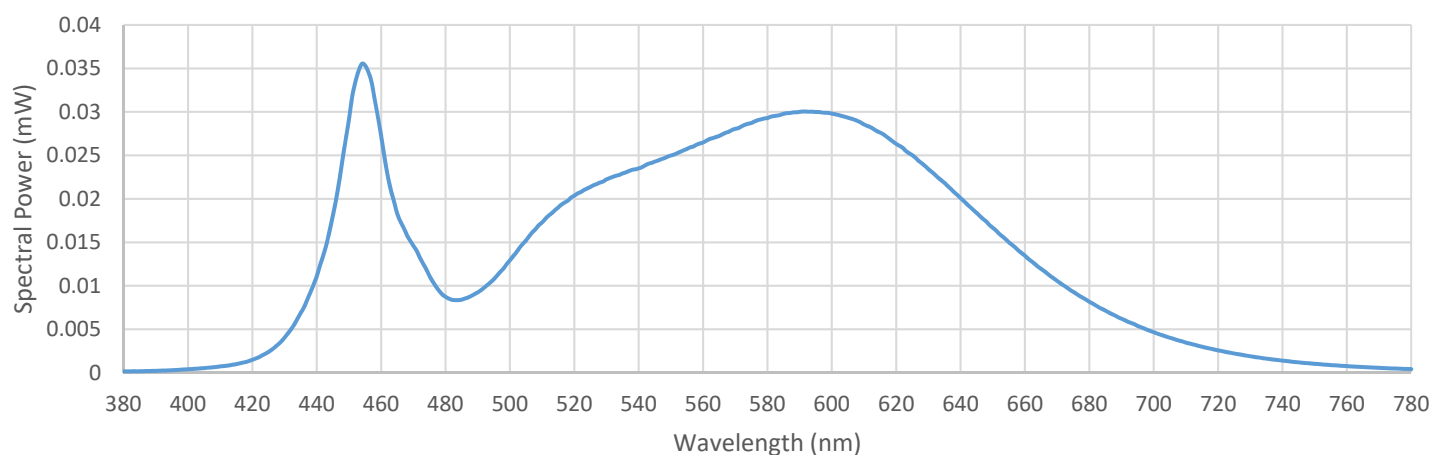
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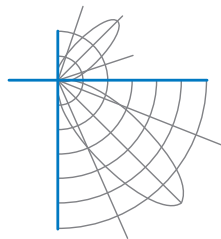
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000159	480	0.008734	580	0.029291	680	0.008170
385	0.000175	485	0.008406	585	0.029778	685	0.007149
390	0.000227	490	0.009251	590	0.030004	690	0.006222
395	0.000295	495	0.010757	595	0.029982	695	0.005390
400	0.000408	500	0.012926	600	0.029803	700	0.004675
405	0.000540	505	0.015217	605	0.029329	705	0.004028
410	0.000730	510	0.017283	610	0.028555	710	0.003472
415	0.000989	515	0.019008	615	0.027621	715	0.003000
420	0.001495	520	0.020358	620	0.026318	720	0.002579
425	0.002400	525	0.021372	625	0.025026	725	0.002212
430	0.004046	530	0.022243	630	0.023418	730	0.001903
435	0.006867	535	0.022921	635	0.021832	735	0.001628
440	0.011104	540	0.023505	640	0.020089	740	0.001396
445	0.018085	545	0.024280	645	0.018375	745	0.001203
450	0.029129	550	0.024985	650	0.016673	750	0.001035
455	0.035347	555	0.025742	655	0.015005	755	0.000888
460	0.027220	560	0.026479	660	0.013468	760	0.000768
465	0.018300	565	0.027233	665	0.011954	765	0.000660
470	0.014606	570	0.028054	670	0.010560	770	0.000568
475	0.011148	575	0.028722	675	0.009314	775	0.000489
						780	0.000422





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Test Equipment Configuration:	LightLab International Allentown 2m Integrating Sphere Measurements acquired using a Labsphere CDS 2600 spectroradiometer Testing was performed using 4 π geometry
Test Temperature:	24.4 °C
Test Procedure:	Tested in accordance with the applicable sections of: LM-79-08, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2015, ANSI C82-77-10:2014
Significance:	The laboratory has not participated in the selection of samples to be tested. All testing is performed on the understanding that the significance of the report is limited to the extent that the test sample is representative of production units.
Notes:	The measurements and other derived quantities contained in this report are based on the absolute data as measured. Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results. This report is free of erasures and corrections This report may contain data that are not covered by the NVLAP accreditation. Quantities marked with * are not covered.

Sphere Report Template V2-7