LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA000824-034A

Catalog Number: 3-653-114
Pendant mounted, formed steel canopy, spun aluminum housing, cast aluminum heatsink, translucent white glass enclosure.
12 white LEDs, one Harvard Engineering LEDENG-163-930 LED board
One L.T.F. DA6W150C2040LP010-0014 dimmable LED driver
120.0Vac, 60.00Hz, 0.0589A, 6.62W, 0.936PF, 10.5%THD(i)

Performance Summary

Total Light Output	416	lm
Luminaire Power	6.62	W
Luminous Efficacy	62.8	lm/W

PREPARED FOR : Oxygen Lighting, 201 Railhead Road, Fort Worth, TX 76106, USA

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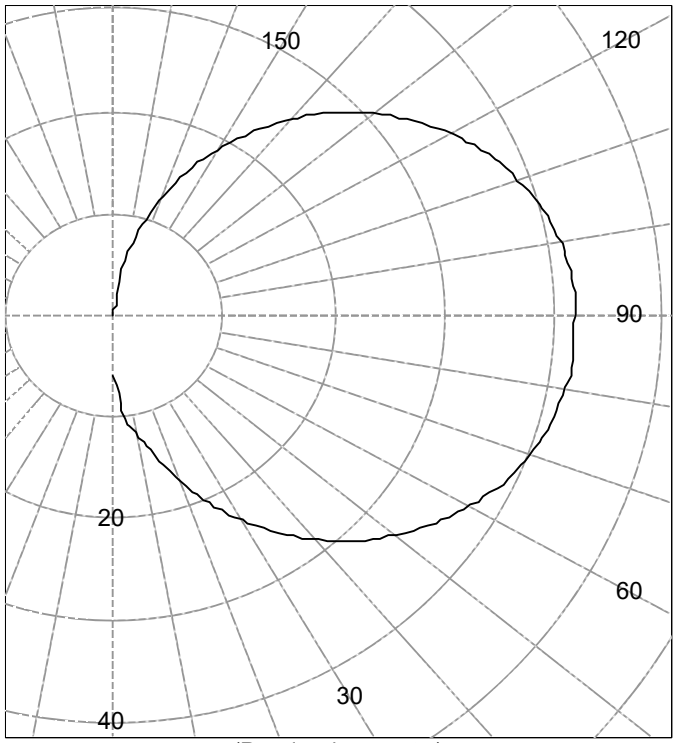
Legend: All planes - Solid (cd)



(Rotational symmetry)

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	5.9		90	41.9	
5	9.5	1	95	41.8	46
10	11.7		100	41.3	
15	14.4	4	105	40.4	43
20	17.4		110	39.1	
25	20.4	10	115	37.5	37
30	23.3		120	35.6	
35	26.1	16	125	33.4	30
40	28.8		130	30.9	
45	31.3	24	135	28.1	22
50	33.6		140	25.1	
55	35.7	32	145	22.0	14
60	37.5		150	18.8	
65	39.0	39	155	15.4	7
70	40.2		160	12.0	
75	41.1	43	165	8.6	3
80	41.7		170	4.6	
85	41.9	46	175	0.1	0
90	41.9		180	0.0	

AVERAGE LUMINANCE (cd / m^2)

Gamma	C0
45.0	1352
55.0	1411
65.0	1462
75.0	1510
85.0	1555

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	15	N / A	3.5
0-40	31	N / A	7.5
0-60	87	N / A	21.0
0-90	215	N / A	51.7
40-90	184	N / A	44.2
60-90	128	N / A	30.7
90-180	201	N / A	48.3
0-180	416	N / A	100.0

Total Light Output = 416 lm

Signed: Michael L. Grather

Authorized Signatory

Date of test 13-Sep-2017

Date of report 14-Sep-2017

USA LightLab International, LLC *west* 24825 N. 16th Avenue *coast* Suite 125 Phoenix, AZ, 85085 Ph : +1 623-434-1499 Fx : +1 623-434-1492 www.lightlabint.com

USA LightLab Int'l Allentown LLC *east* 905 Harrison Street *coast* Suite 135 Allentown, PA 18103 Ph: +1 484-273-0705 www.lightlabint.com (issuing laboratory)

Australasia LightLab International *&* 50 Redcliffe Gardens Drive *S.E. Asia* Clontarf Queensland, 4019, Australia Ph : +61 7 3283 7862 Fx : +61 7 3283 8751 www.lightlabint.com

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120.0Vac, 60.00Hz, 0.0589A, 6.62W, 0.936PF, 10.5%THD(i)

Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	5.9		90.0	41.9	
2.5	7.3		92.5	42.0	
5.0	9.5	1	95.0	41.8	
7.5	10.9		97.5	41.6	46
10.0	11.7		100.0	41.3	
12.5	12.9		102.5	40.9	
15.0	14.4	4	105.0	40.4	
17.5	15.9		107.5	39.8	43
20.0	17.4		110.0	39.1	
22.5	18.9		112.5	38.4	
25.0	20.4	10	115.0	37.5	
27.5	21.9		117.5	36.6	37
30.0	23.3		120.0	35.6	
32.5	24.7		122.5	34.5	
35.0	26.1	16	125.0	33.4	
37.5	27.5		127.5	32.2	30
40.0	28.8		130.0	30.9	
42.5	30.1		132.5	29.5	
45.0	31.3	24	135.0	28.1	
47.5	32.5		137.5	26.7	22
50.0	33.6		140.0	25.1	
52.5	34.7		142.5	23.6	
55.0	35.7	32	145.0	22.0	
57.5	36.6		147.5	20.4	14
60.0	37.5		150.0	18.8	
62.5	38.3		152.5	17.1	
65.0	39.0	39	155.0	15.4	
67.5	39.6		157.5	13.7	7
70.0	40.2		160.0	12.0	
72.5	40.7		162.5	10.3	
75.0	41.1	43	165.0	8.6	
77.5	41.5		167.5	6.8	3
80.0	41.7		170.0	4.6	
82.5	41.9		172.5	1.4	
85.0	41.9	46	175.0	0.1	
87.5	41.9		177.5	0.0	0
90.0	41.9		180.0	0.0	

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120.0Vac, 60.00Hz, 0.0589A, 6.62W, 0.936PF, 10.5%THD(i)

Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	108	108	108	108	99	99	99	99	84	84	84	70	70	70	58	58	58	52
1	93	86	80	74	85	79	73	69	66	61	58	53	50	47	42	40	38	32
2	82	72	63	56	75	66	58	52	54	48	43	44	39	35	34	30	27	22
3	74	61	52	44	67	56	48	41	46	39	34	37	32	27	28	24	21	17
4	66	53	43	36	60	49	40	33	40	33	27	32	26	22	24	20	17	13
5	60	47	37	30	55	43	34	27	35	28	23	28	22	18	21	17	14	10
6	55	41	32	25	50	38	29	23	31	24	19	25	19	15	19	15	11	8
7	51	37	28	21	46	34	25	20	28	21	16	22	17	13	17	13	10	7
8	47	33	24	18	43	30	22	17	25	19	14	20	15	11	15	11	8	6
9	44	30	22	16	40	28	20	15	23	17	12	18	13	10	14	10	7	5
10	41	27	19	14	37	25	18	13	21	15	11	17	12	8	13	9	6	4

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	0.2	25.66	25.66
8.0	0.1	34.21	34.21
10.0	0.1	42.76	42.76
12.0	0.0	51.31	51.31
14.0	0.0	59.86	59.86
16.0	0.0	68.41	68.41

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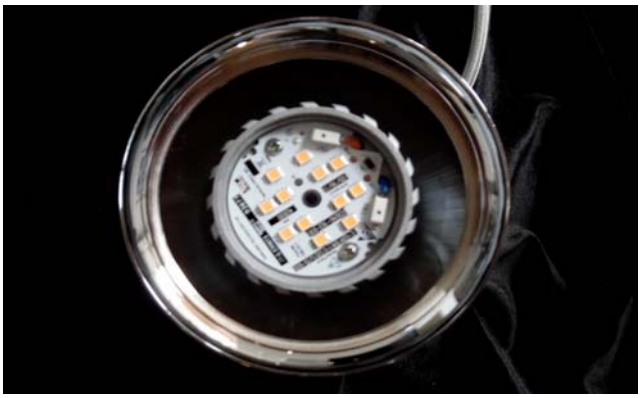

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120.0Vac, 60.00Hz, 0.0589A, 6.62W, 0.936PF, 10.5%THD(i)

Test Distance	9.5 m
Test Temperature	25.0 °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 C78.377:2015, ANSI C82.77-10:2014.

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.

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Report of Test

LLIA000824-034B

Integrating Sphere Report
Catalog Number: 3-653-114
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12 white LEDs, one Harvard Engineering LEDENG-163-930 LED board
One L.T.F. DA6W150C2040LP010-0014 dimmable LED driver

Performance Summary

Voltage		120.0	Vac
Current		0.0589	A
Power		6.62	W
Frequency		60.00	Hz
Power Factor		0.936	
Current THD		10.4	%
Total Luminous Flux		411.9	lm
Efficacy		62.2	lm/W
Chromaticity	(x,y)	(0.4371, 0.3982)	
	(u',v')	(0.2532, 0.5191)	
Duv		-0.0024	
CCT		2949	K
CRI (Ra)		97	
R9		86	

Prepared For:
Oxygen Lighting
201 Railhead Road
Fort Worth, TX 76106, USA

Test date: 09/13/2017
Report date: 09/14/2017

Test Report Number: LLIA000824-034B

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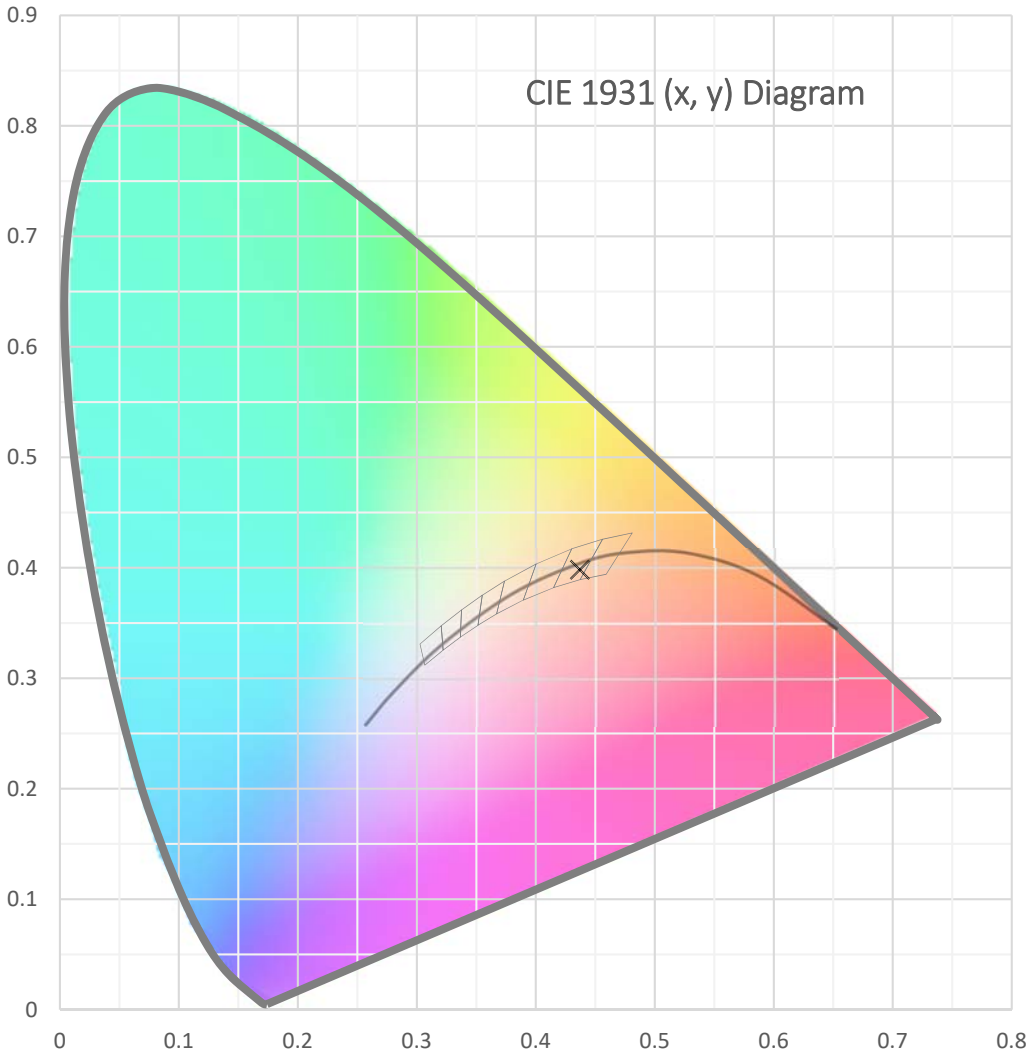

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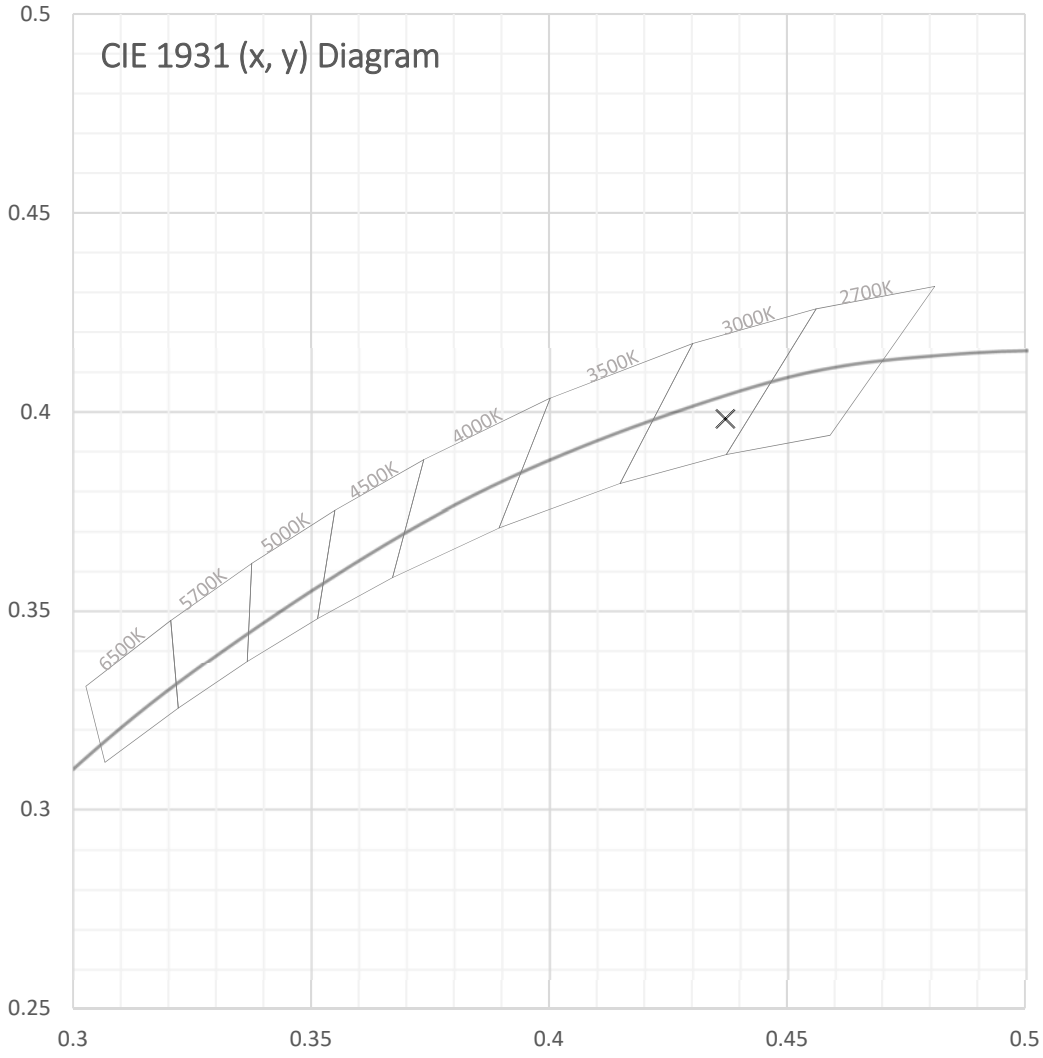

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Spectral Data	Total Radiant Flux	1.564	W
	Total Luminous Flux	411.9	Lm
	Chromaticity CIE 1931 (x, y)	(0.4371, 0.3982)	
	Chromaticity CIE 1976 (u', v')	(0.2532, 0.5191)	
	Correlated Color Temperature (CCT)	2949	K
	Color Rendering Index (Ra)	97	
	R1	98	
	R2	98	
	R3	96	
	R4	97	
	R5	98	
	R6	97	
	R7	96	
	R8	94	
	R9	86	
	R10	94	
	R11	97	
	R12	85	
	R13	99	
	R14	97	
	Distance from Planckian Locus (Duv)	-0.0024	
	Scotopic/Photopic Ratio *	1.424	
Electrical Data			
	Voltage	120.0	Vac
	Current	0.0589	A
	Power	6.62	W
	Frequency	60.00	Hz
	Power Factor	0.936	
	Current THD	10.4	%

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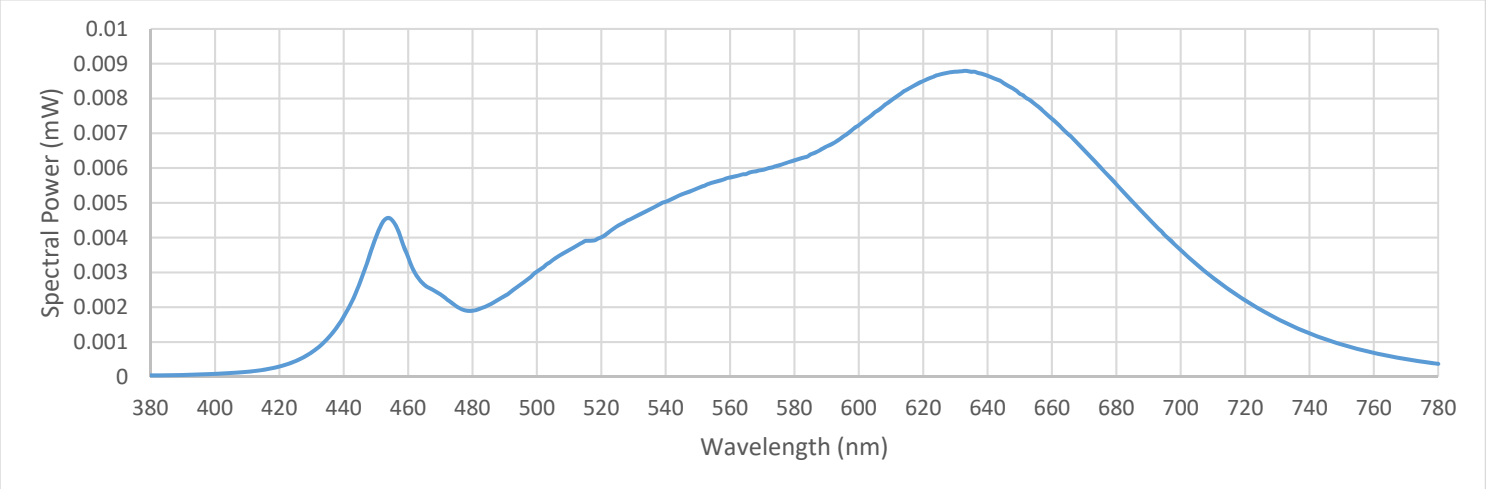
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000040	480	0.001898	580	0.006221	680	0.005531
385	0.000042	485	0.002059	585	0.006392	685	0.005043
390	0.000052	490	0.002326	590	0.006623	690	0.004555
395	0.000065	495	0.002654	595	0.006896	695	0.004075
400	0.000084	500	0.003023	600	0.007230	700	0.003645
405	0.000108	505	0.003362	605	0.007604	705	0.003235
410	0.000144	510	0.003637	610	0.007938	710	0.002847
415	0.000198	515	0.003904	615	0.008253	715	0.002508
420	0.000297	520	0.004013	620	0.008500	720	0.002198
425	0.000449	525	0.004333	625	0.008681	725	0.001916
430	0.000706	530	0.004570	630	0.008770	730	0.001674
435	0.001101	535	0.004799	635	0.008768	735	0.001446
440	0.001722	540	0.005030	640	0.008654	740	0.001245
445	0.002703	545	0.005244	645	0.008444	745	0.001076
450	0.004021	550	0.005421	650	0.008140	750	0.000926
455	0.004504	555	0.005592	655	0.007819	755	0.000796
460	0.003435	560	0.005728	660	0.007422	760	0.000689
465	0.002648	565	0.005828	665	0.006980	765	0.000591
470	0.002370	570	0.005944	670	0.006517	770	0.000507
475	0.002019	575	0.006067	675	0.006029	775	0.000435
						780	0.000373



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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 4π geometry
Test Temperature:	25.2 °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.

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