

Report of Test

LLIA000802-013A

Catalog Number: 3-695-24 Echo

Ceiling mounted, formed steel housing, white patterned fabric enclosure with translucent plastic liner, translucent white plastic lower enclosure.

60 white LEDs, Two Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each.

Two LTF DA12W350C1834D010-0014 dimming LED drivers.

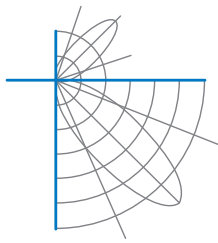
120.0Vac, 60.00Hz, 0.2276A, 26.63W, 0.975PF, 8.6%THD(i)



Performance Summary

Total Light Output	1405 lm
Luminaire Power	26.6 W
Luminous Efficacy	52.8 lm/W

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



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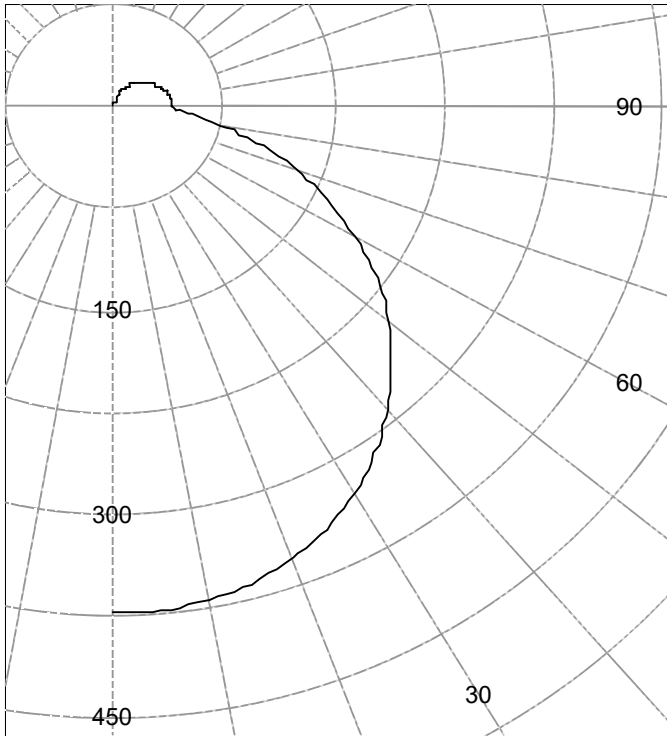
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Legend: All planes - Solid (cd)



(Rotational symmetry)

AVERAGE LUMINANCE (cd / m²)

Gamma	C0
45.0	2542
55.0	2226
65.0	1838
75.0	1357
85.0	872

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	373		90	40	
5	373	35	95	40	43
10	370		100	39	
15	364	103	105	38	40
20	355		110	37	
25	343	158	115	35	35
30	328		120	33	
35	311	195	125	31	28
40	291		130	29	
45	268	207	135	26	20
50	244		140	23	
55	218	195	145	21	13
60	190		150	18	
65	160	159	155	15	7
70	130		160	12	
75	100	106	165	9	3
80	73		170	7	
85	51	57	175	2	0
90	40		180	1	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	296	N / A	21.1
0-40	491	N / A	34.9
0-60	893	N / A	63.6
0-90	1215	N / A	86.5
40-90	724	N / A	51.6
60-90	322	N / A	22.9
90-180	190	N / A	13.5
0-180	1405	N / A	100.0

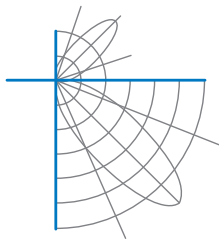
Total Light Output = 1,405 lm

Spacing Criterion: 0-180 1.3
Spacing Criterion: 90-270 1.3

Signed:

Authorized Signatory

Date of test 11-Aug-2017
Date of report 14-Aug-2017



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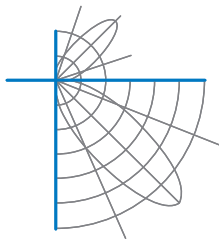
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Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	373		90.0	40	
2.5	373		92.5	40	
5.0	373	35	95.0	40	
7.5	371		97.5	39	43
10.0	370		100.0	39	
12.5	367		102.5	39	
15.0	364	103	105.0	38	
17.5	359		107.5	37	40
20.0	355		110.0	37	
22.5	349		112.5	36	
25.0	343	158	115.0	35	
27.5	336		117.5	34	35
30.0	328		120.0	33	
32.5	320		122.5	32	
35.0	311	195	125.0	31	
37.5	301		127.5	30	28
40.0	291		130.0	29	
42.5	280		132.5	27	
45.0	268	207	135.0	26	
47.5	257		137.5	25	20
50.0	244		140.0	23	
52.5	231		142.5	22	
55.0	218	195	145.0	21	
57.5	204		147.5	19	13
60.0	190		150.0	18	
62.5	175		152.5	16	
65.0	160	159	155.0	15	
67.5	145		157.5	14	7
70.0	130		160.0	12	
72.5	115		162.5	11	
75.0	100	106	165.0	9	
77.5	86		167.5	8	3
80.0	73		170.0	7	
82.5	61		172.5	5	
85.0	51	57	175.0	2	
87.5	44		177.5	2	0
90.0	40		180.0	1	



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Coefficients Of Utilization - Zonal Cavity Method

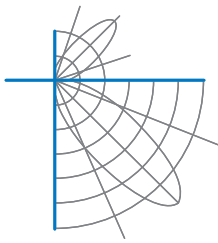
Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	
0	116	116	116	116	112	112	112	112	104	104	104	96	96	96	90	90	90	86
1	104	99	94	90	100	96	91	87	89	85	82	83	80	77	77	75	73	70
2	94	86	78	72	90	83	76	70	77	71	67	72	67	63	67	63	60	57
3	86	75	66	60	82	72	64	58	67	61	55	63	57	53	58	54	50	47
4	78	66	57	50	75	64	55	49	59	52	47	56	50	45	52	47	43	40
5	72	59	49	43	69	57	48	42	53	46	40	50	43	39	46	41	37	34
6	66	53	44	37	63	51	42	36	48	40	35	45	38	34	42	37	32	30
7	61	48	39	32	59	46	38	32	43	36	31	41	34	30	38	33	29	26
8	57	43	35	29	55	42	34	28	40	32	27	37	31	26	35	30	25	23
9	53	40	31	26	51	38	31	25	36	29	25	34	28	24	32	27	23	21
10	50	36	29	23	48	35	28	23	34	27	22	32	26	21	30	25	21	19

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	10.4	7.83	7.83
8.0	5.8	10.44	10.44
10.0	3.7	13.05	13.05
12.0	2.6	15.66	15.66
14.0	1.9	18.27	18.27
16.0	1.5	20.88	20.88



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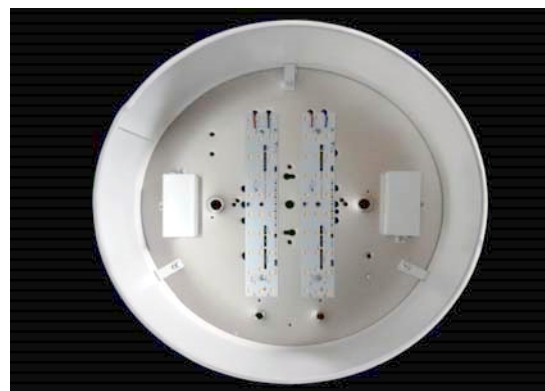
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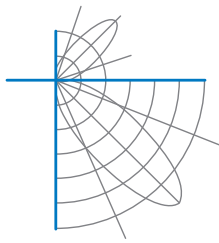
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Test Distance 9.5 m
Test Temperature 24.8 °C

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.

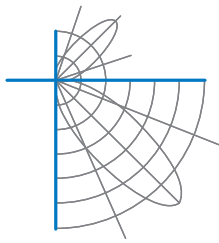
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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.



Report of Test

LLIA000802-013B

Integrating Sphere Report
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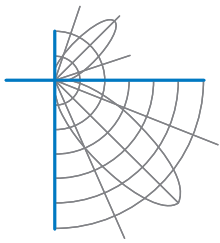


Performance Summary

Voltage	120.0 Vac
Current	0.2274 A
Power	26.63 W
Frequency	59.97 Hz
Power Factor	0.976
Current THD	8.6 %
Total Luminous Flux	1423.5 lm
Efficacy	53.5 lm/W
Chromaticity (x,y)	(0.4435, 0.4086)
(u',v')	(0.2529, 0.5241)
Duv	0.0009
CCT	2928 K
CRI (Ra)	93
R9	63

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

Test date: 08/11/2017
Report date: 08/14/2017



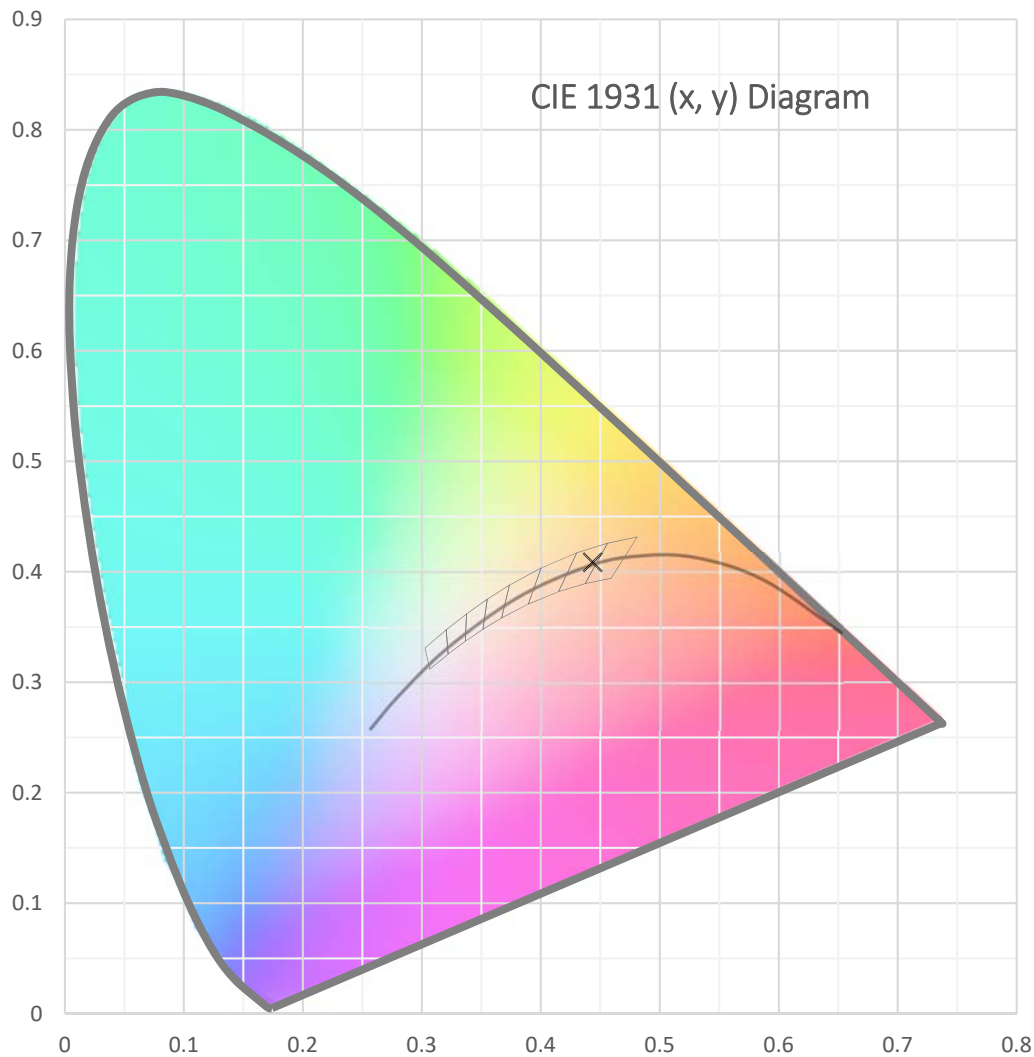
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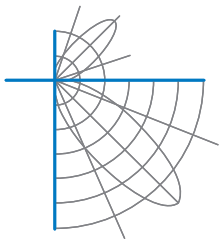
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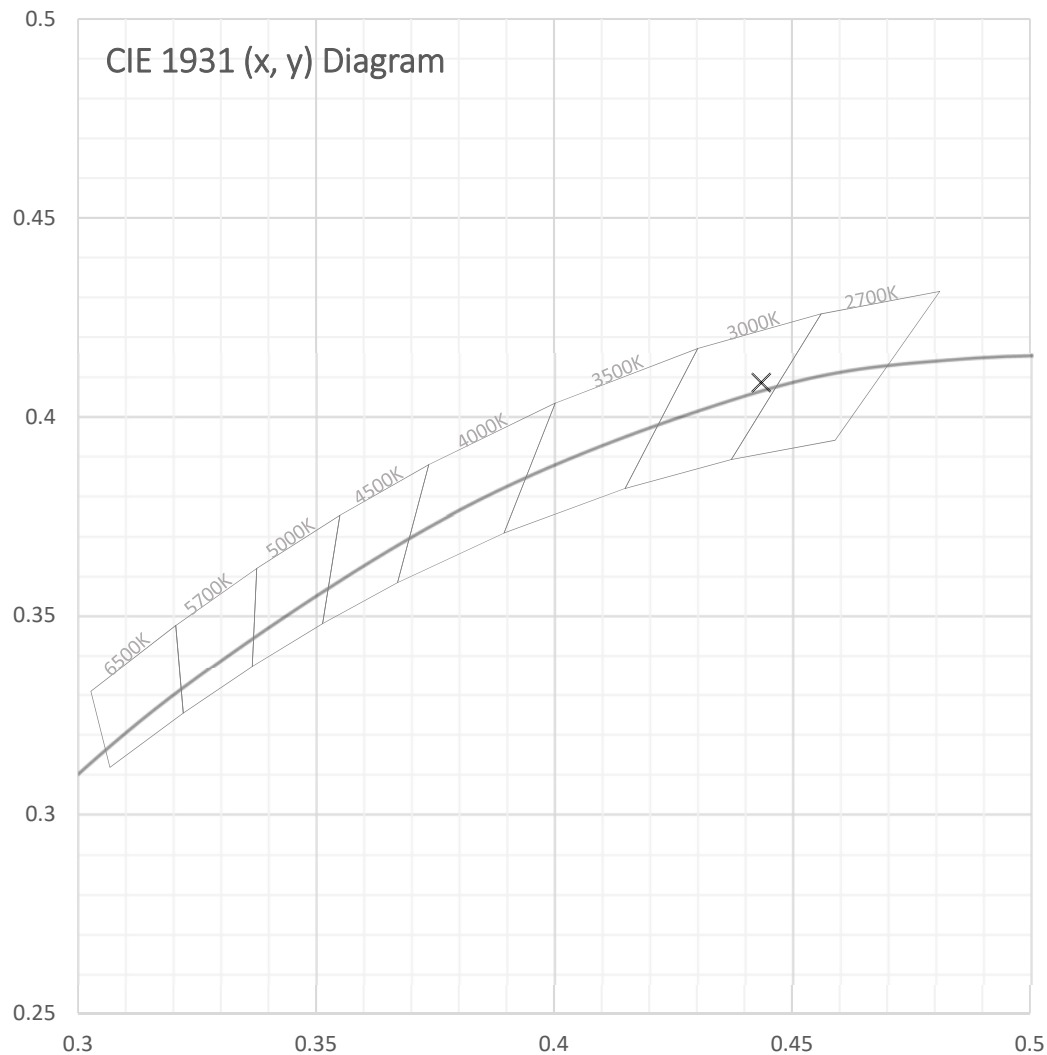
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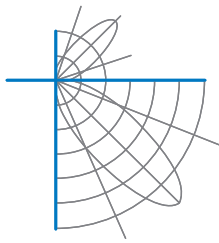
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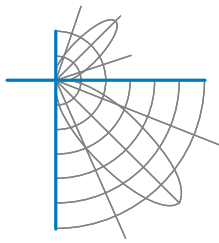
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Spectral Data

Total Radiant Flux	5.066 W
Total Luminous Flux	1423.5 Lm
Chromaticity CIE 1931 (x, y)	(0.4435, 0.4086)
Chromaticity CIE 1976 (u', v')	(0.2529, 0.5241)
Correlated Color Temperature (CCT)	2928 K
Color Rendering Index (Ra)	93
R1	93
R2	95
R3	96
R4	93
R5	92
R6	94
R7	94
R8	84
R9	63
R10	88
R11	93
R12	81
R13	93
R14	97
Distance from Planckian Locus (Duv)	0.0009
Scotopic/Photopic Ratio *	1.365

Electrical Data

Voltage	120.0 Vac
Current	0.2274 A
Power	26.63 W
Frequency	59.97 Hz
Power Factor	0.976
Current THD	8.6 %



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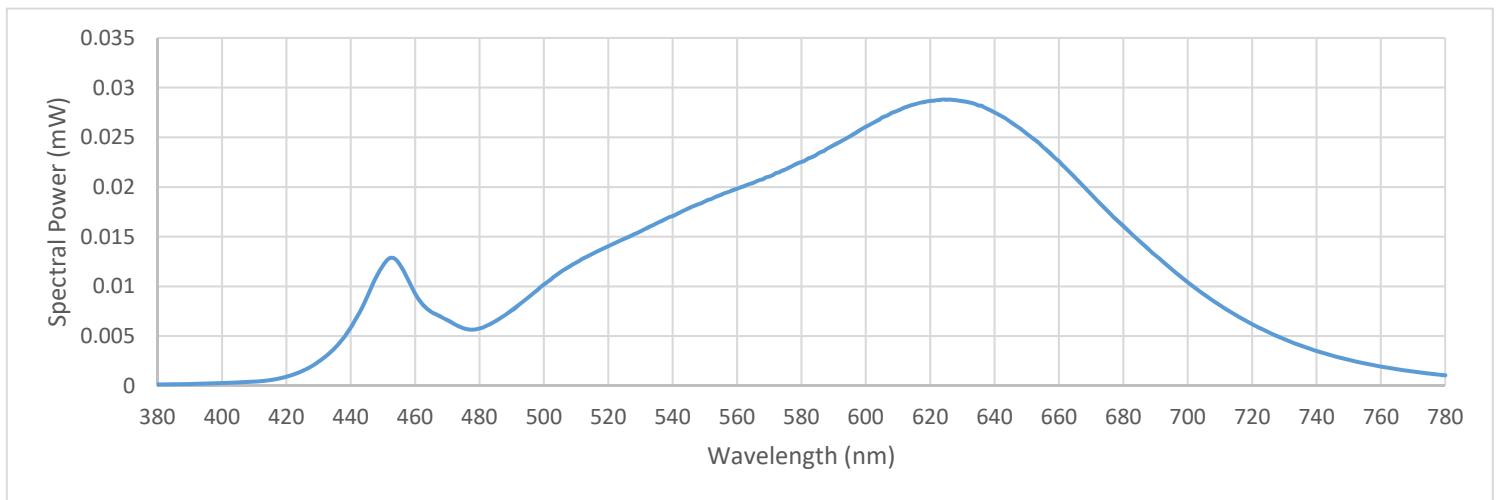
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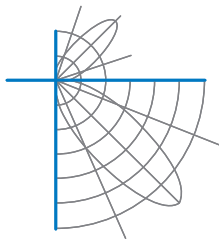
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000137	480	0.005771	580	0.022519	680	0.016057
385	0.000144	485	0.006520	585	0.023326	685	0.014581
390	0.000181	490	0.007581	590	0.024207	690	0.013121
395	0.000217	495	0.008846	595	0.025100	695	0.011712
400	0.000272	500	0.010184	600	0.026039	700	0.010434
405	0.000334	505	0.011389	605	0.026982	705	0.009220
410	0.000419	510	0.012375	610	0.027690	710	0.008088
415	0.000575	515	0.013291	615	0.028292	715	0.007100
420	0.000911	520	0.014066	620	0.028661	720	0.006201
425	0.001502	525	0.014796	625	0.028781	725	0.005394
430	0.002434	530	0.015526	630	0.028639	730	0.004692
435	0.003798	535	0.016333	635	0.028201	735	0.004051
440	0.005840	540	0.017068	640	0.027508	740	0.003501
445	0.008905	545	0.017859	645	0.026513	745	0.003025
450	0.012142	550	0.018555	650	0.025356	750	0.002604
455	0.012317	555	0.019215	655	0.024029	755	0.002242
460	0.009319	560	0.019808	660	0.022600	760	0.001942
465	0.007435	565	0.020403	665	0.020949	765	0.001665
470	0.006621	570	0.021050	670	0.019262	770	0.001428
475	0.005781	575	0.021758	675	0.017608	775	0.001229
						780	0.001055





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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:	24.5 °C
Test Procedure:	Tested in accordance with the applicable sections of: LM-79-08, LM-78-07, LM-58-13, ANSI_ANSI 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.