



Report of Test

LLIA000824-049A

Catalog Number: 3-656 Spindle Pendant

Pendant mounted, formed steel canopy, center lampholder with spun steel reflector, cast aluminum heatsink, frosted glass enclosure below LEDs, clear glass outer 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, 0.0585A, 6.57W, 0.936PF, 9.9%THD(i)



Performance Summary

Total Light Output	406 lm
Luminaire Power	6.57 W
Luminous Efficacy	61.8 lm/W

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



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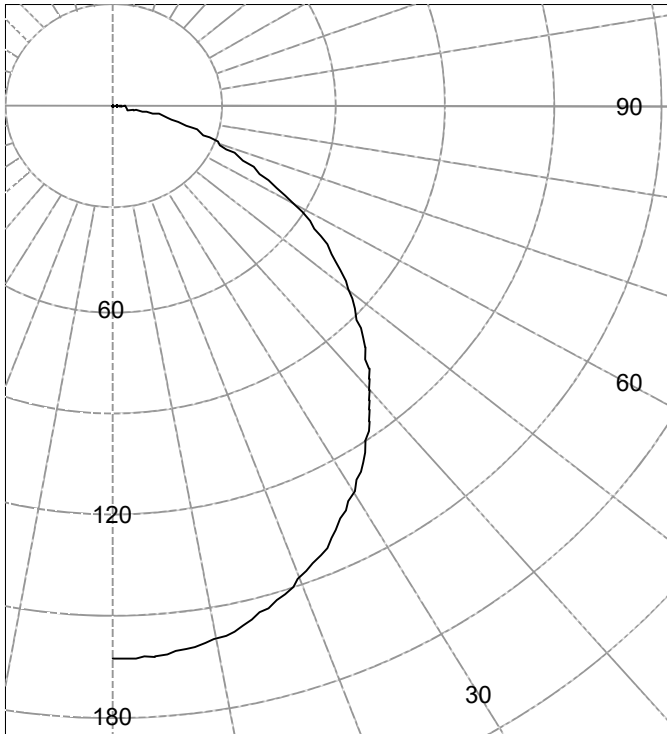
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Legend: All planes - Solid (cd)



(Rotational symmetry)

AVERAGE LUMINANCE (cd / m²)

Gamma	C0
45.0	94323
55.0	82570
65.0	62278
75.0	44013
85.0	17049

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	163		90	1	
5	162	15	95	1	1
10	159		100	0	
15	155	44	105	0	0
20	148		110	0	
25	140	65	115	0	0
30	131		120	0	
35	120	75	125	0	0
40	109		130	0	
45	96	74	135	0	0
50	84		140	0	
55	71	63	145	0	0
60	56		150	0	
65	42	41	155	0	0
70	30		160	0	
75	20	21	165	0	0
80	11		170	0	
85	4	5	175	0	0
90	1		180	0	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	123	N / A	30.4
0-40	199	N / A	48.9
0-60	336	N / A	82.8
0-90	403	N / A	99.4
40-90	205	N / A	50.5
60-90	68	N / A	16.6
90-180	2	N / A	0.6
0-180	406	N / A	100.0

Total Light Output = 406 lm

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

Signed:

Authorized Signatory

Date of test 15-Sep-2017
Date of report 20-Sep-2017



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Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	163		90.0	1	
2.5	163		92.5	1	
5.0	162	15	95.0	1	
7.5	161		97.5	0	1
10.0	159		100.0	0	
12.5	157		102.5	0	
15.0	155	44	105.0	0	
17.5	152		107.5	0	0
20.0	148		110.0	0	
22.5	144		112.5	0	
25.0	140	65	115.0	0	
27.5	136		117.5	0	0
30.0	131		120.0	0	
32.5	126		122.5	0	
35.0	120	75	125.0	0	
37.5	114		127.5	0	0
40.0	109		130.0	0	
42.5	102		132.5	0	
45.0	96	74	135.0	0	
47.5	90		137.5	0	0
50.0	84		140.0	0	
52.5	77		142.5	0	
55.0	71	63	145.0	0	
57.5	64		147.5	0	0
60.0	56		150.0	0	
62.5	49		152.5	0	
65.0	42	41	155.0	0	
67.5	34		157.5	0	0
70.0	30		160.0	0	
72.5	25		162.5	0	
75.0	20	21	165.0	0	
77.5	16		167.5	0	0
80.0	11		170.0	0	
82.5	7		172.5	0	
85.0	4	5	175.0	0	
87.5	2		177.5	0	0
90.0	1		180.0	0	



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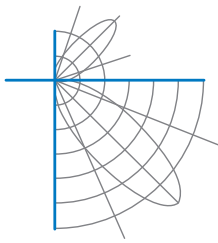
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Coefficients Of Utilization - Zonal Cavity Method																		
Effective Floor Cavity Reflectance 0.20																		
RC	80				70				50			30			10			0
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	99
1	109	105	101	97	107	103	99	96	98	95	93	94	92	90	91	89	87	85
2	100	92	86	80	97	90	84	79	87	82	77	83	79	76	80	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	64	71	67	63	61
4	84	73	64	58	82	71	63	57	69	62	56	66	60	56	64	59	55	53
5	78	65	56	50	75	64	56	50	62	55	49	60	54	49	58	52	48	46
6	72	59	50	44	70	58	50	44	56	49	43	54	48	43	53	47	42	40
7	67	53	45	39	65	53	45	39	51	44	38	50	43	38	48	42	38	36
8	62	49	41	35	60	48	40	35	47	40	35	46	39	34	44	38	34	32
9	58	45	37	31	57	44	37	31	43	36	31	42	36	31	41	35	31	29
10	54	42	34	29	53	41	34	29	40	33	28	39	33	28	38	32	28	26

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.

Height(ft)	Illuminance at Nadir (fc)	Beam Width (across 50% Nadir Illum)	
		0-180	90-270
6.0	4.5	7.18	7.18
8.0	2.5	9.58	9.58
10.0	1.6	11.97	11.97
12.0	1.1	14.37	14.37
14.0	0.8	16.76	16.76
16.0	0.6	19.15	19.15



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Test Distance 9.5 m
Test Temperature 25.5 °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 C78.377:2015, 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

LLIA000824-049B

Integrating Sphere Report

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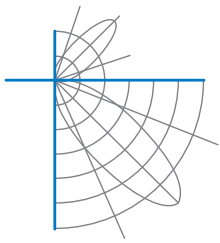
Performance Summary

Voltage	120.0 Vac
Current	0.0588 A
Power	6.64 W
Frequency	60.00 Hz
Power Factor	0.941
Current THD	9.4 %
Total Luminous Flux	401.4 lm
Efficacy	60.5 lm/W
Chromaticity (x,y)	(0.4353, 0.3996)
(u',v')	(0.2514, 0.5194)
Duv	-0.0016
CCT	2991 K
CRI (Ra)	97
R9	86

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

Test date: 09/15/2017

Report date: 09/20/2017



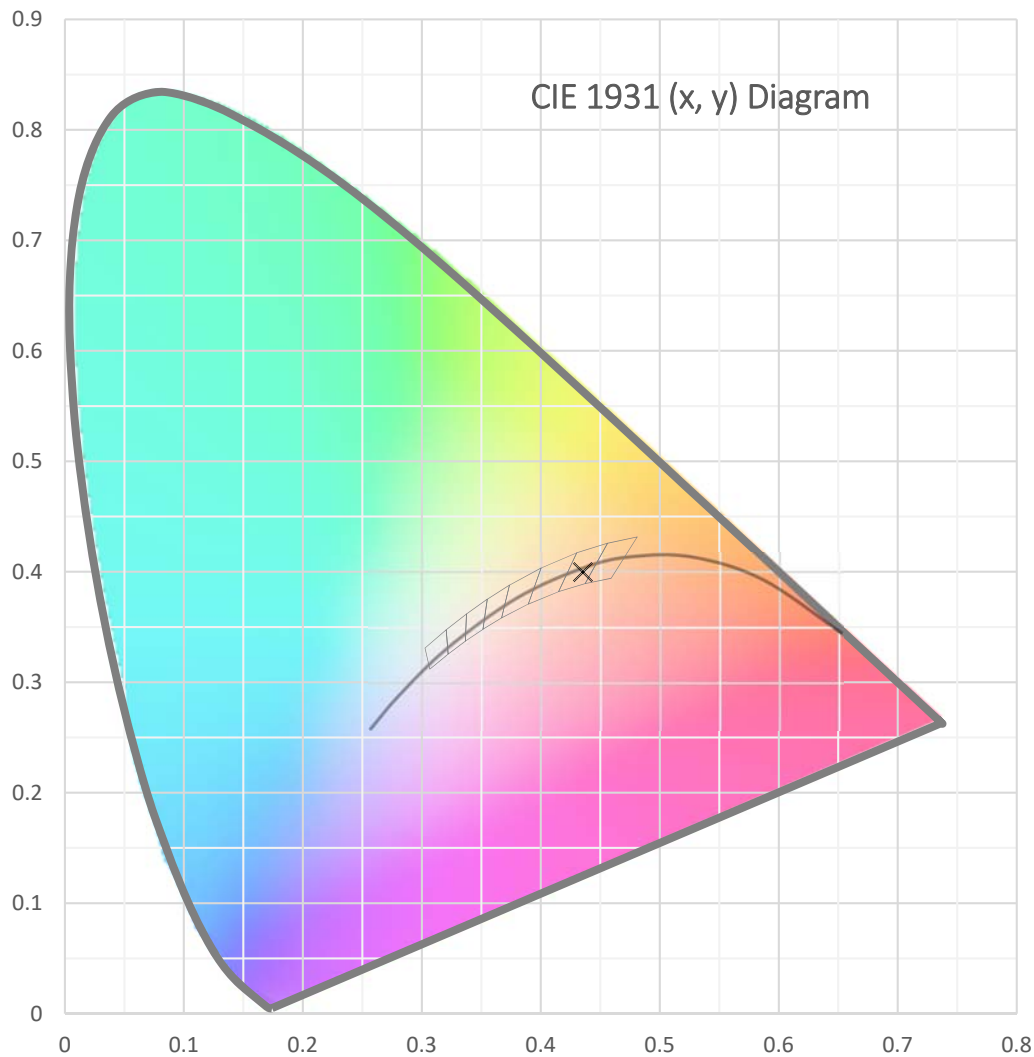
Test Report Number: LLIA000824-049B

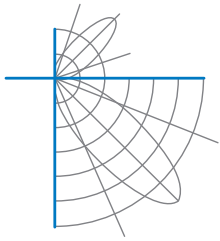
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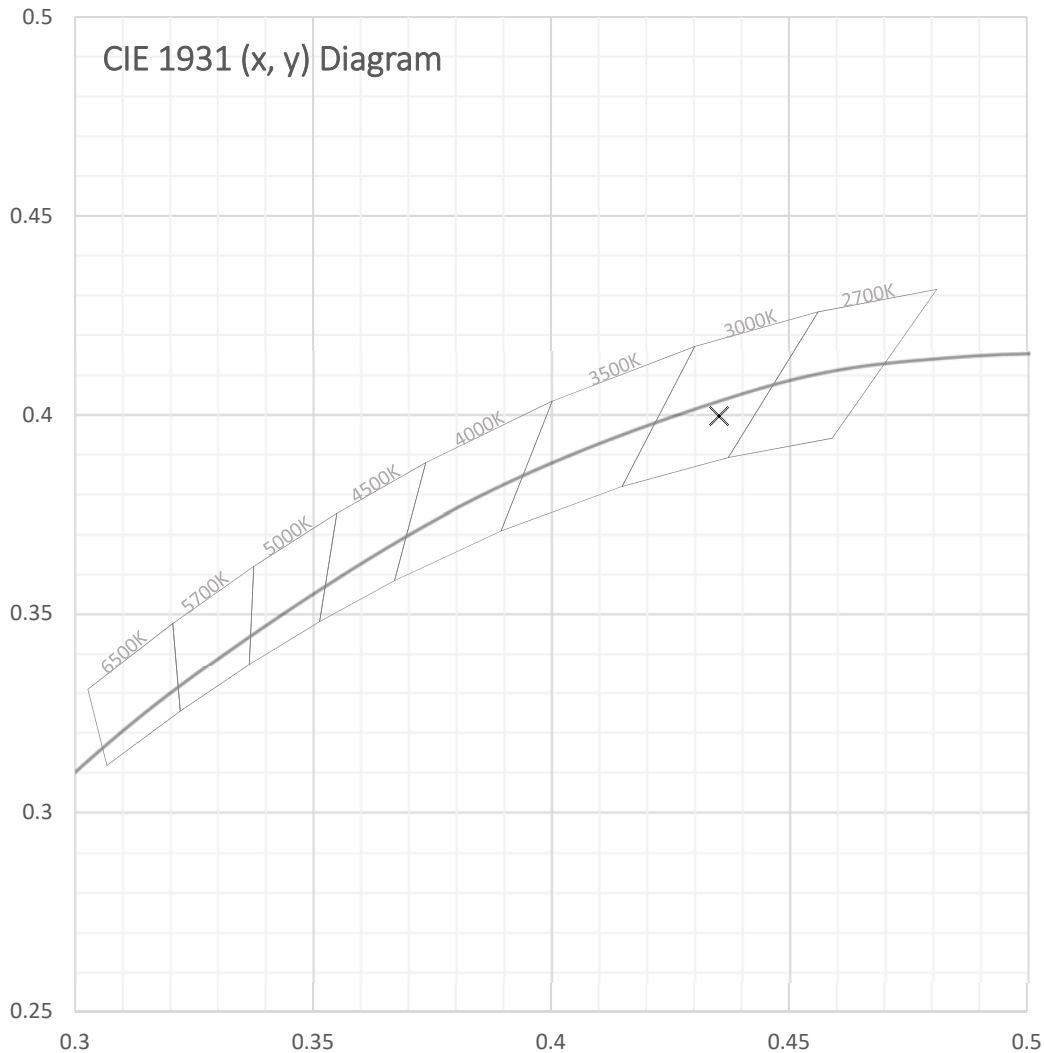
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Spectral Data

Total Radiant Flux	1.499 W
Total Luminous Flux	401.4 Lm
Chromaticity CIE 1931 (x, y)	(0.4353, 0.3996)
Chromaticity CIE 1976 (u', v')	(0.2514, 0.5194)
Correlated Color Temperature (CCT)	2991 K
Color Rendering Index (Ra)	97
R1	99
R2	98
R3	96
R4	98
R5	98
R6	97
R7	97
R8	94
R9	86
R10	94
R11	97
R12	85
R13	99
R14	97
Distance from Planckian Locus (Duv)	-0.0016
Scotopic/Photopic Ratio *	1.441

Electrical Data

Voltage	120.0 Vac
Current	0.0588 A
Power	6.64 W
Frequency	60.00 Hz
Power Factor	0.941
Current THD	9.4 %



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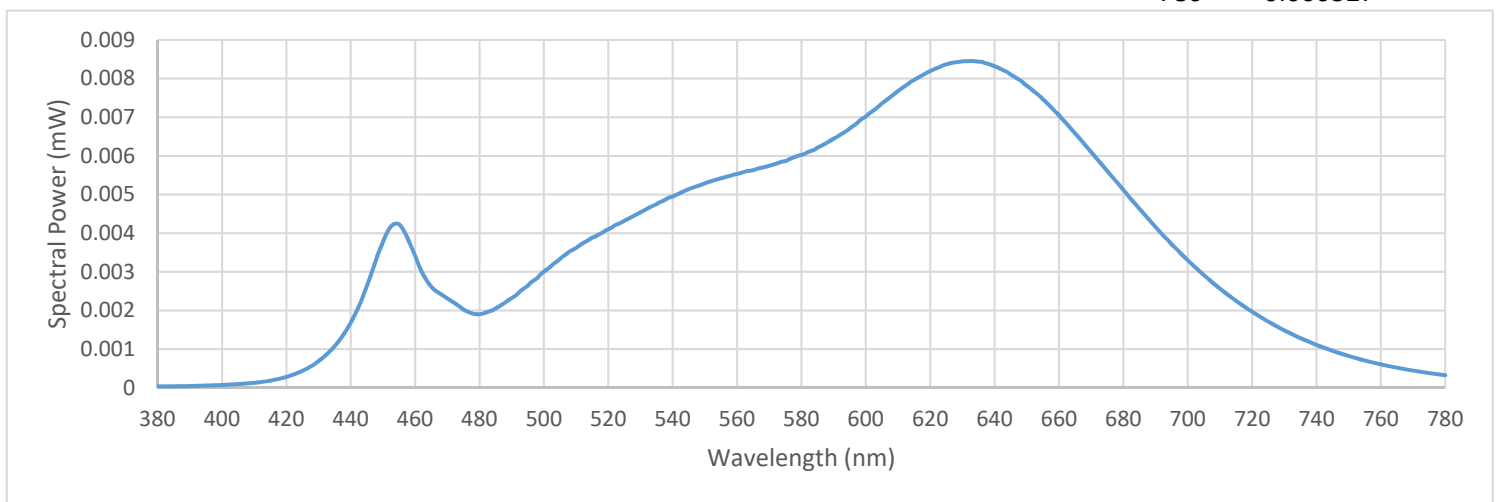
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000036	480	0.001907	580	0.006025	680	0.005116
385	0.000038	485	0.002051	585	0.006213	685	0.004637
390	0.000045	490	0.002321	590	0.006447	690	0.004166
395	0.000056	495	0.002642	595	0.006707	695	0.003708
400	0.000071	500	0.003004	600	0.007019	700	0.003307
405	0.000094	505	0.003332	605	0.007359	705	0.002920
410	0.000129	510	0.003619	610	0.007677	710	0.002562
415	0.000184	515	0.003885	615	0.007957	715	0.002252
420	0.000283	520	0.004102	620	0.008195	720	0.001968
425	0.000441	525	0.004320	625	0.008370	725	0.001712
430	0.000693	530	0.004537	630	0.008443	730	0.001487
435	0.001081	535	0.004751	635	0.008434	735	0.001284
440	0.001686	540	0.004949	640	0.008318	740	0.001105
445	0.002634	545	0.005134	645	0.008104	745	0.000955
450	0.003778	550	0.005287	650	0.007813	750	0.000821
455	0.004230	555	0.005419	655	0.007464	755	0.000705
460	0.003416	560	0.005533	660	0.007060	760	0.000610
465	0.002615	565	0.005630	665	0.006581	765	0.000522
470	0.002313	570	0.005738	670	0.006092	770	0.000445
475	0.002023	575	0.005862	675	0.005611	775	0.000382
						780	0.000327





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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:	24.7 °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.