



Report of Test

LLIA000824-028A

Catalog Number: 3-652 Liberty 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, 0.0588A, 6.57W, 0.930PF, 11.1%THD(i)



Performance Summary

Total Light Output	401 lm
Luminaire Power	6.57 W
Luminous Efficacy	61.0 lm/W

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



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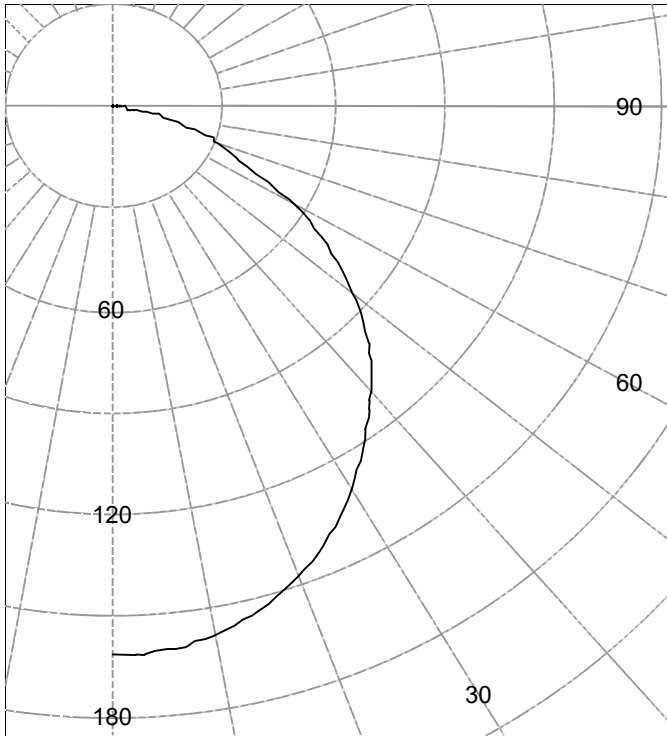
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Legend: All planes - Solid (cd)



(Rotational symmetry)

AVERAGE LUMINANCE (cd / m²)

Gamma	C0
45.0	96132
55.0	82807
65.0	57052
75.0	39170
85.0	14689

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	162		90	1	
5	161	15	95	0	0
10	158		100	0	0
15	153	43	105	0	0
20	147		110	0	0
25	139	64	115	0	0
30	130		120	0	0
35	119	75	125	0	0
40	109		130	0	0
45	98	75	135	0	0
50	85		140	0	0
55	71	63	145	0	0
60	55		150	0	0
65	38	39	155	0	0
70	29		160	0	0
75	18	20	165	0	0
80	9		170	0	0
85	3	4	175	0	0
90	1		180	0	0

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	123	N / A	30.5
0-40	197	N / A	49.2
0-60	336	N / A	83.7
0-90	399	N / A	99.5
40-90	202	N / A	50.3
60-90	63	N / A	15.8
90-180	2	N / A	0.5
0-180	401	N / A	100.0

Total Light Output = 401 lm

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

Signed:

Authorized Signatory

Date of test 14-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	162		90.0	1	
2.5	161		92.5	1	
5.0	161	15	95.0	0	
7.5	160		97.5	0	0
10.0	158		100.0	0	
12.5	156		102.5	0	
15.0	153	43	105.0	0	
17.5	151		107.5	0	0
20.0	147		110.0	0	
22.5	143		112.5	0	
25.0	139	64	115.0	0	
27.5	135		117.5	0	0
30.0	130		120.0	0	
32.5	125		122.5	0	
35.0	119	75	125.0	0	
37.5	114		127.5	0	0
40.0	109		130.0	0	
42.5	104		132.5	0	
45.0	98	75	135.0	0	
47.5	92		137.5	0	0
50.0	85		140.0	0	
52.5	78		142.5	0	
55.0	71	63	145.0	0	
57.5	64		147.5	0	0
60.0	55		150.0	0	
62.5	45		152.5	0	
65.0	38	39	155.0	0	
67.5	34		157.5	0	0
70.0	29		160.0	0	
72.5	25		162.5	0	
75.0	18	20	165.0	0	
77.5	13		167.5	0	0
80.0	9		170.0	0	
82.5	6		172.5	0	
85.0	3	4	175.0	0	
87.5	2		177.5	0	0
90.0	1		180.0	0	



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Coefficients Of Utilization - Zonal Cavity Method

Effective Floor Cavity Reflectance 0.20

RC	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	99
1	110	105	101	98	107	103	99	96	99	96	93	95	92	90	91	89	87	85
2	100	93	86	81	98	91	85	80	87	82	78	84	80	76	81	77	74	72
3	92	82	74	68	89	80	73	67	77	71	66	74	69	65	72	67	64	62
4	84	73	64	58	82	72	64	58	69	62	57	67	61	56	64	59	55	53
5	78	65	57	50	76	64	56	50	62	55	49	60	54	49	58	53	48	46
6	72	59	50	44	70	58	50	44	56	49	44	55	48	43	53	47	43	41
7	67	54	45	39	65	53	45	39	51	44	39	50	43	38	48	43	38	36
8	62	49	41	35	61	48	40	35	47	40	35	46	39	34	45	39	34	32
9	58	45	37	32	57	44	37	32	43	36	31	42	36	31	41	35	31	29
10	55	42	34	29	53	41	34	29	40	33	29	39	33	28	38	32	28	27

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	4.5	7.20	7.20
8.0	2.5	9.60	9.60
10.0	1.6	11.99	11.99
12.0	1.1	14.39	14.39
14.0	0.8	16.79	16.79
16.0	0.6	19.19	19.19



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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 C82.77:2014.

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

LLIA000824-028B

Integrating Sphere Report

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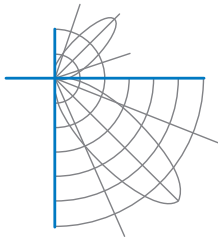
Performance Summary

Voltage	120.0 Vac
Current	0.0589 A
Power	6.59 W
Frequency	60.00 Hz
Power Factor	0.931
Current THD	11.2 %

Total Luminous Flux	398.8 lm
Efficacy	60.5 lm/W
Chromaticity (x,y)	(0.4360, 0.4003)
(u',v')	(0.2516, 0.5198)
Duv	-0.0014
CCT	2985 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



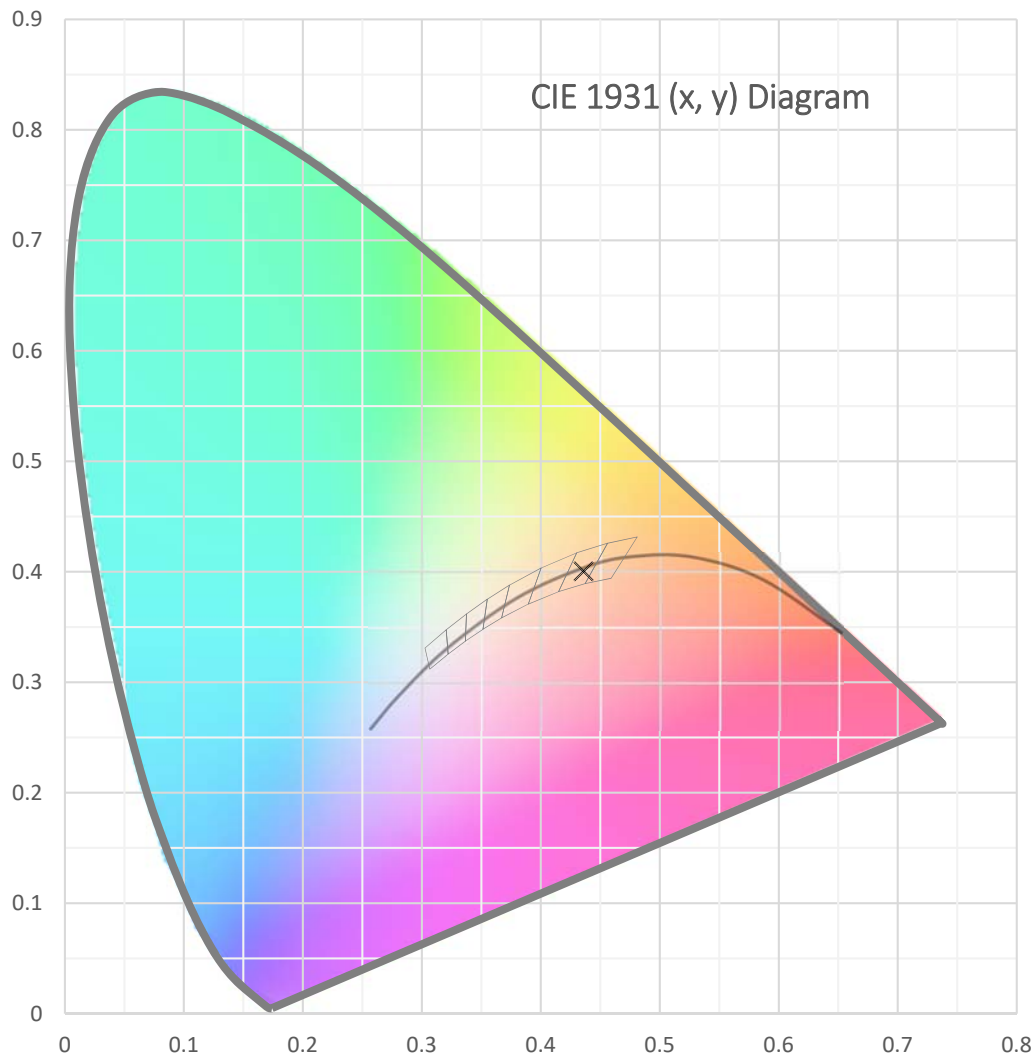
Test Report Number: LLIA000824-028B

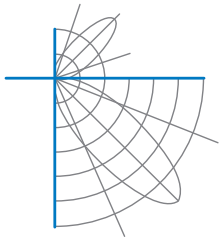
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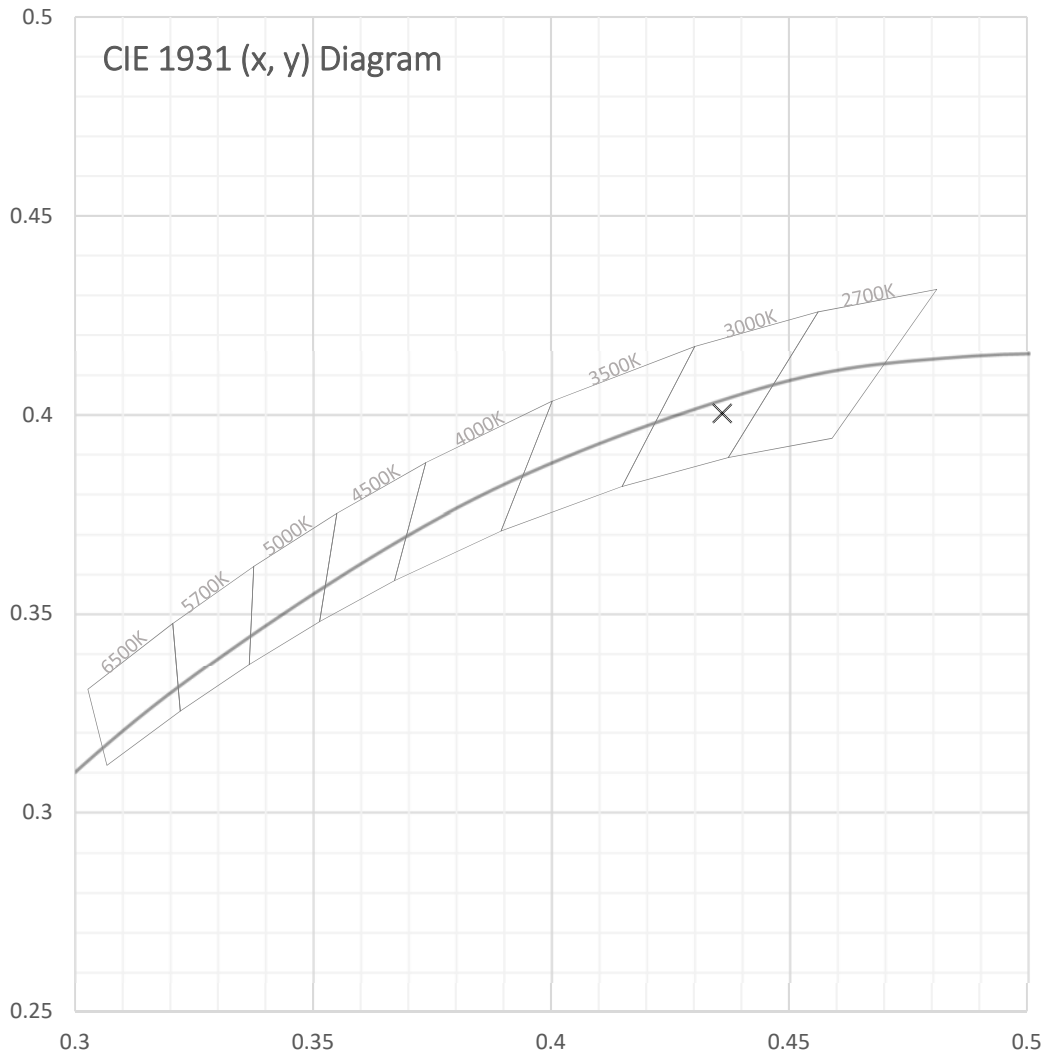
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Spectral Data

Total Radiant Flux	1.489 W
Total Luminous Flux	398.8 Lm
Chromaticity CIE 1931 (x, y)	(0.4360, 0.4003)
Chromaticity CIE 1976 (u', v')	(0.2516, 0.5198)
Correlated Color Temperature (CCT)	2985 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)	-0.0014
Scotopic/Photopic Ratio *	1.439

Electrical Data

Voltage	120.0 Vac
Current	0.0589 A
Power	6.59 W
Frequency	60.00 Hz
Power Factor	0.931
Current THD	11.2 %



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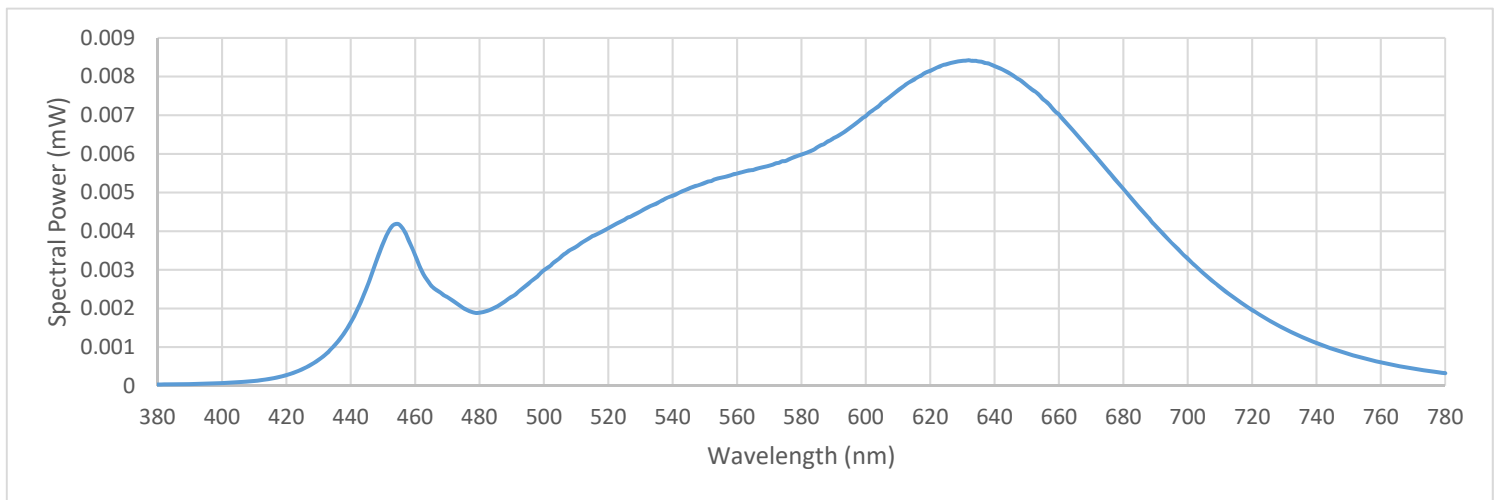
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000035	480	0.001890	580	0.005978	680	0.005095
385	0.000037	485	0.002038	585	0.006175	685	0.004614
390	0.000044	490	0.002303	590	0.006407	690	0.004145
395	0.000054	495	0.002625	595	0.006672	695	0.003694
400	0.000070	500	0.002988	600	0.006977	700	0.003294
405	0.000092	505	0.003311	605	0.007320	705	0.002906
410	0.000125	510	0.003594	610	0.007639	710	0.002551
415	0.000181	515	0.003869	615	0.007922	715	0.002243
420	0.000278	520	0.004080	620	0.008148	720	0.001959
425	0.000431	525	0.004296	625	0.008316	725	0.001707
430	0.000672	530	0.004507	630	0.008405	730	0.001484
435	0.001051	535	0.004714	635	0.008393	735	0.001282
440	0.001635	540	0.004915	640	0.008271	740	0.001104
445	0.002548	545	0.005102	645	0.008062	745	0.000952
450	0.003684	550	0.005251	650	0.007770	750	0.000819
455	0.004175	555	0.005379	655	0.007418	755	0.000704
460	0.003381	560	0.005491	660	0.007020	760	0.000609
465	0.002589	565	0.005582	665	0.006547	765	0.000522
470	0.002294	570	0.005693	670	0.006064	770	0.000445
475	0.002003	575	0.005816	675	0.005581	775	0.000383
						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:	24.2 °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.