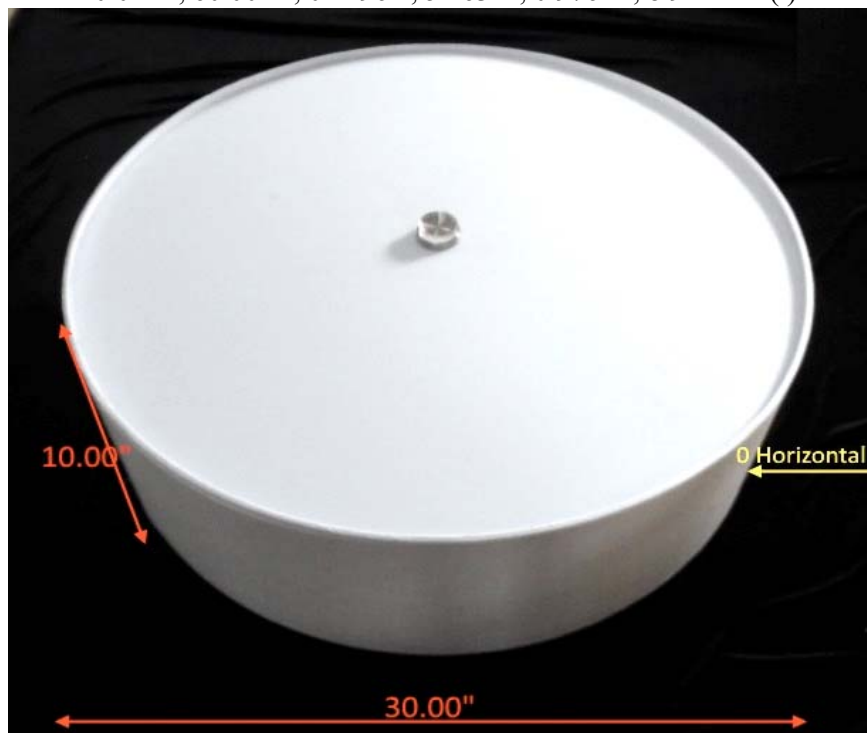


Report of Test

LLIA000802-016A

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.
120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each
Four LTF DA12W350C1834D010-0014 dimming LED drivers.
120.0Vac, 60.00Hz, 0.4496A, 52.63W, 0.976PF, 8.9%THD(i)



Performance Summary

Total Light Output	2775 lm
Luminaire Power	52.6 W
Luminous Efficacy	52.8 lm/W

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



Test Report No. LLIA000802-016A

Catalog Number: 3-640-24 Echo Pendant

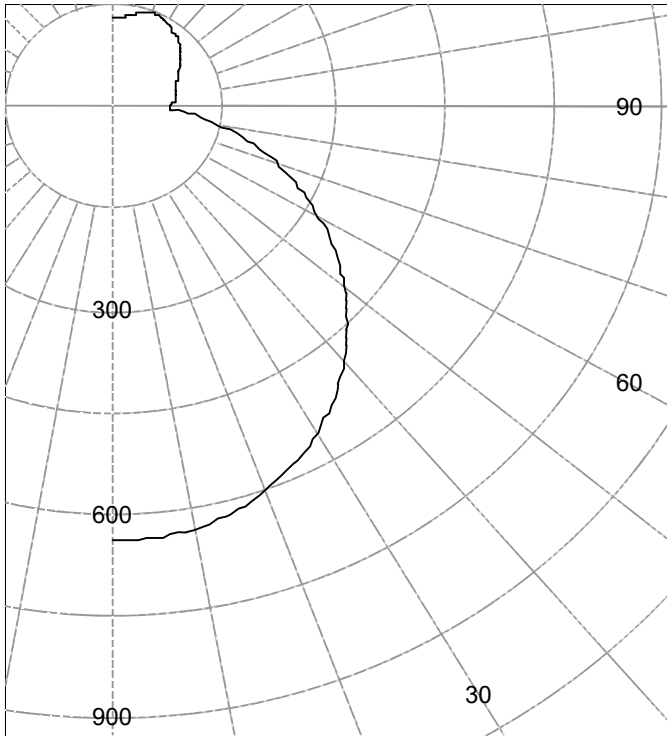
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Legend: All planes - Solid (cd)



(Rotational symmetry)

AVERAGE LUMINANCE (cd / m²)

Gamma	C0
45.0	982
55.0	875
65.0	757
75.0	618
85.0	442

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	639		90	77	
5	637	61	95	82	88
10	631		100	83	
15	620	175	105	86	91
20	603		110	89	
25	581	268	115	94	94
30	554		120	102	
35	523	328	125	110	98
40	489		130	119	
45	451	348	135	127	98
50	410		140	133	
55	368	329	145	139	87
60	324		150	143	
65	279	276	155	147	68
70	233		160	146	
75	189	199	165	143	41
80	144		170	137	
85	103	114	175	133	13
90	77		180	130	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	503	N / A	18.1
0-40	831	N / A	29.9
0-60	1508	N / A	54.3
0-90	2097	N / A	75.6
40-90	1266	N / A	45.6
60-90	589	N / A	21.2
90-180	677	N / A	24.4
0-180	2775	N / A	100.0

Total Light Output = 2,775 lm

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

Signed:

Authorized Signatory

Date of test 6-Oct-2017
Date of report 6-Oct-2017



Test Report No. LLIA000802-016A

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.

120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each

Four LTF DA12W350C1834D010-0014 dimming LED drivers.

120.0Vac, 60.00Hz, 0.4496A, 52.63W, 0.976PF, 8.9%THD(i)

Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	639		90.0	77	
2.5	639		92.5	80	
5.0	637	61	95.0	82	
7.5	635		97.5	82	88
10.0	631		100.0	83	
12.5	626		102.5	84	
15.0	620	175	105.0	86	
17.5	612		107.5	87	91
20.0	603		110.0	89	
22.5	593		112.5	91	
25.0	581	268	115.0	94	
27.5	568		117.5	98	94
30.0	554		120.0	102	
32.5	539		122.5	106	
35.0	523	328	125.0	110	
37.5	506		127.5	114	98
40.0	489		130.0	119	
42.5	470		132.5	123	
45.0	451	348	135.0	127	
47.5	431		137.5	131	98
50.0	410		140.0	133	
52.5	389		142.5	136	
55.0	368	329	145.0	139	
57.5	346		147.5	141	87
60.0	324		150.0	143	
62.5	301		152.5	145	
65.0	279	276	155.0	147	
67.5	256		157.5	148	68
70.0	233		160.0	146	
72.5	211		162.5	145	
75.0	189	199	165.0	143	
77.5	166		167.5	140	41
80.0	144		170.0	137	
82.5	123		172.5	135	
85.0	103	114	175.0	133	
87.5	84		177.5	131	13
90.0	77		180.0	130	



Test Number: LLIA000802-016A

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.

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120.0Vac, 60.00Hz, 0.4496A, 52.63W, 0.976PF, 8.9%THD(i)

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	113	113	113	113	108	108	108	108	98	98	98	88	88	88	80	80	80	76
1	102	97	92	88	97	92	88	84	83	80	77	75	73	70	68	66	64	60
2	92	83	76	70	87	79	73	68	72	67	62	65	61	57	59	55	53	49
3	84	73	64	58	79	69	62	56	63	57	52	57	52	48	51	47	44	41
4	76	64	55	48	72	61	53	47	56	49	44	50	45	40	46	41	37	34
5	70	57	48	41	66	54	46	40	50	43	37	45	39	35	41	36	32	29
6	64	51	42	36	61	49	41	35	45	38	32	41	35	30	37	32	28	26
7	60	46	37	31	56	44	36	30	40	34	29	37	31	27	34	29	25	23
8	55	42	34	28	52	40	32	27	37	30	25	34	28	24	31	26	22	20
9	52	38	30	25	49	37	29	24	34	27	23	31	25	21	28	24	20	18
10	48	35	27	22	46	34	27	22	31	25	20	29	23	19	26	22	18	16

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	17.8	7.72	7.72
8.0	10.0	10.30	10.30
10.0	6.4	12.87	12.87
12.0	4.4	15.45	15.45
14.0	3.3	18.02	18.02
16.0	2.5	20.60	20.60



Test Report No. LLIA000802-016A

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.

120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each

Four LTF DA12W350C1834D010-0014 dimming LED drivers.

120.0Vac, 60.00Hz, 0.4496A, 52.63W, 0.976PF, 8.9%THD(i)





Test Report No. LLIA000802-016A

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.
120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each
Four LTF DA12W350C1834D010-0014 dimming LED drivers.
120.0Vac, 60.00Hz, 0.4496A, 52.63W, 0.976PF, 8.9%THD(i)

Test Distance 9.5 m
Test Temperature 25.2 °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

LLIA000802-016B

Integrating Sphere Report

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.

120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each

Four LTF DA12W350C1834D010-0014 dimming LED drivers.



Performance Summary

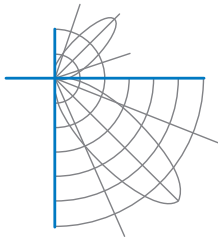
Voltage	120.0 Vac
Current	0.4499 A
Power	52.68 W
Frequency	60.00 Hz
Power Factor	0.976
Current THD	8.8 %

Total Luminous Flux	2819.5 lm
Efficacy	53.5 lm/W
Chromaticity (x,y)	(0.4449, 0.4080)
(u',v')	(0.2540, 0.5241)
Duv	0.0005
CCT	2902 K
CRI (Ra)	95
R9	74

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

Test date: 10/06/2017

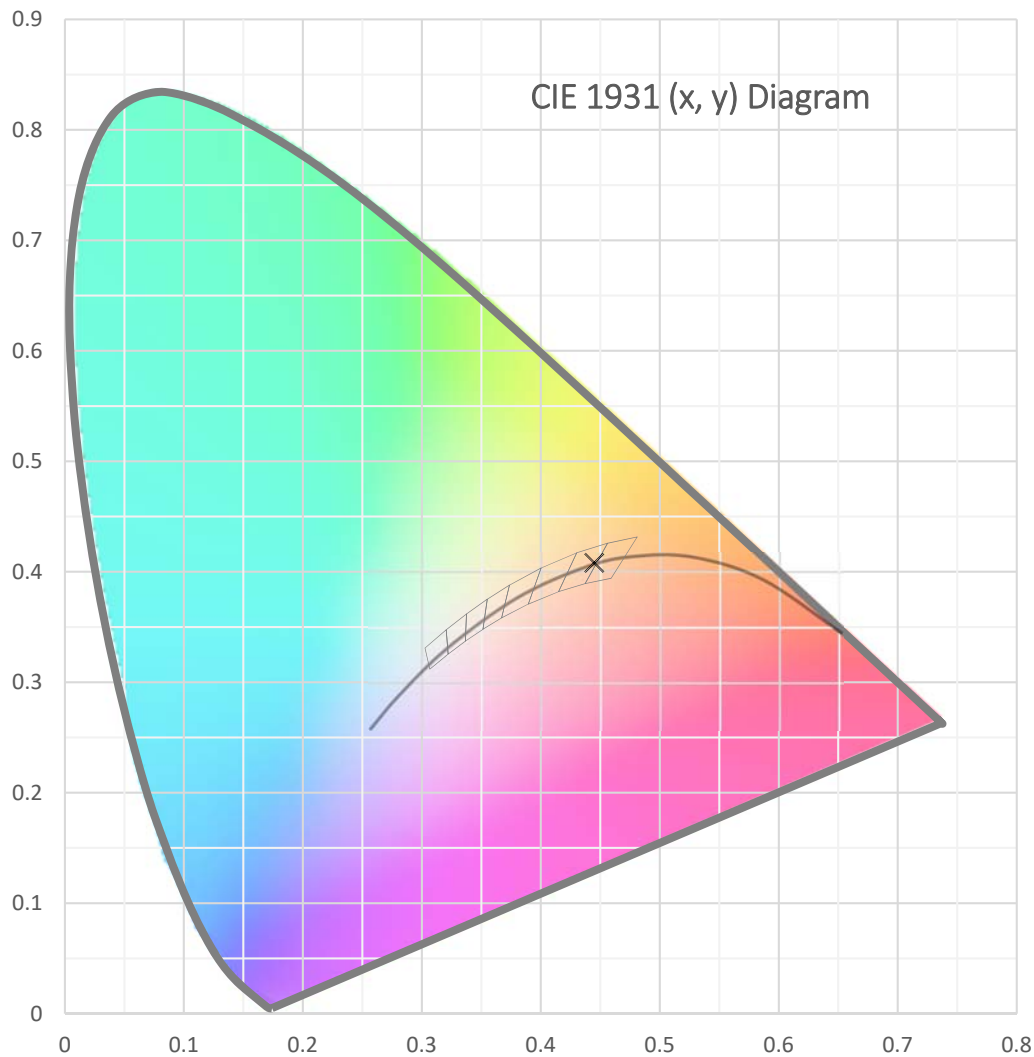
Report date: 10/06/2017



Test Report Number: LLIA000802-016B

Catalog Number: 3-640-24 Echo Pendant

Pendant mounted, spun steel canopy, formed aluminum top plate with white enamel perforated steel upper enclosure, textured fabric shade with translucent white lower enclosure.
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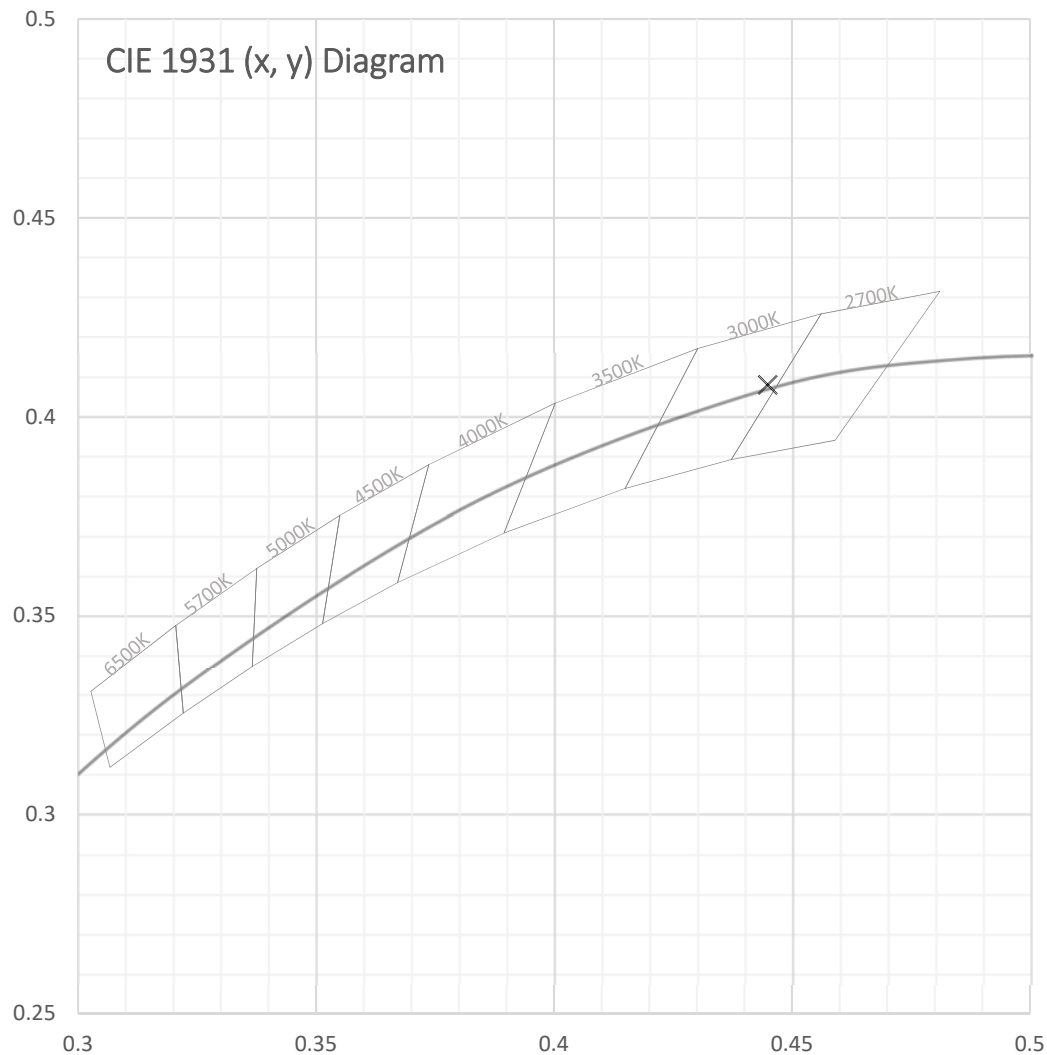




Test Report Number: LLIA000802-016B

Catalog Number: 3-640-24 Echo Pendant

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Four LTF DA12W350C1834D010-0014 dimming LED drivers.

Spectral Data

Total Radiant Flux	10.34 W
Total Luminous Flux	2819.5 Lm
Chromaticity CIE 1931 (x, y)	(0.4449, 0.4080)
Chromaticity CIE 1976 (u', v')	(0.2540, 0.5241)
Correlated Color Temperature (CCT)	2902 K
Color Rendering Index (Ra)	95
R1	96
R2	97
R3	96
R4	96
R5	95
R6	96
R7	95
R8	89
R9	74
R10	91
R11	97
R12	84
R13	96
R14	97
Distance from Planckian Locus (Duv)	0.0005
Scotopic/Photopic Ratio *	1.375

Electrical Data

Voltage	120.0 Vac
Current	0.4499 A
Power	52.68 W
Frequency	60.00 Hz
Power Factor	0.976
Current THD	8.8 %



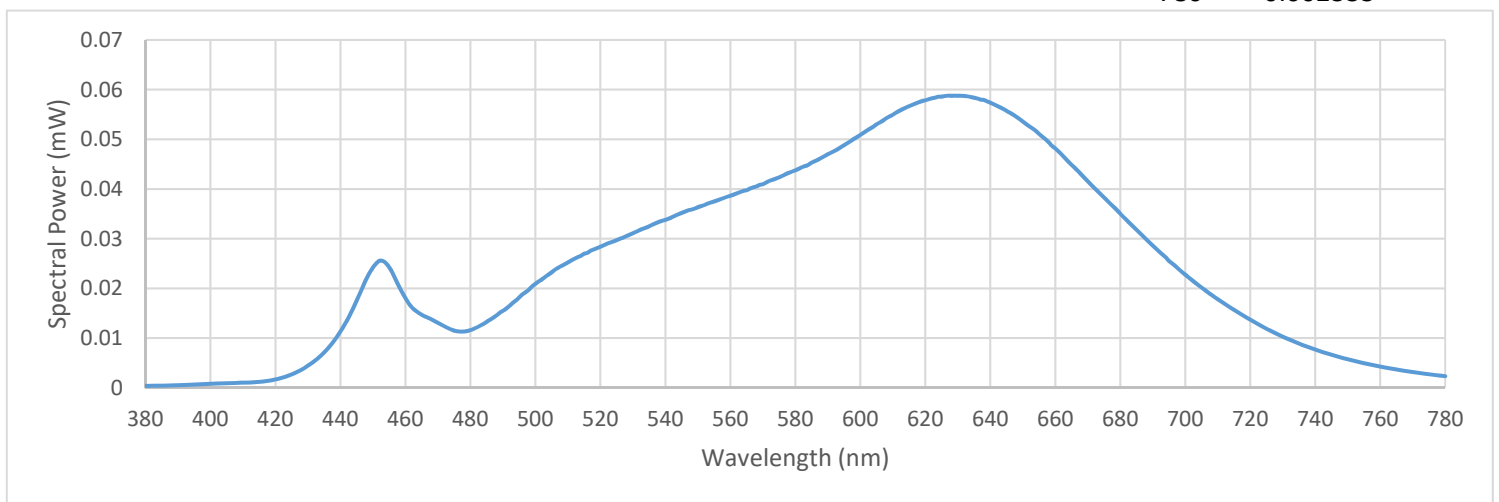
Test Report Number: LLIA000802-016B

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120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000399	480	0.011618	580	0.043755	680	0.035009
385	0.000416	485	0.013267	585	0.045314	685	0.031812
390	0.000528	490	0.015486	590	0.047029	690	0.028584
395	0.000632	495	0.018182	595	0.048822	695	0.025519
400	0.000780	500	0.020910	600	0.050850	700	0.022799
405	0.000933	505	0.023211	605	0.053038	705	0.020203
410	0.001038	510	0.025195	610	0.054927	710	0.017797
415	0.001184	515	0.026968	615	0.056635	715	0.015685
420	0.001678	520	0.028408	620	0.057840	720	0.013683
425	0.002687	525	0.029687	625	0.058569	725	0.011865
430	0.004472	530	0.031060	630	0.058751	730	0.010306
435	0.007140	535	0.032466	635	0.058343	735	0.008872
440	0.011290	540	0.033785	640	0.057397	740	0.007679
445	0.017559	545	0.035163	645	0.055704	745	0.006638
450	0.024210	550	0.036333	650	0.053600	750	0.005726
455	0.024258	555	0.037442	655	0.051062	755	0.004947
460	0.018053	560	0.038627	660	0.048194	760	0.004286
465	0.014678	565	0.039753	665	0.044872	765	0.003672
470	0.013093	570	0.040963	670	0.041549	770	0.003147
475	0.011473	575	0.042322	675	0.038304	775	0.002720
						780	0.002333





Test Report Number: LLIA000802-016B

Catalog Number: 3-640-24 Echo Pendant

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120 white LEDs, four Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each
Four LTF DA12W350C1834D010-0014 dimming LED drivers.

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.

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