

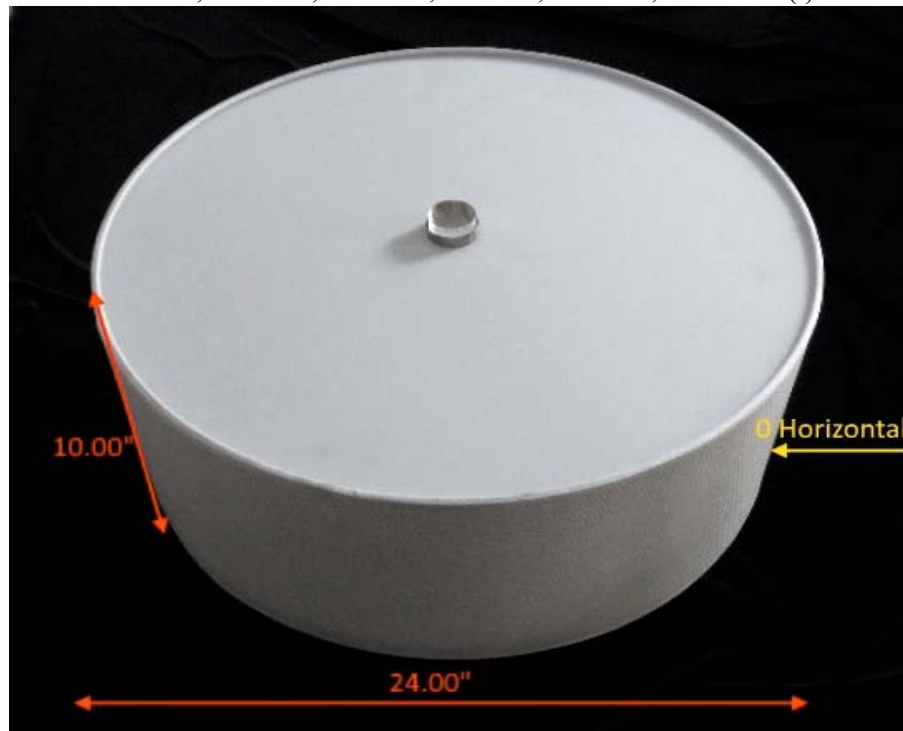


Report of Test

LLIA000802-015A

Catalog Number: 3-639-24 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.
90 white LEDs, Three Harvard Engineering LEDENG-152-930-NL LED boards with 30 LEDs each
Three LTF DA12W350C1834D010-0014 dimming LED drivers.
120.0Vac, 60.00Hz, 0.3319A, 38.91W, 0.977PF, 8.7%THD(i)



Performance Summary

Total Light Output	2040 lm
Luminaire Power	38.9 W
Luminous Efficacy	52.4 lm/W

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



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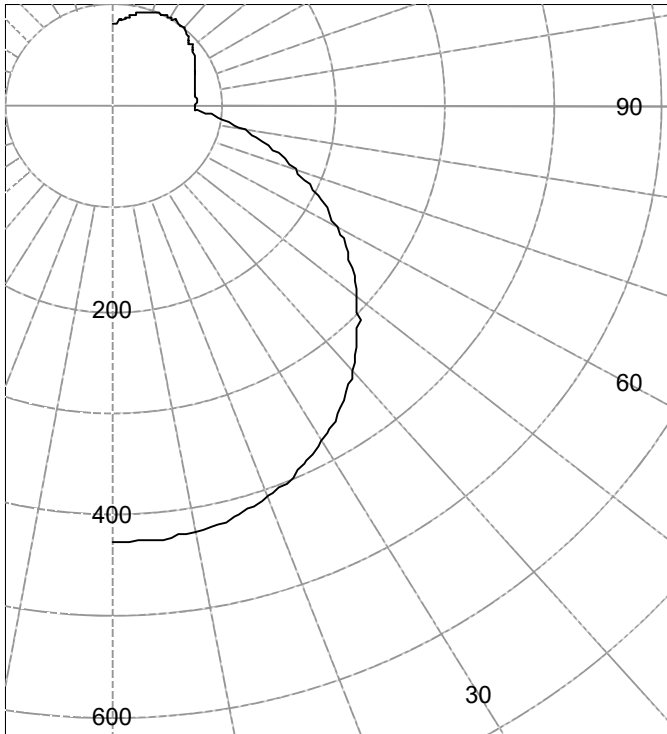
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Legend: All planes - Solid (cd)



(Rotational symmetry)

AVERAGE LUMINANCE (cd / m²)

Gamma	C0
45.0	995
55.0	890
65.0	775
75.0	646
85.0	498

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	428		90	73	
5	427	41	95	75	82
10	424		100	76	
15	417	118	105	77	81
20	408		110	78	
25	395	182	115	81	81
30	379		120	85	
35	360	225	125	89	79
40	338		130	92	
45	315	243	135	96	74
50	289		140	99	
55	262	234	145	101	63
60	234		150	101	
65	205	203	155	100	46
70	175		160	99	
75	146	154	165	95	27
80	117		170	90	
85	90	99	175	85	8
90	73		180	82	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	341	N / A	16.7
0-40	566	N / A	27.7
0-60	1043	N / A	51.1
0-90	1499	N / A	73.4
40-90	933	N / A	45.7
60-90	456	N / A	22.3
90-180	542	N / A	26.6
0-180	2040	N / A	100.0

Total Light Output = 2,040 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



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Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	428		90.0	73	
2.5	427		92.5	74	
5.0	427	41	95.0	75	
7.5	426		97.5	75	82
10.0	424		100.0	76	
12.5	421		102.5	76	
15.0	417	118	105.0	77	
17.5	413		107.5	78	81
20.0	408		110.0	78	
22.5	402		112.5	80	
25.0	395	182	115.0	81	
27.5	387		117.5	83	81
30.0	379		120.0	85	
32.5	369		122.5	87	
35.0	360	225	125.0	89	
37.5	349		127.5	91	79
40.0	338		130.0	92	
42.5	327		132.5	94	
45.0	315	243	135.0	96	
47.5	302		137.5	98	74
50.0	289		140.0	99	
52.5	276		142.5	100	
55.0	262	234	145.0	101	
57.5	248		147.5	101	63
60.0	234		150.0	101	
62.5	219		152.5	101	
65.0	205	203	155.0	100	
67.5	190		157.5	99	46
70.0	175		160.0	99	
72.5	160		162.5	97	
75.0	146	154	165.0	95	
77.5	131		167.5	93	27
80.0	117		170.0	90	
82.5	103		172.5	88	
85.0	90	99	175.0	85	
87.5	78		177.5	83	8
90.0	73		180.0	82	



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Coefficients Of Utilization - Zonal Cavity Method

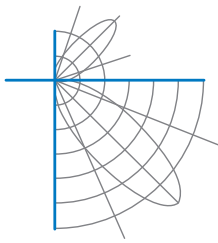
Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10
0	113	113	113	113	107	107	107	107	96	96	96	87	87	87	78	78	78	73
1	101	96	91	86	95	91	86	82	82	78	75	73	70	68	65	63	61	58
2	91	82	75	69	86	78	72	66	70	65	60	63	59	55	56	53	50	46
3	83	72	63	56	78	68	60	54	61	55	50	55	50	46	49	45	42	38
4	75	63	54	47	71	60	52	45	54	47	42	49	43	39	44	39	35	32
5	69	56	47	40	65	53	45	39	48	41	36	43	38	33	39	34	30	28
6	63	50	41	35	60	48	39	33	43	36	31	39	33	29	35	30	27	24
7	59	45	36	30	55	43	35	29	39	32	27	35	30	25	32	27	23	21
8	54	41	33	27	51	39	31	26	36	29	24	32	27	23	29	24	21	19
9	51	37	29	24	48	36	28	23	33	26	22	30	24	20	27	22	19	17
10	47	34	27	21	45	33	26	21	30	24	19	28	22	18	25	20	17	15

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	11.9	7.88	7.88
8.0	6.7	10.51	10.51
10.0	4.3	13.14	13.14
12.0	3.0	15.77	15.77
14.0	2.2	18.40	18.40
16.0	1.7	21.02	21.02



Test Report No. LLIA000802-015A

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Test Distance 9.5 m
Test Temperature 25.1 °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

LLIA000802-015B

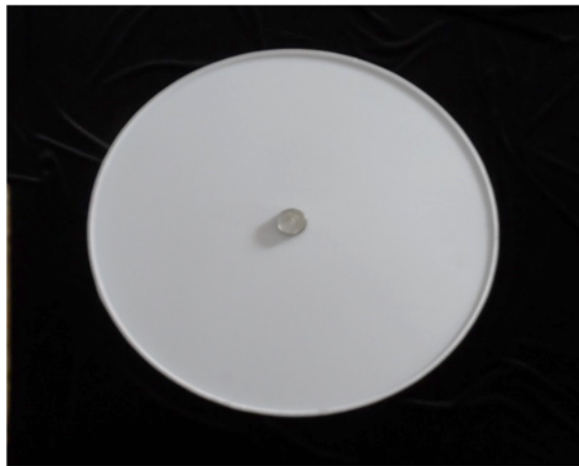
Integrating Sphere Report

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Performance Summary

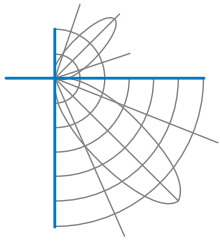
Voltage	120.0 Vac
Current	0.3320 A
Power	38.92 W
Frequency	60.00 Hz
Power Factor	0.977
Current THD	8.7 %

Total Luminous Flux	2058.7 lm
Efficacy	52.9 lm/W
Chromaticity (x,y)	(0.4470, 0.4089)
(u',v')	(0.2550, 0.5248)
Duv	0.0006
CCT	2876 K
CRI (Ra)	95
R9	75

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

Test date: 10/01/2017

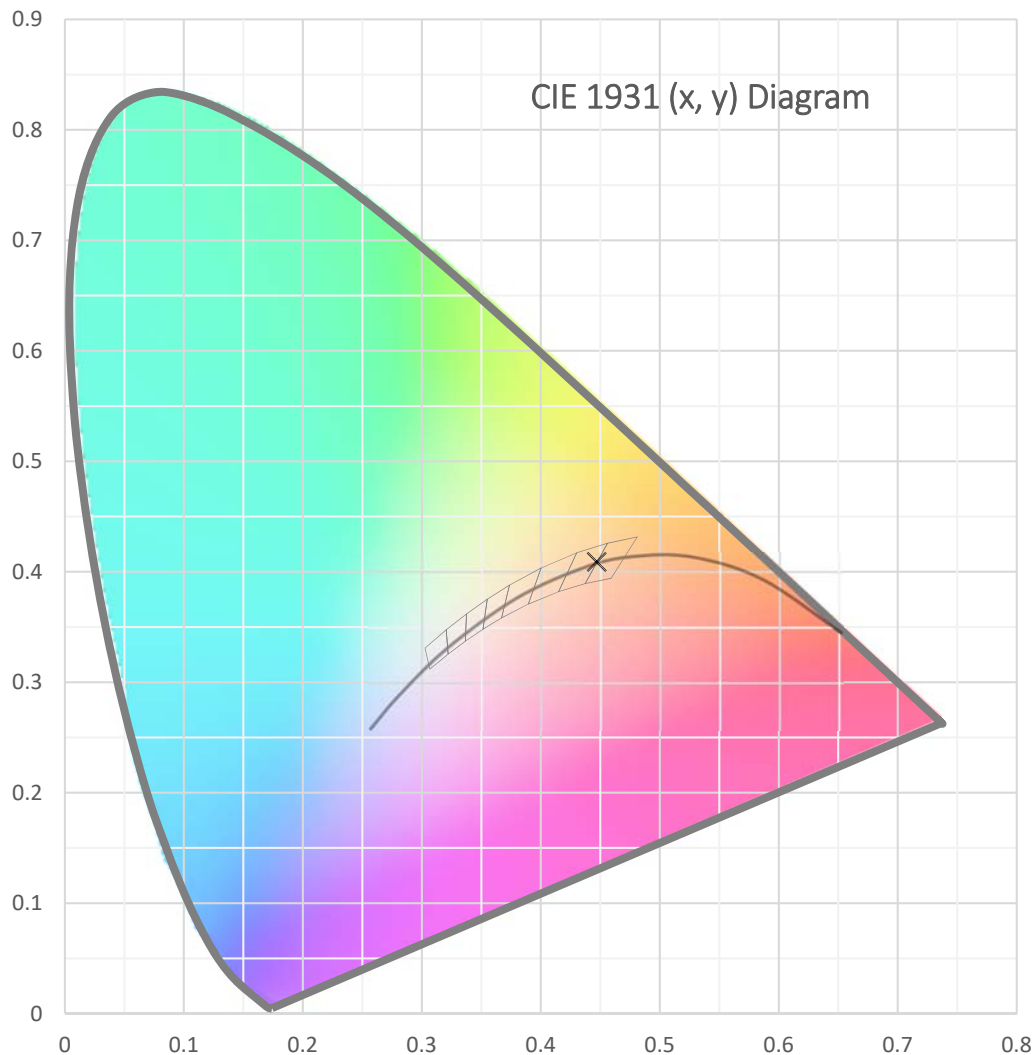
Report date: 10/06/2017

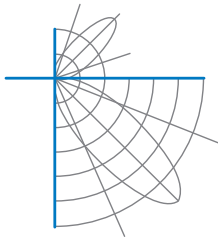


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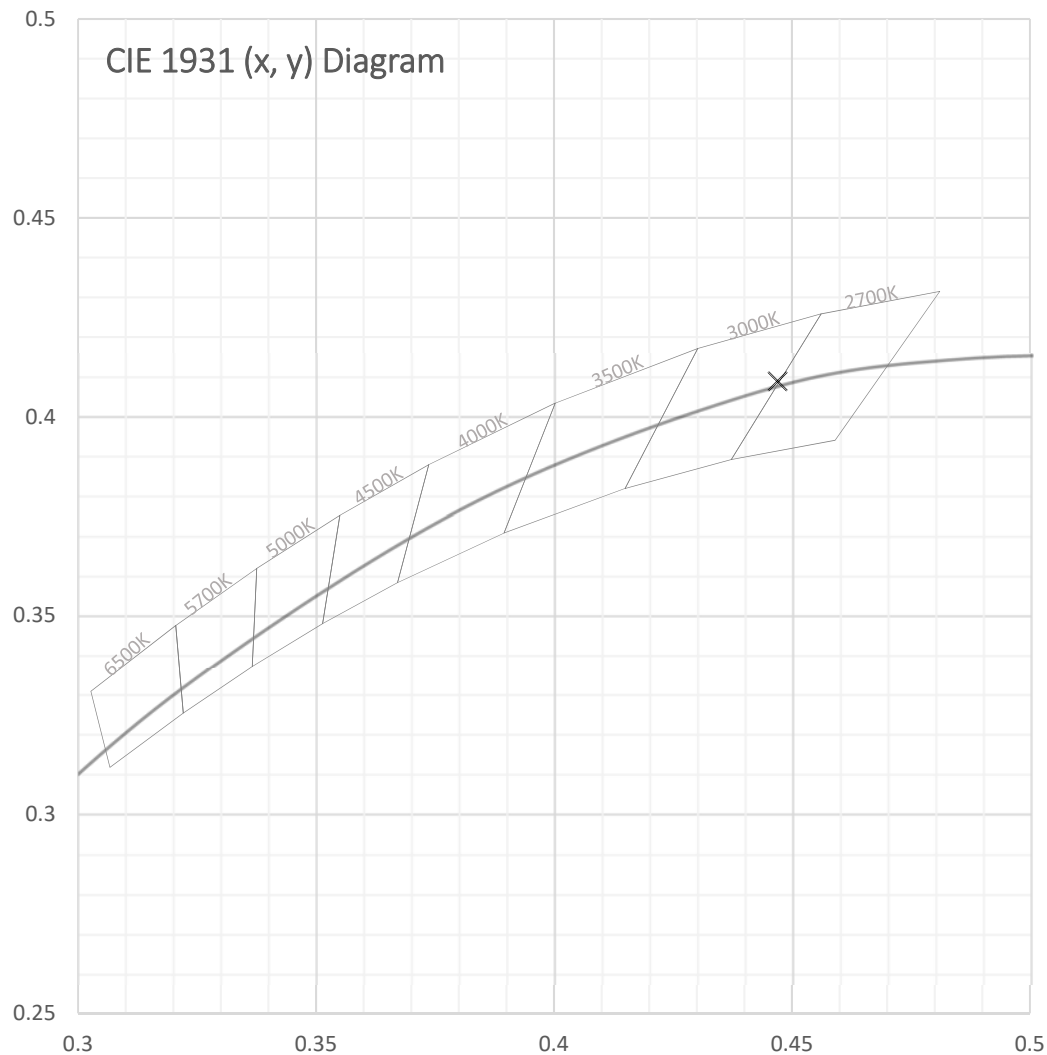




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Spectral Data

Total Radiant Flux	7.605 W
Total Luminous Flux	2058.7 Lm
Chromaticity CIE 1931 (x, y)	(0.4470, 0.4089)
Chromaticity CIE 1976 (u', v')	(0.2550, 0.5248)
Correlated Color Temperature (CCT)	2876 K
Color Rendering Index (Ra)	95
R1	96
R2	97
R3	96
R4	96
R5	95
R6	96
R7	96
R8	90
R9	75
R10	91
R11	97
R12	84
R13	96
R14	97
Distance from Planckian Locus (Duv)	0.0006
Scotopic/Photopic Ratio *	1.363

Electrical Data

Voltage	120.0 Vac
Current	0.3320 A
Power	38.92 W
Frequency	60.00 Hz
Power Factor	0.977
Current THD	8.7 %



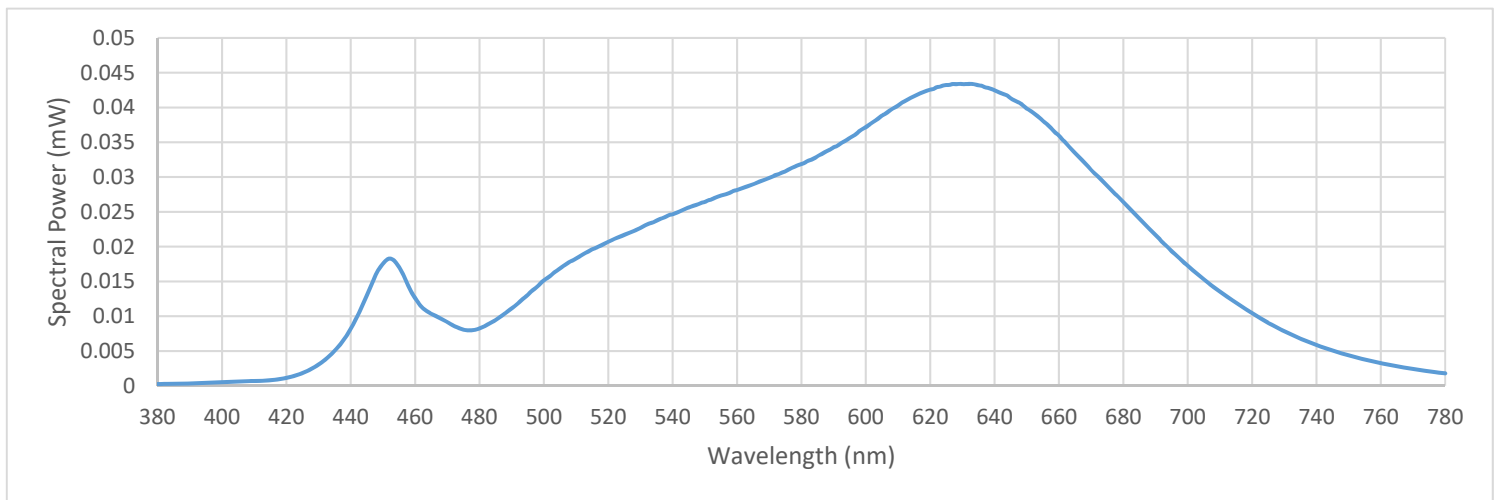
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Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000257	480	0.008251	580	0.031868	680	0.026395
385	0.000271	485	0.009442	585	0.033007	685	0.024040
390	0.000343	490	0.011132	590	0.034275	690	0.021671
395	0.000417	495	0.013071	595	0.035610	695	0.019331
400	0.000514	500	0.015157	600	0.037149	700	0.017272
405	0.000607	505	0.016871	605	0.038823	705	0.015332
410	0.000690	510	0.018291	610	0.040261	710	0.013539
415	0.000803	515	0.019621	615	0.041613	715	0.011924
420	0.001130	520	0.020708	620	0.042568	720	0.010433
425	0.001830	525	0.021674	625	0.043232	725	0.009047
430	0.003070	530	0.022692	630	0.043361	730	0.007867
435	0.005039	535	0.023731	635	0.043183	735	0.006776
440	0.008193	540	0.024645	640	0.042482	740	0.005845
445	0.012997	545	0.025630	645	0.041322	745	0.005068
450	0.017547	550	0.026430	650	0.039851	750	0.004378
455	0.017063	555	0.027349	655	0.038077	755	0.003762
460	0.012618	560	0.028126	660	0.035969	760	0.003265
465	0.010336	565	0.028935	665	0.033459	765	0.002804
470	0.009142	570	0.029856	670	0.031015	770	0.002409
475	0.008046	575	0.030806	675	0.028728	775	0.002078
						780	0.001785





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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: 24.9 °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.

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