



Report of Test

LLIA001166-017A

Indoor Distribution Photometry Test Report

Catalog Number: Terra 3-691-24

Pendant mounted, formed steel canopy, formed steel and aluminum LED plate with translucent white plastic enclosure, coated white glass outer enclosure.

28 white LEDs, one D100-120A LED board

One onboard LED driver



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

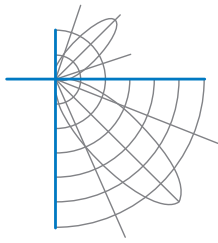
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	582.2 Lumens
Input Current	0.1040 A	Total Efficacy	49.4 Lm/W
Input Power	11.79 W	Downward Flux	281.0 Lumens
Frequency	60.00 Hz	Downward Flux	48.3 % of Total
Power Factor	0.945		
Current THD	33.7 %		

This test report was issued by LightLab International Allentown, LLC without alterations or erasures.

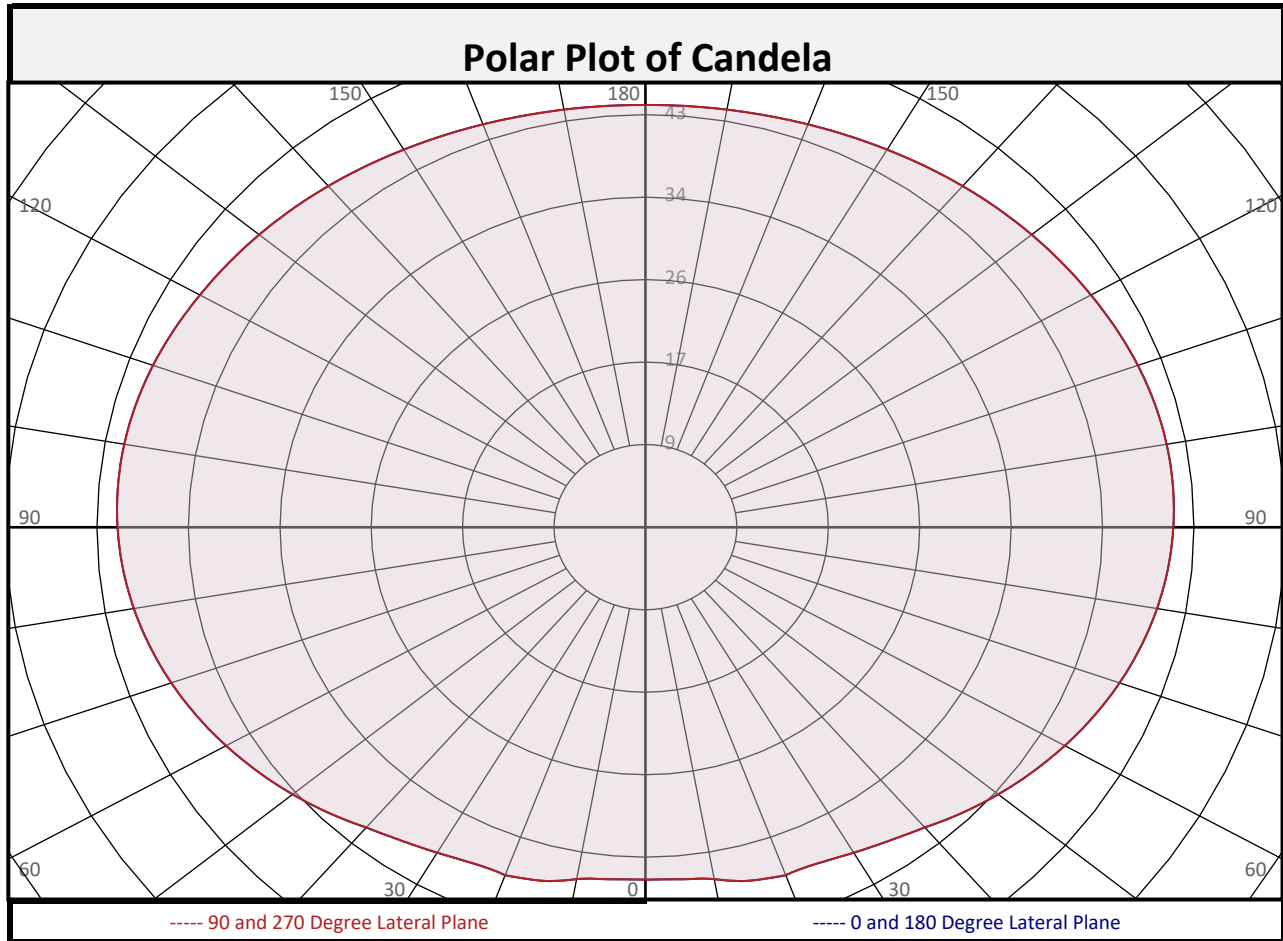
Test date: 10/18/2019

Report date: 10/18/2019

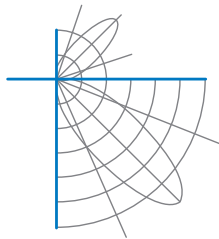
Signed: _____



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Zonal Flux Summary										
Zone (Deg Vert)	Flux (Lumens)	Percent of Total		Zone (Deg Vert)	Flux (Lumens)	Percent of Total		Zone (Deg Vert)	Flux (Lumens)	Percent of Total
0-10	3.5	0.6%		90-100	54.3	9.3%		0-20	14.3	2.5%
10-20	10.8	1.9%		100-110	52.5	9.0%		0-30	32.3	5.5%
20-30	17.9	3.1%		110-120	48.5	8.3%		0-40	57.4	9.9%
30-40	25.1	4.3%		120-130	43.0	7.4%		0-60	129.9	22.3%
40-50	32.6	5.6%		130-140	36.4	6.3%		0-80	227.1	39.0%
50-60	39.9	6.9%		140-150	28.9	5.0%		10-90	277.4	47.6%
60-70	46.2	7.9%		150-160	20.9	3.6%		20-50	75.7	13.0%
70-80	51.0	8.8%		160-170	12.6	2.2%		40-90	223.6	38.4%
80-90	53.8	9.2%		170-180	4.2	0.7%		60-90	151.0	25.9%
0-90	281.0	48.3%		90-180	301.3	51.8%		0-180	582.2	100.0%

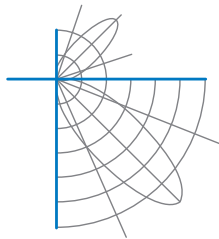


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7
	2.5	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7
	5	36.8	36.8	36.8	36.8	36.8	36.8	36.8	36.8	36.8
	7.5	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0	37.0
	10	37.2	37.2	37.2	37.2	37.2	37.2	37.2	37.2	37.2
	12.5	37.7	37.7	37.7	37.7	37.7	37.7	37.7	37.7	37.7
	15	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1
	17.5	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4	38.4
	20	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6
	22.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5	38.5
	25	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6	38.6
	27.5	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8
	30	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
	32.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5	39.5
	35	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
	37.5	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4
	40	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8	40.8
	42.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5	41.5
	45	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
	47.5	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7
50	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	
52.5	43.9	43.9	43.9	43.9	43.9	43.9	43.9	43.9	43.9	
55	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	
57.5	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
60	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	
62.5	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	46.1	
65	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	46.6	
67.5	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	47.0	
70	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	
72.5	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	
75	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	
77.5	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	
80	48.9	48.9	48.9	48.9	48.9	48.9	48.9	48.9	48.9	
82.5	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	
85	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	49.4	
87.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	
90	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	

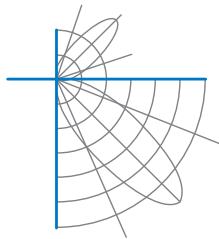


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	90	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
	92.5	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8
	95	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8
	97.5	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8
	100	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.8
	102.5	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7	49.7
	105	49.6	49.6	49.6	49.6	49.6	49.6	49.6	49.6	49.6
	107.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5
	110	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3	49.3
	112.5	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1	49.1
	115	48.9	48.9	48.9	48.9	48.9	48.9	48.9	48.9	48.9
	117.5	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6	48.6
	120	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4	48.4
	122.5	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2
	125	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9
	127.5	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7	47.7
	130	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5
	132.5	47.2	47.2	47.2	47.2	47.2	47.2	47.2	47.2	47.2
	135	46.9	46.9	46.9	46.9	46.9	46.9	46.9	46.9	46.9
	137.5	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7
140	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	46.4	
142.5	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	46.2	
145	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	45.9	
147.5	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	
150	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	
152.5	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	45.2	
155	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	
157.5	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	
160	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	44.7	
162.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	
165	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	44.4	
167.5	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	44.3	
170	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	44.2	
172.5	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	
175	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1	
177.5	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	
180	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	



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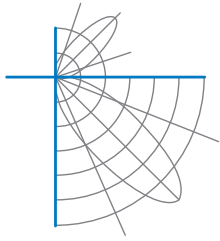
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																						
Effective Floor Cavity Reflectance 0.20																						
RC	80					70					50				30				10			0
RW	70	50	30	10		70	50	30	10		50	30	10		50	30	10		50	30	10	0
RCR																						
0	107	107	107	107		98	98	98	98		82	82	82		68	68	68		55	55	55	48
1	93	87	81	76		85	79	74	70		65	62	58		53	50	47		41	39	37	31
2	83	73	65	59		75	67	60	54		55	49	45		44	40	36		34	31	28	23
3	75	63	54	47		68	57	50	43		47	41	36		37	33	29		29	25	22	18
4	68	55	46	38		61	50	42	35		41	35	29		33	28	24		25	21	18	14
5	62	48	39	32		56	44	36	30		36	30	25		29	24	20		22	18	15	11
6	57	43	34	27		51	39	31	25		32	26	21		26	21	17		20	16	13	10
7	52	39	30	24		47	35	27	22		29	23	18		23	18	14		18	14	11	8
8	48	35	26	20		44	32	24	19		26	20	16		21	16	13		16	12	10	7
9	45	32	23	18		41	29	22	17		24	18	14		19	15	11		15	11	8	6
10	42	29	21	16		38	26	19	15		22	16	12		18	13	10		14	10	8	5

For absolute test reports, RUs are expressed as a percentage of total lumen output. For relative test reports, CUs are expressed as a percentage of total lamp 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)	Ground-level distance to half-of-nadir illuminance (ft)		
		0-180 deg	90-270 deg	
6.0	1.0	10.07	10.07	
8.0	0.6	13.43	13.43	
10.0	0.4	16.78	16.78	
12.0	0.3	20.14	20.14	
14.0	0.2	23.50	23.50	
16.0	0.1	26.85	26.85	

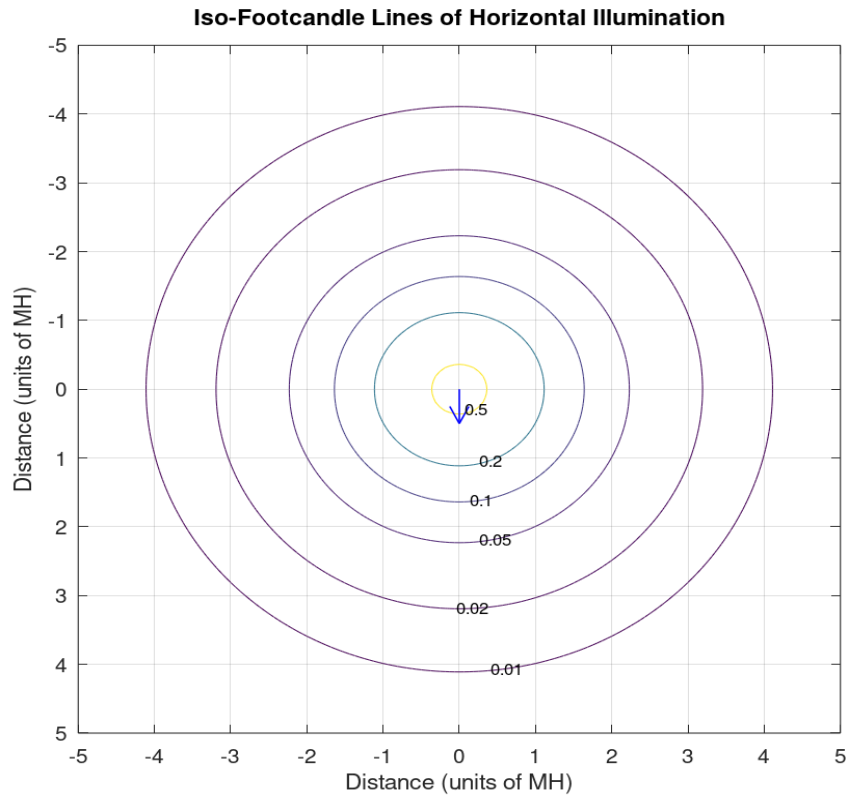
Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	602	602	602
45	690	690	679
55	729	729	706
65	763	763	728
75	791	791	742
85	809	809	748

Spacing Criterion	
Spacing Criterion:	1.7

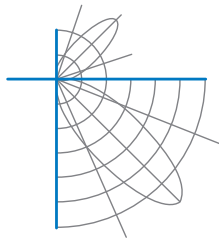


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Iso-Illuminance Plot



The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution of room reflections.



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Test Distance 9.5 m
Ambient Temperature 24.5 °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-79-19 and ANSI C82.77-10:2014. Format of reports and angular increments based on IES LM-41-14 and LM-46-04.

The luminous intensity values, and other derived quantities, contained in this report are based on the absolute data, as measured.

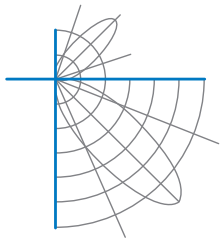
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

This report is free of erasures and corrections.

Photometric intensity values are reported using the CIE C-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

LLIA001166-017B

Integrating Sphere Report
Catalog Number: Terra 3-691-24

Pendant mounted, formed steel canopy, formed steel and aluminum LED plate with translucent white plastic enclosure, coated white glass outer enclosure.

28 white LEDs, one D100-120A LED board

One onboard LED driver

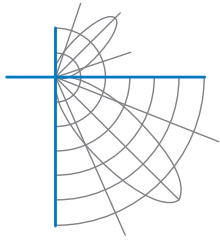


Performance Summary

Voltage	120.0 Vac
Current	0.1043 A
Power	11.80 W
Frequency	59.99 Hz
Power Factor	0.944
Current THD	33.7 %
Total Luminous Flux	588.7 lm
Efficacy	49.9 lm/W
Chromaticity (x,y)	(0.4454, 0.4050)
(u',v')	(0.2556, 0.5230)
Duv	-0.0007
CCT	2870 K
CRI (Ra)	91
R9	63
TM-30: Rf	89
TM-30: Rg	102

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

Test date: 10/18/2019
Report date: 10/18/2019



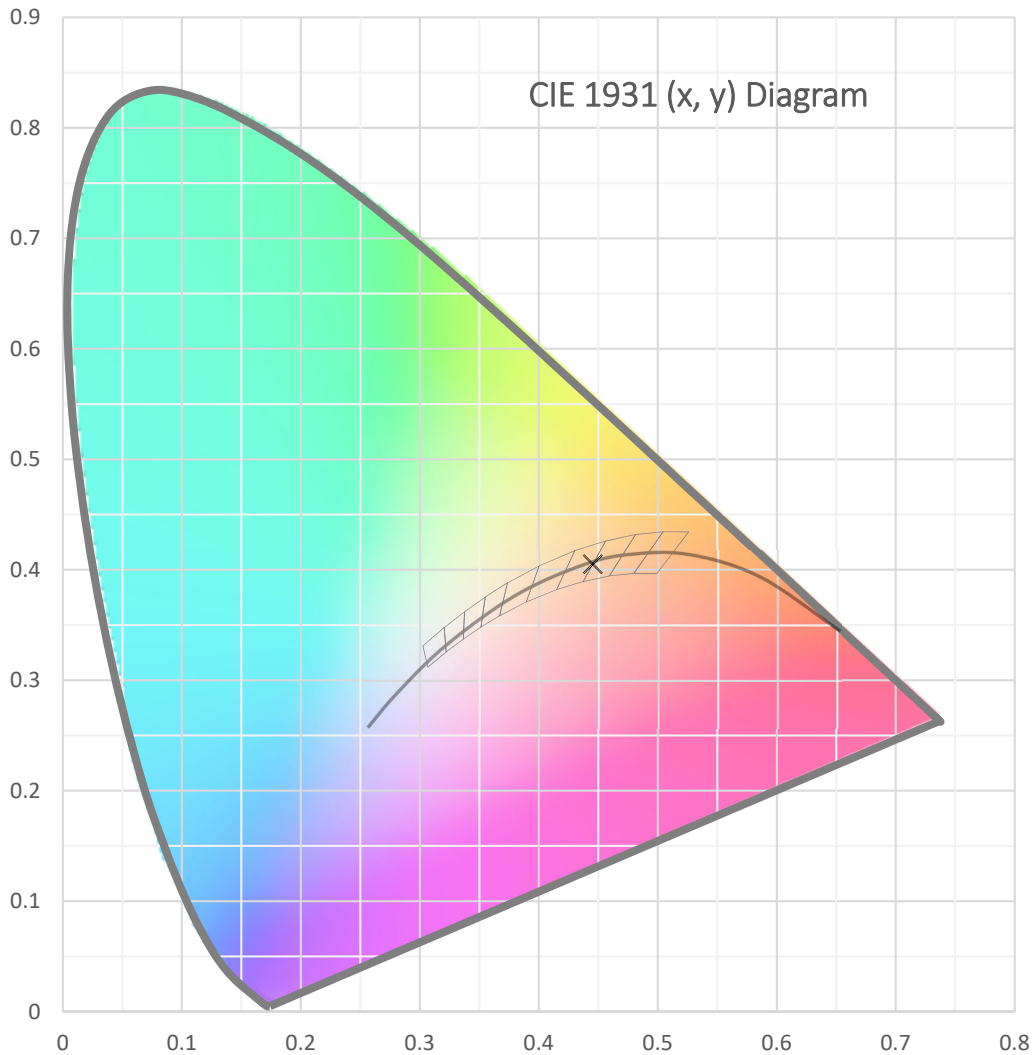
Test Report Number: LLIA001166-017B

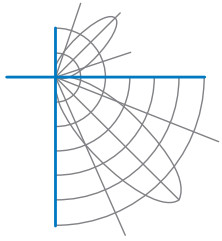
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One onboard LED driver





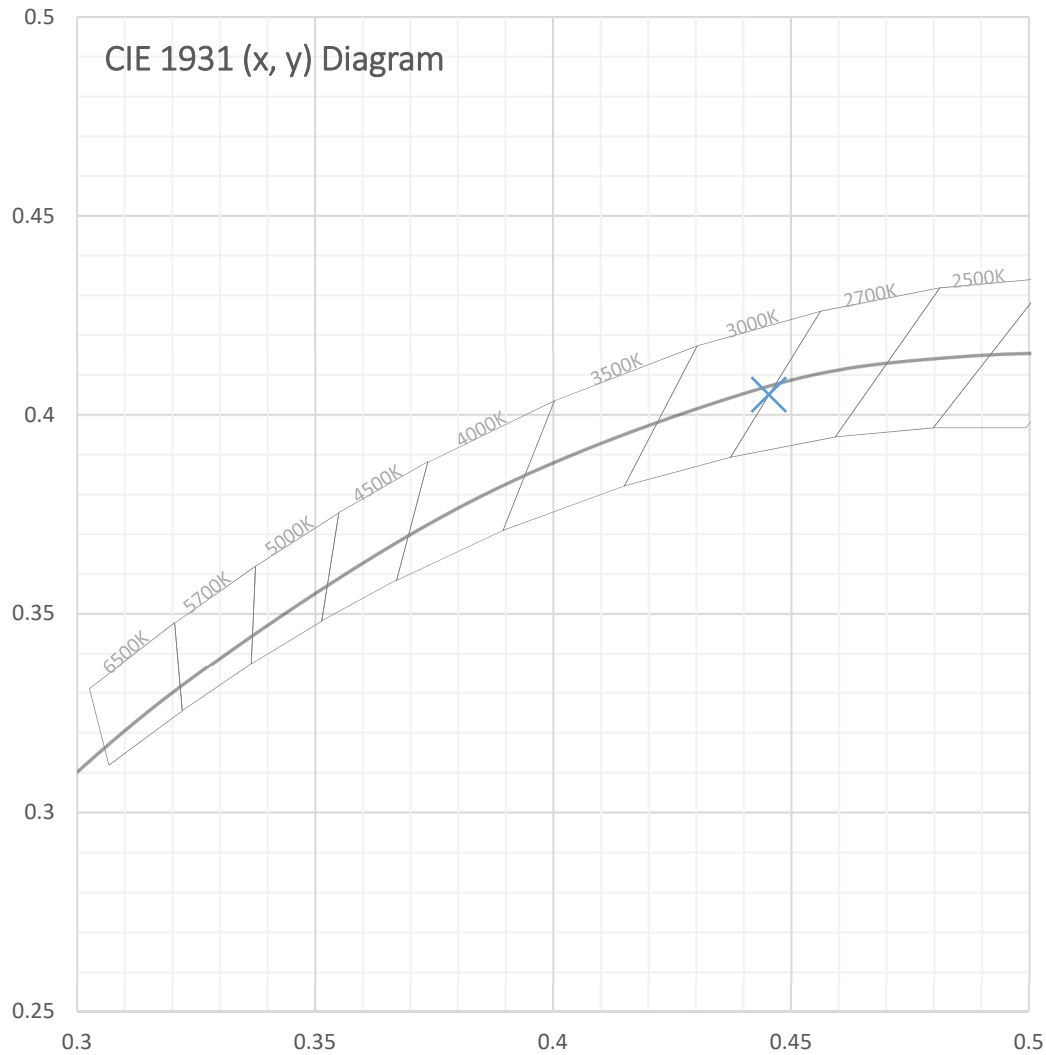
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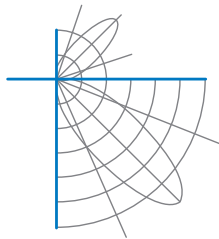
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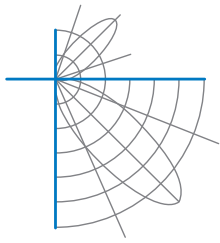
One onboard LED driver

Spectral Data

Total Radiant Flux	2.105 W
Total Luminous Flux	588.7 Lm
Chromaticity CIE 1931 (x, y)	(0.4454, 0.4050)
Chromaticity CIE 1976 (u', v')	(0.2556, 0.5230)
Correlated Color Temperature (CCT)	2870 K
Color Rendering Index (Ra)	91
R1	92
R2	94
R3	94
R4	92
R5	91
R6	92
R7	93
R8	84
R9	63
R10	84
R11	92
R12	79
R13	92
R14	96
TM-30: Rf	89
TM-30: Rg	102
Distance from Planckian Locus (Duv)	-0.0007
Scotopic/Photopic Ratio *	1.320

Electrical Data

Voltage	120.0 Vac
Current	0.1043 A
Power	11.80 W
Frequency	59.99 Hz
Power Factor	0.944
Current THD	33.7 %



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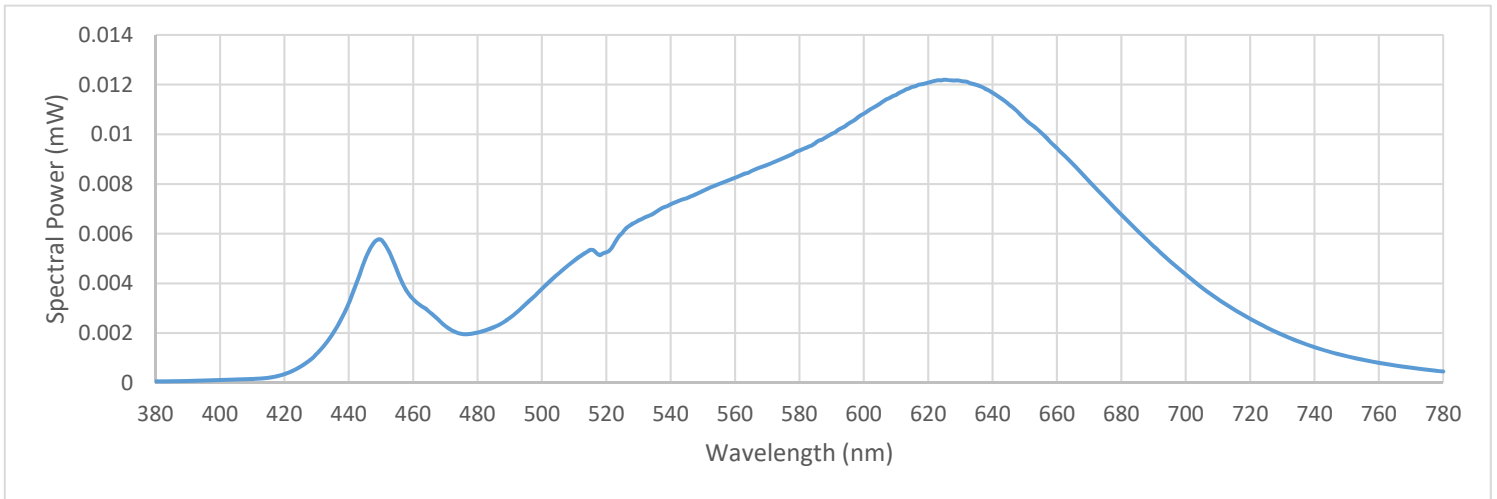
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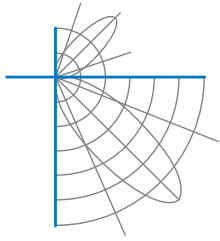
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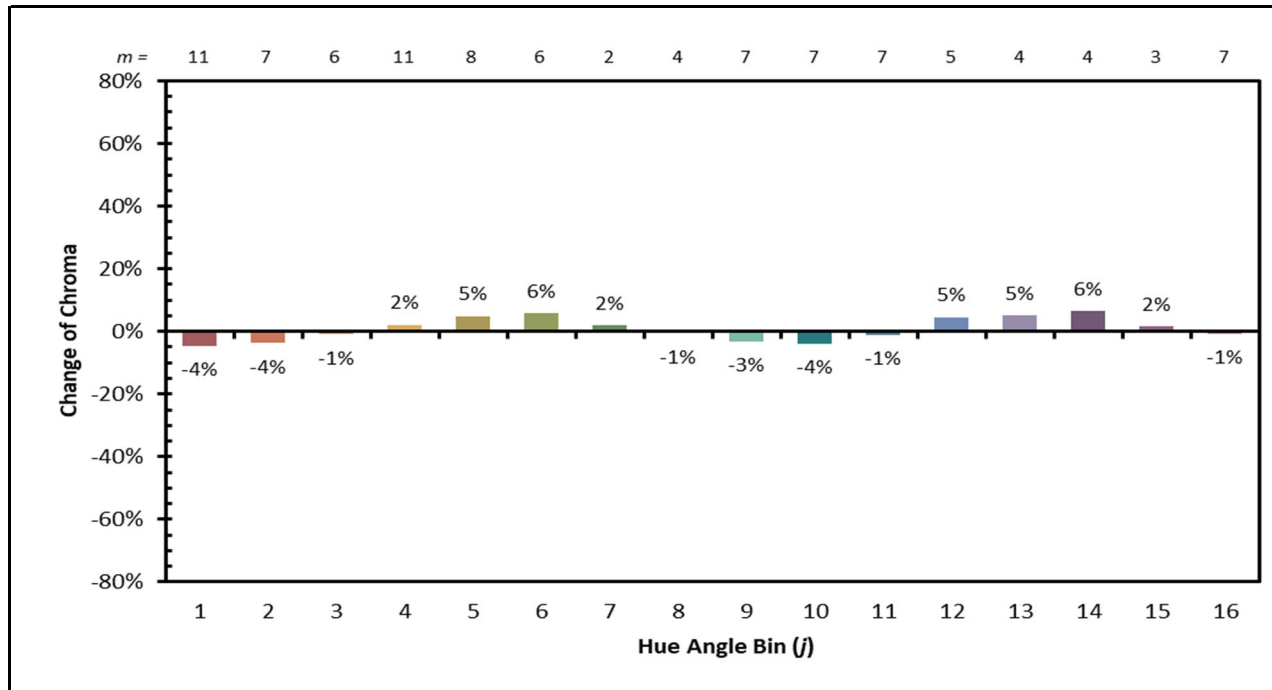
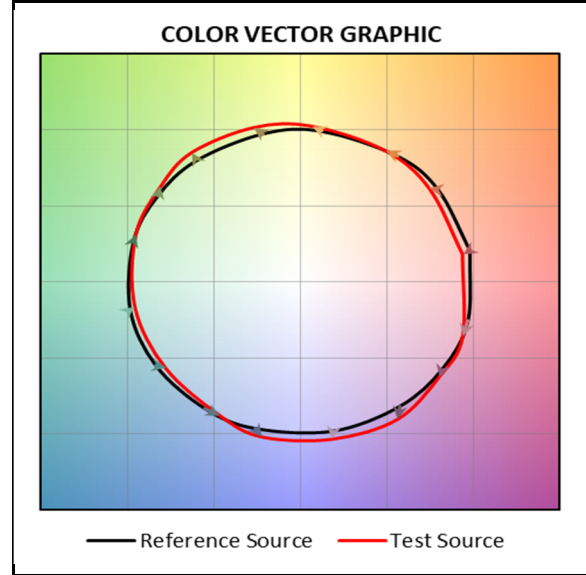
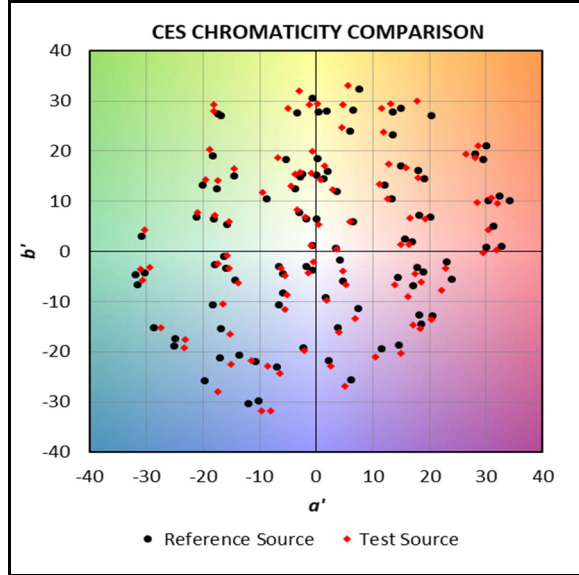
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

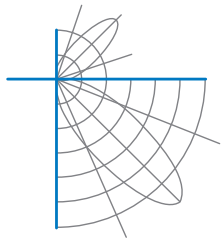
380	0.000058	480	0.002020	580	0.009338	680	0.006770
385	0.000060	485	0.002232	585	0.009656	685	0.006131
390	0.000074	490	0.002606	590	0.010016	690	0.005497
395	0.000089	495	0.003168	595	0.010410	695	0.004902
400	0.000110	500	0.003783	600	0.010831	700	0.004366
405	0.000132	505	0.004369	605	0.011230	705	0.003840
410	0.000156	510	0.004918	610	0.011585	710	0.003366
415	0.000198	515	0.005346	615	0.011905	715	0.002951
420	0.000349	520	0.005253	620	0.012078	720	0.002575
425	0.000646	525	0.006034	625	0.012196	725	0.002228
430	0.001165	530	0.006532	630	0.012153	730	0.001934
435	0.001966	535	0.006841	635	0.011986	735	0.001665
440	0.003195	540	0.007184	640	0.011667	740	0.001428
445	0.004936	545	0.007430	645	0.011208	745	0.001236
450	0.005760	550	0.007727	650	0.010619	750	0.001069
455	0.004509	555	0.008002	655	0.010074	755	0.000924
460	0.003378	560	0.008246	660	0.009441	760	0.000805
465	0.002851	565	0.008509	665	0.008806	765	0.000698
470	0.002285	570	0.008771	670	0.008104	770	0.000604
475	0.001963	575	0.009038	675	0.007442	775	0.000524
						780	0.000454





IES TM-30 Details





Test Report Number: LLIA001166-017B

Catalog Number: Terra 3-691-24

Pendant mounted, formed steel canopy, formed steel and aluminum LED plate with translucent white plastic enclosure, coated white glass outer enclosure.

28 white LEDs, one D100-120A LED board

One onboard LED driver

Test Equipment Configuration: LightLab International Allentown 2m Integrating Sphere
Measurements acquired using a Labsphere CDS 2600 spectroradiometer
Testing was performed using 4π geometry

Test Temperature: 24.4 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-19, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2017,
ANSI C82-77-10:2014, TM-30-15

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.