



Report of Test

LLIA001166-022A

Indoor Distribution Photometry Test Report

Catalog Number: Aperto 3-724-15

Wall mounted, formed and extruded aluminum housing, white coated glass enclosure.

44 white LEDs, one DES-12018-385X32-LF-V1.0 LED board

One onboard LED driver



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

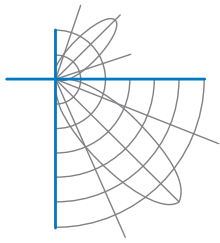
Performance Summary			
Input Voltage	120.0 V	Luminous Flux	796.0 Lumens
Input Current	0.1576 A	Total Efficacy	43.0 Lm/W
Input Power	18.51 W	Downward Flux	403.0 Lumens
Frequency	60.00 Hz	Downward Flux	50.6 % of Total
Power Factor	0.979		
Current THD	20.3 %		

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

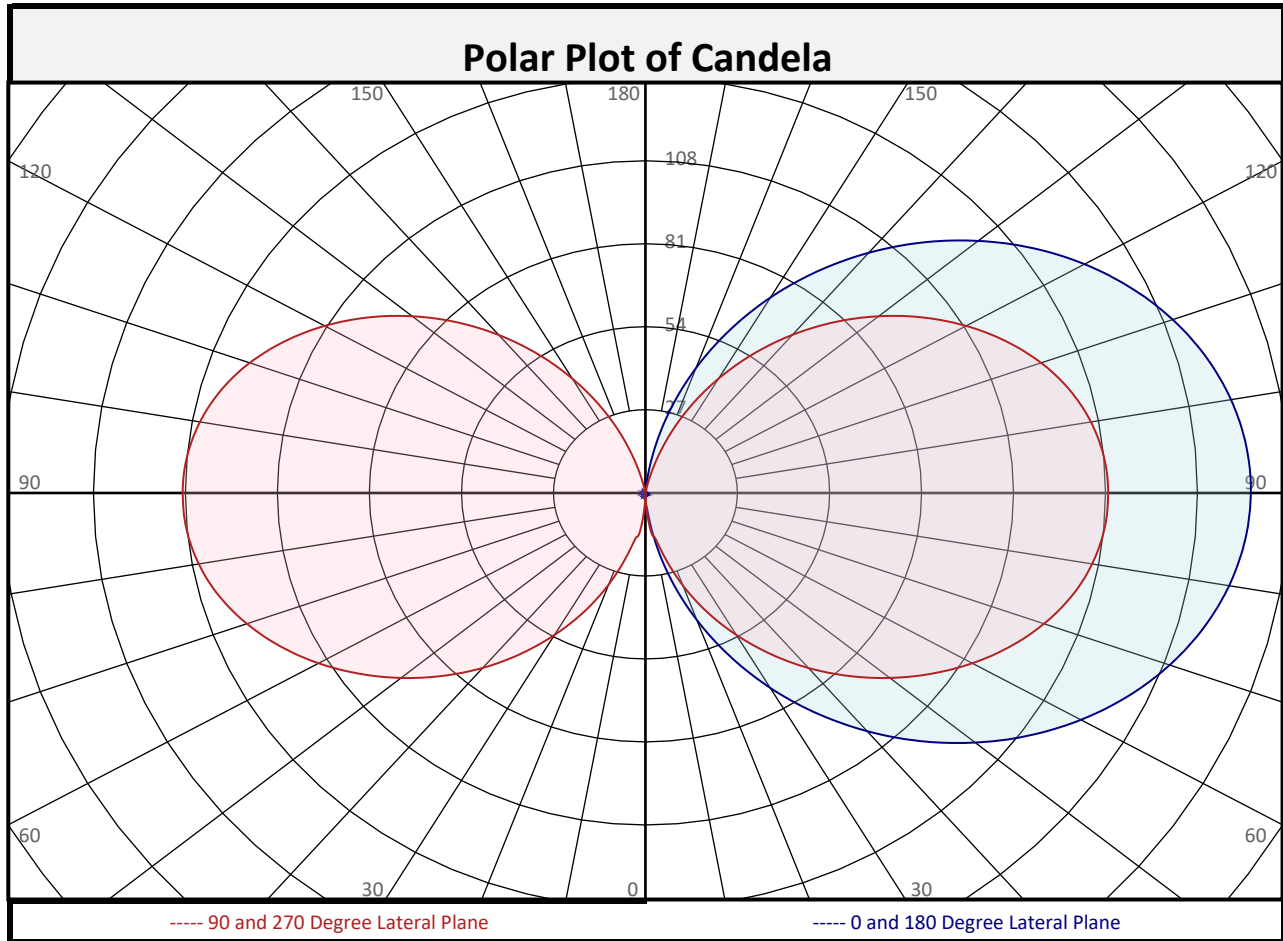
Test date: 10/22/2019

Report date: 10/24/2019

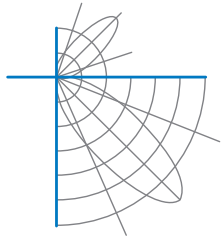
Signed: _____



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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	0.7	0.1%		90-100	92.9	11.7%		0-20	5.5	0.7%
10-20	4.8	0.6%		100-110	86.5	10.9%		0-30	19.3	2.4%
20-30	13.8	1.7%		110-120	74.5	9.4%		0-40	46.4	5.8%
30-40	27.1	3.4%		120-130	58.6	7.4%		0-60	148.8	18.7%
40-50	42.9	5.4%		130-140	41.2	5.2%		0-80	310.1	39.0%
50-60	59.5	7.5%		140-150	24.8	3.1%		10-90	402.3	50.5%
60-70	74.8	9.4%		150-160	11.4	1.4%		20-50	83.8	10.5%
70-80	86.6	10.9%		160-170	2.8	0.4%		40-90	356.6	44.8%
80-90	92.9	11.7%		170-180	0.1	0.0%		60-90	254.3	31.9%
0-90	403.0	50.6%		90-180	393.0	49.4%		0-180	796.0	100.0%

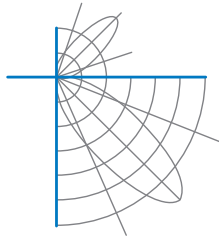


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Luminous Intensity (Candela) Table

		Lateral (C-Plane) Angles								
		0	22.5	45	67.5	90	112.5	135	157.5	180
Vertical (Gamma) Angles	0	0	0	0	0	0	0	0	0	0
	2.5	3	3	4	4	3	3	2	1	1
	5	5	6	8	10	8	6	4	2	1
	7.5	9	9	10	15	13	9	4	2	1
	10	15	15	14	16	15	10	4	2	1
	12.5	22	22	19	17	17	11	5	2	1
	15	29	29	24	19	22	12	4	2	1
	17.5	37	37	30	22	27	14	4	2	1
	20	44	44	36	25	32	16	4	2	1
	22.5	51	51	41	29	37	18	4	2	1
	25	59	58	47	32	43	20	4	2	1
	27.5	66	66	53	35	48	22	4	1	1
	30	73	73	59	38	53	24	4	1	1
	32.5	80	80	64	41	59	27	4	1	1
	35	87	87	70	44	64	29	4	1	1
	37.5	94	94	75	47	69	31	3	1	1
	40	101	101	81	50	74	33	3	1	1
	42.5	108	107	86	53	79	35	3	1	1
	45	114	114	91	56	84	36	3	1	1
	47.5	120	120	96	58	89	38	3	1	1
50	126	126	100	61	94	40	3	1	1	
52.5	132	131	105	63	98	42	2	1	0	
55	138	137	109	66	103	44	2	1	0	
57.5	143	142	113	68	107	45	2	1	0	
60	148	147	117	71	111	47	2	1	0	
62.5	152	151	121	73	115	48	2	1	0	
65	156	156	124	75	118	50	2	1	0	
67.5	160	159	127	76	121	51	2	1	0	
70	164	163	130	78	124	52	2	1	0	
72.5	167	166	133	80	127	53	1	1	0	
75	170	169	135	81	130	54	1	1	0	
77.5	172	171	137	82	132	55	1	0	0	
80	174	173	139	83	133	56	1	0	0	
82.5	175	175	140	84	134	56	1	0	0	
85	177	176	141	84	135	57	1	0	0	
87.5	177	177	141	84	136	57	1	0	0	
90	178	177	142	84	136	57	1	0	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	90	178	177	142	84	136	57	1	0	0
	92.5	178	177	142	84	136	57	1	0	0
	95	177	176	141	84	135	57	1	0	0
	97.5	176	175	140	83	134	56	1	0	0
	100	174	174	139	83	133	56	1	0	0
	102.5	173	172	138	82	131	55	1	0	0
	105	170	169	136	80	129	54	1	0	0
	107.5	168	167	133	79	126	53	1	0	0
	110	165	164	131	77	124	52	1	0	0
	112.5	161	160	128	75	120	51	1	0	0
	115	157	156	125	73	117	50	1	0	0
	117.5	153	152	121	71	113	48	1	0	0
	120	149	148	118	68	109	46	1	0	0
	122.5	144	143	114	66	104	44	1	0	0
	125	139	138	109	63	99	43	1	1	0
	127.5	133	132	105	60	95	41	1	1	0
	130	127	126	100	57	89	38	1	0	0
	132.5	121	120	95	53	84	36	1	0	0
	135	115	114	90	50	79	34	1	0	0
	137.5	109	107	84	47	73	31	1	0	0
140	102	100	79	43	67	29	1	0	0	
142.5	95	93	73	39	61	26	1	0	0	
145	88	86	67	36	55	24	1	0	0	
147.5	81	79	61	32	49	21	1	0	0	
150	73	72	55	28	43	19	1	0	0	
152.5	66	64	49	24	37	16	1	0	0	
155	58	57	43	20	31	13	0	0	0	
157.5	51	49	36	16	25	11	0	0	0	
160	43	41	30	12	19	8	0	0	0	
162.5	35	34	24	8	13	5	0	0	0	
165	28	26	17	5	7	3	0	0	0	
167.5	20	18	11	2	2	1	0	0	0	
170	13	11	6	0	0	0	0	0	0	
172.5	6	5	2	0	0	0	0	0	0	
175	1	0	0	0	0	0	0	0	0	
177.5	0	0	0	0	0	0	0	0	0	
180	0	0	0	0	0	0	0	0	0	



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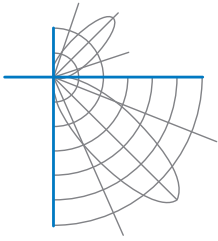
Coefficients of Utilization/Room Utilization - Zonal Cavity Method																					
Effective Floor Cavity Reflectance 0.20																					
RC	80				70				50				30				10				0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																					
0	107	107	107	107	99	99	99	99	84	84	84	70	70	70	57	57	57	51			
1	92	85	79	73	84	78	72	67	64	60	56	52	49	46	41	38	36	30			
2	81	71	62	55	74	65	57	51	53	47	42	42	38	34	32	29	26	21			
3	73	60	51	43	66	55	46	40	45	38	33	36	30	26	27	23	19	15			
4	66	52	42	35	59	48	39	32	39	32	26	31	25	21	23	19	15	11			
5	60	46	36	29	54	42	33	26	34	27	21	27	21	17	20	16	12	9			
6	55	40	31	24	49	37	28	22	30	23	18	24	18	14	18	13	10	7			
7	50	36	27	20	45	33	25	19	27	20	15	21	16	12	16	12	8	6			
8	46	32	24	18	42	30	22	16	24	18	13	19	14	10	14	10	7	5			
9	43	29	21	15	39	27	19	14	22	16	11	17	12	9	13	9	6	4			
10	40	27	19	13	36	24	17	12	20	14	10	16	11	8	12	8	5	3			

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	0.0	60.50	99.99
8.0	0.0	80.67	133.32
10.0	0.0	100.83	166.65
12.0	0.0	121.00	199.98
14.0	0.0	141.17	233.31
16.0	0.0	161.33	266.63

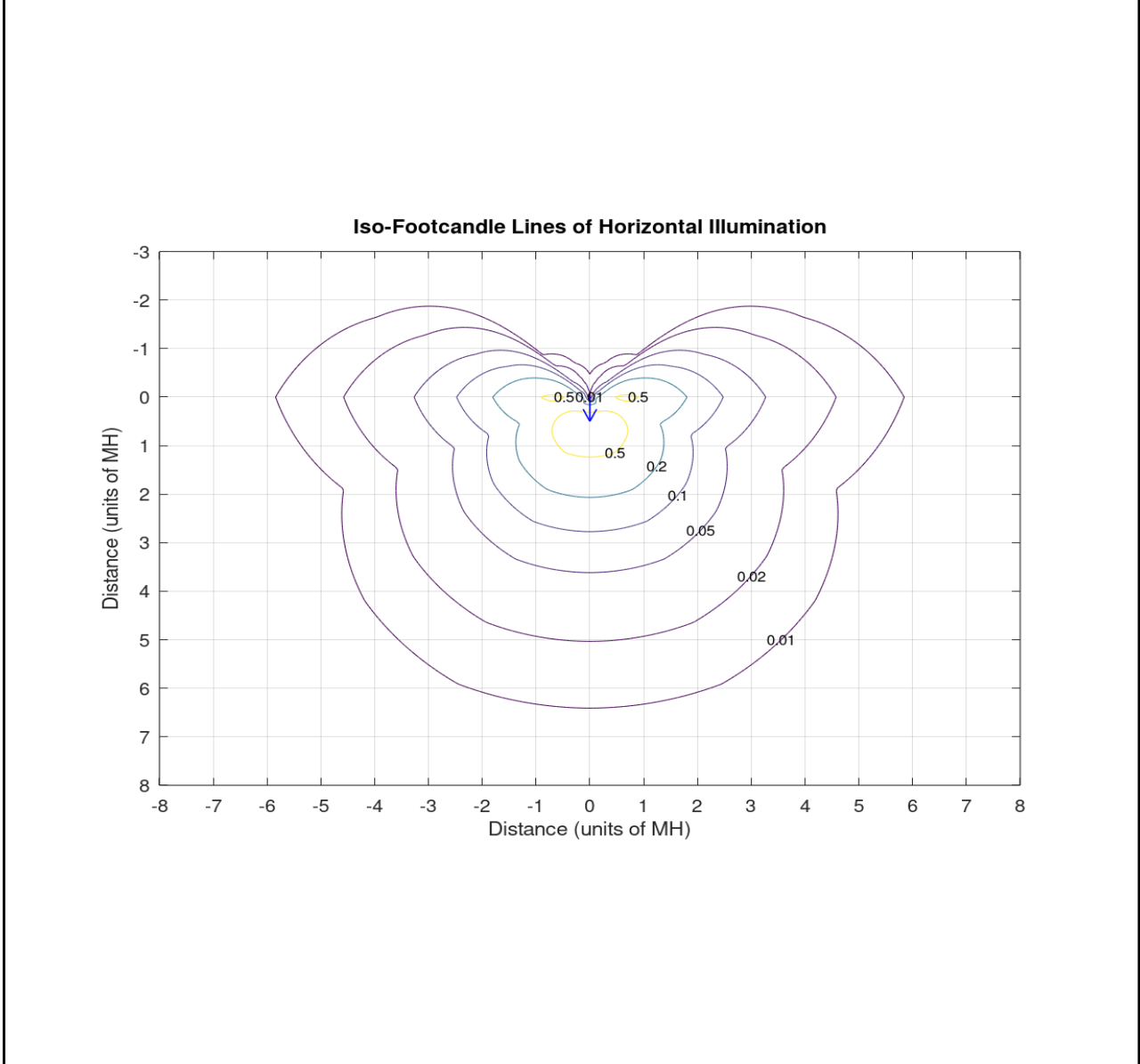
Average Luminance (cd/m ²)			
	0 deg Plane	45 deg Plane	90 deg Plane
0	40	40	40
45	2027	1602	2952
55	2203	1740	3394
65	2346	1855	3813
75	2464	1952	4202
85	2564	2032	4548

Spacing Criterion	
0 degree plane:	18.3
90 degree plane:	16.7
180 degree plane:	1.9
270 degree plane:	16.7

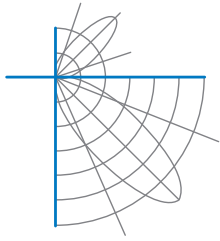


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Iso-Illuminance Plot



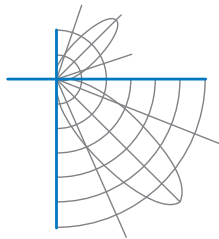
The isofootcandle values shown in the plot above are based on a mounting height of $h = 8.0$ feet. Grid values show multiples of mounting height. The isoilluminance contour lines are expressed in units of footcandles. The values expressed are based on the direct light from a single unit without the contribution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



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Additional Pictures of Test Subject





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Test Distance 9.5 m
Ambient Temperature 24.9 °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

LLIA001166-022B

Integrating Sphere Report

Catalog Number: Aperto 3-724-15

Wall mounted, formed and extruded aluminum housing,
white coated glass enclosure.

44 white LEDs, one DES-12018-385X32-LF-V1.0 LED board

One onboard LED driver



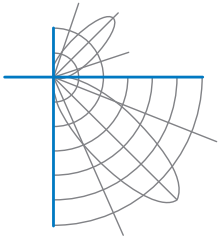
Performance Summary

Voltage	120.0 Vac
Current	0.1578 A
Power	18.53 W
Frequency	59.97 Hz
Power Factor	0.978
Current THD	20.1 %
Total Luminous Flux	809.2 lm
Efficacy	43.7 lm/W
Chromaticity (x,y)	(0.4465, 0.4084)
(u',v')	(0.2549, 0.5245)
Duv	0.0005
CCT	2879 K
CRI (Ra)	91
R9	53
TM-30: Rf	90
TM-30: Rg	98

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

Test date: 10/22/2019

Report date: 10/24/2019



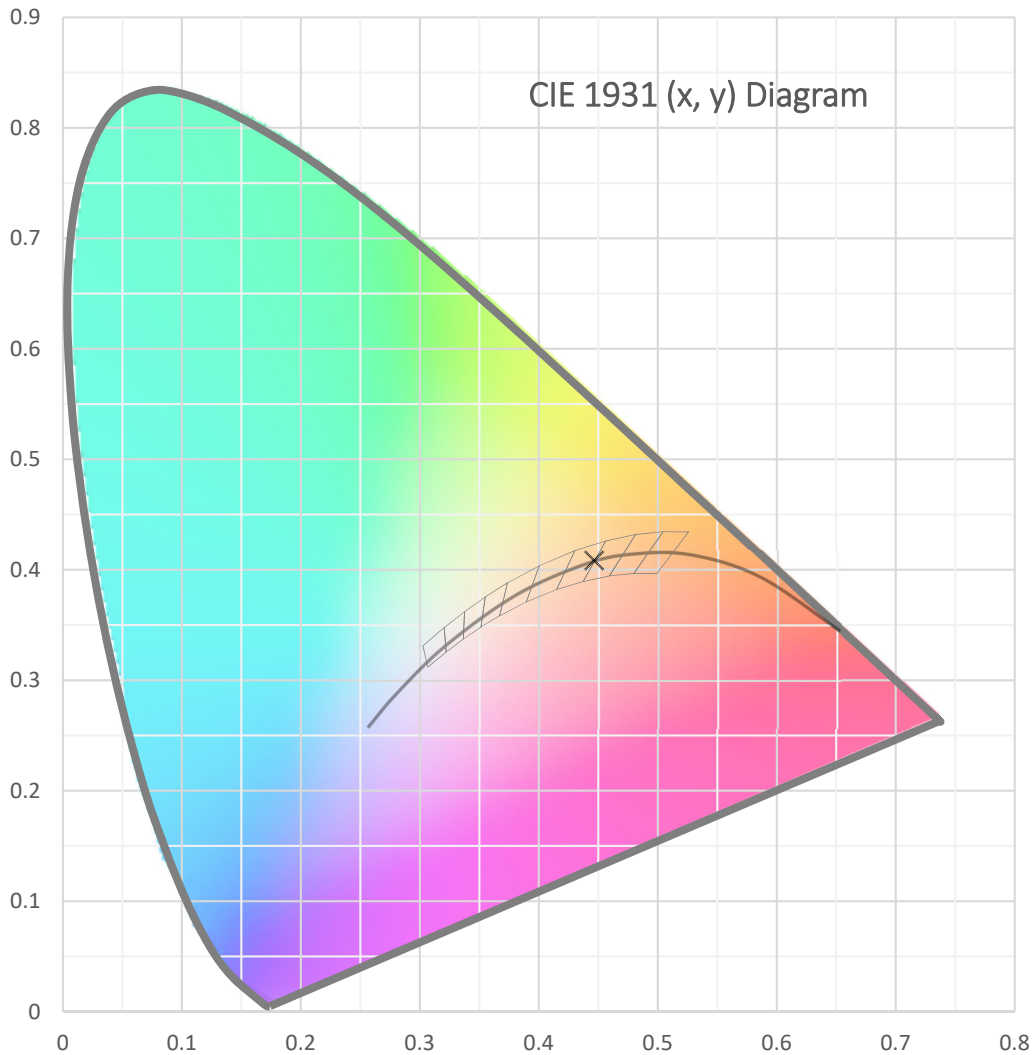
Test Report Number: LLIA001166-022B

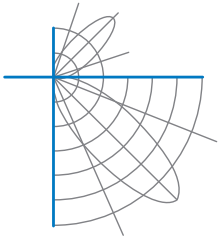
Catalog Number: Aperto 3-724-15

Wall mounted, formed and extruded aluminum housing,
white coated glass enclosure.

44 white LEDs, one DES-12018-385X32-LF-V1.0 LED board

One onboard LED driver





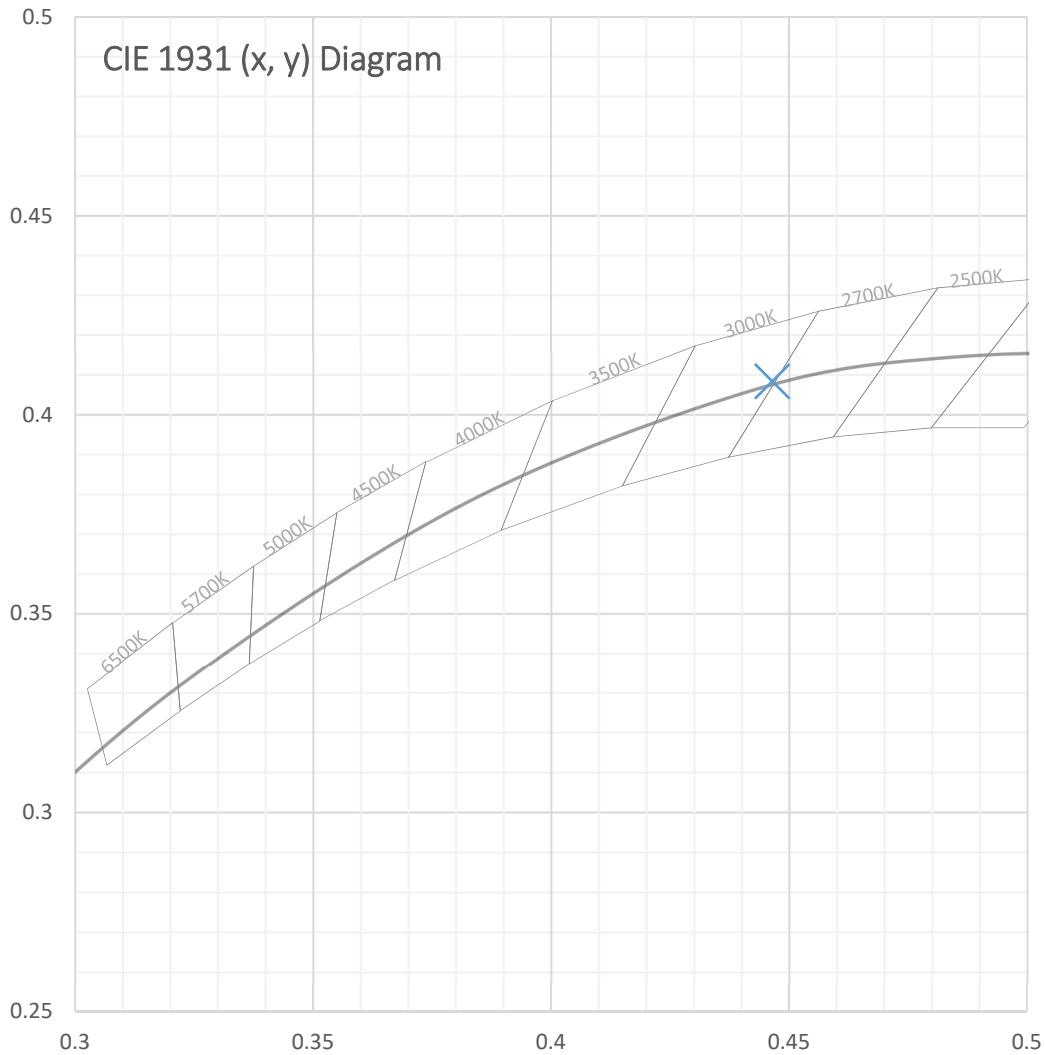
Test Report Number: LLIA001166-022B

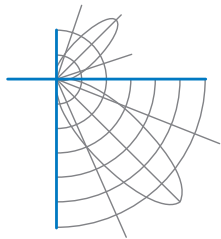
Catalog Number: Aperto 3-724-15

Wall mounted, formed and extruded aluminum housing,
white coated glass enclosure.

44 white LEDs, one DES-12018-385X32-LF-V1.0 LED board

One onboard LED driver





Test Report Number: LLIA001166-022B

Catalog Number: Aperto 3-724-15

Wall mounted, formed and extruded aluminum housing,
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44 white LEDs, one DES-12018-385X32-LF-V1.0 LED board

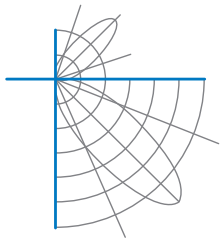
One onboard LED driver

Spectral Data

Total Radiant Flux	2.812 W
Total Luminous Flux	809.2 Lm
Chromaticity CIE 1931 (x, y)	(0.4465, 0.4084)
Chromaticity CIE 1976 (u', v')	(0.2549, 0.5245)
Correlated Color Temperature (CCT)	2879 K
Color Rendering Index (Ra)	91
R1	91
R2	95
R3	98
R4	91
R5	91
R6	95
R7	91
R8	79
R9	53
R10	89
R11	91
R12	82
R13	92
R14	99
TM-30: Rf	90
TM-30: Rg	98
Distance from Planckian Locus (Duv)	0.0005
Scotopic/Photopic Ratio *	1.348

Electrical Data

Voltage	120.0 Vac
Current	0.1578 A
Power	18.53 W
Frequency	59.97 Hz
Power Factor	0.978
Current THD	20.1 %



Test Report Number: LLIA001166-022B

Catalog Number: Aperto 3-724-15

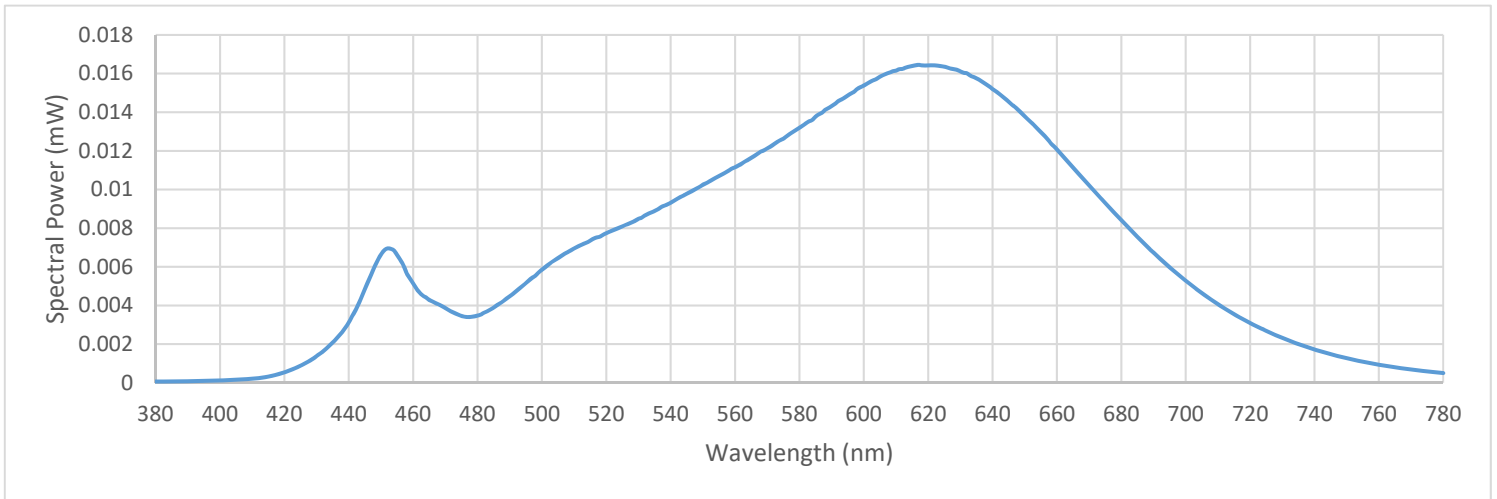
Wall mounted, formed and extruded aluminum housing,
white coated glass enclosure.

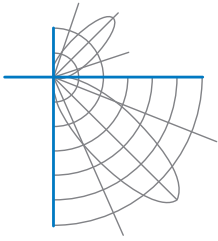
44 white LEDs, one DES-12018-385X32-LF-V1.0 LED board

One onboard LED driver

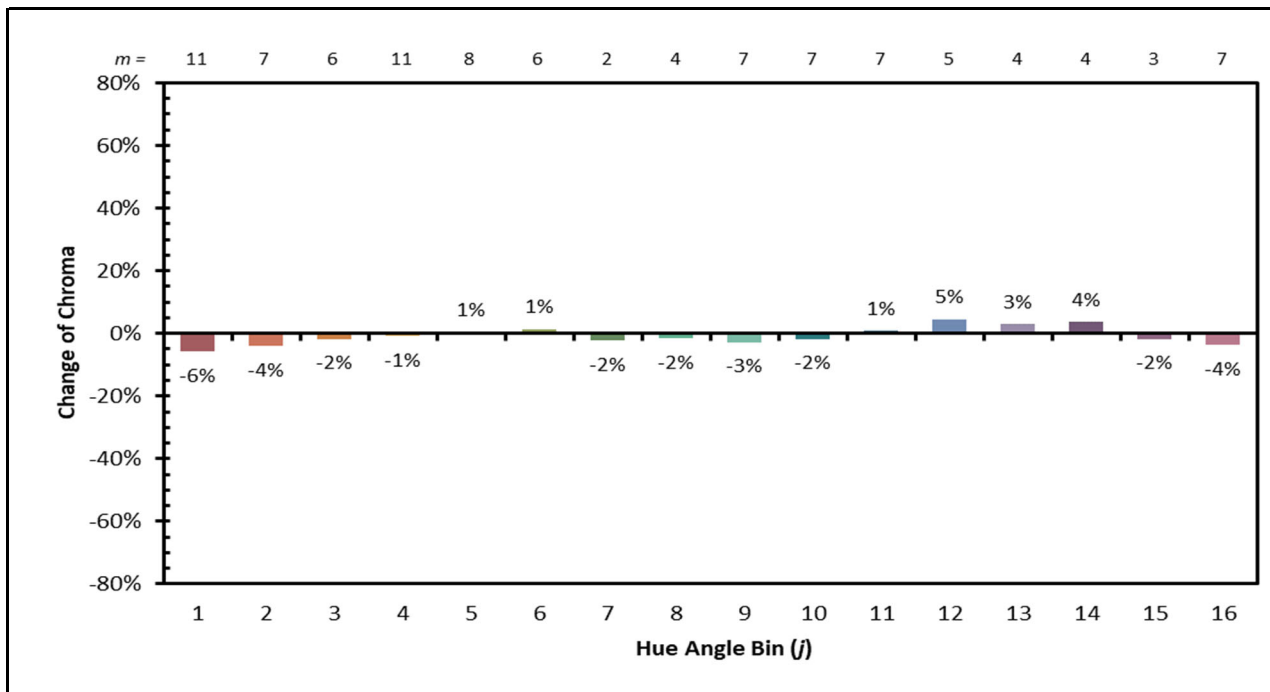
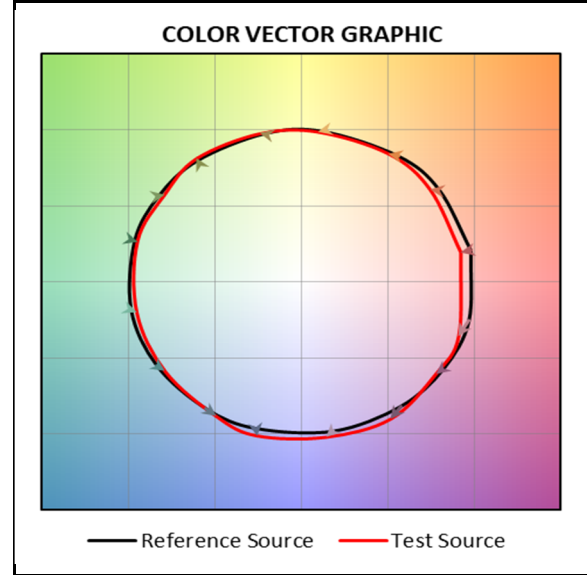
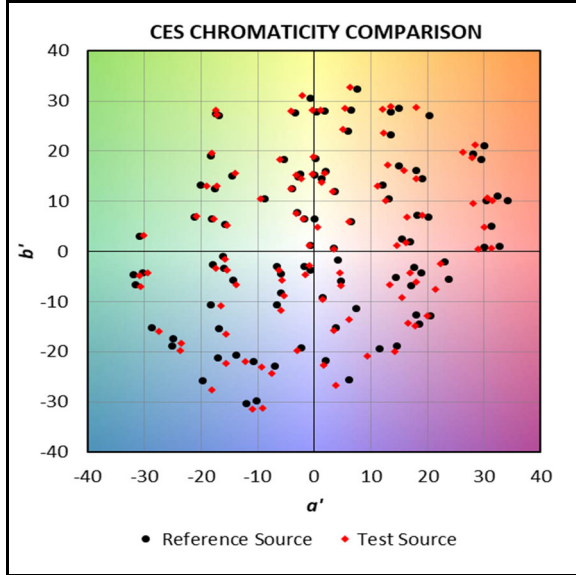
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

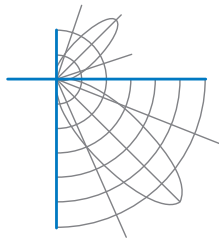
380	0.000064	480	0.003477	580	0.013192	680	0.008406
385	0.000068	485	0.003890	585	0.013769	685	0.007564
390	0.000081	490	0.004476	590	0.014318	690	0.006737
395	0.000097	495	0.005145	595	0.014859	695	0.005961
400	0.000123	500	0.005851	600	0.015382	700	0.005294
405	0.000154	505	0.006447	605	0.015838	705	0.004648
410	0.000207	510	0.006951	610	0.016151	710	0.004066
415	0.000321	515	0.007353	615	0.016392	715	0.003551
420	0.000543	520	0.007743	620	0.016424	720	0.003095
425	0.000885	525	0.008097	625	0.016354	725	0.002685
430	0.001382	530	0.008486	630	0.016112	730	0.002328
435	0.002070	535	0.008881	635	0.015765	735	0.002002
440	0.003108	540	0.009322	640	0.015195	740	0.001719
445	0.004838	545	0.009786	645	0.014547	745	0.001481
450	0.006642	550	0.010251	650	0.013792	750	0.001270
455	0.006622	555	0.010689	655	0.012963	755	0.001090
460	0.005135	560	0.011152	660	0.012086	760	0.000938
465	0.004280	565	0.011629	665	0.011158	765	0.000803
470	0.003867	570	0.012135	670	0.010200	770	0.000686
475	0.003452	575	0.012631	675	0.009308	775	0.000588
						780	0.000502





IES TM-30 Details





Test Report Number: LLIA001166-022B

Catalog Number: Aperto 3-724-15

Wall mounted, formed and extruded aluminum housing,
white coated glass enclosure.

44 white LEDs, one DES-12018-385X32-LF-V1.0 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 4 π geometry

Test Temperature: 25.2 °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.