LightLab INTERNATIONAL ALLENTOWN LLC

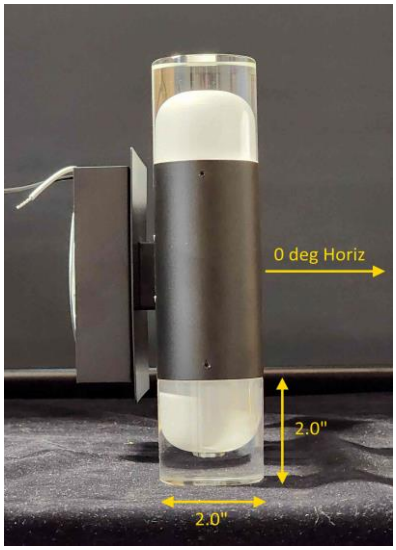
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA002028-008A

Indoor Distribution Photometry Test Report

Catalog Number: 3-596-15 ALARUM 6LT LED VNTY - BK
Wall mounted, black painted formed steel housing,
clear glass enclosures with frosted interior.
72 white LEDs. Six white circuit boards with 12 LEDs each.
One Novbo NE024120050-2G LED driver



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

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	1045.3	Lumens
Input Current	0.1625	A	Total Efficacy	54.6	Lm/W
Input Power	19.15	W	Downward Flux	522.7	Lumens
Frequency	60.00	Hz	Downward Flux	50.0	% of Total
Power Factor	0.982				
Current THD	15.0	%			

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

Test date: 03/16/2023
Report date: 03/17/2023

Signed: Michael L. Grather Digitally signed by Michael L. Grather Date: 2023.03.20 11:16:40 -04'00'

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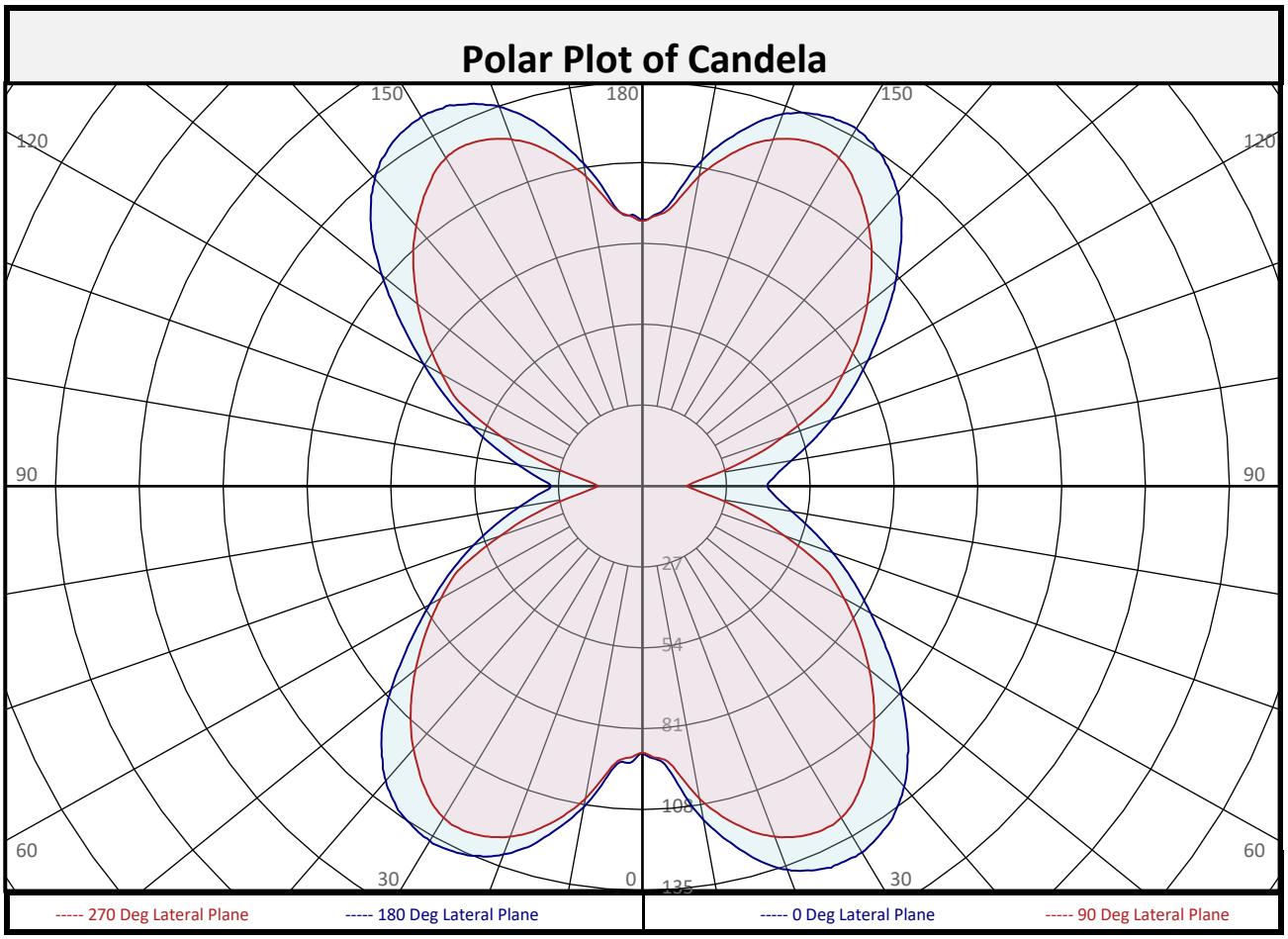

Zonal Flux Summary

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	9.5	0.9%	90-100	40.1	3.8%	0-20	43.8	4.2%
10-20	34.4	3.3%	100-110	54.2	5.2%	0-30	105.6	10.1%
20-30	61.8	5.9%	110-120	69.9	6.7%	0-40	187.8	18.0%
30-40	82.2	7.9%	120-130	82.4	7.9%	0-60	358.8	34.3%
40-50	88.6	8.5%	130-140	88.4	8.5%	0-80	482.7	46.2%
50-60	82.4	7.9%	140-150	82.2	7.9%	10-90	513.3	49.1%
60-70	69.9	6.7%	150-160	61.7	5.9%	20-50	232.5	22.2%
70-80	54.1	5.2%	160-170	34.2	3.3%	40-90	334.9	32.0%
80-90	40.0	3.8%	170-180	9.4	0.9%	60-90	164.0	15.7%
0-90	522.7	50.0%	90-180	522.5	50.0%	0-180	1045	100.0%

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
		0	22.5	45	67.5	90	112.5	135	157.5	180
	0	89	89	89	89	89	89	89	89	89
	2.5	91	91	90	90	91	91	92	92	93
	5	95	94	93	92	92	93	93	93	93
	7.5	104	103	102	99	99	99	100	100	101
	10	113	112	110	107	106	106	108	108	109
	12.5	120	119	116	113	112	112	114	114	115
	15	126	125	122	119	117	118	119	120	121
	17.5	132	131	128	124	121	122	124	126	127
	20	136	135	132	127	124	126	128	130	131
	22.5	139	138	135	130	127	128	131	133	134
	25	141	140	136	132	128	130	133	135	136
	27.5	141	140	137	132	129	130	133	136	137
	30	141	141	137	132	128	130	134	137	137
	32.5	140	140	136	131	126	129	133	136	136
	35	138	138	134	130	123	127	131	135	134
	37.5	135	135	132	127	119	124	129	132	132
	40	131	131	128	123	115	120	124	128	128
	42.5	126	126	123	119	110	115	120	123	124
	45	121	120	118	113	105	110	114	118	119
	47.5	115	114	112	109	100	105	109	112	113
	50	109	108	107	104	95	100	103	106	106
	52.5	103	102	101	98	90	95	97	99	98
	55	96	96	95	93	85	89	91	92	92
	57.5	91	90	90	88	80	84	85	86	85
	60	85	85	84	83	75	79	79	80	79
	62.5	80	80	80	79	70	74	72	74	74
	65	75	75	75	74	64	70	66	69	68
	67.5	70	70	70	70	56	65	61	64	63
	70	65	66	66	66	49	61	55	59	58
	72.5	61	61	62	62	42	57	50	54	53
	75	56	57	58	59	36	52	45	50	48
	77.5	53	53	54	54	30	48	41	46	44
	80	49	49	50	51	25	43	37	42	40
	82.5	46	46	47	47	21	40	33	39	37
	85	43	44	44	44	18	36	30	36	34
	87.5	41	42	42	42	16	33	28	33	31
	90	40	41	41	41	14	31	27	31	30
16 lateral half-planes of data were acquired, 22.5 degree increments shown.										

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Luminous Intensity (Candela) Table

Vertical (Gamma) Angles - Data was acquired in 0.5° increments, 2.5° increments shown.	Lateral (C-Plane) Angles									
		0	22.5	45	67.5	90	112.5	135	157.5	180
	90	40	41	41	41	14	31	27	31	30
	92.5	41	41	42	42	16	33	29	32	31
	95	43	43	44	44	17	36	33	35	34
	97.5	46	46	47	47	20	40	36	38	37
	100	49	49	50	51	25	44	40	41	40
	102.5	52	52	53	54	30	48	44	45	44
	105	56	56	57	58	36	52	48	50	49
	107.5	60	60	61	62	42	57	52	54	54
	110	65	65	65	66	48	61	57	59	58
	112.5	69	69	69	70	56	65	63	64	64
	115	74	74	74	74	64	70	68	70	69
	117.5	79	78	78	79	70	74	74	75	75
	120	84	83	83	83	75	79	80	81	81
	122.5	89	89	88	88	79	84	86	88	88
	125	95	94	93	93	85	90	93	95	95
	127.5	100	100	99	97	89	95	99	102	102
	130	106	106	104	102	95	100	105	109	109
	132.5	112	111	110	107	99	105	111	116	117
	135	118	117	115	112	104	110	116	122	124
	137.5	123	123	120	116	109	115	122	128	129
	140	128	128	125	121	113	120	127	133	134
	142.5	131	132	129	125	117	123	131	139	138
	145	135	135	131	127	121	127	134	141	140
	147.5	136	136	133	129	124	129	136	143	142
	150	138	138	134	130	126	130	137	143	142
	152.5	138	138	134	130	127	131	137	143	142
	155	136	136	133	129	127	130	135	141	140
	157.5	135	135	132	128	125	128	133	138	138
	160	132	132	129	125	123	126	130	134	135
	162.5	128	127	125	122	120	122	126	129	130
	165	123	122	120	117	115	117	120	123	124
	167.5	117	116	114	111	111	112	114	116	117
	170	110	110	108	106	105	106	108	109	110
	172.5	102	102	100	98	98	99	100	101	101
	175	94	93	93	92	92	92	93	93	93
	177.5	91	90	90	90	90	90	91	91	91
	180	89	89	89	89	89	89	89	89	89

16 lateral half-planes of data were acquired, 22.5 degree increments shown.

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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		99	99	99	99		83	83	83		69	69	69		56	56	56	50
1	96	91	87	82		88	84	80	76		71	68	65		58	56	54		47	45	44	39
2	87	79	72	66		80	72	66	61		61	56	52		50	47	44		40	38	36	31
3	79	68	60	54		72	63	56	50		53	48	43		44	40	36		35	32	30	25
4	72	60	52	45		66	55	48	42		47	41	36		39	34	31		31	28	25	21
5	66	53	45	38		60	49	41	36		41	35	31		34	30	26		28	24	21	18
6	60	47	39	33		55	44	36	31		37	31	27		31	26	22		25	21	19	16
7	56	43	34	28		51	39	32	27		33	27	23		28	23	20		23	19	16	13
8	51	39	30	25		47	36	28	23		30	24	20		25	21	17		21	17	14	12
9	48	35	27	22		44	33	25	21		28	22	18		23	19	15		19	15	13	11
10	45	32	24	20		41	30	23	18		25	20	16		21	17	14		17	14	11	9

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	2.5	11.70	10.95
8.0	1.4	15.60	14.59
10.0	0.9	19.51	18.24
12.0	0.6	23.41	21.89
14.0	0.5	27.31	25.54
16.0	0.3	31.21	29.19

Spacing Criterion

0 deg:	2.0
90 deg:	1.8
180 deg:	1.9
270 deg:	1.8

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	11514	11514	11514
45	7359	7439	11559
55	5632	5798	9814
65	4319	4536	8095
75	3330	3574	5125
85	2690	2893	3055

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UGR Table - Corrected

Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	11.5	12.4	12.4	13.4	14.6	8.9	9.8	9.8	10.8	12.0
	3H	13.7	14.5	14.6	15.5	16.8	10.4	11.2	11.3	12.2	13.5
	4H	14.6	15.4	15.6	16.4	17.7	10.9	11.7	11.8	12.6	13.9
	6H	15.6	16.4	16.6	17.3	18.7	11.2	11.9	12.2	12.9	14.2
	8H	16.1	16.8	17.1	17.8	19.1	11.3	12.0	12.3	13.0	14.3
	12H	16.6	17.3	17.6	18.3	19.6	11.4	12.0	12.4	13.0	14.4
4H	2H	11.7	12.5	12.7	13.5	14.8	9.5	10.3	10.5	11.3	12.6
	3H	14.1	14.7	15.1	15.8	17.1	11.3	12.0	12.3	13.0	14.3
	4H	15.2	15.8	16.2	16.8	18.1	12.0	12.7	13.0	13.7	15.0
	6H	16.3	16.9	17.3	17.9	19.2	12.6	13.1	13.6	14.1	15.5
	8H	16.9	17.4	17.9	18.4	19.8	12.7	13.3	13.7	14.3	15.6
	12H	17.5	17.9	18.5	19.0	20.3	12.9	13.3	13.9	14.4	15.7
8H	4H	15.3	15.8	16.3	16.9	18.2	12.5	13.0	13.5	14.0	15.3
	6H	16.6	17.0	17.6	18.1	19.4	13.3	13.7	14.3	14.7	16.1
	8H	17.3	17.6	18.3	18.7	20.0	13.6	14.0	14.6	15.0	16.4
	12H	18.0	18.3	19.0	19.4	20.8	13.9	14.2	14.9	15.3	16.7
12H	4H	15.3	15.8	16.3	16.8	18.2	12.5	13.0	13.6	14.0	15.4
	6H	16.6	17.0	17.7	18.0	19.4	13.4	13.8	14.4	14.8	16.2
	8H	17.3	17.7	18.4	18.7	20.1	13.8	14.2	14.9	15.2	16.6

Maximum UGR = 20.8

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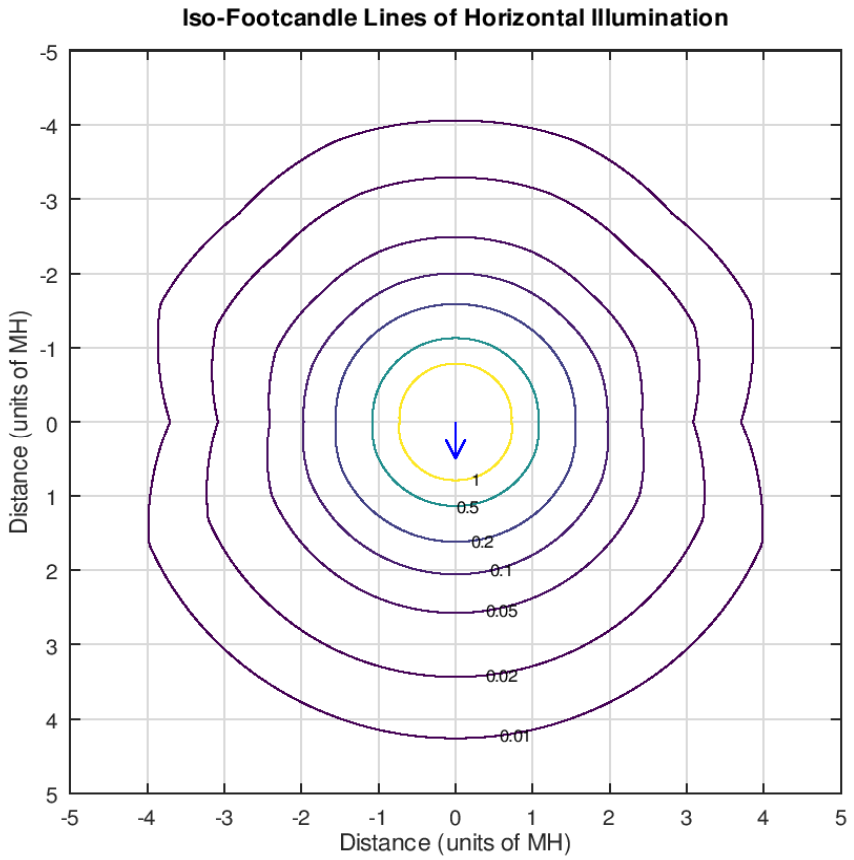
Iso-Illuminance Plot



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

Report of Test

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Test Distance	9.5 m
Ambient Temperature	25.3 °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 IES LM-79-19. Format of reports and angular increments based on IES LM-41-20 and LM-46-20.

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

LLIA002028-008B

Integrating Sphere Report
Catalog Number: 3-596-15 ALARUM 6LT LED VNTY - BK
Wall mounted, black painted formed steel housing,
clear glass enclosures with frosted interior.
72 white LEDs. Six white circuit boards with 12 LEDs each.
One Novbo NE024120050-2G LED driver

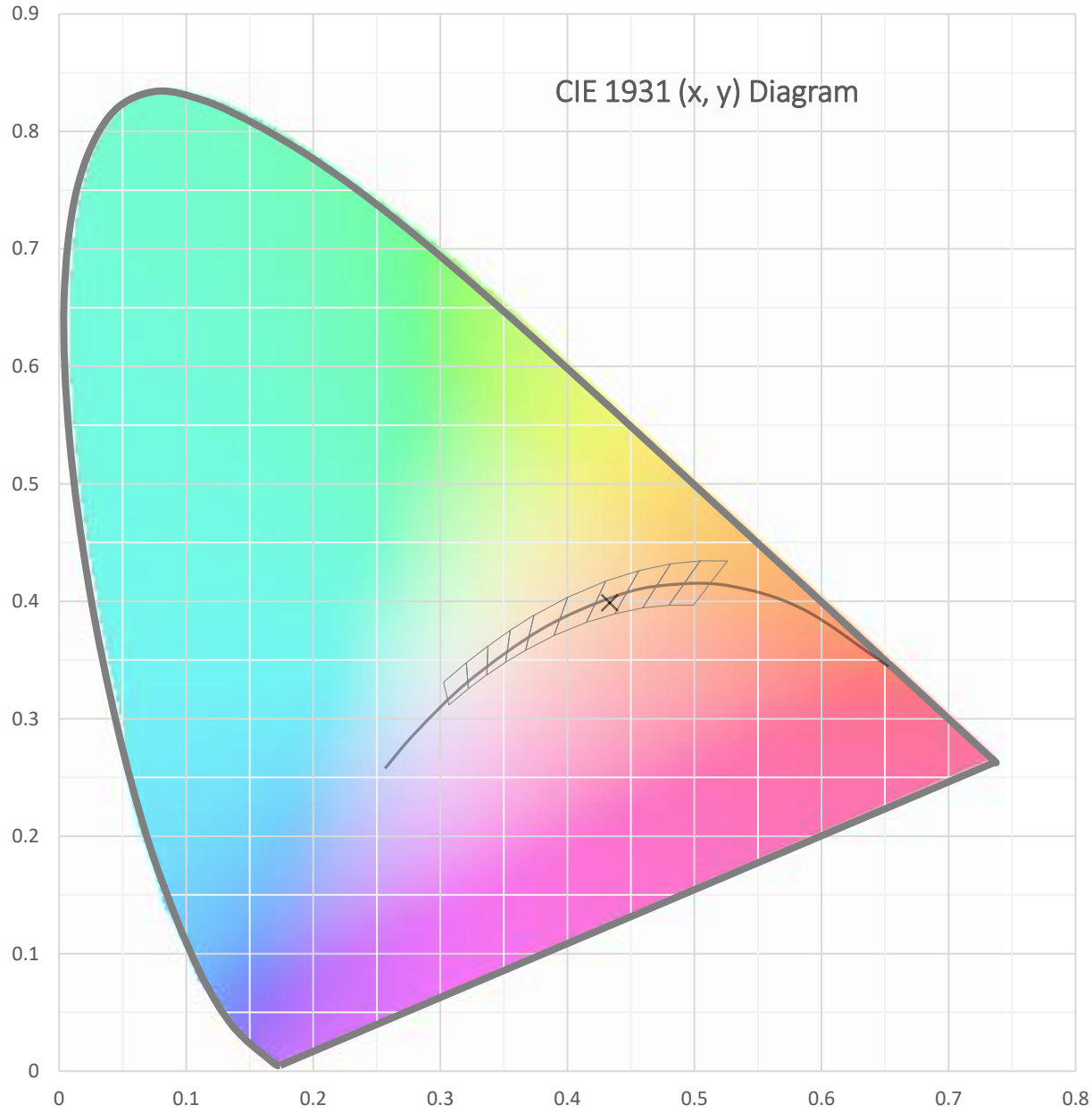
Performance Summary

Voltage	120.0	Vac
Current	0.1625	A
Power	19.15	W
Frequency	59.99	Hz
Power Factor	0.982	
Current THD	15.1	%
Total Luminous Flux	1049.9	lm
Efficacy	54.8	lm/W
Chromaticity (x,y)	(0.4335, 0.3987)	
(u',v')	(0.2507, 0.5187)	
Duv	-0.0017	
CCT	3015	K
CRI (Ra)	92	
R9	61	
TM-30: Rf	90	
TM-30: Rg	99	
TM-30: Rcs,h1	-5	

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

Test date: 03/14/2023
Report date: 03/17/2023

Test Report Number: LLIA002028-008B



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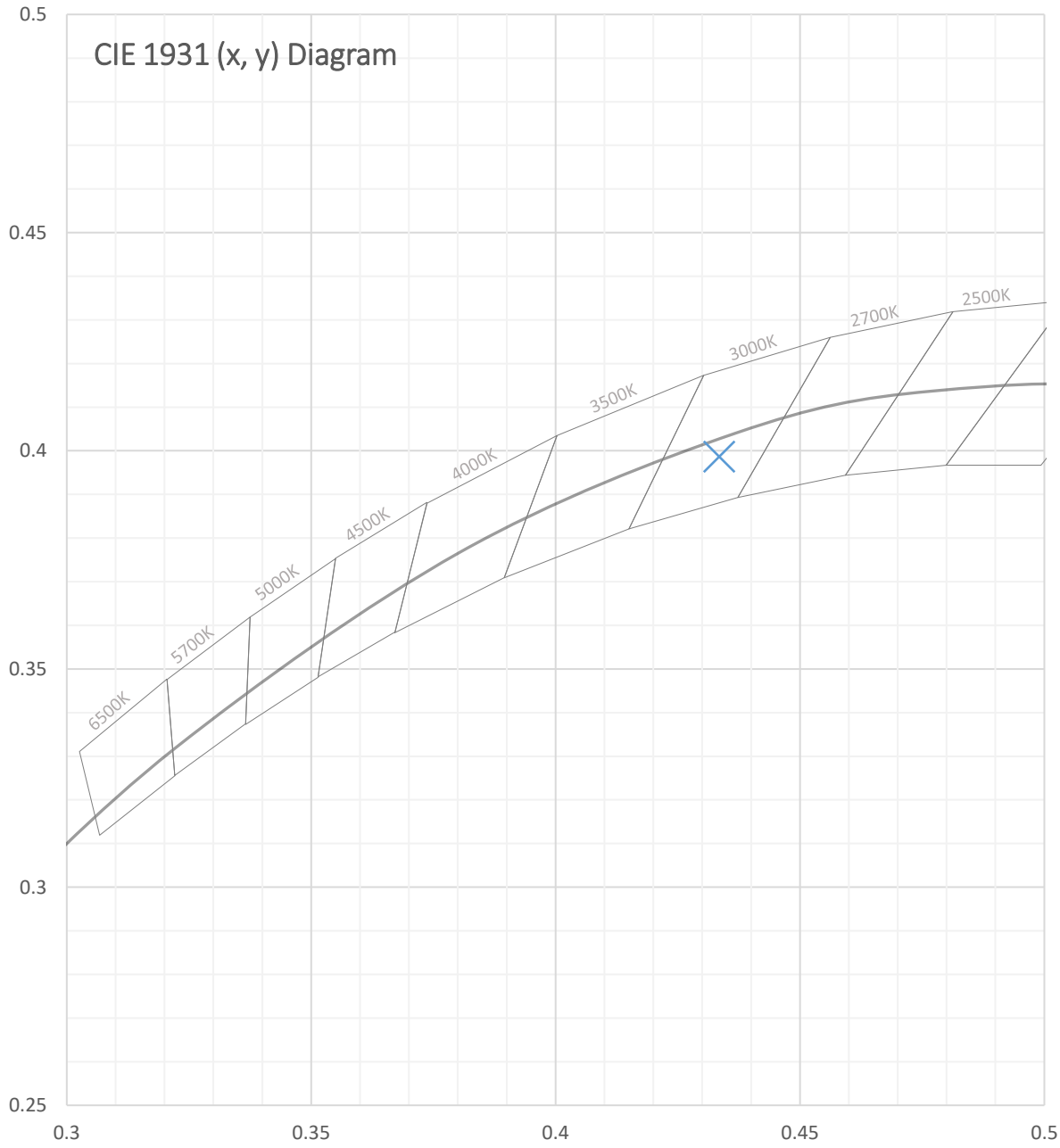


Test Report Number: LLIA002028-008B

Total Radiant Flux	3.714	W
Total Luminous Flux	1049.9	Lm
Chromaticity CIE 1931 (x, y)	(0.4335, 0.3987)	
Chromaticity CIE 1976 (u', v')	(0.2507, 0.5187)	
Correlated Color Temperature (CCT)	3015	K
Color Rendering Index (Ra)	92	
R1	93	
R2	96	
R3	97	
R4	91	
R5	92	
R6	94	
R7	92	
R8	82	
R9	61	
R10	90	
R11	91	
R12	80	
R13	94	
R14	98	
TM-30: Rf	90	
TM-30: Rg	99	
TM-30: Rcs,h1	-5	
Distance from Planckian Locus (Duv)	-0.0017	
Scotopic/Photopic Ratio ǂ	1.423	

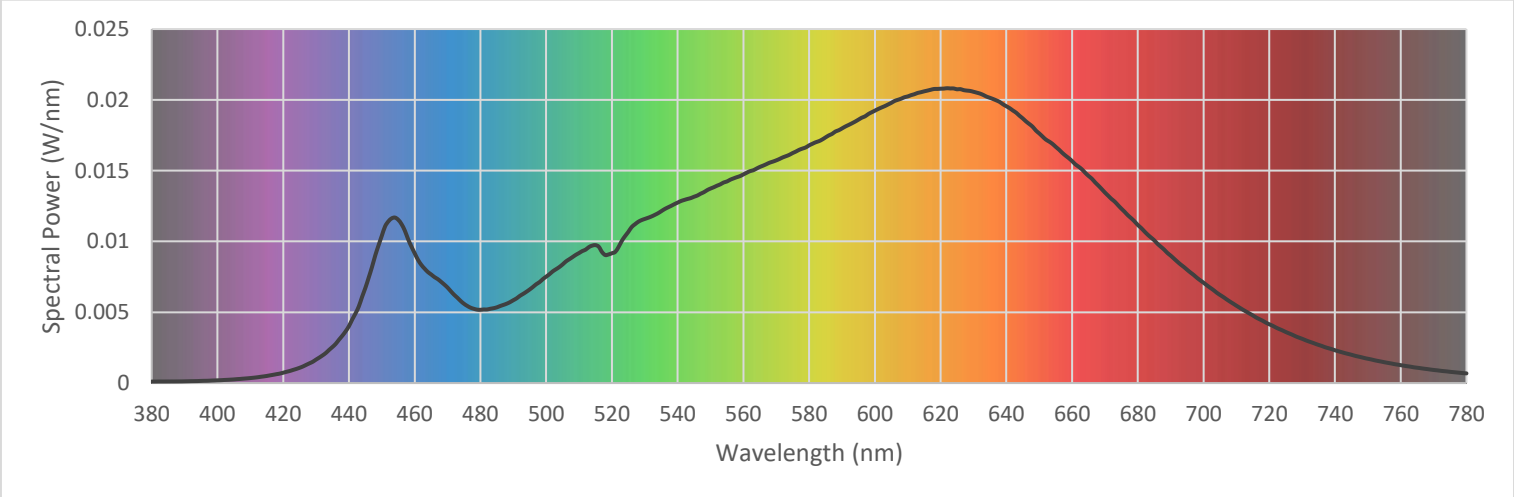
Electrical Data

Voltage	120.0	Vac
Current	0.1625	A
Power	19.15	W
Frequency	59.99	Hz
Power Factor	0.982	
Current THD	15.1	%

Test Report Number: LLIA002028-008B

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

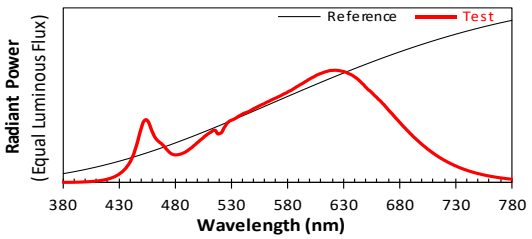
380	0.000107	480	0.005175	580	0.016786	680	0.011165
385	0.000112	485	0.005348	585	0.017348	685	0.010082
390	0.000124	490	0.005850	590	0.017982	690	0.009002
395	0.000153	495	0.006612	595	0.018599	695	0.008004
400	0.000194	500	0.007515	600	0.019234	700	0.007086
405	0.000257	505	0.008378	605	0.019787	705	0.006227
410	0.000353	510	0.009181	610	0.020241	710	0.005465
415	0.000503	515	0.009740	615	0.020601	715	0.004778
420	0.000732	520	0.009169	620	0.020787	720	0.004152
425	0.001080	525	0.010676	625	0.020745	725	0.003609
430	0.001660	530	0.011590	630	0.020571	730	0.003128
435	0.002551	535	0.012134	635	0.020146	735	0.002694
440	0.004024	540	0.012745	640	0.019550	740	0.002316
445	0.006725	545	0.013159	645	0.018690	745	0.001999
450	0.010404	550	0.013737	650	0.017634	750	0.001716
455	0.011530	555	0.014236	655	0.016690	755	0.001472
460	0.009162	560	0.014735	660	0.015679	760	0.001265
465	0.007672	565	0.015262	665	0.014629	765	0.001083
470	0.006745	570	0.015727	670	0.013457	770	0.000926
475	0.005599	575	0.016245	675	0.012318	775	0.000795
						780	0.000683

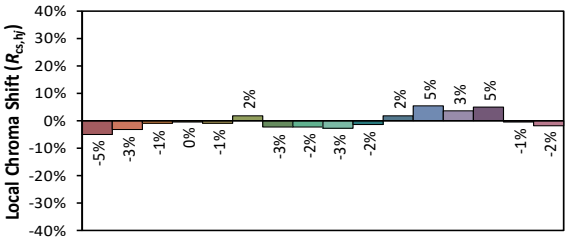


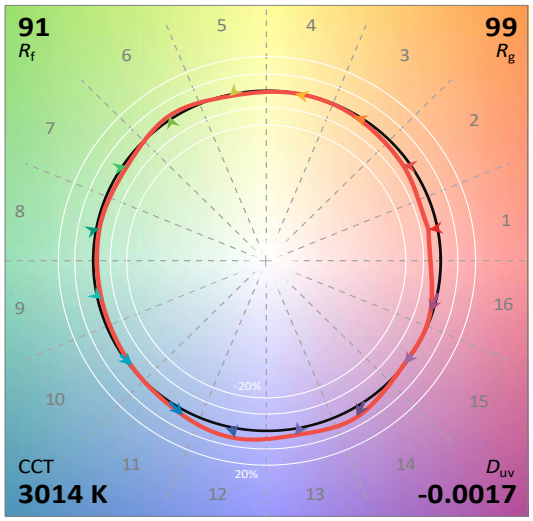
Test Report Number: LLIA002028-008B

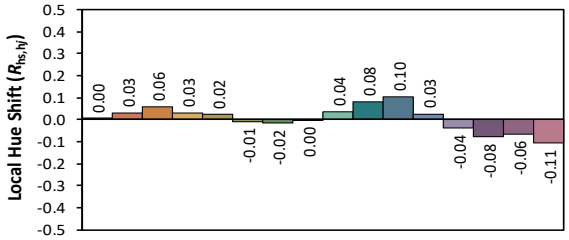
IES TM-30 Details

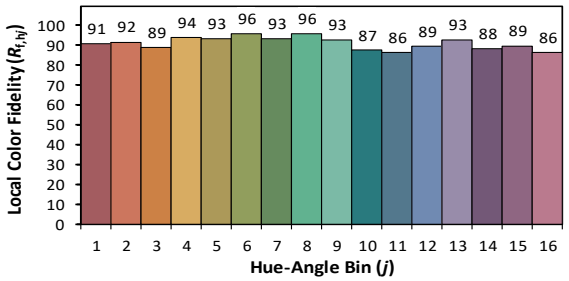
Source:	LLIA002028-008B	**Manufacturer:**	Oxygen Lighting
Date:	3/17/2023	**Model:**	3-596-15 ALARUM 6LT LED VNTY - BK

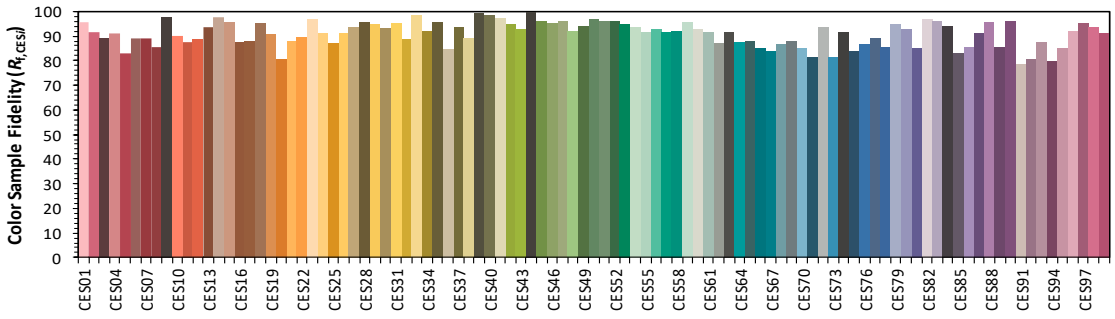












Notes:

x	**0.4335**
y	**0.3986**
u'	**0.2507**
v'	**0.5187**

CIE 13.3-1995 (CRI)

R_a	92
R_9	61

Test Report Number: LLIA002028-008B

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:	24.9 °C
Test Procedure:	Tested in accordance with the applicable sections of: LM-79-19, LM-78-20, LM-58-20, ANSI_ANSLG C78.377-2017, TM-30-20
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. 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.

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