LightLab INTERNATIONAL ALLENTOWN LLC

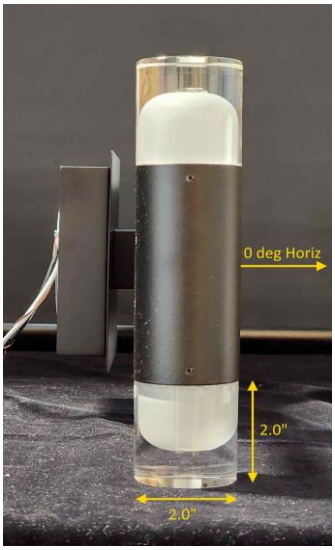
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA002028-009A

Indoor Distribution Photometry Test Report

Catalog Number: 3-597-15 ALARUM 8LT LED VNTY - BK
Wall mounted, black painted formed steel housing, clear glass enclosures with frosted interior.
96 white LEDs. Eight white circuit boards with 12 LEDs each.
One Novbo NE032120070-2G LED driver



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

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	1471.3	Lumens
Input Current	0.2630	A	Total Efficacy	50.4	Lm/W
Input Power	29.20	W	Downward Flux	738.1	Lumens
Frequency	60.00	Hz	Downward Flux	50.2	% of Total
Power Factor	0.925				
Current THD	13.8	%			

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

Test date: 03/15/2023
Report date: 03/17/2023

Signed: Michael L. Grather Digitally signed by Michael L. Grather Date: 2023.03.20 11:17:09 -04'00'

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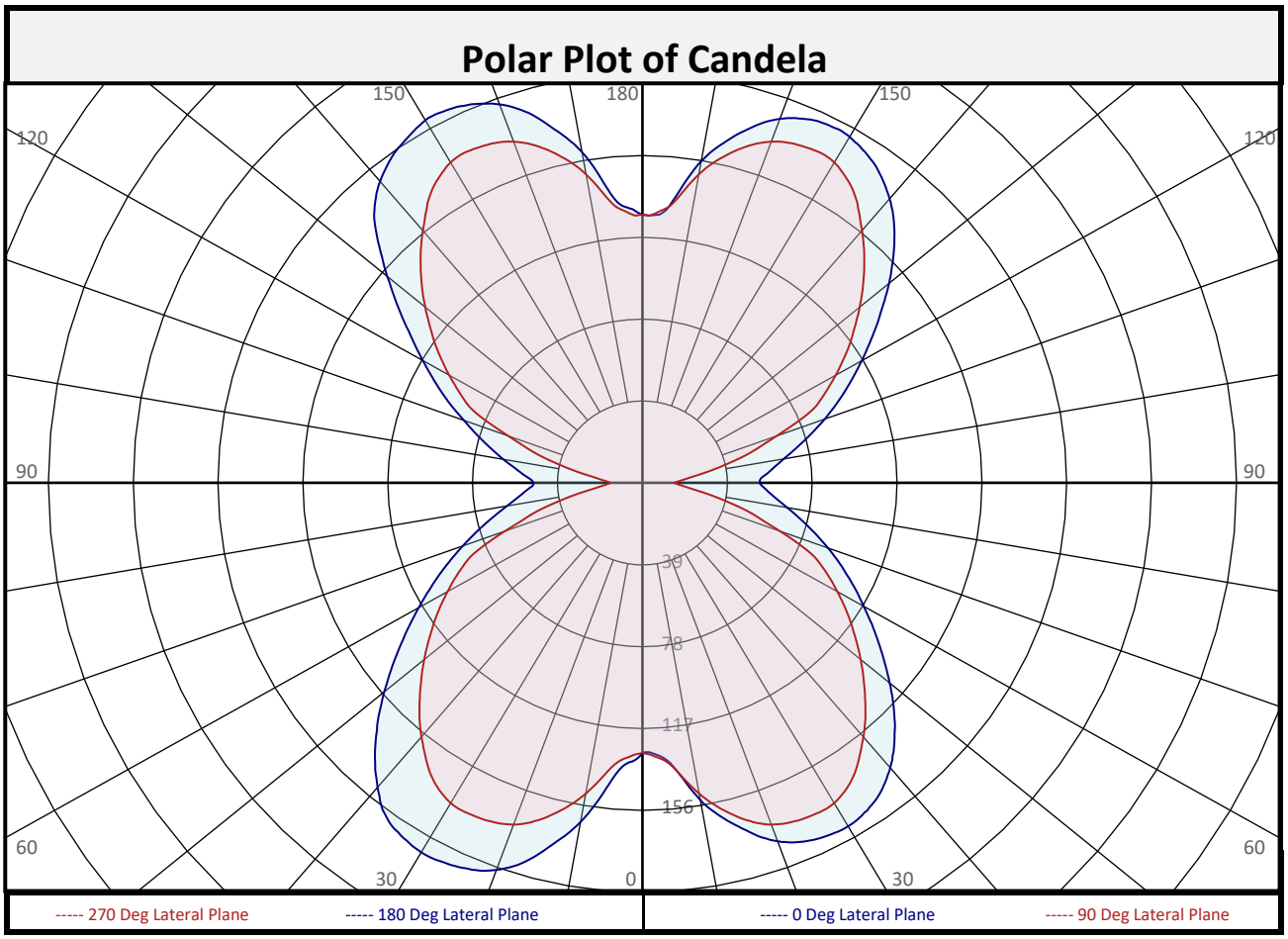

Zonal Flux Summary

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	13.6	0.9%	90-100	56.5	3.8%	0-20	62.2	4.2%
10-20	48.6	3.3%	100-110	75.8	5.2%	0-30	149.3	10.1%
20-30	87.1	5.9%	110-120	98.1	6.7%	0-40	265.4	18.0%
30-40	116.1	7.9%	120-130	115.0	7.8%	0-60	505.3	34.3%
40-50	124.1	8.4%	130-140	123.8	8.4%	0-80	681.3	46.3%
50-60	115.8	7.9%	140-150	115.6	7.9%	10-90	724.6	49.2%
60-70	99.3	6.8%	150-160	86.6	5.9%	20-50	327.3	22.2%
70-80	76.7	5.2%	160-170	48.5	3.3%	40-90	472.7	32.1%
80-90	56.8	3.9%	170-180	13.4	0.9%	60-90	232.9	15.8%
0-90	738.1	50.2%	90-180	733.2	49.8%	0-180	1471	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	129	129	129	129	129	129	129	129	129
	2.5	129	129	129	129	131	131	132	133	133
	5	133	133	132	132	134	135	137	139	139
	7.5	142	142	140	140	142	144	148	151	152
	10	153	153	150	149	150	154	159	163	164
	12.5	162	161	159	156	158	161	167	172	174
	15	169	168	166	163	164	169	176	181	183
	17.5	176	175	173	169	170	177	183	190	191
	20	182	180	178	174	173	185	188	195	196
	22.5	185	184	181	177	175	191	191	199	200
	25	187	186	183	179	176	196	193	204	202
	27.5	189	187	184	180	177	196	195	206	203
	30	189	188	184	181	176	191	197	206	203
	32.5	188	187	183	180	174	186	196	206	202
	35	186	185	181	178	170	183	195	206	200
	37.5	182	182	178	175	164	180	191	202	196
	40	177	177	173	170	158	174	181	191	189
	42.5	171	171	167	164	152	166	173	181	182
	45	164	163	160	156	145	157	164	171	173
	47.5	156	155	153	149	138	149	156	162	164
	50	148	147	146	142	131	142	147	152	155
	52.5	140	139	138	136	124	134	139	143	145
	55	132	132	131	129	117	126	131	134	136
	57.5	125	124	124	123	110	119	123	125	127
	60	117	117	117	116	103	112	115	117	119
	62.5	111	110	110	110	96	105	107	109	110
	65	104	104	104	104	90	98	100	101	103
	67.5	97	97	97	98	80	91	92	94	95
	70	91	91	91	92	67	84	85	86	88
	72.5	85	85	85	86	57	77	78	80	81
	75	78	79	80	81	48	71	72	73	75
	77.5	73	73	74	75	39	65	66	67	69
	80	68	68	69	70	31	60	60	62	63
	82.5	63	63	64	65	24	55	55	57	59
	85	59	60	60	61	20	51	52	53	55
	87.5	56	57	57	57	17	47	48	50	52
	90	54	54	55	54	15	44	46	48	50

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

Report of Test

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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	54	54	55	54	15	44	46	48	50
92.5	55	55	56	56	16	46	48	50	52
95	58	59	59	60	19	50	52	54	56
97.5	62	62	63	64	24	54	56	58	60
100	66	66	68	69	30	60	61	62	65
102.5	71	72	73	74	38	65	66	67	70
105	77	77	78	80	47	70	72	72	75
107.5	83	83	84	85	56	76	78	79	81
110	89	89	90	91	66	82	84	86	87
112.5	96	96	96	96	78	90	91	93	94
115	102	103	103	103	89	97	99	100	102
117.5	109	109	109	109	95	103	106	108	109
120	116	116	116	115	102	110	114	116	116
122.5	124	124	123	122	109	117	122	124	125
125	132	131	130	129	117	125	130	133	134
127.5	139	139	138	135	123	133	138	142	143
130	148	147	145	142	130	141	146	151	153
132.5	156	156	153	149	137	148	155	161	163
135	164	164	160	156	144	155	164	171	174
137.5	171	172	167	162	151	162	174	183	182
140	177	178	174	168	157	168	184	194	188
142.5	182	183	178	173	163	173	190	201	192
145	186	187	182	177	169	177	197	203	195
147.5	188	189	185	180	173	180	199	204	198
150	190	191	186	181	176	182	198	204	200
152.5	191	191	187	182	177	182	195	201	199
155	190	190	186	181	177	182	192	199	198
157.5	188	187	184	179	175	180	190	196	196
160	185	184	180	175	173	177	186	192	192
162.5	179	178	175	171	169	173	180	186	187
165	173	171	168	165	164	167	173	178	179
167.5	165	164	161	158	157	160	164	169	170
170	156	155	152	149	149	152	156	159	160
172.5	143	143	141	139	139	141	144	146	147
175	131	131	131	130	132	133	134	135	135
177.5	128	128	127	127	128	129	130	131	131
180	128	128	128	128	128	128	128	128	128

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	46	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		42	35	31		34	30	26		28	24	21	18
6	60	47	39	33		55	44	36	31		37	31	27		31	26	23		25	21	19	16
7	56	43	34	28		51	39	32	27		33	27	23		28	23	20		23	19	16	14
8	51	39	30	25		47	36	28	23		30	25	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	25	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	3.6	11.55	10.66
8.0	2.0	15.40	14.21
10.0	1.3	19.25	17.77
12.0	0.9	23.10	21.32
14.0	0.7	26.95	24.87
16.0	0.5	30.80	28.43

Spacing Criterion

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

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	12461	12461	12461
45	7494	7921	13205
55	5798	6280	11541
65	4495	4968	9902
75	3468	3923	6277
85	2754	3155	3228

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Report of Test

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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	11.4	12.3	12.3	13.3	14.6	8.7	9.6	9.6	10.5	11.8
	3H	13.7	14.5	14.6	15.5	16.8	10.1	11.0	11.1	11.9	13.2
	4H	14.7	15.5	15.7	16.5	17.8	10.6	11.4	11.6	12.4	13.7
	6H	15.7	16.5	16.7	17.5	18.8	10.9	11.6	11.9	12.6	13.9
	8H	16.3	16.9	17.2	18.0	19.3	10.9	11.6	11.9	12.6	14.0
	12H	16.8	17.4	17.8	18.4	19.8	11.0	11.6	12.0	12.6	14.0
4H	2H	11.6	12.4	12.6	13.4	14.7	9.4	10.2	10.4	11.2	12.5
	3H	14.0	14.7	15.0	15.7	17.0	11.1	11.8	12.1	12.8	14.1
	4H	15.2	15.8	16.2	16.8	18.2	11.8	12.4	12.8	13.4	14.8
	6H	16.4	16.9	17.4	18.0	19.3	12.3	12.8	13.3	13.9	15.2
	8H	17.0	17.5	18.0	18.5	19.9	12.4	13.0	13.5	14.0	15.3
	12H	17.6	18.1	18.6	19.1	20.5	12.5	13.0	13.6	14.0	15.4
8H	4H	15.3	15.8	16.3	16.9	18.2	12.3	12.8	13.3	13.8	15.2
	6H	16.6	17.1	17.7	18.1	19.5	13.1	13.5	14.1	14.5	15.9
	8H	17.3	17.7	18.4	18.8	20.1	13.4	13.7	14.4	14.8	16.2
	12H	18.1	18.4	19.1	19.5	20.9	13.6	13.9	14.7	15.0	16.4
12H	4H	15.3	15.8	16.4	16.8	18.2	12.4	12.9	13.4	13.9	15.3
	6H	16.7	17.0	17.7	18.1	19.5	13.2	13.6	14.3	14.7	16.0
	8H	17.4	17.7	18.4	18.8	20.2	13.6	14.0	14.7	15.0	16.4

Maximum UGR = 20.9

Report of Test

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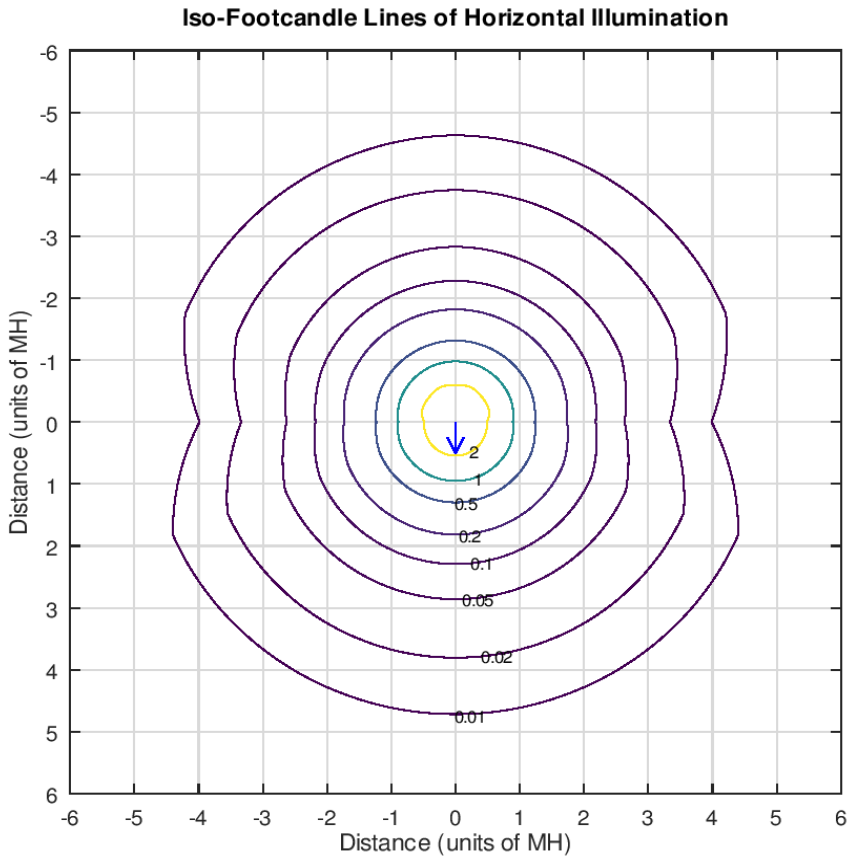
Iso-Illuminance Plot



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.

Report of Test

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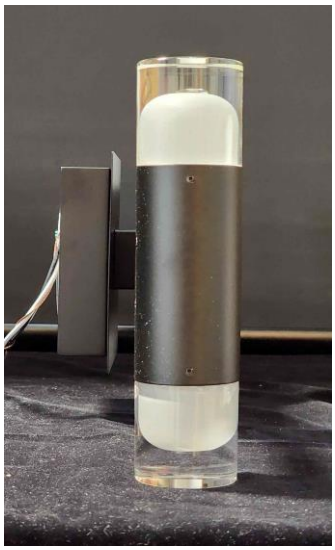
Additional Pictures of Test Subject



Report of Test

LLIA002028-009A

Test Distance	9.5 m
Ambient 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 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

LLIA002028-009B

Integrating Sphere Report
Catalog Number: 3-597-15 ALARUM 8LT LED VNTY - BK
Wall mounted, black painted formed steel housing, clear glass enclosures with frosted interior.
96 white LEDs. Eight white circuit boards with 12 LEDs each.
One Novbo NE032120070-2G LED driver

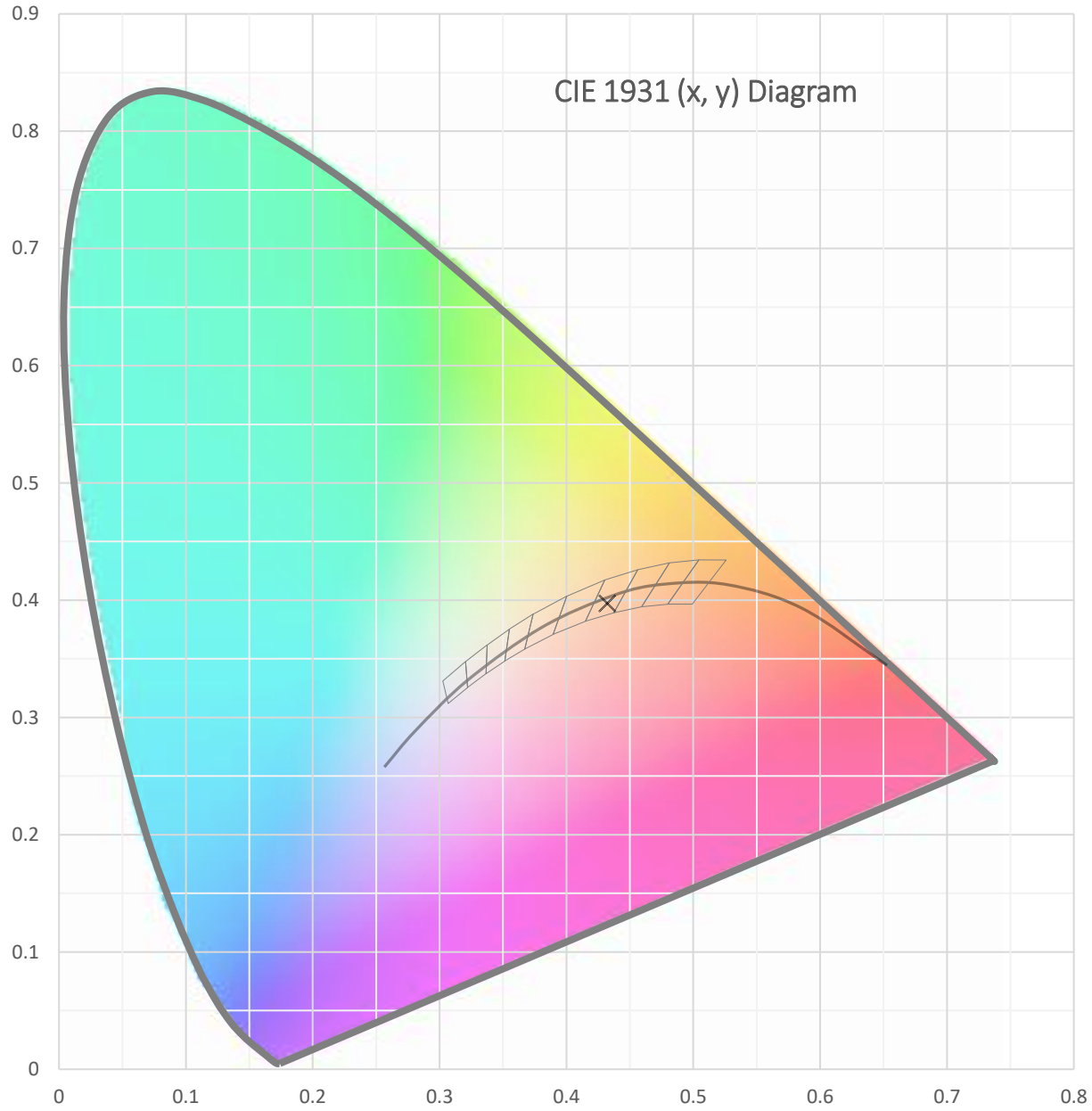
Performance Summary

Voltage	120.0	Vac
Current	0.2627	A
Power	29.19	W
Frequency	59.99	Hz
Power Factor	0.926	
Current THD	13.6	%
Total Luminous Flux	1476.5	lm
Efficacy	50.6	lm/W
Chromaticity (x,y)	(0.4323, 0.3973)	
(u',v')	(0.2505, 0.5180)	
Duv	-0.0021	
CCT	3024	K
CRI (Ra)	92	
R9	61	
TM-30: Rf	90	
TM-30: Rg	99	
TM-30: Rcs,h1	-5	

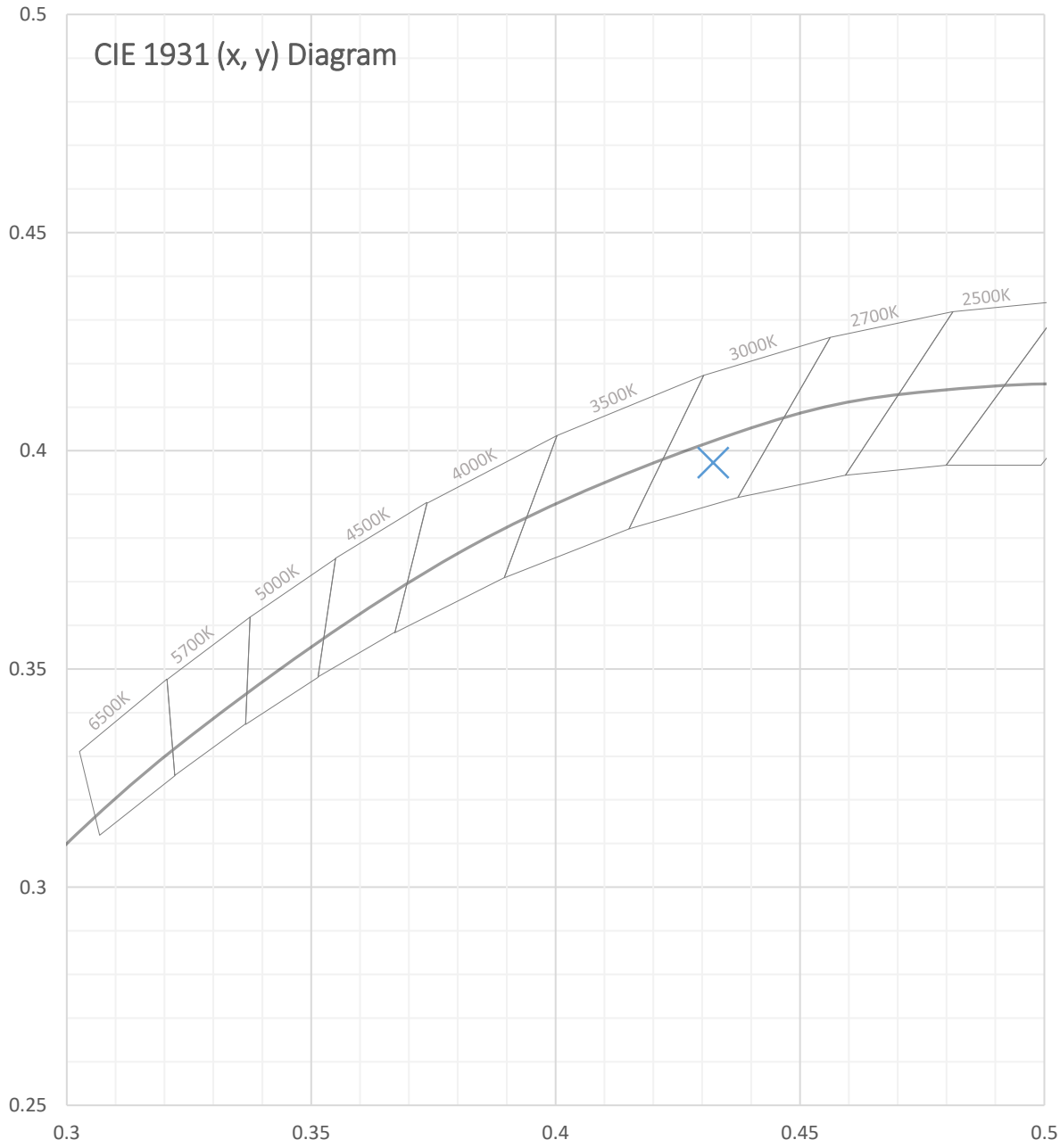
Prepared For:
Oxygen Lighting
201 Railhead Road
Fort Worth, TX 76106, USA

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

Test Report Number: LLIA002028-009B



Test Report Number: LLIA002028-009B



Test Report Number: LLIA002028-009B

Total Radiant Flux	5.232	W
Total Luminous Flux	1476.5	Lm
Chromaticity CIE 1931 (x, y)	(0.4323, 0.3973)	
Chromaticity CIE 1976 (u', v')	(0.2505, 0.5180)	
Correlated Color Temperature (CCT)	3024	K
Color Rendering Index (Ra)	92	
R1	93	
R2	97	
R3	98	
R4	91	
R5	92	
R6	95	
R7	92	
R8	82	
R9	61	
R10	90	
R11	90	
R12	80	
R13	94	
R14	98	
TM-30: Rf	90	
TM-30: Rg	99	
TM-30: Rcs,h1	-5	
Distance from Planckian Locus (Duv)	-0.0021	
Scotopic/Photopic Ratio ǂ	1.431	

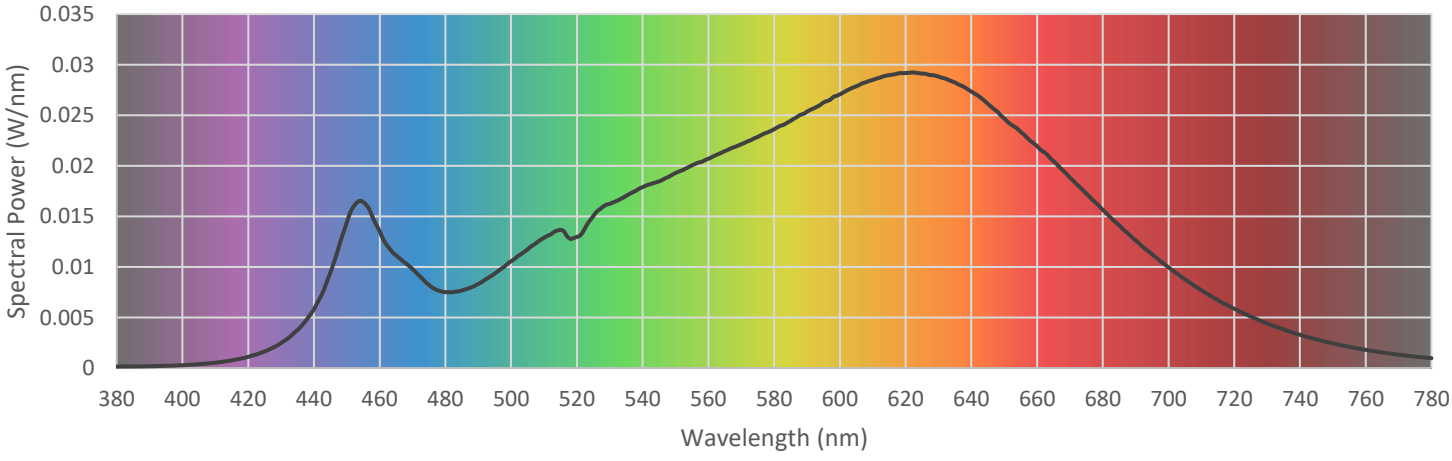
Electrical Data

Voltage	120.0	Vac
Current	0.2627	A
Power	29.19	W
Frequency	59.99	Hz
Power Factor	0.926	
Current THD	13.6	%

Test Report Number: LLIA002028-009B

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

380	0.000153	480	0.007499	580	0.023612	680	0.015638
385	0.000159	485	0.007669	585	0.024437	685	0.014124
390	0.000179	490	0.008314	590	0.025345	690	0.012623
395	0.000221	495	0.009338	595	0.026250	695	0.011239
400	0.000281	500	0.010561	600	0.027062	700	0.009959
405	0.000383	505	0.011742	605	0.027856	705	0.008769
410	0.000531	510	0.012881	610	0.028488	710	0.007694
415	0.000760	515	0.013661	615	0.028956	715	0.006732
420	0.001115	520	0.012973	620	0.029167	720	0.005858
425	0.001641	525	0.015021	625	0.029110	725	0.005089
430	0.002472	530	0.016234	630	0.028817	730	0.004422
435	0.003765	535	0.017033	635	0.028232	735	0.003819
440	0.005817	540	0.017886	640	0.027337	740	0.003286
445	0.009434	545	0.018457	645	0.026131	745	0.002833
450	0.014404	550	0.019279	650	0.024683	750	0.002437
455	0.016391	555	0.020033	655	0.023360	755	0.002089
460	0.013521	560	0.020690	660	0.021937	760	0.001804
465	0.011139	565	0.021452	665	0.020454	765	0.001544
470	0.009800	570	0.022134	670	0.018829	770	0.001324
475	0.008209	575	0.022847	675	0.017256	775	0.001132
						780	0.000975



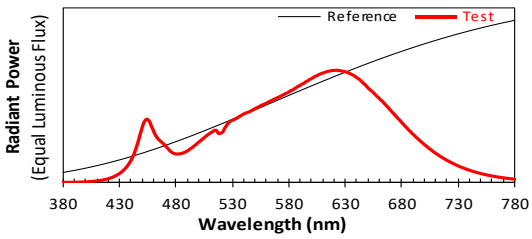
LightLab INTERNATIONAL ALLENTOWN LLC

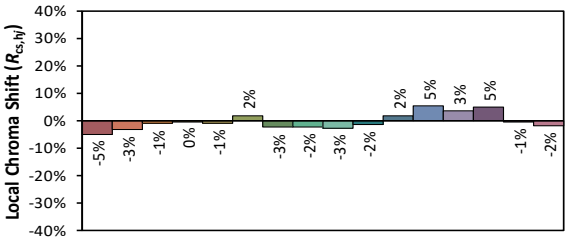
NVLAP TESTING Lab Code: 201079-0

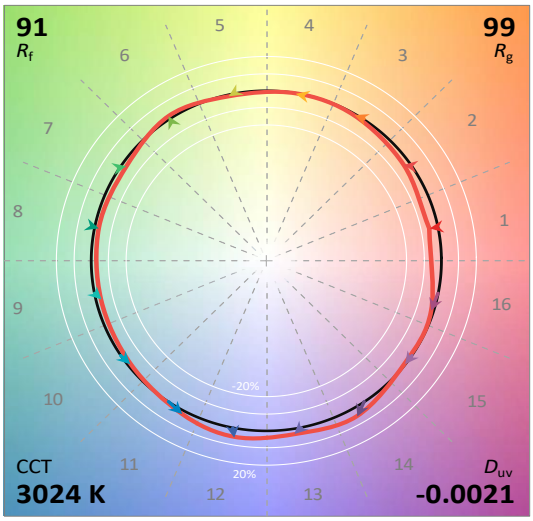
Test Report Number: LLIA002028-009B

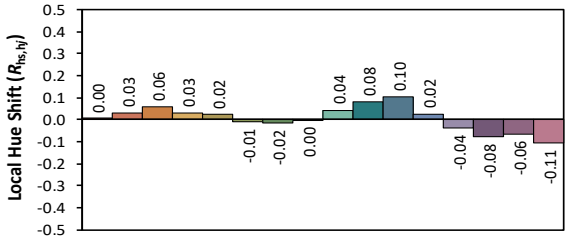
IES TM-30 Details

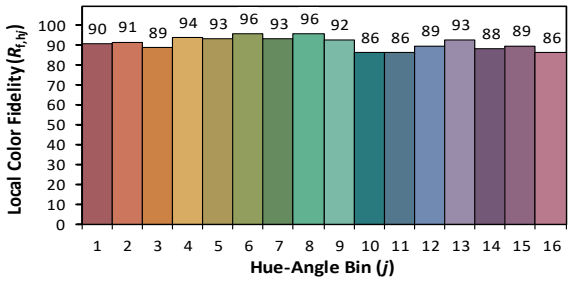
Source:	LLIA002028-009B	**Manufacturer:**	Oxygen Lighting
Date:	3/17/2023	**Model:**	3-597-15 ALARUM 8LT LED VNTY - BK

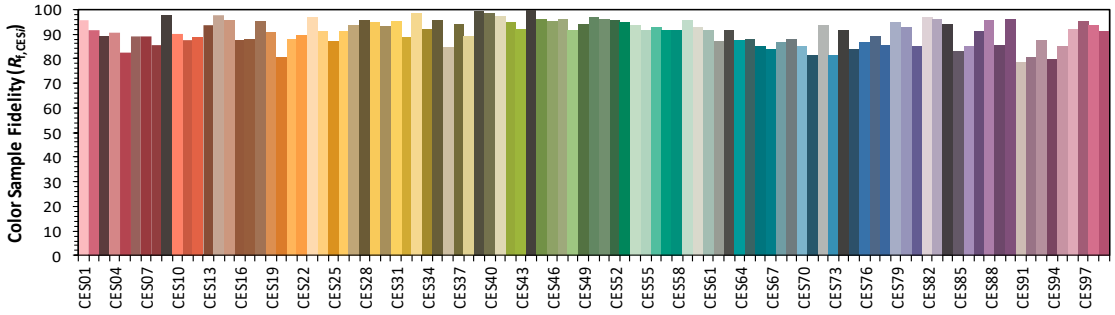












Notes:

x	**0.4323**
y	**0.3973**
u'	**0.2505**
v'	**0.5180**

CIE 13.3-1995 (CRI)

R_a	92
R_9	61

Test Report Number: LLIA002028-009B

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:	25.1 °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.

Sphere Report Template V2-18