LightLab INTERNATIONAL ALLENTOWN LLC

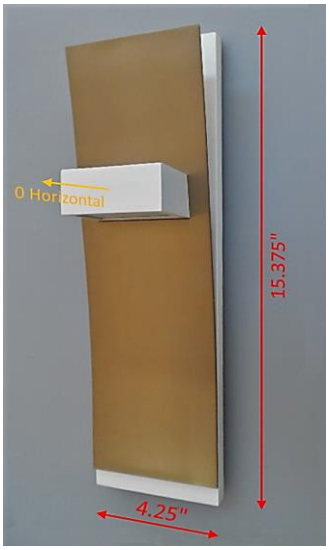
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001626-002A

Indoor Distribution Photometry Test Report

Catalog Number: Dario 3-400-xx
Wall mounted, formed steel housing, translucent white plastic top and bottom enclosures.
48 white LEDs, two Luxtech 3-9-30040 LED boards with 24 LEDs, one aimed up, one aimed down.
One ERP ESS010W-0180-42-XGN LED driver



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

Performance Summary					
Input Voltage	120.0	Vac	Luminous Flux	270.3	Lumens
Input Current	0.0582	A	Total Efficacy	39.6	Lm/W
Input Power	6.83	W	Downward Flux	143.4	Lumens
Frequency	60.00	Hz	Downward Flux	53.1	% of Total
Power Factor	0.979				
Current THD	16.1	%			

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

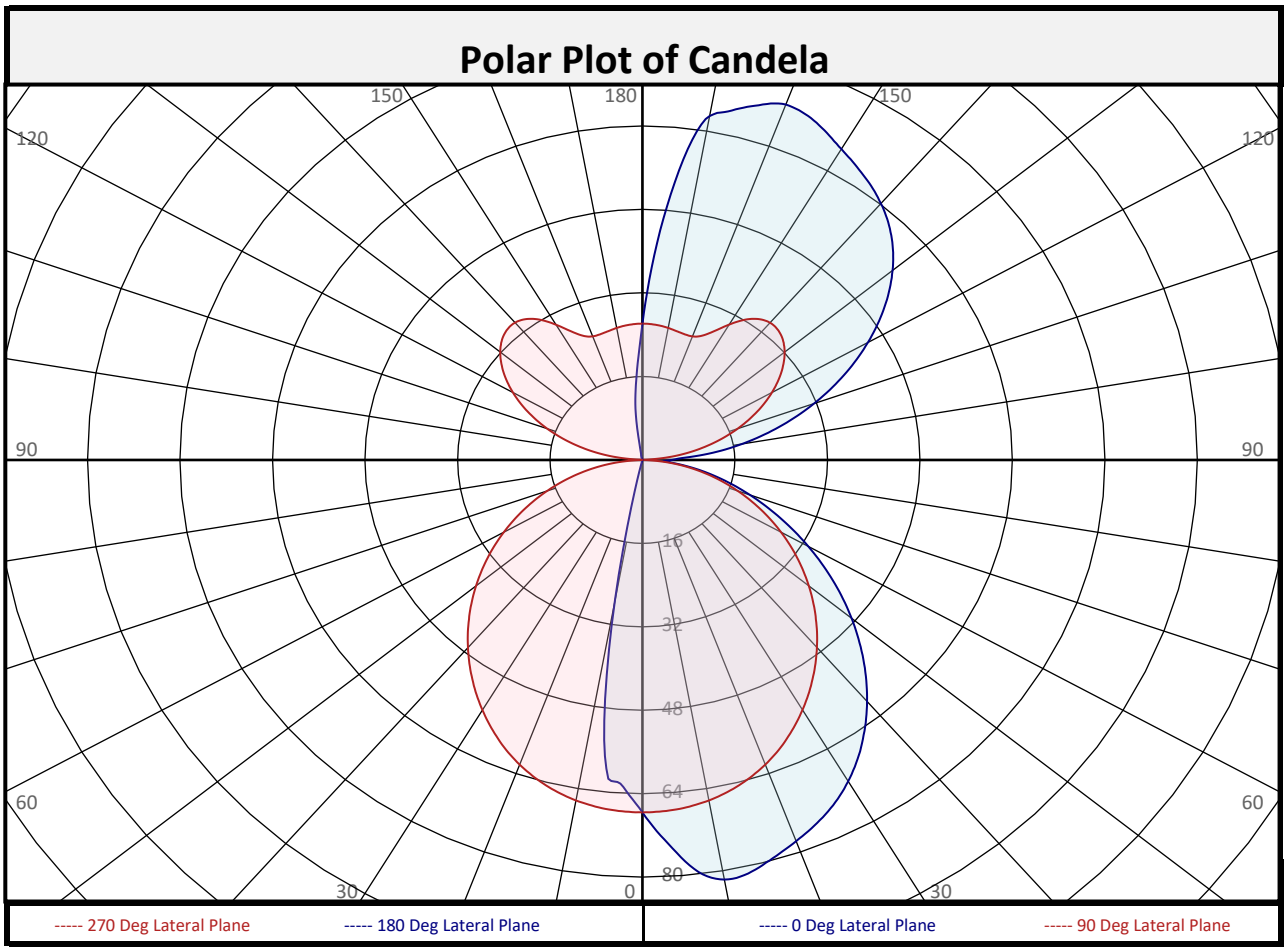
Test date: 01/14/2022
Report date: 01/19/2022

Signed: Michael L. Grather

USA west coast LightLab International, LLC, 24825 N. 16th Avenue, Suite 125, Phoenix, AZ, 85085, Ph : +1 623-434-1499, Fx : +1 623-434-1492, www.lightlabint.com
USA east coast LightLab Int'l Allentown LLC, 905 Harrison Street, Suite 135, Allentown, PA 18103, Ph: +1 484-273-0705, www.lightlaballentown.com (issuing laboratory)
Australasia & S.E. Asia LightLab International, 50 Redcliffe Gardens Drive, Clontarf, Queensland, 4019, Australia, Ph : +61 7 3283 7862, Fx : +61 7 3283 8751, www.lightlabint.com

Report of Test

LLIA001626-002A



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	6.4	2.4%	90-100	4.6	1.7%	0-20	21.4	7.9%
10-20	15.0	5.5%	100-110	12.1	4.5%	0-30	42.6	15.8%
20-30	21.2	7.8%	110-120	18.0	6.7%	0-40	67.4	24.9%
30-40	24.9	9.2%	120-130	21.8	8.1%	0-60	114.2	42.3%
40-50	25.0	9.2%	130-140	22.5	8.3%	0-80	140.2	51.9%
50-60	21.8	8.1%	140-150	20.2	7.5%	10-90	137.0	50.7%
60-70	16.3	6.0%	150-160	15.5	5.7%	20-50	71.0	26.3%
70-80	9.7	3.6%	160-170	9.3	3.4%	40-90	76.0	28.1%
80-90	3.2	1.2%	170-180	2.9	1.1%	60-90	29.2	10.8%
0-90	143.4	53.1%	90-180	126.9	46.9%	0-180	270.3	100.0%

Report of Test

LLIA001626-002A

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	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6	67.6
2.5	72.1	71.7	70.6	69.2	67.5	65.9	64.7	63.8	63.6
5	76.4	75.6	73.5	70.6	67.3	64.3	62.0	61.8	61.8
7.5	80.1	79.3	76.4	71.9	66.8	62.5	61.4	54.4	50.4
10	81.7	81.1	78.7	72.8	66.3	61.0	52.9	34.3	27.2
12.5	81.5	81.3	79.5	73.4	65.5	60.3	37.7	12.3	6.2
15	80.4	80.3	79.0	73.3	64.6	58.8	22.0	1.2	0.0
17.5	79.1	78.8	77.5	72.2	63.5	56.8	12.0	0.0	0.0
20	77.8	77.3	75.5	70.6	62.2	55.4	9.2	0.0	0.0
22.5	76.4	75.7	73.3	68.7	60.7	53.9	8.6	0.0	0.0
25	74.9	74.0	71.2	66.7	59.0	52.2	7.9	0.0	0.0
27.5	73.2	72.2	69.0	64.6	57.3	50.3	7.1	0.0	0.0
30	71.2	70.1	66.8	62.4	55.4	48.1	6.3	0.0	0.0
32.5	68.8	67.8	64.5	60.1	53.4	45.8	5.6	0.0	0.0
35	66.3	65.3	62.1	57.8	51.3	43.4	5.0	0.0	0.0
37.5	63.5	62.6	59.6	55.4	49.2	41.0	4.5	0.0	0.0
40	60.5	59.7	57.0	52.9	47.0	38.5	3.9	0.0	0.0
42.5	57.4	56.7	54.3	50.4	44.7	36.1	3.5	0.0	0.0
45	54.1	53.6	51.4	47.8	42.4	33.6	3.1	0.0	0.0
47.5	50.7	50.4	48.5	45.1	40.0	31.2	2.8	0.0	0.0
50	47.3	47.1	45.5	42.4	37.6	28.9	2.5	0.0	0.0
52.5	43.8	43.7	42.4	39.6	35.1	26.5	2.2	0.0	0.0
55	40.2	40.2	39.3	36.8	32.7	24.2	1.9	0.0	0.0
57.5	36.7	36.8	36.1	34.0	30.2	22.0	1.7	0.0	0.0
60	33.2	33.3	32.9	31.2	27.7	19.9	1.5	0.0	0.0
62.5	29.7	29.9	29.8	28.4	25.2	17.7	1.3	0.0	0.0
65	26.3	26.6	26.6	25.6	22.7	15.7	1.2	0.0	0.0
67.5	23.1	23.4	23.5	22.8	20.2	13.7	1.2	0.0	0.0
70	20.0	20.3	20.5	20.0	17.7	11.9	1.0	0.0	0.0
72.5	17.1	17.3	17.5	17.3	15.2	10.1	0.9	0.0	0.0
75	14.3	14.5	14.7	14.6	12.8	8.4	0.8	0.0	0.0
77.5	11.6	11.8	12.1	12.1	10.4	6.7	0.7	0.0	0.0
80	9.0	9.2	9.5	9.6	8.0	5.1	0.6	0.0	0.0
82.5	6.6	6.8	7.1	7.1	5.6	3.6	0.7	0.0	0.0
85	4.5	4.6	4.8	4.7	3.0	2.0	0.0	0.0	0.0
87.5	3.8	3.6	3.0	2.3	0.0	0.0	0.0	0.0	0.0
90	5.1	4.7	3.5	2.3	0.0	0.0	0.0	0.0	0.0

Report of Test

LLIA001626-002A

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	5.1	4.7	3.5	2.3	0.0	0.0	0.0	0.0	0.0
92.5	6.3	5.9	4.5	3.0	0.0	0.0	0.0	0.0	0.0
95	9.9	9.5	8.0	6.1	2.9	1.7	0.0	0.0	0.0
97.5	13.8	13.2	11.4	9.3	5.7	2.4	0.0	0.0	0.0
100	17.4	16.7	14.5	12.2	8.2	2.9	0.0	0.0	0.0
102.5	20.9	20.1	17.7	15.1	10.6	3.3	0.5	0.0	0.0
105	24.5	23.6	20.8	17.9	13.0	3.6	0.5	0.0	0.0
107.5	28.1	27.0	23.9	20.7	15.3	4.0	0.6	0.0	0.0
110	31.6	30.4	27.0	23.5	17.6	4.3	0.6	0.0	0.0
112.5	35.1	33.8	30.1	26.3	19.8	4.6	0.6	0.0	0.0
115	38.5	37.1	33.1	29.0	21.9	4.9	0.7	0.0	0.0
117.5	41.8	40.3	36.0	31.8	24.0	5.1	0.7	0.0	0.0
120	45.1	43.4	38.9	34.5	25.9	5.3	0.7	0.0	0.0
122.5	48.2	46.4	41.8	37.2	27.7	5.5	0.7	0.0	0.0
125	51.1	49.3	44.5	39.8	29.4	5.7	0.7	0.0	0.0
127.5	53.9	52.0	47.2	42.4	30.8	5.8	0.8	0.0	0.0
130	56.5	54.5	49.8	44.8	32.1	5.8	0.8	0.0	0.0
132.5	58.9	56.8	52.3	47.2	33.2	5.9	0.8	0.0	0.0
135	60.9	58.9	54.8	49.4	33.9	5.8	0.8	0.0	0.0
137.5	62.7	60.8	57.1	51.5	34.3	5.8	0.8	0.0	0.0
140	64.2	62.5	59.4	53.3	34.3	5.7	0.8	0.0	0.0
142.5	65.5	64.1	61.5	55.0	33.9	5.5	0.8	0.0	0.0
145	66.7	65.5	63.6	56.5	33.0	5.4	0.7	0.0	0.0
147.5	67.8	66.9	65.5	57.8	31.6	5.2	0.7	0.0	0.0
150	68.9	68.3	67.0	58.8	29.9	5.0	0.7	0.0	0.0
152.5	70.1	69.8	68.0	59.8	28.1	4.8	0.7	0.0	0.0
155	71.3	71.0	68.3	60.6	26.6	5.0	0.8	0.0	0.0
157.5	72.2	71.6	67.9	60.2	25.6	6.1	0.8	0.0	0.0
160	72.5	71.4	67.4	58.1	25.2	8.1	0.9	0.6	0.5
162.5	71.5	70.3	66.7	54.9	25.1	10.0	1.1	0.7	0.7
165	70.1	69.0	66.2	51.1	25.3	11.7	1.7	0.9	0.9
167.5	68.4	67.7	64.0	46.9	25.4	13.5	4.8	1.3	1.1
170	67.0	65.6	58.0	42.6	25.7	15.4	9.6	3.6	2.4
172.5	60.1	57.7	50.1	38.3	25.9	17.6	12.9	9.9	8.7
175	48.8	47.0	41.7	34.0	26.0	20.0	16.3	14.2	13.5
177.5	37.0	36.0	33.5	29.9	26.1	22.8	20.4	19.0	18.6
180	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1

Report of Test

LLIA001626-002A

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	108	108	108	108		100	100	100	100		85	85	85		71	71	71		59	59	59	53
1	98	94	90	86		91	87	84	81		74	72	70		63	61	59		52	51	50	44
2	90	82	76	71		83	76	71	66		65	61	58		55	52	50		46	44	42	37
3	82	72	65	59		75	67	61	55		58	53	49		49	45	42		41	38	36	32
4	75	64	56	50		69	60	52	47		51	46	41		43	39	36		36	33	31	27
5	69	57	49	43		63	53	46	40		46	40	36		39	35	31		33	29	27	24
6	63	51	43	37		59	48	41	35		41	36	31		35	31	27		30	26	24	21
7	59	46	38	33		54	43	36	31		38	32	28		32	28	24		27	24	21	19
8	54	42	34	29		50	39	32	28		34	29	25		30	25	22		25	22	19	17
9	51	39	31	26		47	36	29	25		32	26	22		27	23	20		23	20	17	15
10	47	35	28	23		44	33	27	22		29	24	20		25	21	18		22	18	16	14

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	1.9	5.39	7.32
8.0	1.1	7.19	9.76
10.0	0.7	8.98	12.20
12.0	0.5	10.78	14.64
14.0	0.3	12.58	17.08
16.0	0.3	14.38	19.52

Spacing Criterion

0 deg:	1.5
90 deg:	1.2
180 deg:	0.3
270 deg:	1.2

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	15164	15164	15164
45	1629	2107	13456
55	1076	1446	12787
65	652	914	12048
75	338	488	11088
85	104	157	7631

Report of Test

LLIA001626-002A

UGR Table - Corrected

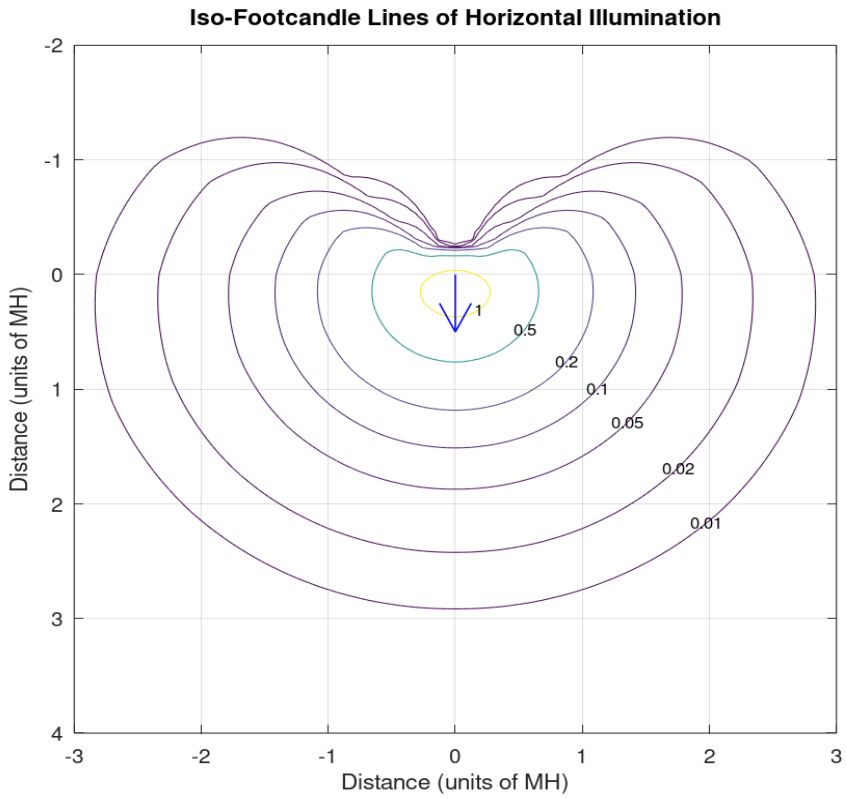
Reflectances											
Ceiling Cavity		70	70	50	50	30	70	70	50	50	30
Walls		50	30	50	30	30	50	30	50	30	30
Floor Cavity		20	20	20	20	20	20	20	20	20	20
Room Size		UGR Viewed Crosswise					UGR Viewed Endwise				
X=2H	Y=2H	11.3	12.2	12.3	13.2	14.4	8.2	9.1	9.1	10.0	11.3
	3H	12.6	13.4	13.6	14.4	15.6	9.4	10.2	10.4	11.2	12.5
	4H	13.1	13.8	14.0	14.8	16.0	9.8	10.6	10.8	11.5	12.8
	6H	13.3	14.0	14.3	15.0	16.2	10.0	10.7	11.0	11.7	13.0
	8H	13.3	14.0	14.3	15.0	16.3	10.1	10.7	11.1	11.7	13.0
	12H	13.4	14.0	14.3	15.0	16.3	10.1	10.7	11.0	11.7	13.0
4H	2H	11.5	12.3	12.5	13.2	14.5	8.5	9.2	9.4	10.2	11.4
	3H	13.0	13.6	13.9	14.6	15.9	9.9	10.5	10.8	11.5	12.8
	4H	13.5	14.0	14.4	15.0	16.3	10.4	10.9	11.3	11.9	13.2
	6H	13.8	14.3	14.8	15.3	16.6	10.7	11.2	11.7	12.2	13.5
	8H	13.9	14.3	14.9	15.3	16.7	10.7	11.2	11.7	12.2	13.5
	12H	13.9	14.3	14.9	15.3	16.7	10.7	11.2	11.8	12.2	13.5
8H	4H	13.5	14.0	14.5	15.0	16.3	10.5	10.9	11.5	11.9	13.2
	6H	13.9	14.3	14.9	15.3	16.6	10.8	11.2	11.9	12.3	13.6
	8H	14.0	14.4	15.1	15.4	16.7	11.0	11.3	12.0	12.3	13.6
	12H	14.1	14.4	15.1	15.4	16.8	11.0	11.3	12.0	12.3	13.7
12H	4H	13.5	13.9	14.5	14.9	16.2	10.4	10.8	11.4	11.9	13.2
	6H	13.9	14.2	14.9	15.2	16.6	10.8	11.2	11.8	12.2	13.5
	8H	14.0	14.3	15.0	15.3	16.7	11.0	11.3	12.0	12.3	13.7

Maximum UGR = 16.8

Report of Test

LLIA001626-002A

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

LLIA001626-002A

Test Distance	9.5 m
Ambient 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 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

LLIA001626-002B

Integrating Sphere Report
Catalog Number: Dario 3-400-xx
Wall mounted, formed steel housing, translucent white plastic top and bottom enclosures.
48 white LEDs, two Luxtech 3-9-30040 LED boards with 24 LEDs, one aimed up, one aimed down.
One ERP ESS010W-0180-42-XGN LED driver

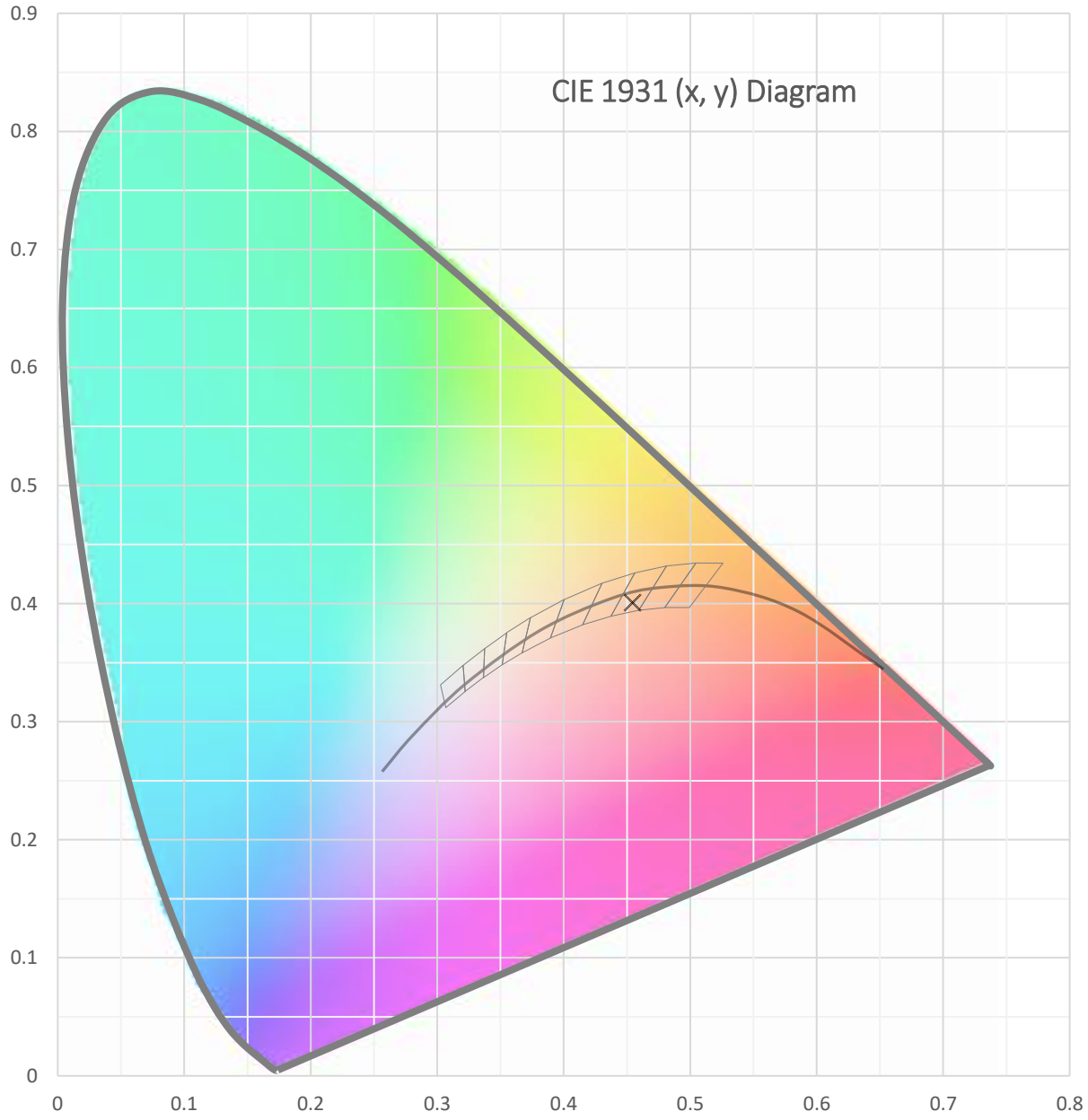
Performance Summary

Voltage	120.0	Vac
Current	0.0581	A
Power	6.84	W
Frequency	59.99	Hz
Power Factor	0.980	
Current THD	16.1	%
Total Luminous Flux	269.0	lm
Efficacy	39.3	lm/W
Chromaticity (x,y)	(0.4545, 0.4009)	
(u',v')	(0.2634, 0.5228)	
Duv	-0.0032	
CCT	2700	K
CRI (Ra)	93	
R9	64	
TM-30: Rf	90	
TM-30: Rg	98	
TM-30: Rcs,h1	-5	

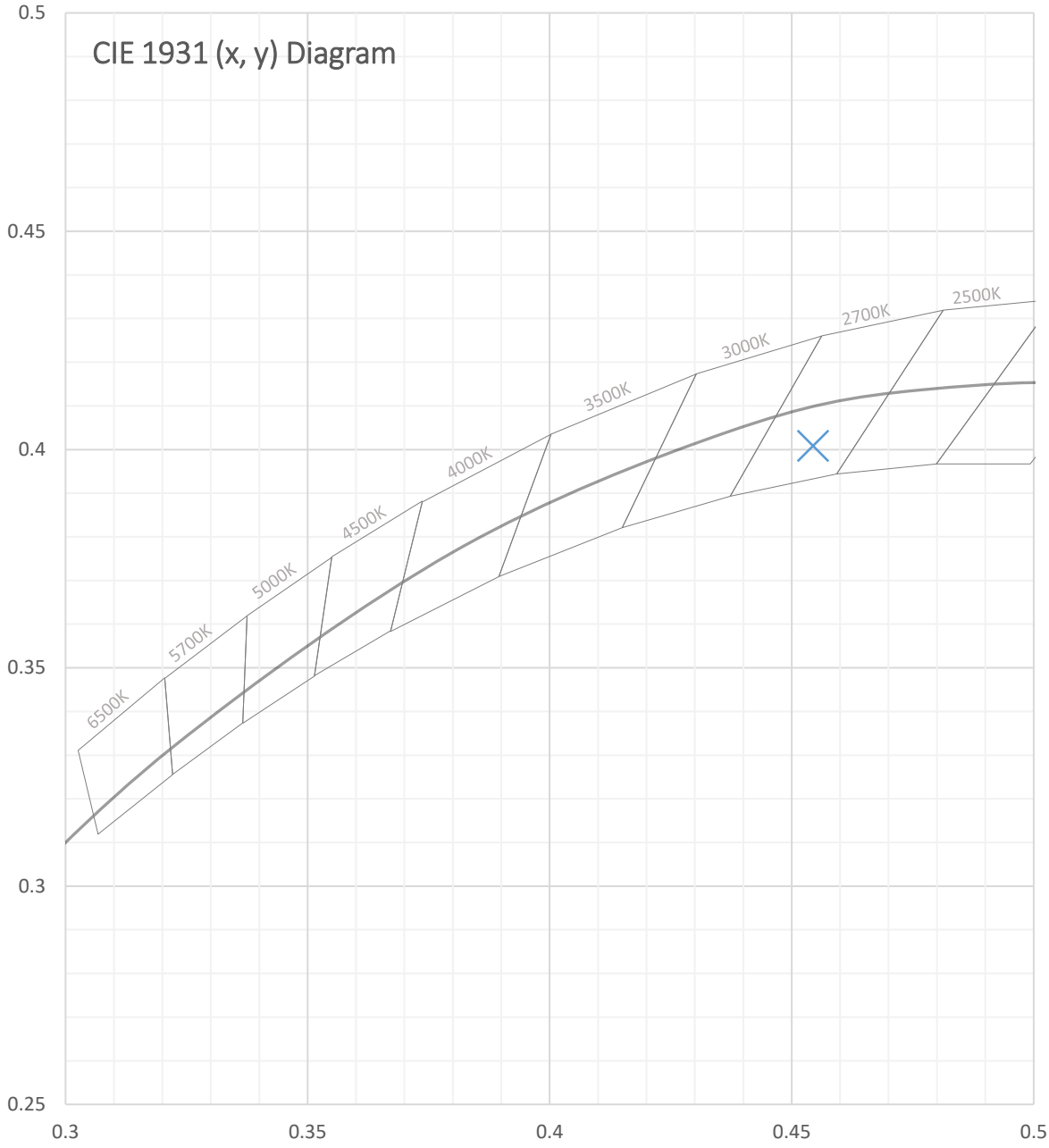
Prepared For:
Oxygen Lighting
201 Railhead Road
Fort Worth, TX 76106, USA

Test date: 01/12/2022
Report date: 01/19/2022

Test Report Number: LLIA001626-002B



Test Report Number: LLIA001626-002B



Test Report Number: LLIA001626-002B

Total Radiant Flux	0.975	W
Total Luminous Flux	269.0	Lm
Chromaticity CIE 1931 (x, y)	(0.4545, 0.4009)	
Chromaticity CIE 1976 (u', v')	(0.2634, 0.5228)	
Correlated Color Temperature (CCT)	2700	K
Color Rendering Index (Ra)	93	
R1	96	
R2	99	
R3	95	
R4	94	
R5	96	
R6	94	
R7	89	
R8	81	
R9	64	
R10	99	
R11	96	
R12	85	
R13	98	
R14	99	
TM-30: Rf	90	
TM-30: Rg	98	
TM-30: Rcs,h1	-5	
Distance from Planckian Locus (Duv)	-0.0032	
Scotopic/Photopic Ratio ǂ	1.348	

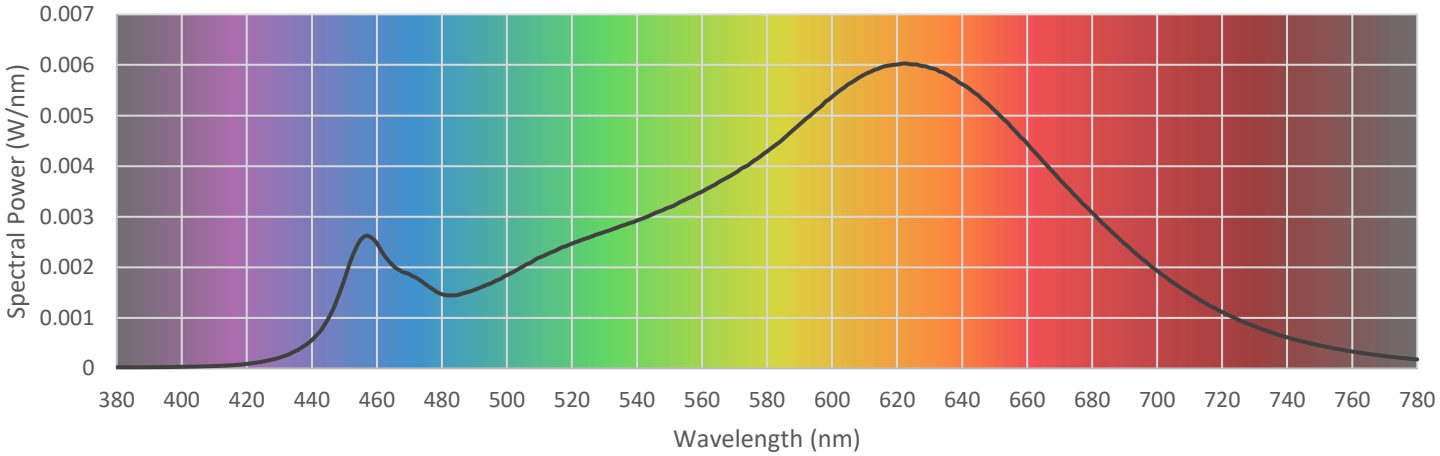
Electrical Data

Voltage	120.0	Vac
Current	0.0581	A
Power	6.84	W
Frequency	59.99	Hz
Power Factor	0.980	
Current THD	16.1	%

Test Report Number: LLIA001626-002B

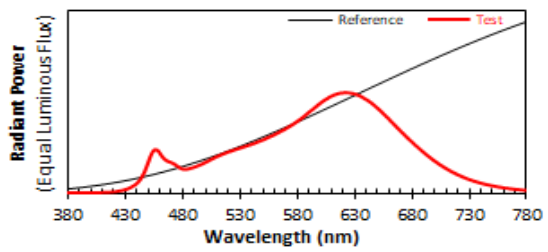
Summary Spectral Power Distribution (wavelength - nm, spectral power - W/nm)

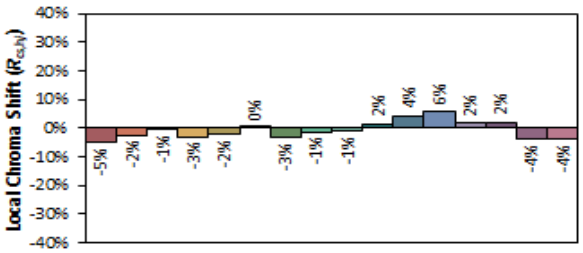
380	0.000023	480	0.001469	580	0.004289	680	0.003078
385	0.000023	485	0.001456	585	0.004538	685	0.002768
390	0.000024	490	0.001554	590	0.004823	690	0.002467
395	0.000027	495	0.001680	595	0.005101	695	0.002185
400	0.000032	500	0.001846	600	0.005369	700	0.001932
405	0.000038	505	0.002018	605	0.005620	705	0.001693
410	0.000048	510	0.002194	610	0.005810	710	0.001480
415	0.000062	515	0.002331	615	0.005947	715	0.001288
420	0.000091	520	0.002468	620	0.006008	720	0.001115
425	0.000138	525	0.002585	625	0.006009	725	0.000963
430	0.000215	530	0.002698	630	0.005942	730	0.000833
435	0.000346	535	0.002814	635	0.005822	735	0.000713
440	0.000562	540	0.002926	640	0.005621	740	0.000615
445	0.000982	545	0.003055	645	0.005399	745	0.000530
450	0.001758	550	0.003185	650	0.005103	750	0.000455
455	0.002540	555	0.003341	655	0.004781	755	0.000390
460	0.002474	560	0.003494	660	0.004450	760	0.000336
465	0.002032	565	0.003677	665	0.004088	765	0.000287
470	0.001863	570	0.003858	670	0.003739	770	0.000246
475	0.001661	575	0.004060	675	0.003404	775	0.000210
						780	0.000179

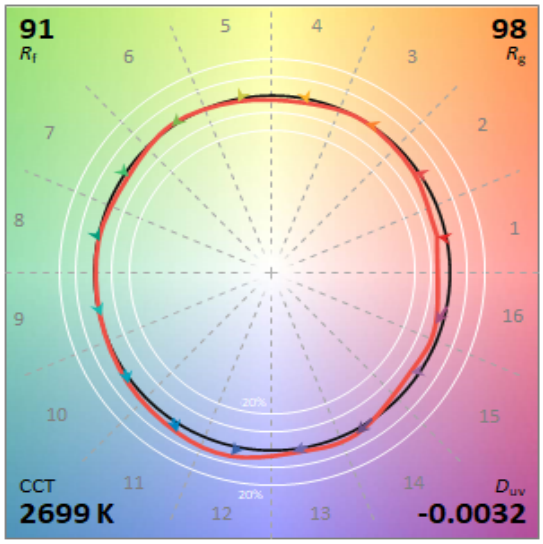


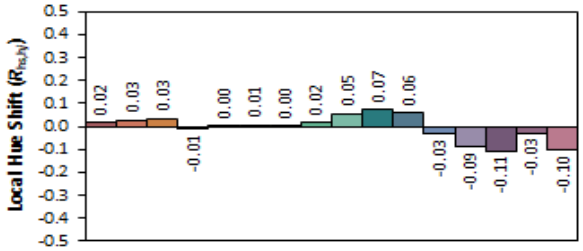
Test Report Number: LLIA001626-002B

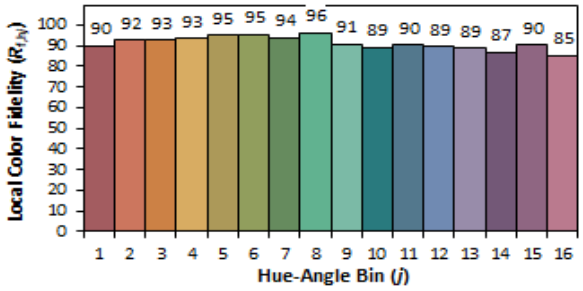
IES TM-30 Details

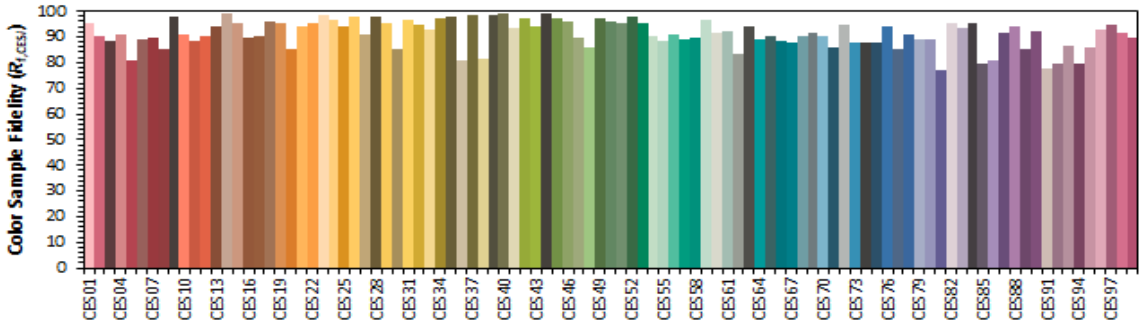












Notes:

x	0.4545
y	0.4008
u'	0.2634
v'	0.5227

CIE 13.3-1995 (CRI)

R_a	93
R_9	64

Test Report Number: LLIA001626-002B

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:	25.0 °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 V2-17