LightLab INTERNATIONAL ALLENTOWN LLC

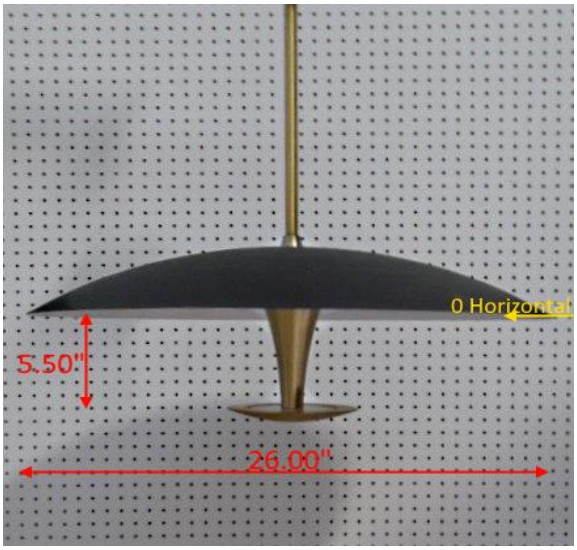
NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001389-007A

Indoor Distribution Photometry Test Report

Catalog Number: 3-647-1540 Spacely
Pendant mounted, formed steel canopy, white enamel steel upper reflector,
translucent white plastic enclosure above LEDs.
120 White LEDs, one LED board
One Novbo NE024120058-1G LED driver



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

Performance Summary					
Input Voltage	120.0	V	Luminous Flux	1180.1	Lumens
Input Current	0.1861	A	Total Efficacy	53.6	Lm/W
Input Power	22.01	W	Downward Flux	982.0	Lumens
Frequency	60.00	Hz	Downward Flux	83.2	% of Total
Power Factor	0.986				
Current THD	16.2	%			

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

Test date: 01/22/2021
Report date: 01/26/2021

Signed: Michael L. Grather

Report of Test

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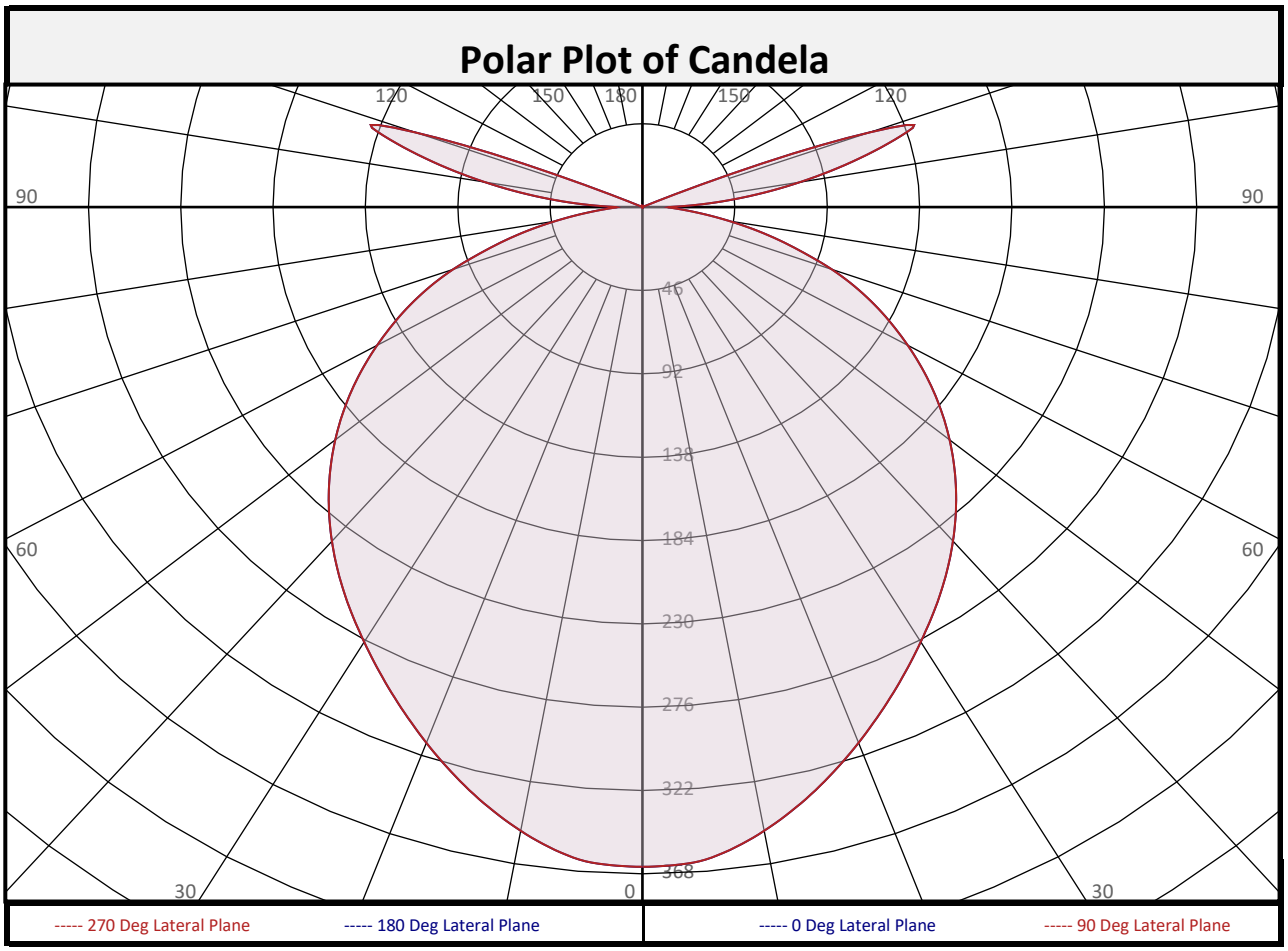

Zonal Flux Summary

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	34.1	2.9%	90-100	48.0	4.1%	0-20	127.9	10.8%
10-20	93.8	7.9%	100-110	122.8	10.4%	0-30	264.2	22.4%
20-30	136.3	11.5%	110-120	26.5	2.2%	0-40	426.5	36.1%
30-40	162.3	13.8%	120-130	0.2	0.0%	0-60	754.8	64.0%
40-50	170.4	14.4%	130-140	0.2	0.0%	0-80	955.3	80.9%
50-60	158.0	13.4%	140-150	0.2	0.0%	10-90	947.9	80.3%
60-70	125.8	10.7%	150-160	0.1	0.0%	20-50	469.0	39.7%
70-80	74.7	6.3%	160-170	0.1	0.0%	40-90	555.5	47.1%
80-90	26.6	2.3%	170-180	0.0	0.0%	60-90	227.2	19.3%
0-90	982.0	83.2%	90-180	198.1	16.8%	0-180	1180	100.0%

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Luminous Intensity (Candela) Table

	Lateral (C-Plane) Angles									
Vertical (Gamma) Angles		0	22.5	45	67.5	90	112.5	135	157.5	180
	0	364	364	364	364	364	364	364	364	364
	2.5	364	364	364	364	364	364	364	364	364
	5	361	361	361	361	361	361	361	361	361
	7.5	356	356	356	356	356	356	356	356	356
	10	349	349	349	349	349	349	349	349	349
	12.5	342	342	342	342	342	342	342	342	342
	15	333	333	333	333	333	333	333	333	333
	17.5	324	324	324	324	324	324	324	324	324
	20	315	315	315	315	315	315	315	315	315
	22.5	305	305	305	305	305	305	305	305	305
	25	296	296	296	296	296	296	296	296	296
	27.5	286	286	286	286	286	286	286	286	286
	30	277	277	277	277	277	277	277	277	277
	32.5	268	268	268	268	268	268	268	268	268
	35	259	259	259	259	259	259	259	259	259
	37.5	250	250	250	250	250	250	250	250	250
	40	241	241	241	241	241	241	241	241	241
	42.5	231	231	231	231	231	231	231	231	231
	45	221	221	221	221	221	221	221	221	221
	47.5	210	210	210	210	210	210	210	210	210
	50	200	200	200	200	200	200	200	200	200
	52.5	188	188	188	188	188	188	188	188	188
	55	177	177	177	177	177	177	177	177	177
	57.5	165	165	165	165	165	165	165	165	165
	60	153	153	153	153	153	153	153	153	153
	62.5	140	140	140	140	140	140	140	140	140
	65	128	128	128	128	128	128	128	128	128
	67.5	114	114	114	114	114	114	114	114	114
	70	100	100	100	100	100	100	100	100	100
	72.5	85	85	85	85	85	85	85	85	85
	75	70	70	70	70	70	70	70	70	70
	77.5	57	57	57	57	57	57	57	57	57
	80	43	43	43	43	43	43	43	43	43
	82.5	32	32	32	32	32	32	32	32	32
	85	23	23	23	23	23	23	23	23	23
	87.5	16	16	16	16	16	16	16	16	16
	90	13	13	13	13	13	13	13	13	13

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Luminous Intensity (Candela) Table

	Lateral (C-Plane) Angles									
Vertical (Gamma) Angles		0	22.5	45	67.5	90	112.5	135	157.5	180
	90	13	13	13	13	13	13	13	13	13
	92.5	26	26	26	26	26	26	26	26	26
	95	43	43	43	43	43	43	43	43	43
	97.5	61	61	61	61	61	61	61	61	61
	100	80	80	80	80	80	80	80	80	80
	102.5	100	100	100	100	100	100	100	100	100
	105	119	119	119	119	119	119	119	119	119
	107.5	138	138	138	138	138	138	138	138	138
	110	121	121	121	121	121	121	121	121	121
	112.5	47	47	47	47	47	47	47	47	47
	115	1	1	1	1	1	1	1	1	1
	117.5	0	0	0	0	0	0	0	0	0
	120	0	0	0	0	0	0	0	0	0
	122.5	0	0	0	0	0	0	0	0	0
	125	0	0	0	0	0	0	0	0	0
	127.5	0	0	0	0	0	0	0	0	0
	130	0	0	0	0	0	0	0	0	0
	132.5	0	0	0	0	0	0	0	0	0
	135	0	0	0	0	0	0	0	0	0
	137.5	0	0	0	0	0	0	0	0	0
	140	0	0	0	0	0	0	0	0	0
	142.5	0	0	0	0	0	0	0	0	0
	145	0	0	0	0	0	0	0	0	0
	147.5	0	0	0	0	0	0	0	0	0
	150	0	0	0	0	0	0	0	0	0
	152.5	0	0	0	0	0	0	0	0	0
	155	0	0	0	0	0	0	0	0	0
	157.5	0	0	0	0	0	0	0	0	0
	160	0	0	0	0	0	0	0	0	0
	162.5	0	0	0	0	0	0	0	0	0
	165	0	0	0	0	0	0	0	0	0
	167.5	0	0	0	0	0	0	0	0	0
	170	0	0	0	0	0	0	0	0	0
	172.5	0	0	0	0	0	0	0	0	0
	175	0	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	0
RCR																						
0	115	115	115	115		110	110	110	110		102	102	102		94	94	94		87	87	87	83
1	105	100	95	92		100	96	92	88		89	85	83		82	79	77		76	74	72	69
2	95	87	80	74		91	83	77	72		77	72	68		71	67	64		66	63	60	57
3	86	76	68	61		83	73	66	60		68	62	57		63	58	54		58	54	51	48
4	79	67	58	52		75	65	57	51		60	53	48		56	50	46		52	47	43	41
5	73	60	51	44		69	58	50	43		54	47	41		50	44	40		47	42	38	35
6	67	54	45	39		64	52	44	38		49	41	36		45	39	35		42	37	33	31
7	62	49	40	34		59	47	39	33		44	37	32		41	35	31		39	33	29	27
8	58	44	36	30		55	43	35	30		40	33	29		38	32	27		35	30	26	24
9	54	41	33	27		52	39	32	27		37	30	26		35	29	25		33	28	24	22
10	50	37	30	25		48	36	29	24		34	28	23		32	26	22		30	25	22	20

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	10.1	6.86	6.86
8.0	5.7	9.14	9.14
10.0	3.6	11.43	11.43
12.0	2.5	13.71	13.71
14.0	1.9	16.00	16.00
16.0	1.4	18.28	18.28

Average Luminance (cd/m^2)

	0 deg Plane	45 deg Plane	90 deg Plane
0	1063	1063	1063
45	912	912	912
55	900	900	900
65	881	881	881
75	794	794	794
85	760	760	760

Spacing Criterion

Spacing Criterion: 1.1

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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	8.6	9.9	9.2	10.5	11.2	8.6	9.9	9.2	10.5	11.2
	3H	10.4	11.5	11.0	12.2	12.9	10.4	11.5	11.0	12.2	12.9
	4H	11.0	12.1	11.6	12.7	13.5	11.0	12.1	11.6	12.7	13.5
	6H	11.3	12.4	12.0	13.0	13.8	11.3	12.4	12.0	13.0	13.8
	8H	11.4	12.4	12.1	13.1	13.9	11.4	12.4	12.1	13.1	13.9
	12H	11.5	12.4	12.2	13.1	13.9	11.5	12.4	12.2	13.1	13.9
4H	2H	9.2	10.3	9.8	10.9	11.7	9.2	10.3	9.8	10.9	11.7
	3H	11.1	12.0	11.8	12.7	13.5	11.1	12.0	11.8	12.7	13.5
	4H	11.8	12.6	12.5	13.3	14.1	11.8	12.6	12.5	13.3	14.1
	6H	12.3	13.0	13.0	13.7	14.5	12.3	13.0	13.0	13.7	14.5
	8H	12.4	13.1	13.1	13.8	14.6	12.4	13.1	13.1	13.8	14.6
	12H	12.5	13.1	13.2	13.9	14.7	12.5	13.1	13.2	13.9	14.7
8H	4H	12.0	12.7	12.7	13.4	14.2	12.0	12.7	12.7	13.4	14.2
	6H	12.6	13.2	13.3	13.9	14.7	12.6	13.2	13.3	13.9	14.7
	8H	12.8	13.3	13.5	14.1	14.9	12.8	13.3	13.5	14.1	14.9
	12H	12.9	13.4	13.7	14.1	15.0	12.9	13.4	13.7	14.1	15.0
12H	4H	12.0	12.6	12.7	13.4	14.2	12.0	12.6	12.7	13.4	14.2
	6H	12.6	13.1	13.4	13.9	14.7	12.6	13.1	13.4	13.9	14.7
	8H	12.8	13.3	13.6	14.0	14.9	12.8	13.3	13.6	14.0	14.9

Maximum UGR = 15.0

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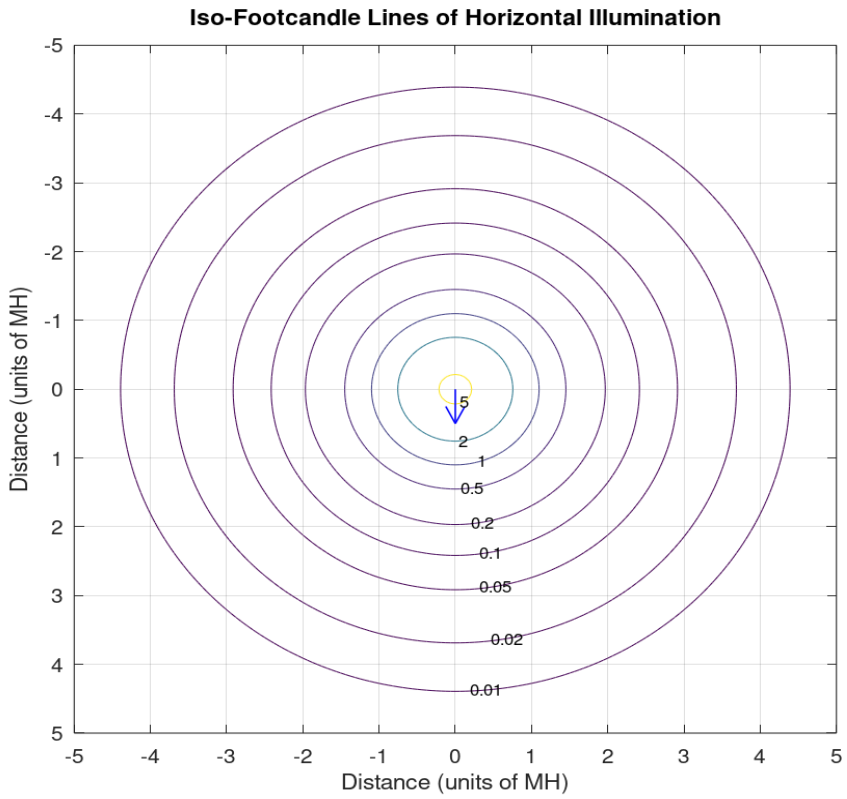
Iso-Illuminance Plot



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	24.9 °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 IES LM-79-19. 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.

LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA001389-007B

Integrating Sphere Report
Catalog Number: 3-647-1540 Spacely
Pendant mounted, formed steel canopy, white enamel steel upper reflector,
translucent white plastic enclosure above LEDs.
120 White LEDs, one LED board
One Novbo NE024120058-1G LED driver

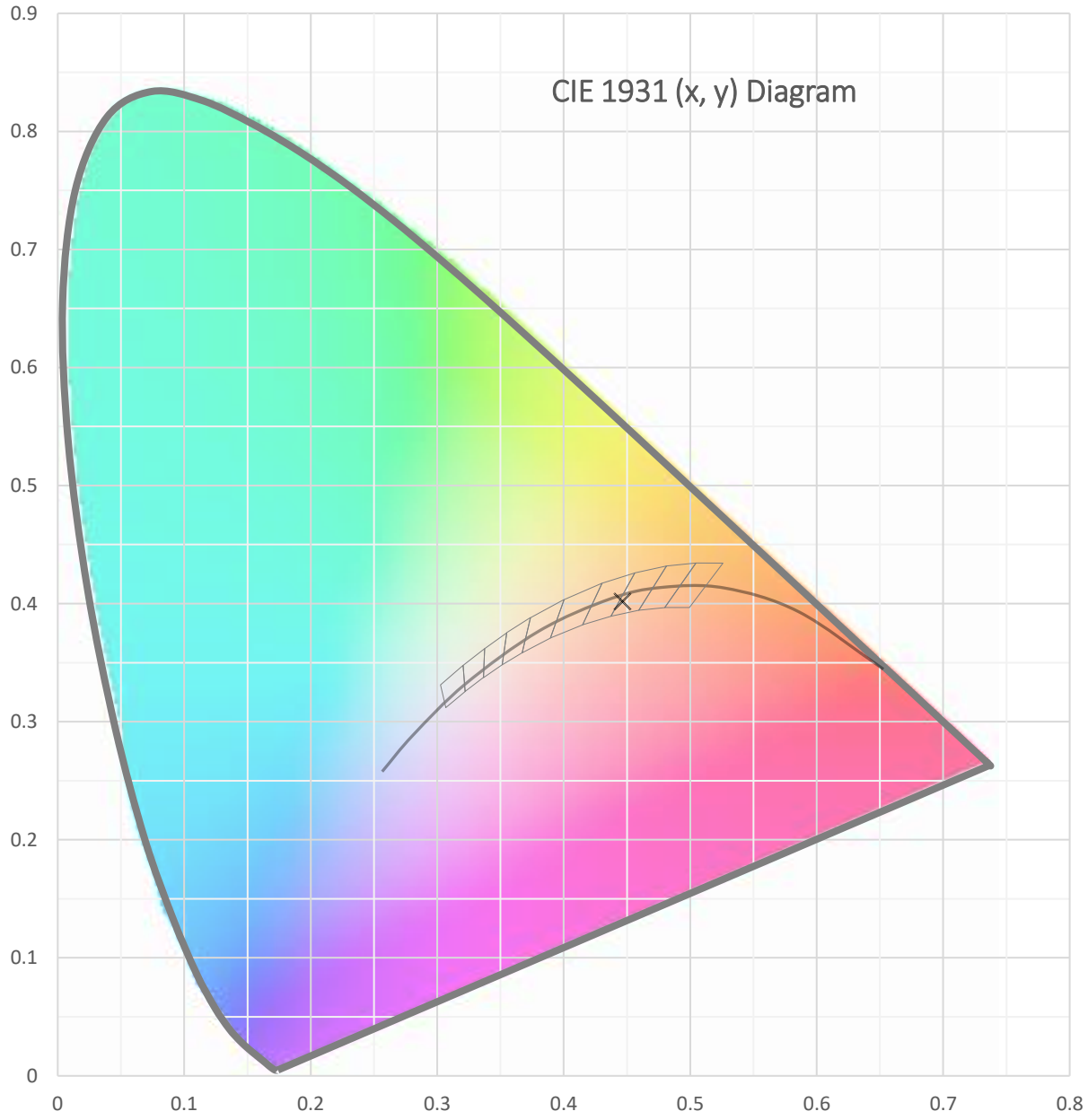
Performance Summary

Voltage	120.0	Vac
Current	0.1855	A
Power	21.93	W
Frequency	59.99	Hz
Power Factor	0.985	
Current THD	16.3	%
Total Luminous Flux	1227.1	lm
Efficacy	56.0	lm/W
Chromaticity (x,y)	(0.4464, 0.4018)	
(u',v')	(0.2577, 0.5219)	
Duv	-0.0021	
CCT	2828	K
CRI (Ra)	92	
R9	60	
TM-30: Rf	89	
TM-30: Rg	98	
TM-30: Rcs,h1	-5	

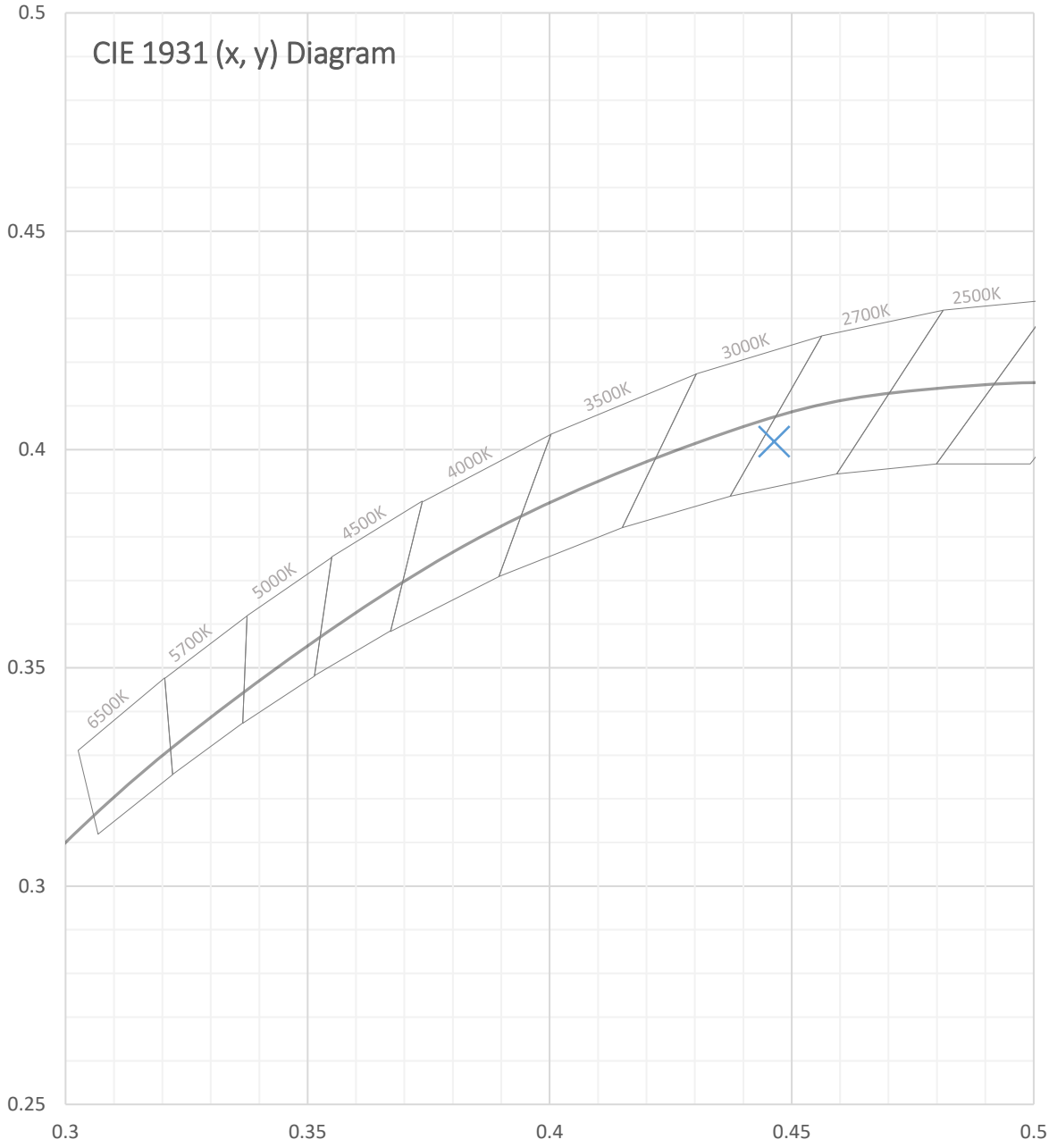
Prepared For:
Oxygen Lighting
201 Railhead Road
Fort Worth, TX 76106, USA

Test date: 01/15/2021
Report date: 01/25/2021

Test Report Number: LLIA001389-007B



Test Report Number: LLIA001389-007B



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Total Radiant Flux	4.432	W
Total Luminous Flux	1227.1	Lm
Chromaticity CIE 1931 (x, y)	(0.4464, 0.4018)	
Chromaticity CIE 1976 (u', v')	(0.2577, 0.5219)	
Correlated Color Temperature (CCT)	2828	K
Color Rendering Index (Ra)	92	
R1	93	
R2	98	
R3	97	
R4	90	
R5	92	
R6	96	
R7	90	
R8	80	
R9	60	
R10	94	
R11	90	
R12	81	
R13	94	
R14	100	
TM-30: Rf	89	
TM-30: Rg	98	
TM-30: Rcs,h1	-5	
Distance from Planckian Locus (Duv)	-0.0021	
Scotopic/Photopic Ratio ǂ	1.366	

Electrical Data

Voltage	120.0	Vac
Current	0.1855	A
Power	21.93	W
Frequency	59.99	Hz
Power Factor	0.985	
Current THD	16.3	%

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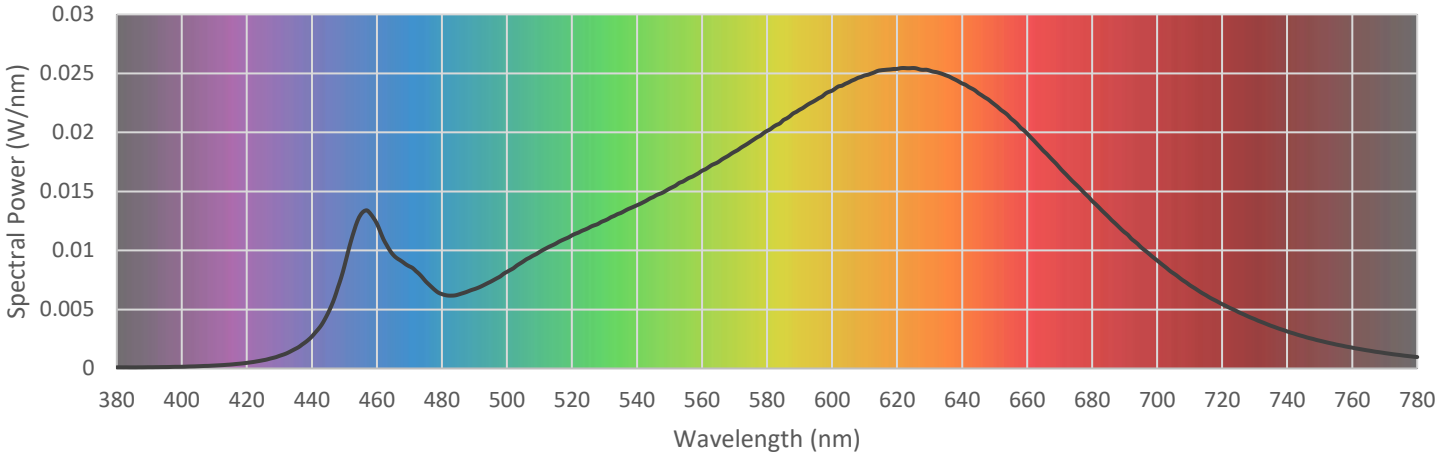
Summary Spectral Power Distribution (wavelength - nm, spectral power - W/nm)

380	0.000097	480	0.006302	580	0.020125	680	0.014189
385	0.000092	485	0.006257	585	0.021041	685	0.012854
390	0.000105	490	0.006724	590	0.021918	690	0.011535
395	0.000118	495	0.007354	595	0.022734	695	0.010279
400	0.000144	500	0.008184	600	0.023531	700	0.009154
405	0.000190	505	0.009062	605	0.024222	705	0.008065
410	0.000248	510	0.009862	610	0.024824	710	0.007066
415	0.000333	515	0.010572	615	0.025261	715	0.006207
420	0.000476	520	0.011278	620	0.025378	720	0.005448
425	0.000697	525	0.011888	625	0.025455	725	0.004778
430	0.001065	530	0.012522	630	0.025241	730	0.004181
435	0.001672	535	0.013171	635	0.024837	735	0.003619
440	0.002707	540	0.013828	640	0.024145	740	0.003138
445	0.004711	545	0.014522	645	0.023326	745	0.002722
450	0.008666	550	0.015236	650	0.022364	750	0.002352
455	0.013028	555	0.015981	655	0.021181	755	0.002033
460	0.012270	560	0.016752	660	0.019907	760	0.001763
465	0.009627	565	0.017488	665	0.018444	765	0.001519
470	0.008650	570	0.018358	670	0.017007	770	0.001306
475	0.007380	575	0.019225	675	0.015600	775	0.001124
						780	0.000966



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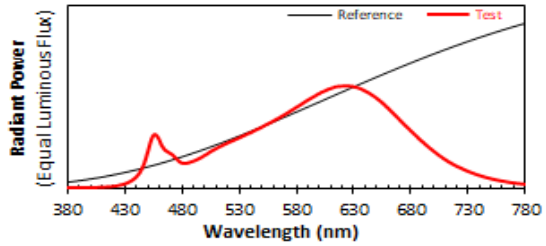
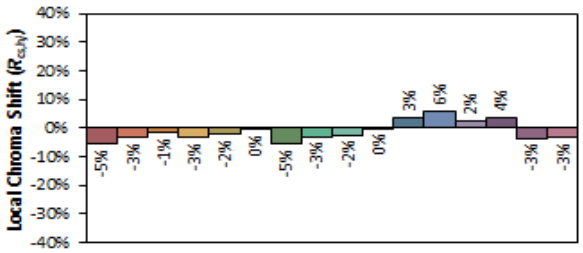
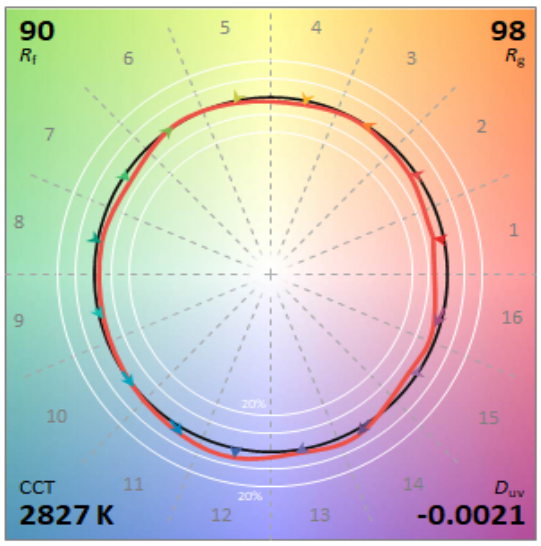
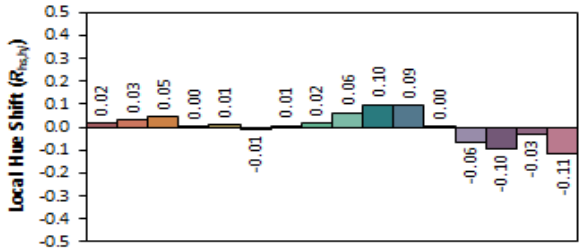
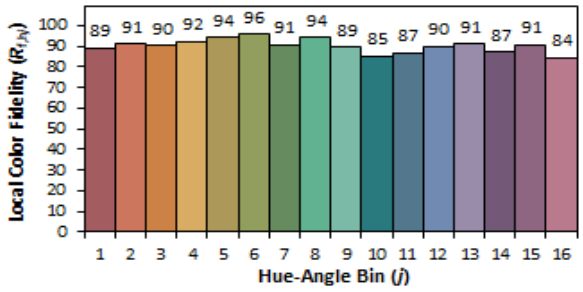
IES TM-30 Details

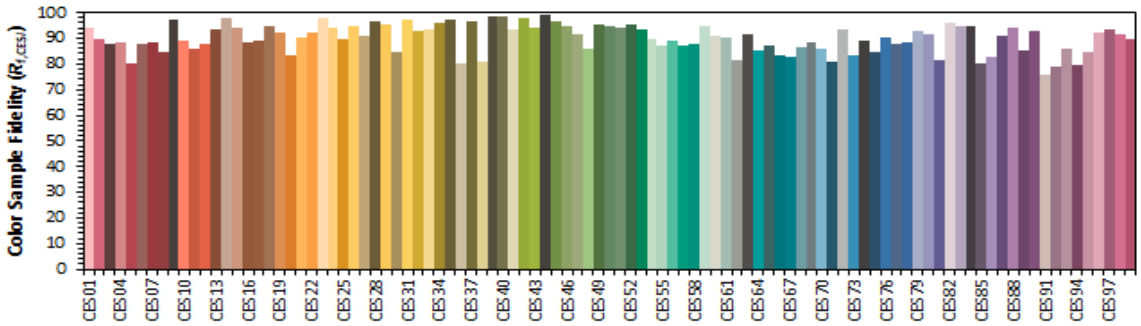












Notes:

x	0.4464
y	0.4017
u'	0.2577
v'	0.5219

CIE 13.3-1995 (CRI)

R_a	92
R_9	60

Test Report Number: LLIA001389-007B

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:	25.2 °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, TM-30-18
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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