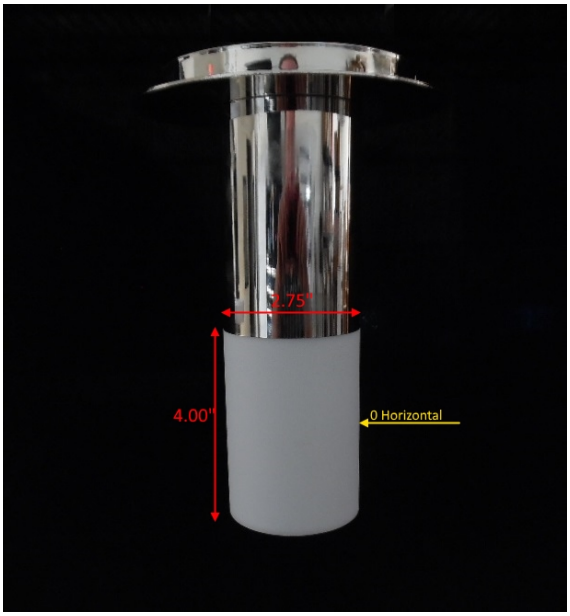
LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA000954-002A

Catalog Number: 3-308-220 Pilar SM
Ceiling mounted, formed steel housing, formed steel center lamp holder, cast aluminum heatsink, frosted glass enclosure above LEDs, translucent white plastic outer enclosure.
12 white LEDs, one Harvard Engineering E-C041041-01201J15-930 LED board
One LTF DA6W150C2040LPD010-0014 dimmable LED driver.
120.0Vac, 60.00Hz, 0.0583A, 6.46W, 0.924PF, 11.0%THD(i)



Performance Summary

Total Light Output	234	lm
Luminaire Power	6.46	W
Luminous Efficacy	36.2	lm/W

PREPARED FOR : Oxygen Lighting, 201 Railhead Road, Fort Worth, TX 76106, USA

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.lightlabint.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

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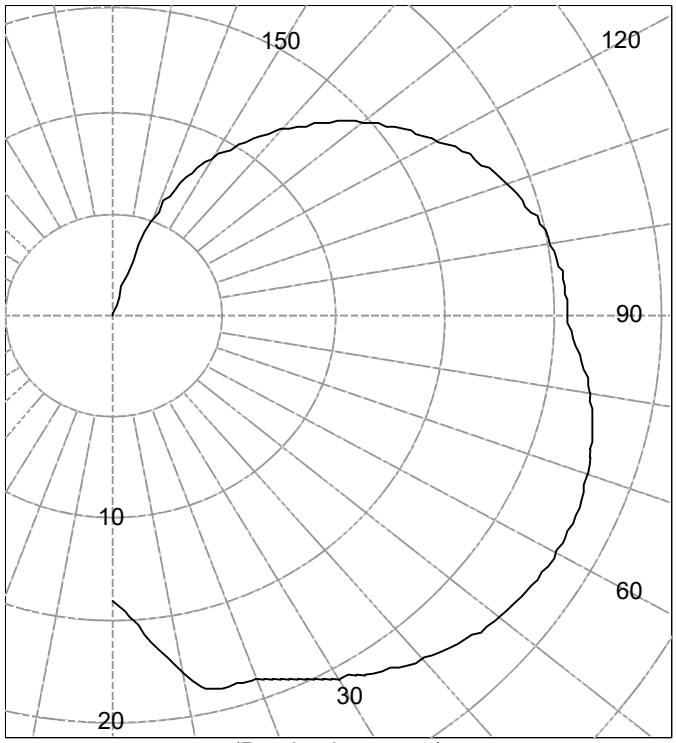
Legend: All planes - Black (cd)



(Rotational symmetry)

INTENSITY SUMMARY (cd)

Gamma	All Planes	Flux (lm)	Gamma	C0	Flux (lm)
0	14.0		90	20.6	
5	15.7	2	95	20.5	22
10	17.9		100	20.2	
15	19.0	5	105	19.7	21
20	19.0		110	19.0	
25	19.7	9	115	18.1	18
30	20.6		120	17.1	
35	21.4	13	125	16.0	14
40	22.0		130	14.7	
45	22.6	17	135	13.4	10
50	22.9		140	11.9	
55	23.2	21	145	10.4	7
60	23.3		150	8.9	
65	23.2	23	155	7.2	3
70	22.9		160	5.0	
75	22.5	24	165	1.5	1
80	22.0		170	0.0	
85	21.3	23	175	0.0	0
90	20.6		180	0.0	

AVERAGE LUMINANCE (cd / m^2)

Gamma	C0
45.0	2905
55.0	2879
65.0	2862
75.0	2855
85.0	2858

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	%Lamp	%Luminaire
0-30	16	N / A	6.9
0-40	30	N / A	12.6
0-60	68	N / A	28.9
0-90	138	N / A	58.8
40-90	108	N / A	46.2
60-90	70	N / A	29.9
90-180	96	N / A	41.2
0-180	234	N / A	100.0

Total Light Output = 234 lm

Spacing Criterion: 0-180 2.2
Spacing Criterion: 90-270 2.2

Signed: Michael L. Grather

Authorized Signatory

Date of test 5-Mar-2018
Date of report 7-Mar-2018

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120.0Vac, 60.00Hz, 0.0583A, 6.46W, 0.924PF, 11.0%THD(i)

Intensity (cd) and Flux (lm) data

Gamma	Intensity	Flux	Gamma	Intensity	Flux
0.0	14.0		90.0	20.6	
2.5	14.7		92.5	20.6	
5.0	15.7	2	95.0	20.5	22
7.5	16.8		97.5	20.4	
10.0	17.9		100.0	20.2	
12.5	18.7		102.5	19.9	
15.0	19.0	5	105.0	19.7	21
17.5	19.0		107.5	19.3	
20.0	19.0		110.0	19.0	
22.5	19.3		112.5	18.6	
25.0	19.7	9	115.0	18.1	18
27.5	20.2		117.5	17.6	
30.0	20.6		120.0	17.1	
32.5	21.0		122.5	16.6	
35.0	21.4	13	125.0	16.0	14
37.5	21.7		127.5	15.4	
40.0	22.0		130.0	14.7	
42.5	22.3		132.5	14.1	
45.0	22.6	17	135.0	13.4	10
47.5	22.8		137.5	12.7	
50.0	22.9		140.0	11.9	
52.5	23.1		142.5	11.2	
55.0	23.2	21	145.0	10.4	7
57.5	23.2		147.5	9.6	
60.0	23.3		150.0	8.9	
62.5	23.2		152.5	8.1	
65.0	23.2	23	155.0	7.2	3
67.5	23.1		157.5	6.2	
70.0	22.9		160.0	5.0	
72.5	22.8		162.5	3.2	
75.0	22.5	24	165.0	1.5	1
77.5	22.3		167.5	0.3	
80.0	22.0		170.0	0.0	
82.5	21.6		172.5	0.0	
85.0	21.3	23	175.0	0.0	0
87.5	20.9		177.5	0.0	
90.0	20.6		180.0	0.0	

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Coefficients Of 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
0	109	109	109	109	102	102	102	102	88	88	88	76	76	76	64	64	64	59
1	95	88	82	77	88	82	77	72	70	66	62	59	56	53	49	47	44	39
2	84	74	66	59	78	69	61	55	59	53	48	49	44	40	40	37	34	29
3	76	64	54	47	70	59	51	44	50	43	38	42	37	32	34	30	27	22
4	69	55	46	38	63	51	43	36	44	37	31	36	31	26	30	25	22	18
5	63	49	39	32	57	45	36	30	38	31	26	32	26	22	26	22	18	15
6	57	43	34	27	53	40	32	25	34	27	22	29	23	19	23	19	15	12
7	53	39	30	23	49	36	28	22	31	24	19	26	20	16	21	17	13	10
8	49	35	26	20	45	32	25	19	28	21	16	23	18	14	19	15	11	9
9	45	32	23	18	42	30	22	17	25	19	14	21	16	12	18	13	10	8
10	42	29	21	16	39	27	20	15	23	17	13	20	15	11	16	12	9	7

For absolute test reports, CUs are expressed as a percentage of total lumen 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)	Beam Width (across 50% Nadir Illum) 0-180	90-270
6.0	0.4	13.14	13.14
8.0	0.2	17.52	17.52
10.0	0.1	21.90	21.90
12.0	0.1	26.28	26.28
14.0	0.1	30.65	30.65
16.0	0.1	35.03	35.03

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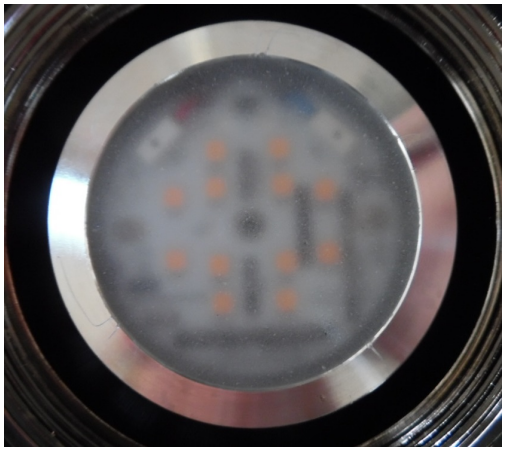

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Test Distance	9.5 m
Test Temperature	24.8 °C

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-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2015, ANSI C82.77-10:2014.

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 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.

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LightLab INTERNATIONAL ALLENTOWN LLC

NVLAP TESTING Lab Code: 201079-0

Report of Test

LLIA000954-002B

Integrating Sphere Report

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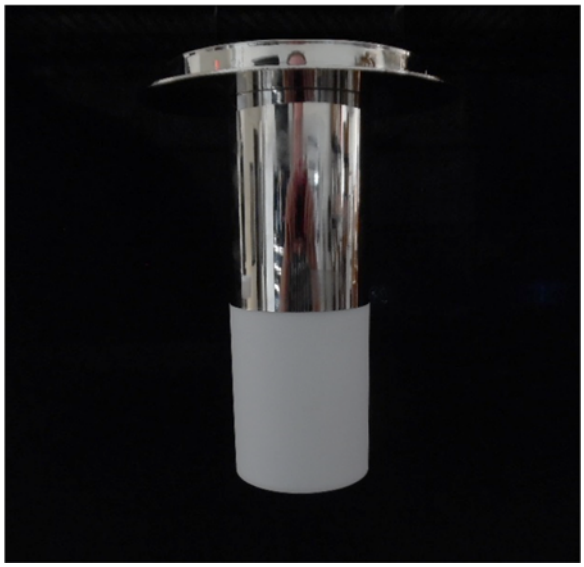

Performance Summary

Voltage	120.0	Vac
Current	0.0581	A
Power	6.44	W
Frequency	59.97	Hz
Power Factor	0.924	
Current THD	11.1	%
Total Luminous Flux	236.5	lm
Efficacy	36.7	lm/W
Chromaticity (x,y)	(0.4475, 0.4083)	
(u',v')	(0.2555, 0.5246)	
Duv	0.0004	
CCT	2864	K
CRI (Ra)	96	
R9	82	
TM-30: Rf	94	
TM-30: Rg	101	

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

Test date: 03/02/2018
Report date: 03/07/2018

Test Report Number: LLIA000954-002B

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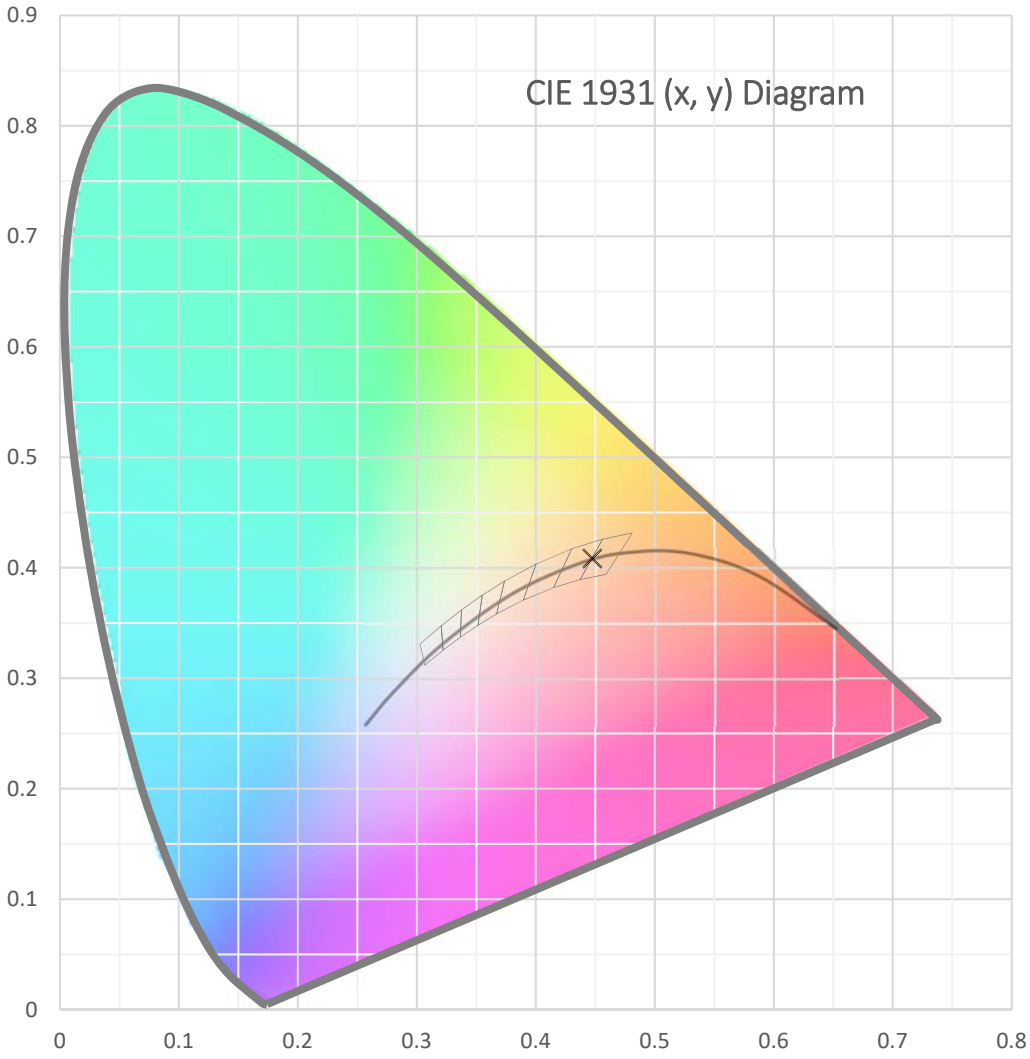

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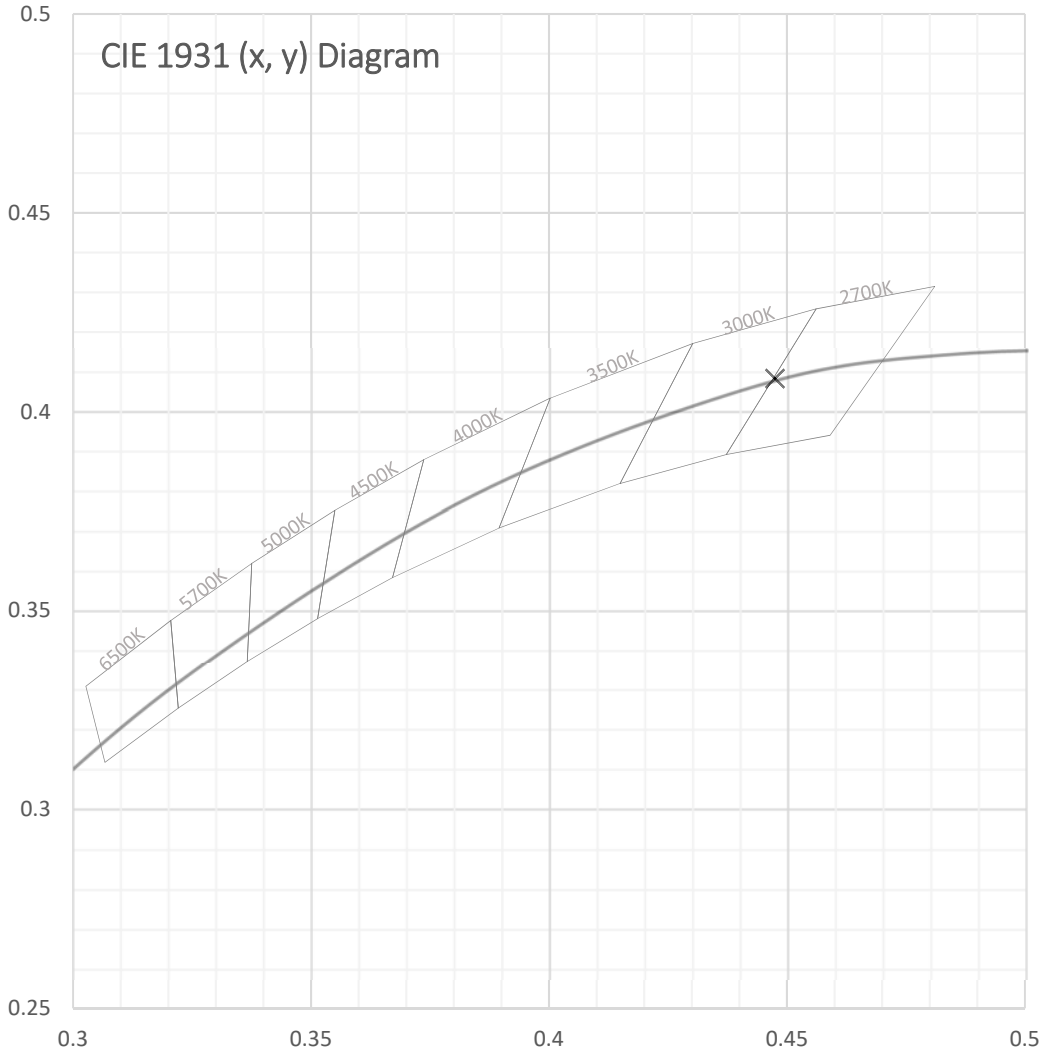

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Spectral Data	Total Radiant Flux	0.884	W
	Total Luminous Flux	236.5	Lm
	Chromaticity CIE 1931 (x, y)	(0.4475, 0.4083)	
	Chromaticity CIE 1976 (u', v')	(0.2555, 0.5246)	
	Correlated Color Temperature (CCT)	2864	K
	Color Rendering Index (Ra)	96	
	R1	97	
	R2	97	
	R3	95	
	R4	97	
	R5	96	
	R6	96	
	R7	97	
	R8	93	
	R9	82	
	R10	92	
	R11	97	
	R12	84	
	R13	97	
	R14	96	
	TM-30: Rf	94	
	TM-30: Rg	101	
	Distance from Planckian Locus (Duv)	0.0004	
	Scotopic/Photopic Ratio *	1.365	
Electrical Data			
	Voltage	120.0	Vac
	Current	0.0581	A
	Power	6.44	W
	Frequency	59.97	Hz
	Power Factor	0.924	
	Current THD	11.1	%

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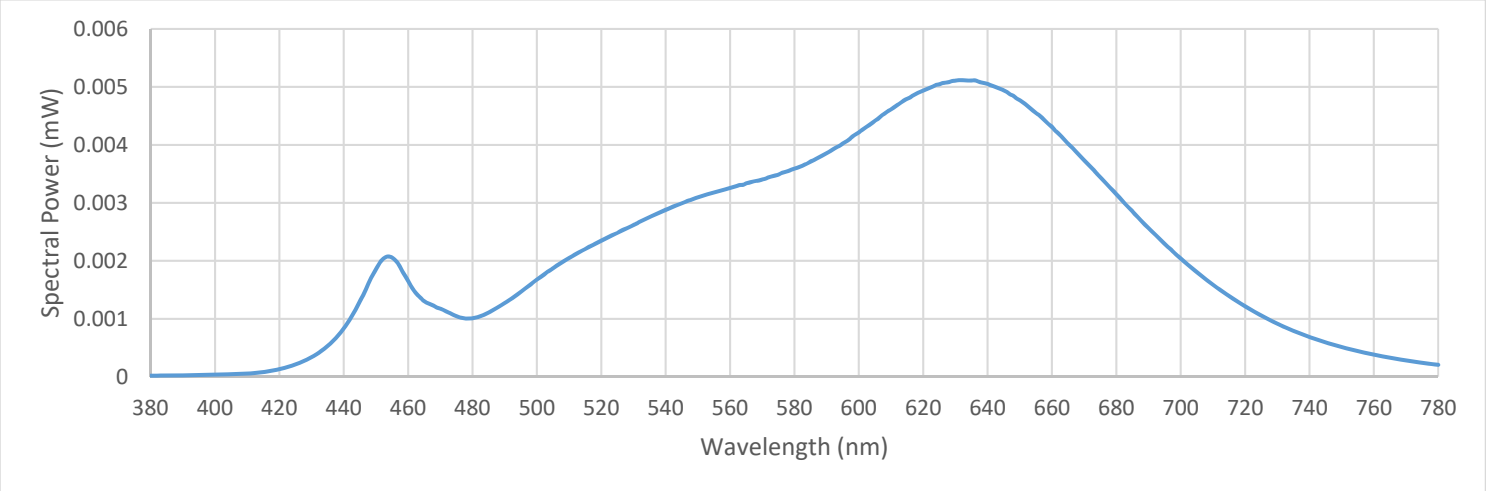
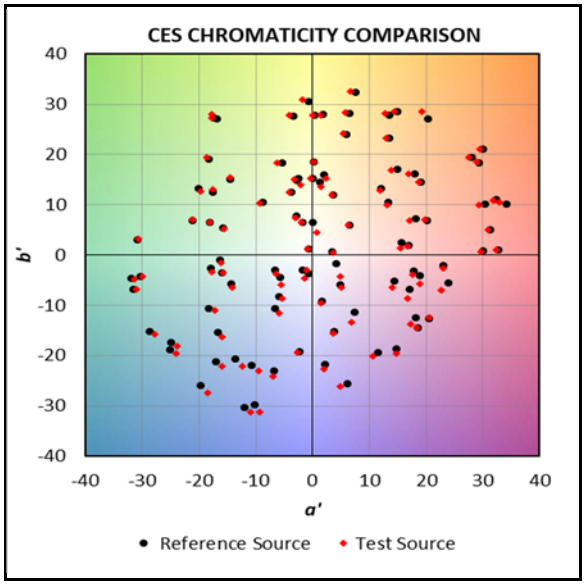
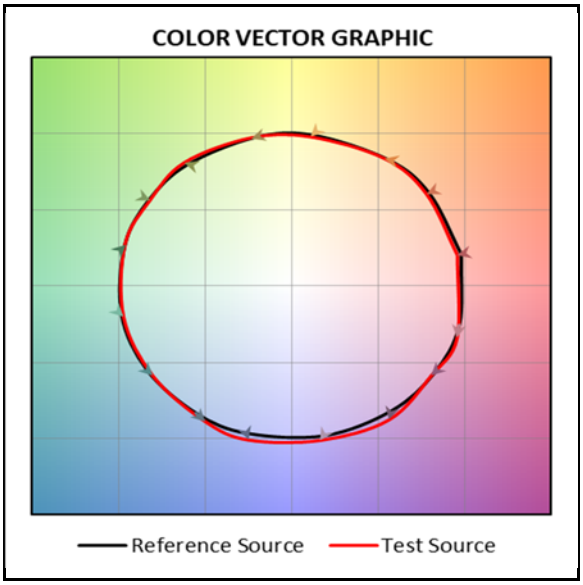
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

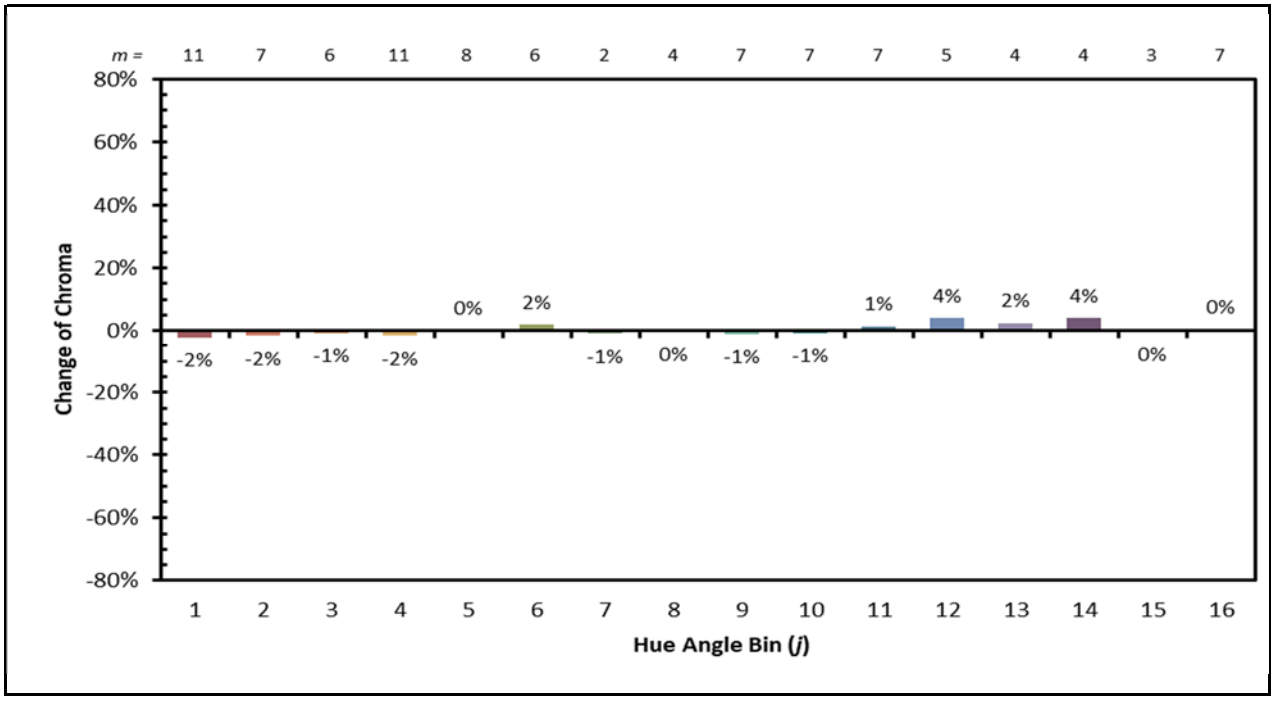
380	0.000020	480	0.001012	580	0.003590	680	0.003147
385	0.000021	485	0.001110	585	0.003713	685	0.002855
390	0.000025	490	0.001272	590	0.003859	690	0.002565
395	0.000030	495	0.001464	595	0.004021	695	0.002288
400	0.000037	500	0.001679	600	0.004215	700	0.002043
405	0.000045	505	0.001871	605	0.004417	705	0.001805
410	0.000055	510	0.002048	610	0.004611	710	0.001586
415	0.000080	515	0.002202	615	0.004794	715	0.001394
420	0.000131	520	0.002351	620	0.004935	720	0.001215
425	0.000212	525	0.002479	625	0.005044	725	0.001055
430	0.000341	530	0.002618	630	0.005107	730	0.000917
435	0.000535	535	0.002753	635	0.005109	735	0.000793
440	0.000831	540	0.002880	640	0.005052	740	0.000685
445	0.001302	545	0.002989	645	0.004940	745	0.000594
450	0.001853	550	0.003097	650	0.004770	750	0.000513
455	0.002056	555	0.003182	655	0.004549	755	0.000443
460	0.001654	560	0.003260	660	0.004313	760	0.000382
465	0.001301	565	0.003335	665	0.004025	765	0.000329
470	0.001172	570	0.003403	670	0.003734	770	0.000282
475	0.001046	575	0.003485	675	0.003447	775	0.000241
						780	0.000206



IES TM-30 Summary







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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:	24.3 °C
Test Procedure:	Tested in accordance with the applicable sections of: LM-79-08, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2015, 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.

Sphere Report Template V2-8