



# Report of Test

## LLIA000938-002A

Catalog Number: MQR2-MO-K35-80-2X4-XX-AL-PPNL/FO1M-UNV

Recessed mounted extruded aluminum housing, formed white enamel aluminum reflectors, translucent white plastic enclosures.

256 white LEDs, two PAL-Lighting LED boards with 88 LEDs each and two boards with 40 LEDs each.

One Osram Optotronic OTi 85/120-277/2A3 DIM L (2750627-1340) LED driver  
120.0Vac, 60.00Hz, 0.4199A, 49.99W, 0.992PF, 11.3%THD(i)



### Performance Summary

Total Light Output	5440 lm
Luminaire Power	50.0 W
Luminous Efficacy	108.8 lm/W

**PREPARED FOR : Precision Architectural Lighting, 4830 Timber Creek Drive, Houston, TX 77017**



**Test Report No. LLIA000938-002A**

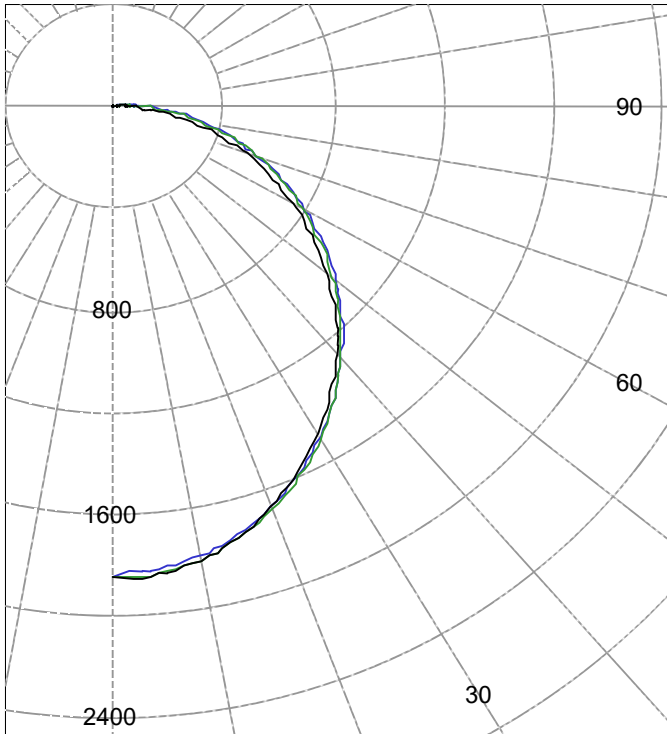
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Legend: C0-Black, C45-Green, C90-Blue (cd)



(Two plane symmetry) C0-C90

**AVERAGE LUMINANCE (cd / m<sup>2</sup>)**

Gamma	C0	C45	C90
45.0	9808	9903	10113
55.0	9217	9476	9774
65.0	8713	9221	9509
75.0	8056	9201	9647
85.0	8149	11063	12606

**INTENSITY SUMMARY (cd)**

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	1850	1850	1850	1850	1850	
5.0	1845	1841	1841	1839	1822	174
10.0	1810	1807	1809	1807	1791	
15.0	1751	1754	1757	1756	1742	494
20.0	1675	1681	1686	1685	1674	
25.0	1584	1593	1600	1599	1592	735
30.0	1484	1493	1502	1500	1497	
35.0	1374	1385	1395	1392	1393	869
40.0	1261	1270	1281	1279	1285	
45.0	1137	1149	1160	1162	1173	892
50.0	1008	1023	1037	1044	1054	
55.0	876	895	914	926	929	813
60.0	747	769	792	805	803	
65.0	621	645	671	682	677	655
70.0	494	521	551	560	555	
75.0	365	399	431	443	437	443
80.0	245	286	320	333	326	
85.0	146	185	217	230	226	221
90.0	42	58	78	87	87	

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1403	N / A	25.8
0-40	2272	N / A	41.8
0-60	3978	N / A	73.1
0-90	5298	N / A	97.4
40-90	3026	N / A	55.6
60-90	1320	N / A	24.3
90-180	142	N / A	2.6
0-180	5440	N / A	100.0

Total Light Output = 5,440 lm

Spacing Criterion: 0-180 1.2  
Spacing Criterion: 90-270 1.2

Signed:

Authorized Signatory

Date of test 5-Feb-2018  
Date of report 6-Feb-2018



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	1850	1850	1850	1850	1850
2.5	1854	1850	1849	1846	1830
5.0	1845	1841	1841	1839	1822
7.5	1830	1827	1828	1826	1809
10.0	1810	1807	1809	1807	1791
12.5	1782	1783	1785	1784	1769
15.0	1751	1754	1757	1756	1742
17.5	1715	1719	1723	1723	1710
20.0	1675	1681	1686	1685	1674
22.5	1631	1638	1645	1644	1635
25.0	1584	1593	1600	1599	1592
27.5	1536	1544	1553	1552	1546
30.0	1484	1493	1502	1500	1497
32.5	1429	1440	1450	1447	1446
35.0	1374	1385	1395	1392	1393
37.5	1317	1328	1339	1336	1340
40.0	1261	1270	1281	1279	1285
42.5	1200	1210	1221	1221	1229
45.0	1137	1149	1160	1162	1173
47.5	1073	1086	1099	1103	1114
50.0	1008	1023	1037	1044	1054
52.5	944	959	975	985	992
55.0	876	895	914	926	929
57.5	812	832	852	865	866
60.0	747	769	792	805	803
62.5	684	707	731	743	740
65.0	621	645	671	682	677
67.5	557	583	610	621	616
70.0	494	521	551	560	555
72.5	429	459	491	501	495
75.0	365	399	431	443	437
77.5	303	341	374	387	380
80.0	245	286	320	333	326
82.5	193	234	267	281	275
85.0	146	185	217	230	226
87.5	106	138	166	180	179
90.0	42	58	78	87	87



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	42	58	78	87	87
92.5	37	49	64	70	71
95.0	53	48	59	64	66
97.5	47	48	62	60	63
100.0	42	41	59	74	73
102.5	37	35	50	65	75
105.0	32	28	39	54	64
107.5	28	23	29	44	53
110.0	22	18	23	34	43
112.5	18	14	18	27	33
115.0	14	12	12	23	27
117.5	11	10	7	19	23
120.0	9	8	4	15	20
122.5	7	6	4	11	16
125.0	6	4	5	8	12
127.5	4	4	5	6	8
130.0	4	4	5	5	6
132.5	4	5	5	6	6
135.0	4	5	5	6	6
137.5	4	5	5	6	6
140.0	4	5	5	5	5
142.5	4	4	5	5	5
145.0	4	4	5	5	5
147.5	4	4	4	5	5
150.0	4	4	4	4	4
152.5	3	4	4	4	4
155.0	3	3	4	4	4
157.5	3	3	3	4	4
160.0	3	3	3	3	4
162.5	3	3	3	3	4
165.0	3	3	3	3	3
167.5	3	3	3	3	3
170.0	3	3	3	3	3
172.5	3	3	3	0	0
175.0	3	3	3	0	0
177.5	0	0	0	0	0
180.0	0	0	0	0	0



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**Coefficients Of Utilization - Zonal Cavity Method**

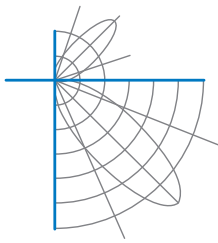
Effective Floor Cavity Reflectance 0.20

RC	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	
0	118	118	118	118	115	115	115	115	110	110	110	104	104	104	100	100	100	97
1	107	102	97	93	104	99	95	91	94	91	88	90	87	85	86	84	82	79
2	97	88	81	75	94	86	79	74	82	77	72	78	74	70	75	71	68	65
3	88	77	69	62	86	75	68	61	72	65	60	69	63	58	66	61	57	55
4	81	68	59	52	78	67	58	52	64	57	51	61	55	50	59	53	49	47
5	74	61	52	45	72	60	51	45	57	50	44	55	48	43	53	47	42	40
6	69	55	46	39	66	54	45	39	52	44	38	50	43	38	48	42	37	35
7	64	50	41	35	62	49	40	34	47	40	34	45	39	34	44	38	33	31
8	59	45	37	31	57	45	36	31	43	36	30	42	35	30	40	34	30	28
9	55	42	33	28	54	41	33	28	40	32	27	38	32	27	37	31	27	25
10	52	39	31	25	50	38	30	25	37	30	25	36	29	25	35	29	24	23

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	51.4	7.19	7.25
8.0	28.9	9.58	9.66
10.0	18.5	11.98	12.08
12.0	12.8	14.37	14.49
14.0	9.4	16.77	16.91
16.0	7.2	19.16	19.33



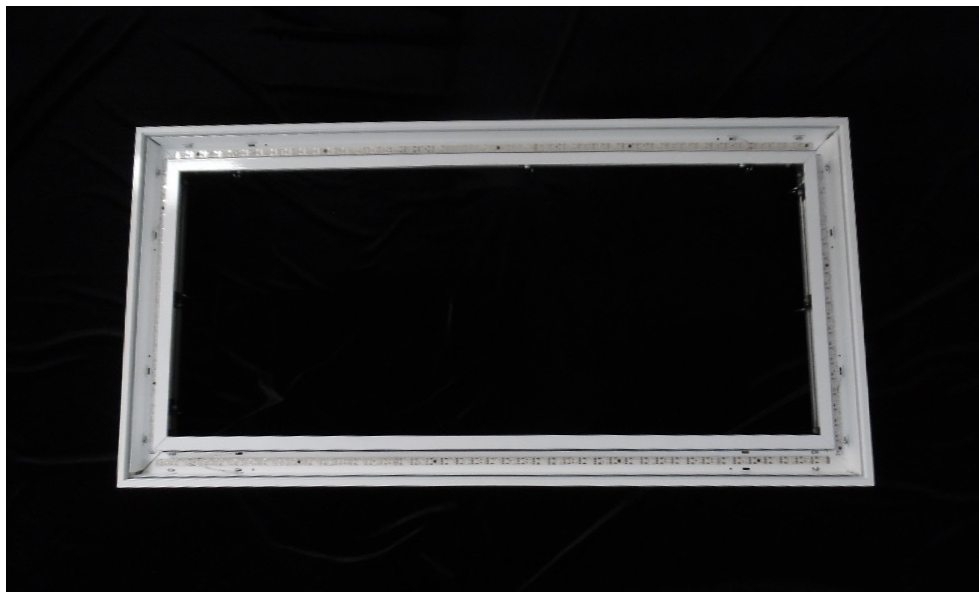
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120.0Vac, 60.00Hz, 0.4199A, 49.99W, 0.992PF, 11.3%THD(i)

**Test Distance** 9.5 m  
**Test 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 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.



## Report of Test

**LLIA000938-002B**

Integrating Sphere Report

Catalog Number: MQR2-MO-K35-80-2X4-XX-AL-PPNL/FO1M-UNV

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### Performance Summary

Voltage	120.0 Vac
Current	0.4203 A
Power	49.77 W
Frequency	59.97 Hz
Power Factor	0.987
Current THD	11.2 %

Total Luminous Flux	5760.3 lm
Efficacy	115.7 lm/W
Chromaticity (x,y)	(0.4101, 0.3932)
(u',v')	(0.2378, 0.5130)
Duv	0.0000
CCT	3417 K
CRI (Ra)	83
R9	11
TM-30: Rf	82
TM-30: Rg	97

Prepared For:

Precision Architectural Lighting  
4830 Timber Creek Drive  
Houston, TX 77017, USA

Test date: 02/02/2018

Report date: 02/05/2018





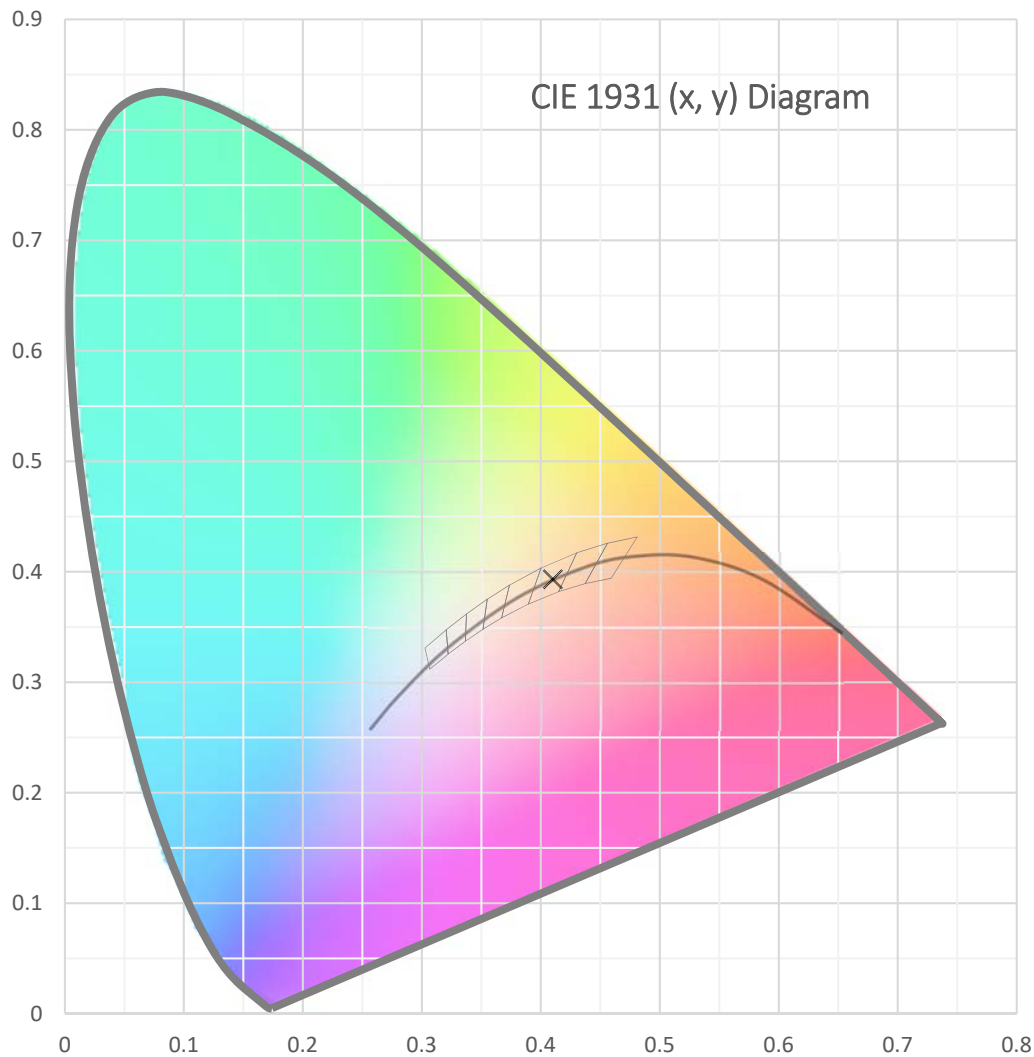
**Test Report Number: LLIA000938-002B**

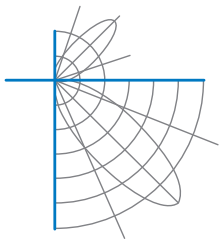
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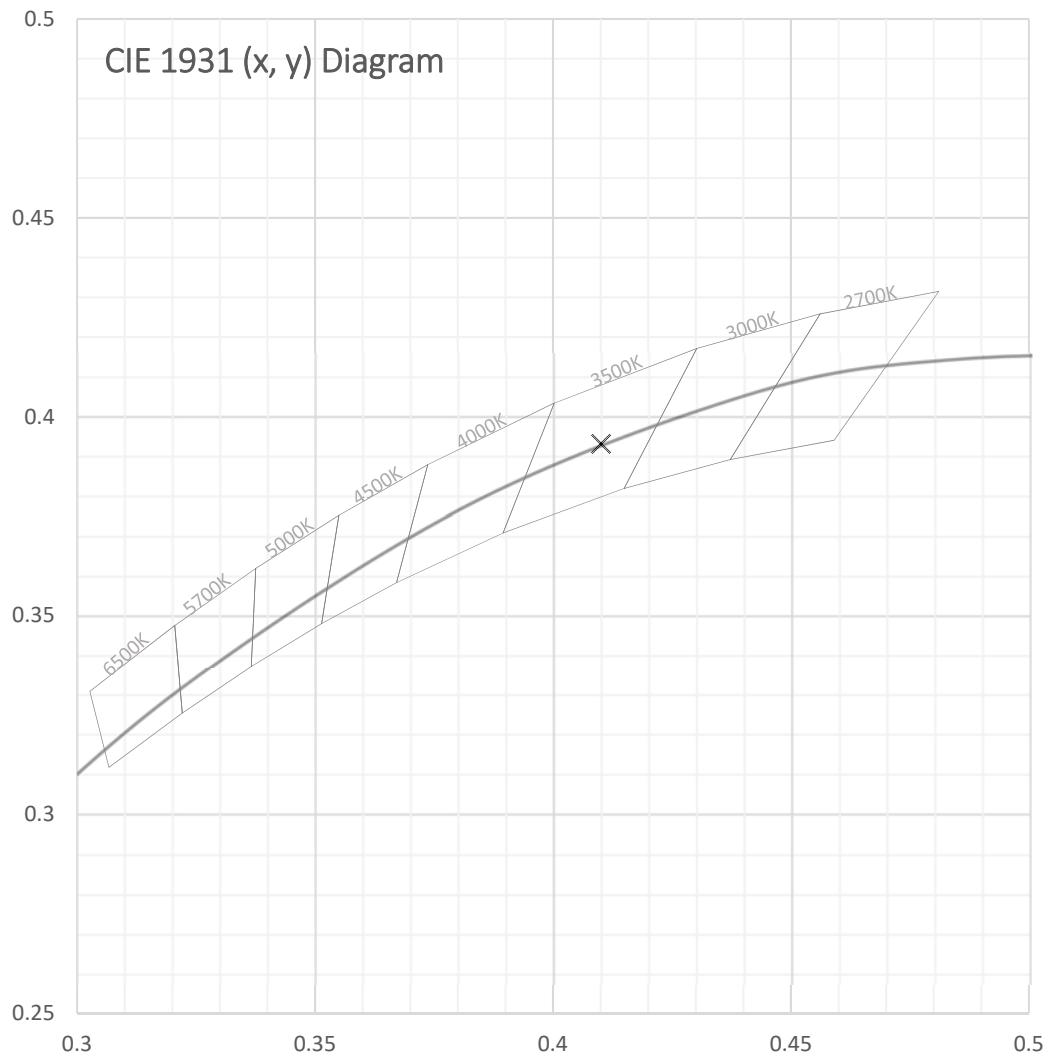
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**Spectral Data**

Total Radiant Flux	17.65 W
Total Luminous Flux	5760.3 Lm
Chromaticity CIE 1931 (x, y)	(0.4101, 0.3932)
Chromaticity CIE 1976 (u', v')	(0.2378, 0.5130)
Correlated Color Temperature (CCT)	3417 K
Color Rendering Index (Ra)	83
R1	81
R2	89
R3	95
R4	82
R5	81
R6	85
R7	85
R8	64
R9	11
R10	74
R11	81
R12	65
R13	83
R14	97
TM-30: Rf	82
TM-30: Rg	97
Distance from Planckian Locus (Duv)	0.0000
Scotopic/Photopic Ratio *	1.479

**Electrical Data**

Voltage	120.0 Vac
Current	0.4203 A
Power	49.77 W
Frequency	59.97 Hz
Power Factor	0.987
Current THD	11.2 %



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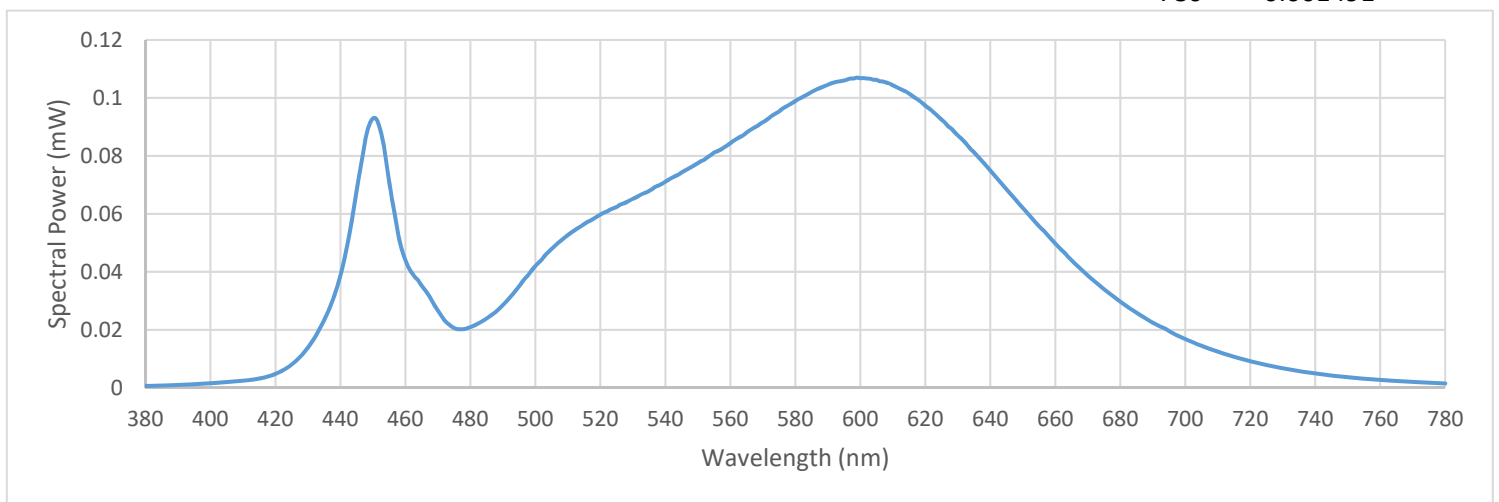
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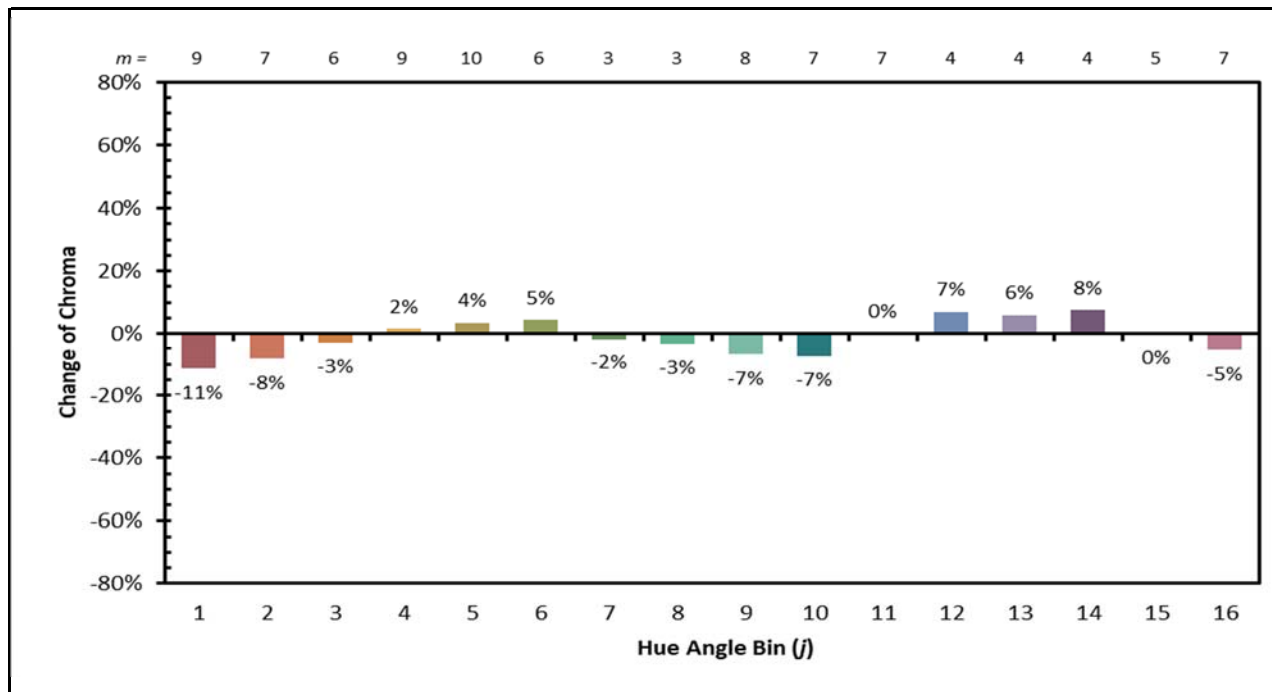
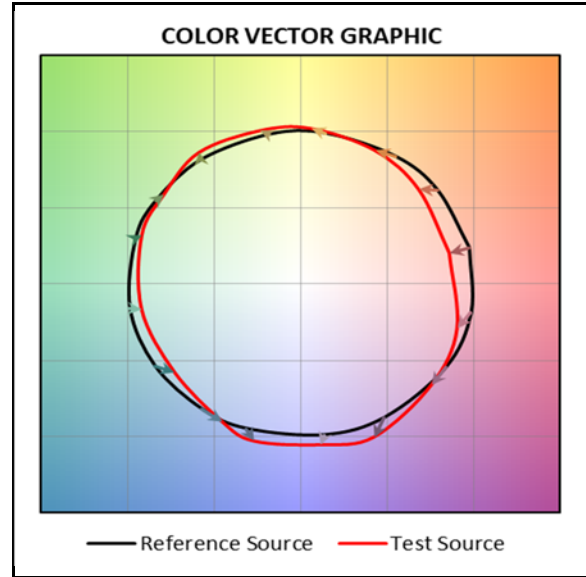
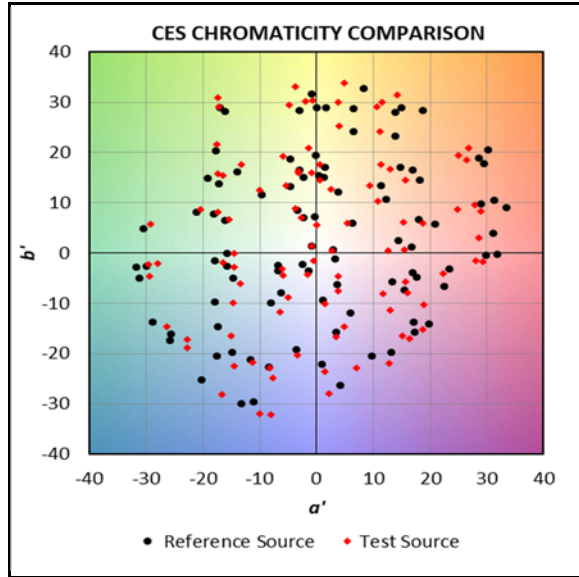
**Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)**

380	0.000651	480	0.020908	580	0.098938	680	0.029704
385	0.000738	485	0.023920	585	0.102043	685	0.025926
390	0.000938	490	0.028585	590	0.104571	690	0.022478
395	0.001226	495	0.035016	595	0.105949	695	0.019549
400	0.001577	500	0.041982	600	0.106801	700	0.016845
405	0.001959	505	0.047919	605	0.106192	705	0.014481
410	0.002408	510	0.052682	610	0.104324	710	0.012414
415	0.003183	515	0.056468	615	0.101491	715	0.010699
420	0.004801	520	0.059774	620	0.097299	720	0.009172
425	0.007963	525	0.062353	625	0.092476	725	0.007846
430	0.013995	530	0.065195	630	0.087023	730	0.006729
435	0.023446	535	0.067926	635	0.081242	735	0.005758
440	0.038654	540	0.071097	640	0.074981	740	0.004921
445	0.068192	545	0.074300	645	0.068522	745	0.004231
450	0.092909	550	0.077478	650	0.062048	750	0.003644
455	0.071355	555	0.081138	655	0.055698	755	0.003129
460	0.044041	560	0.084378	660	0.049848	760	0.002703
465	0.035204	565	0.088049	665	0.043953	765	0.002340
470	0.026624	570	0.091640	670	0.038760	770	0.002004
475	0.020597	575	0.095333	675	0.034044	775	0.001725
						780	0.001491





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 4 $\pi$  geometry

**Test Temperature:** 25.5 °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.

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