

Report of Test

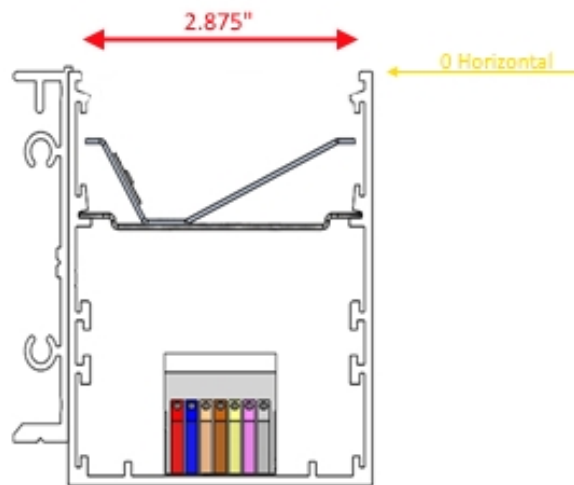
LLIA001116-003A

Catalog Number: MLP3-IASY-HO-K35-80-4-W-OP-FXXX-UNV

Wall mounted, extruded aluminum housing, formed white
enamel LED tray/reflector, no enclosure.

One PAL-Lighting LED board with 92 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM L LED driver labeled as 720mA
120.0Vac, 60.00Hz, 0.2344A, 28.04W, 0.997PF, 5.8%THD(i)



Performance Summary

Total Light Output	3816 lm
Luminaire Power	28.0 W
Luminous Efficacy	136.3 lm/W

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



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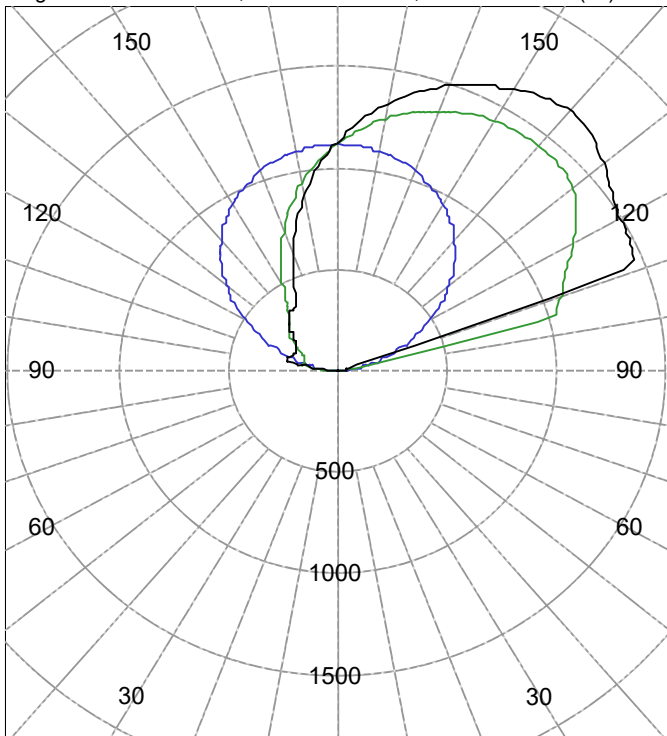
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Legend: C0/C180-Black, C45/C225-Green, C90/C270-Blue (cd)



C180-C270 (Symmetric about C0/C180) C0-C90

INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
90.0	0	0	0	0	0	
95.0	17	17	20	16	44	62
100.0	40	38	33	514	113	
105.0	48	46	942	616	195	314
110.0	1027	1347	1083	764	285	
115.0	1469	1389	1140	884	380	642
120.0	1490	1418	1232	964	479	
125.0	1525	1474	1329	1025	573	674
130.0	1580	1535	1398	1079	664	
135.0	1634	1594	1429	1122	747	665
140.0	1659	1608	1433	1161	822	
145.0	1642	1590	1428	1189	892	585
150.0	1600	1554	1418	1206	950	
155.0	1550	1513	1394	1216	1001	464
160.0	1491	1459	1360	1214	1042	
165.0	1421	1393	1315	1204	1073	304
170.0	1336	1314	1260	1184	1097	
175.0	1238	1224	1194	1155	1111	106
180.0	1120	1120	1120	1120	1120	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
180-150	873	N / A	22.9
180-140	1459	N / A	38.2
180-120	2798	N / A	73.3
180-90	3816	N / A	100.0
140-90	2358	N / A	61.8
120-90	1018	N / A	26.7
90-0	0	N / A	0.0
180-0	3816	N / A	100.0

Total Light Output = 3,816 lm

Signed:

Authorized Signatory

Date of test 13-May-2019
Date of report 20-May-2019



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Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	0	0	0	0	0
2.5	0	0	0	0	0
5.0	0	0	0	0	0
7.5	0	0	0	0	0
10.0	0	0	0	0	0
12.5	0	0	0	0	0
15.0	0	0	0	0	0
17.5	0	0	0	0	0
20.0	0	0	0	0	0
22.5	0	0	0	0	0
25.0	0	0	0	0	0
27.5	0	0	0	0	0
30.0	0	0	0	0	0
32.5	0	0	0	0	0
35.0	0	0	0	0	0
37.5	0	0	0	0	0
40.0	0	0	0	0	0
42.5	0	0	0	0	0
45.0	0	0	0	0	0
47.5	0	0	0	0	0
50.0	0	0	0	0	0
52.5	0	0	0	0	0
55.0	0	0	0	0	0
57.5	0	0	0	0	0
60.0	0	0	0	0	0
62.5	0	0	0	0	0
65.0	0	0	0	0	0
67.5	0	0	0	0	0
70.0	0	0	0	0	0
72.5	0	0	0	0	0
75.0	0	0	0	0	0
77.5	0	0	0	0	0
80.0	0	0	0	0	0
82.5	0	0	0	0	0
85.0	0	0	0	0	0
87.5	0	0	0	0	0
90.0	0	0	0	0	0



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Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	0	0	0	0	0
92.5	10	10	9	9	17
95.0	17	17	20	16	44
97.5	30	31	29	169	77
100.0	40	38	33	514	113
102.5	44	43	38	560	153
105.0	48	46	942	616	195
107.5	52	281	1049	687	240
110.0	1027	1347	1083	764	285
112.5	1456	1365	1110	829	333
115.0	1469	1389	1140	884	380
117.5	1483	1404	1186	930	429
120.0	1490	1418	1232	964	479
122.5	1500	1446	1282	995	525
125.0	1525	1474	1329	1025	573
127.5	1552	1503	1370	1052	619
130.0	1580	1535	1398	1079	664
132.5	1607	1569	1420	1102	707
135.0	1634	1594	1429	1122	747
137.5	1652	1607	1433	1142	785
140.0	1659	1608	1433	1161	822
142.5	1654	1601	1432	1177	859
145.0	1642	1590	1428	1189	892
147.5	1624	1572	1423	1199	922
150.0	1600	1554	1418	1206	950
152.5	1576	1534	1408	1211	976
155.0	1550	1513	1394	1216	1001
157.5	1523	1488	1379	1216	1022
160.0	1491	1459	1360	1214	1042
162.5	1457	1427	1339	1210	1058
165.0	1421	1393	1315	1204	1073
167.5	1379	1355	1290	1195	1086
170.0	1336	1314	1260	1184	1097
172.5	1288	1271	1228	1171	1106
175.0	1238	1224	1194	1155	1111
177.5	1184	1175	1157	1136	1115
180.0	1120	1120	1120	1120	1120



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Intensity data (cd)

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
0.0	0	0	0	0	0
2.5	0	0	0	0	0
5.0	0	0	0	0	0
7.5	0	0	0	0	0
10.0	0	0	0	0	0
12.5	0	0	0	0	0
15.0	0	0	0	0	0
17.5	0	0	0	0	0
20.0	0	0	0	0	0
22.5	0	0	0	0	0
25.0	0	0	0	0	0
27.5	0	0	0	0	0
30.0	0	0	0	0	0
32.5	0	0	0	0	0
35.0	0	0	0	0	0
37.5	0	0	0	0	0
40.0	0	0	0	0	0
42.5	0	0	0	0	0
45.0	0	0	0	0	0
47.5	0	0	0	0	0
50.0	0	0	0	0	0
52.5	0	0	0	0	0
55.0	0	0	0	0	0
57.5	0	0	0	0	0
60.0	0	0	0	0	0
62.5	0	0	0	0	0
65.0	0	0	0	0	0
67.5	0	0	0	0	0
70.0	0	0	0	0	0
72.5	0	0	0	0	0
75.0	0	0	0	0	0
77.5	0	0	0	0	0
80.0	0	0	0	0	0
82.5	0	0	0	0	0
85.0	0	0	0	0	0
87.5	0	0	0	0	0
90.0	0	0	0	0	0



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One PAL-Lighting LED board with 92 LEDs

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120.0Vac, 60.00Hz, 0.2344A, 28.04W, 0.997PF, 5.8%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
90.0	0	0	0	0	0
92.5	17	28	29	31	29
95.0	44	82	63	54	52
97.5	77	76	137	109	98
100.0	113	78	170	192	181
102.5	153	86	160	223	241
105.0	195	97	155	214	234
107.5	240	114	155	205	224
110.0	285	135	159	205	221
112.5	333	158	164	202	218
115.0	380	179	174	203	217
117.5	429	196	187	205	215
120.0	479	212	203	214	220
122.5	525	227	222	223	228
125.0	573	261	243	236	238
127.5	619	293	265	253	252
130.0	664	330	285	271	268
132.5	707	371	299	291	286
135.0	747	414	311	311	306
137.5	785	459	322	330	326
140.0	822	507	332	342	343
142.5	859	555	368	352	355
145.0	892	602	406	360	364
147.5	922	649	450	367	371
150.0	950	696	500	407	379
152.5	976	742	554	451	425
155.0	1001	786	609	505	476
157.5	1022	828	665	566	536
160.0	1042	869	722	629	602
162.5	1058	907	778	694	670
165.0	1073	944	832	761	739
167.5	1086	978	885	826	809
170.0	1097	1011	937	890	877
172.5	1106	1041	986	952	944
175.0	1111	1069	1032	1011	1009
177.5	1115	1095	1077	1069	1071
180.0	1120	1120	1120	1120	1120



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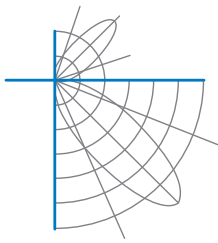
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Coefficients Of Utilization - Zonal Cavity Method

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		95	95	95	95	81	81	81	81	56	56	56	32	32	32	10	10	10	0
1		87	83	79	76	74	71	68	65	48	47	45	28	27	26	9	9	8	0
2		79	72	66	62	67	62	57	53	42	40	37	24	23	22	8	7	7	0
3		72	63	57	51	61	54	49	44	37	34	31	21	20	18	7	6	6	0
4		65	56	48	43	56	48	42	37	33	29	26	19	17	16	6	6	5	0
5		60	49	42	36	51	42	36	32	29	25	22	17	15	13	5	5	4	0
6		55	44	36	31	47	38	32	27	26	22	19	15	13	11	5	4	4	0
7		50	39	32	27	43	34	28	23	23	19	17	14	11	10	4	4	3	0
8		47	35	28	23	40	30	24	20	21	17	14	12	10	9	4	3	3	0
9		43	32	25	20	37	27	22	18	19	15	13	11	9	8	4	3	3	0
10		40	29	22	18	34	25	19	16	17	14	11	10	8	7	3	3	2	0

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.



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Test Distance 9.5 m
Test Temperature 24.2 °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 publications: IES LM-79-08 (Sec. 12), IES LM-16-93, IES LM-58-13, CIE 13.3:1995, CIE 15:2004, ANSI C78.377:2017, 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

LLIA001116-003B

Integrating Sphere Report

Catalog Number: MLP3-IASY-HO-K35-80-4-W-OP-FXXX-UNV

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One PAL-Lighting LED board with 92 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM L LED driver labeled as 720mA



Performance Summary

Voltage	120.0 Vac
Current	0.2343 A
Power	28.03 W
Frequency	59.99 Hz
Power Factor	0.997
Current THD	5.8 %

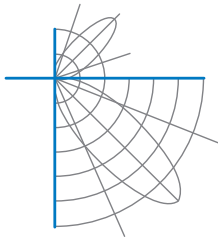
Total Luminous Flux	3872.1 lm
Efficacy	138.1 lm/W
Chromaticity (x,y)	(0.4068, 0.3913)
(u',v')	(0.2364, 0.5117)
Duv	-0.0001
CCT	3473 K
CRI (Ra)	82
R9	10
TM-30: Rf	82
TM-30: Rg	97

Prepared For:

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

Test date: 05/14/2019

Report date: 05/17/2019



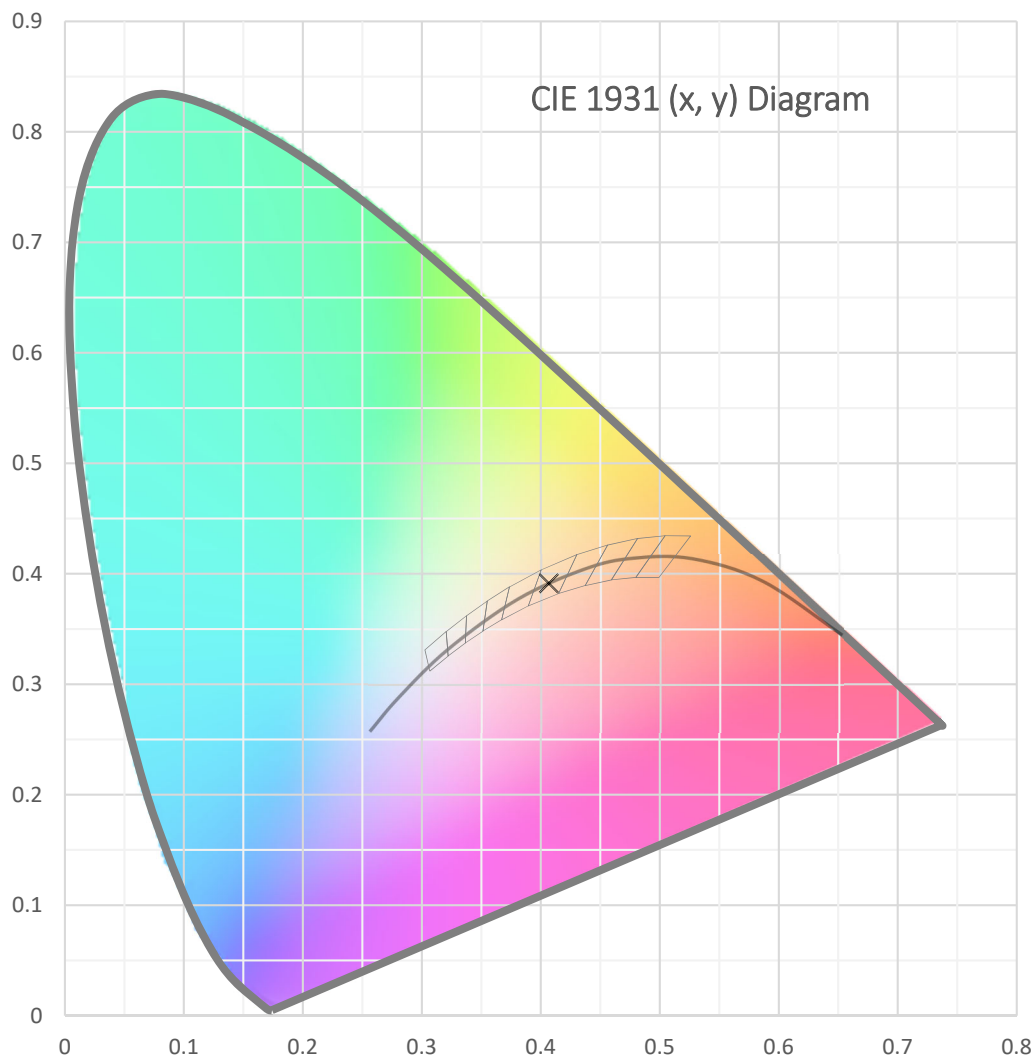
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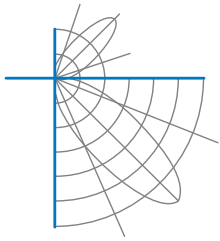
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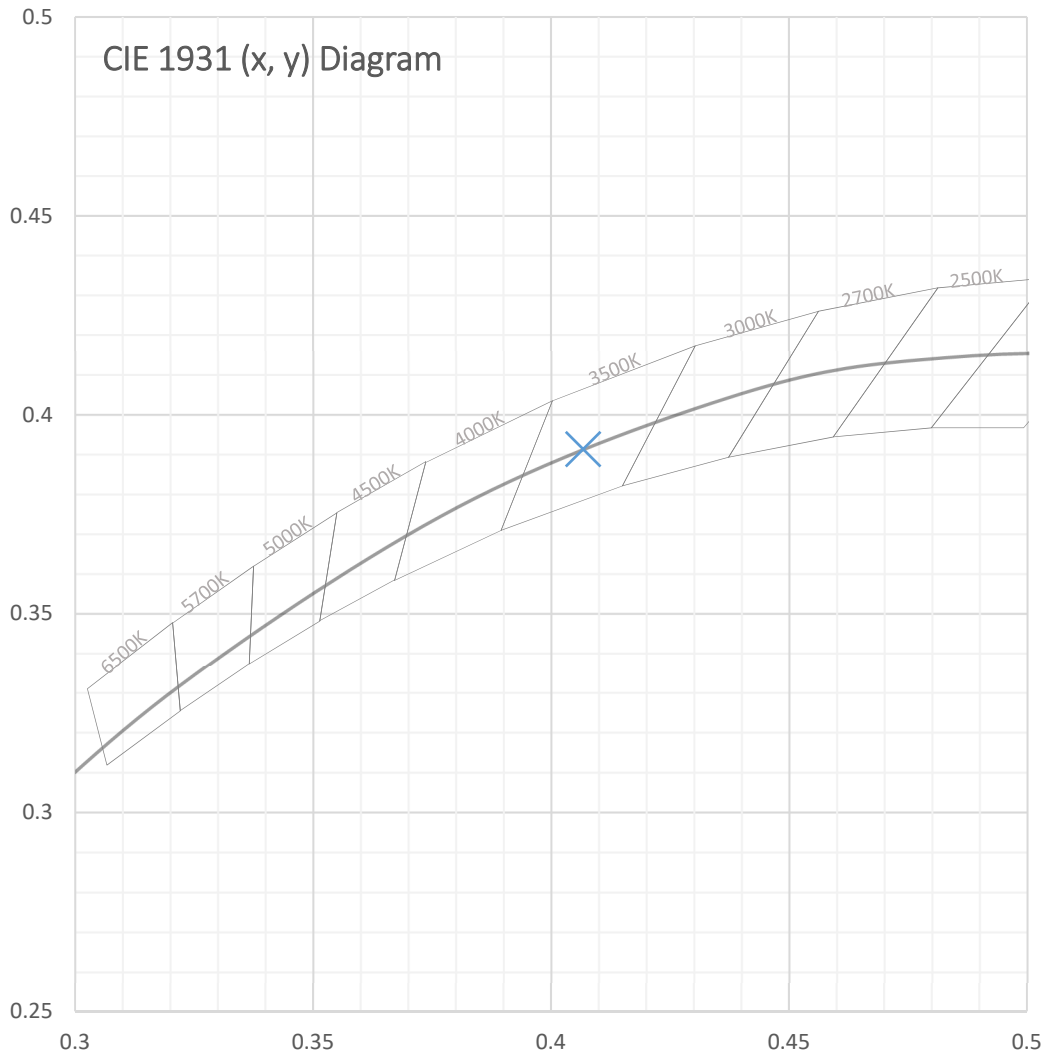
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Spectral Data

Total Radiant Flux	11.87 W
Total Luminous Flux	3872.1 Lm
Chromaticity CIE 1931 (x, y)	(0.4068, 0.3913)
Chromaticity CIE 1976 (u', v')	(0.2364, 0.5117)
Correlated Color Temperature (CCT)	3473 K
Color Rendering Index (Ra)	82
R1	81
R2	89
R3	95
R4	81
R5	81
R6	84
R7	85
R8	64
R9	10
R10	73
R11	80
R12	64
R13	82
R14	97
TM-30: Rf	82
TM-30: Rg	97
Distance from Planckian Locus (Duv)	-0.0001
Scotopic/Photopic Ratio *	1.495

Electrical Data

Voltage	120.0 Vac
Current	0.2343 A
Power	28.03 W
Frequency	59.99 Hz
Power Factor	0.997
Current THD	5.8 %



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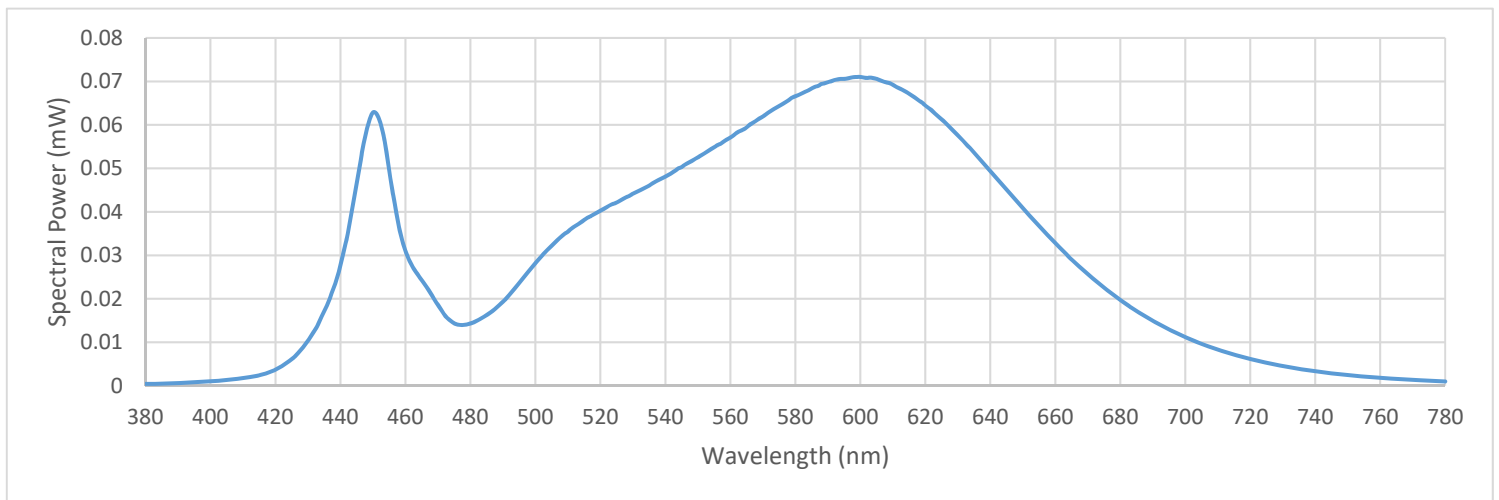
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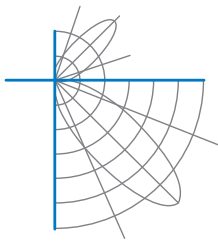
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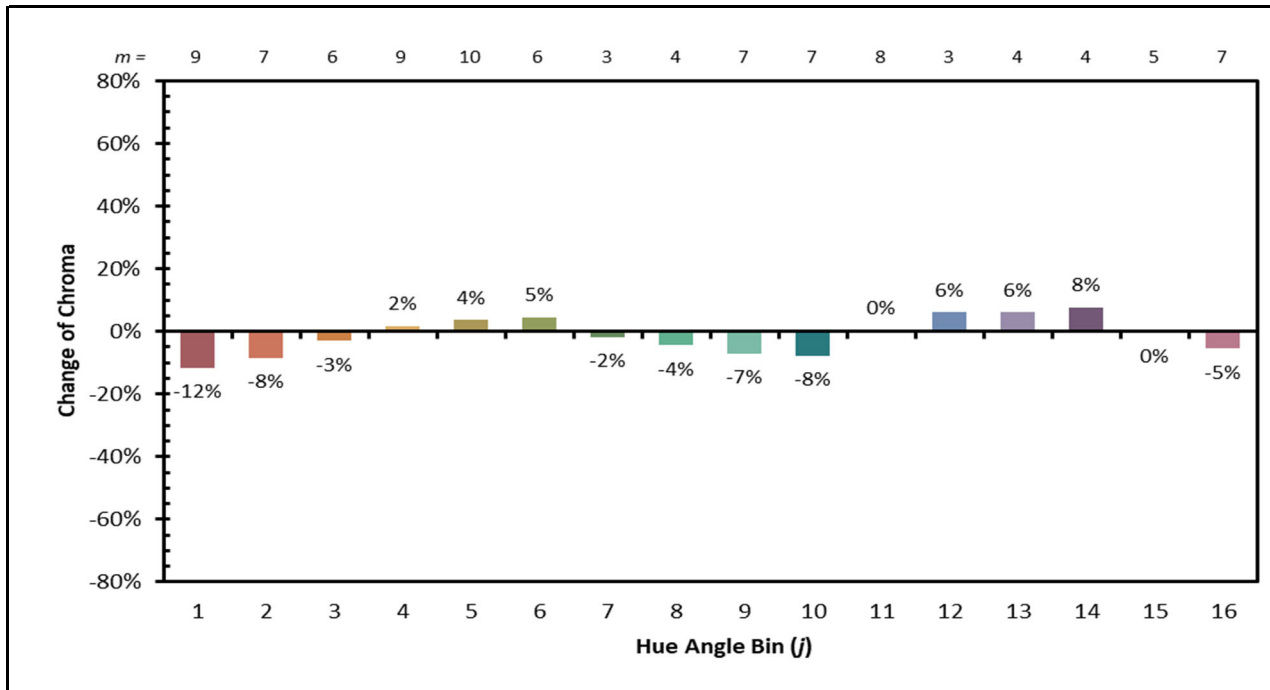
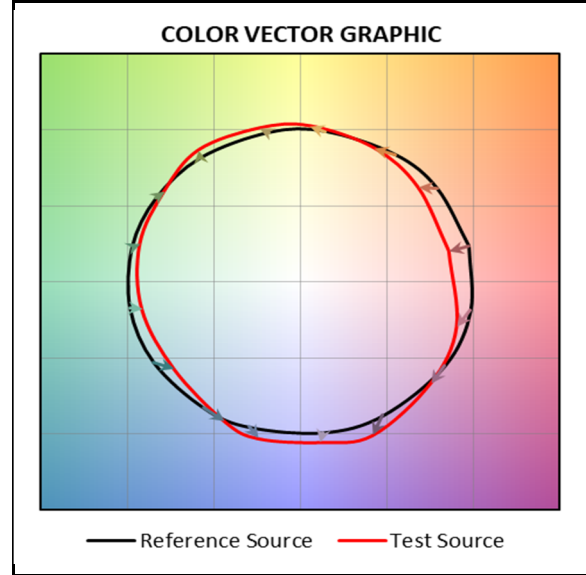
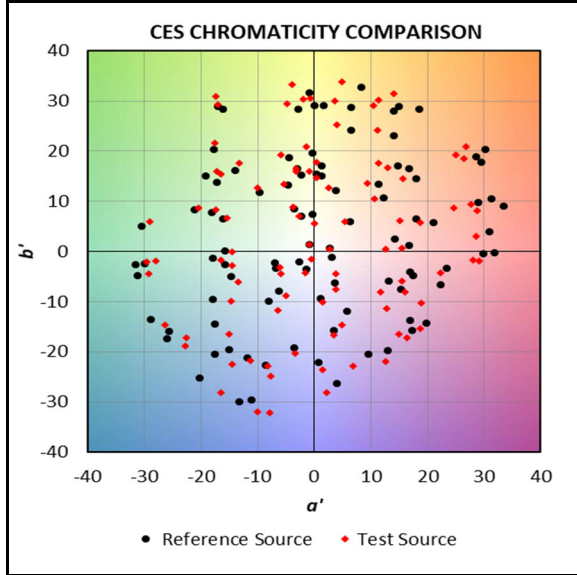
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000424	480	0.014312	580	0.066580	680	0.019719
385	0.000465	485	0.016245	585	0.068365	685	0.017234
390	0.000615	490	0.019311	590	0.069836	690	0.014957
395	0.000787	495	0.023622	595	0.070592	695	0.012976
400	0.001019	500	0.028240	600	0.071026	700	0.011218
405	0.001328	505	0.032198	605	0.070588	705	0.009656
410	0.001741	510	0.035415	610	0.069244	710	0.008309
415	0.002400	515	0.038143	615	0.067127	715	0.007168
420	0.003708	520	0.040244	620	0.064445	720	0.006162
425	0.006110	525	0.042101	625	0.061302	725	0.005296
430	0.010364	530	0.044174	630	0.057515	730	0.004552
435	0.017098	535	0.046036	635	0.053615	735	0.003888
440	0.027649	540	0.048106	640	0.049347	740	0.003338
445	0.046478	545	0.050292	645	0.045051	745	0.002867
450	0.062849	550	0.052516	650	0.040848	750	0.002453
455	0.049525	555	0.054800	655	0.036716	755	0.002115
460	0.031146	560	0.057102	660	0.032861	760	0.001830
465	0.024248	565	0.059402	665	0.029039	765	0.001573
470	0.018582	570	0.061921	670	0.025631	770	0.001349
475	0.014372	575	0.064315	675	0.022589	775	0.001163
						780	0.001002





IES TM-30 Details





Test Report Number: LLIA001116-003B

Catalog Number: MLP3-IASY-HO-K35-80-4-W-OP-FXXX-UNV

Wall mounted, extruded aluminum housing, formed white
enamel LED tray/reflector, no enclosure.

One PAL-Lighting LED board with 92 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM L LED driver labeled as 720mA

Test Equipment Configuration: LightLab International Allentown 2m Integrating Sphere
Measurements acquired using a Labsphere CDS 2600 spectroradiometer
Testing was performed using 4 π geometry

Test Temperature: 25.4 °C

Test Procedure: Tested in accordance with the applicable sections of:
LM-79-08, LM-78-07, LM-58-13, ANSI_ANSLG C78.377-2017,
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.