



# Report of Test

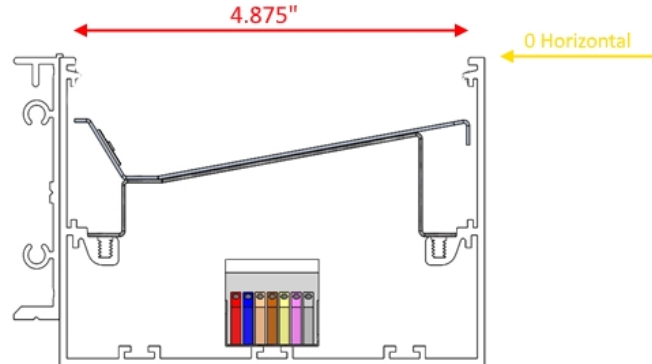
## LLIA001116-005A

Catalog Number: MLP5-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, 0.2338A, 27.97W, 0.997PF, 5.7%THD(i)



### Performance Summary

Total Light Output	3904 lm
Luminaire Power	28.0 W
Luminous Efficacy	139.4 lm/W

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



**Test Report No. LLIA001116-005A**

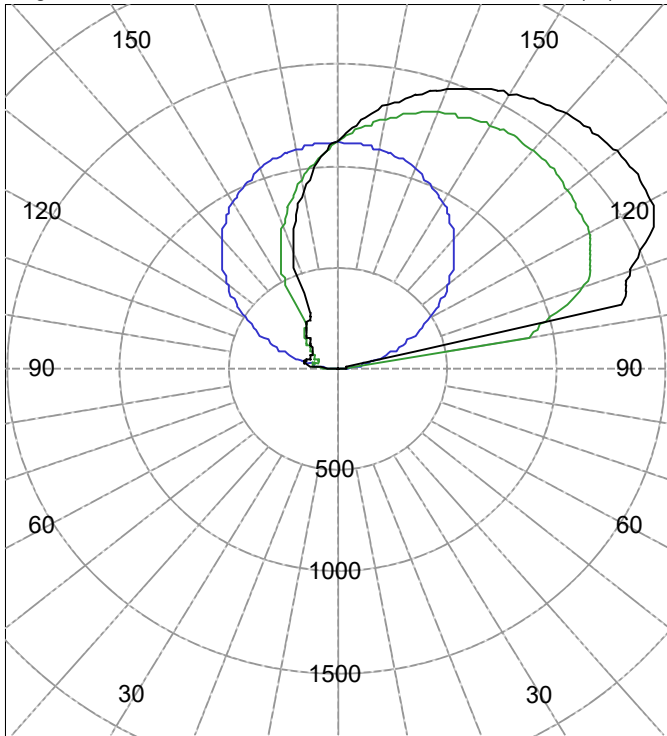
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Legend: C0/C180-Black, C45/C225-Green, C90/C270-Blue (cd)



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	19	19	18	95	40	81
100.0	35	33	879	552	108	
105.0	1358	1256	1001	687	188	492
110.0	1416	1350	1189	776	278	
115.0	1572	1519	1273	846	373	641
120.0	1652	1577	1321	919	472	
125.0	1663	1595	1344	982	566	654
130.0	1660	1594	1361	1040	661	
135.0	1648	1584	1386	1086	743	626
140.0	1628	1567	1397	1129	817	
145.0	1600	1549	1395	1167	890	552
150.0	1566	1523	1383	1188	950	
155.0	1518	1481	1366	1201	1000	449
160.0	1460	1431	1338	1203	1041	
165.0	1394	1372	1298	1196	1074	302
170.0	1317	1302	1249	1178	1097	
175.0	1226	1217	1188	1152	1112	106
180.0	1120	1120	1120	1120	1120	

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
180-150	857	N / A	22.0
180-140	1410	N / A	36.1
180-120	2690	N / A	68.9
180-90	3904	N / A	100.0
140-90	2495	N / A	63.9
120-90	1214	N / A	31.1
90-0	0	N / A	0.0
180-0	3904	N / A	100.0

Total Light Output = 3,904 lm

Signed:

Authorized Signatory

Date of test 15-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	6	6	8	7	13
95.0	19	19	18	95	40
97.5	30	28	24	437	72
100.0	35	33	879	552	108
102.5	82	883	936	632	146
105.0	1358	1256	1001	687	188
107.5	1383	1291	1112	735	233
110.0	1416	1350	1189	776	278
112.5	1484	1441	1245	815	324
115.0	1572	1519	1273	846	373
117.5	1627	1560	1296	885	420
120.0	1652	1577	1321	919	472
122.5	1659	1589	1334	949	520
125.0	1663	1595	1344	982	566
127.5	1663	1597	1352	1016	614
130.0	1660	1594	1361	1040	661
132.5	1655	1591	1374	1064	702
135.0	1648	1584	1386	1086	743
137.5	1640	1576	1392	1107	781
140.0	1628	1567	1397	1129	817
142.5	1614	1558	1398	1151	855
145.0	1600	1549	1395	1167	890
147.5	1583	1537	1391	1179	921
150.0	1566	1523	1383	1188	950
152.5	1545	1503	1376	1195	976
155.0	1518	1481	1366	1201	1000
157.5	1490	1457	1352	1203	1022
160.0	1460	1431	1338	1203	1041
162.5	1427	1403	1318	1201	1059
165.0	1394	1372	1298	1196	1074
167.5	1357	1337	1275	1189	1086
170.0	1317	1302	1249	1178	1097
172.5	1275	1261	1220	1167	1105
175.0	1226	1217	1188	1152	1112
177.5	1175	1172	1153	1134	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

One Osram Optotronic OTi30/120-277/1A0 DIM L LED driver labeled as 720mA  
120.0Vac, 60.00Hz, 0.2338A, 27.97W, 0.997PF, 5.7%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
90.0	0	0	0	0	0
92.5	13	38	31	31	31
95.0	40	56	92	82	79
97.5	72	53	112	141	141
100.0	108	50	113	147	157
102.5	146	51	107	146	157
105.0	188	55	103	142	155
107.5	233	64	100	136	149
110.0	278	76	97	133	145
112.5	324	92	99	129	142
115.0	373	109	102	127	137
117.5	420	127	108	126	135
120.0	472	144	116	127	134
122.5	520	159	128	130	136
125.0	566	172	141	137	140
127.5	614	183	157	146	146
130.0	661	202	174	157	155
132.5	702	323	192	170	166
135.0	743	400	208	185	180
137.5	781	451	223	202	195
140.0	817	503	235	219	212
142.5	855	556	246	235	230
145.0	890	606	253	249	246
147.5	921	655	274	262	260
150.0	950	702	473	270	271
152.5	976	748	550	275	278
155.0	1000	793	611	348	287
157.5	1022	836	671	560	483
160.0	1041	876	728	631	602
162.5	1059	914	785	700	677
165.0	1074	951	840	767	749
167.5	1086	985	893	833	820
170.0	1097	1015	944	896	890
172.5	1105	1045	991	957	957
175.0	1112	1072	1035	1014	1021
177.5	1115	1097	1079	1069	1082
180.0	1120	1120	1120	1120	1120



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One PAL-Lighting LED board with 92 LEDs

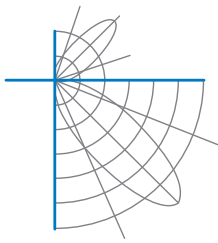
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**Coefficients Of Utilization - Zonal Cavity Method**

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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120.0Vac, 60.00Hz, 0.2338A, 27.97W, 0.997PF, 5.7%THD(i)

**Test Distance**            9.5 m  
**Test Temperature**      24.3 °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

**LLIA001116-005B**

Integrating Sphere Report

Catalog Number: MLP5-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	0.2355 A
Power	28.18 W
Frequency	59.99 Hz
Power Factor	0.997
Current THD	5.7 %

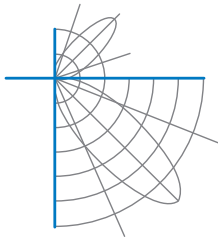
Total Luminous Flux	3959.9 lm
Efficacy	140.5 lm/W
Chromaticity (x,y)	(0.4077, 0.3923)
(u',v')	(0.2366, 0.5123)
Duv	0.0002
CCT	3462 K
CRI (Ra)	82
R9	10
TM-30: Rf	82
TM-30: Rg	97

Prepared For:

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

Test date: 05/15/2019

Report date: 05/17/2019



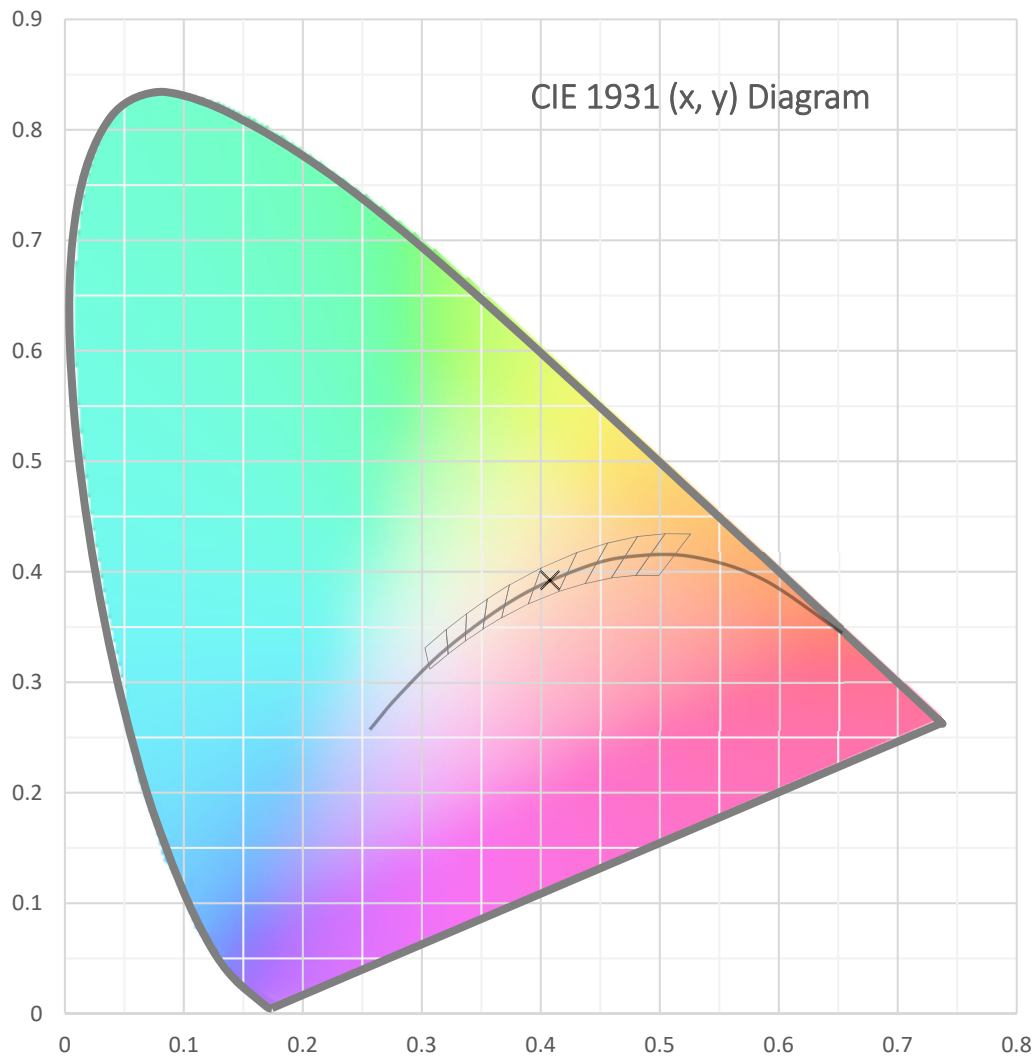
**Test Report Number: LLIA001116-005B**

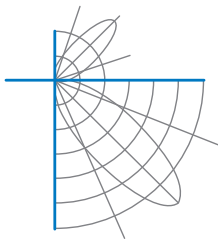
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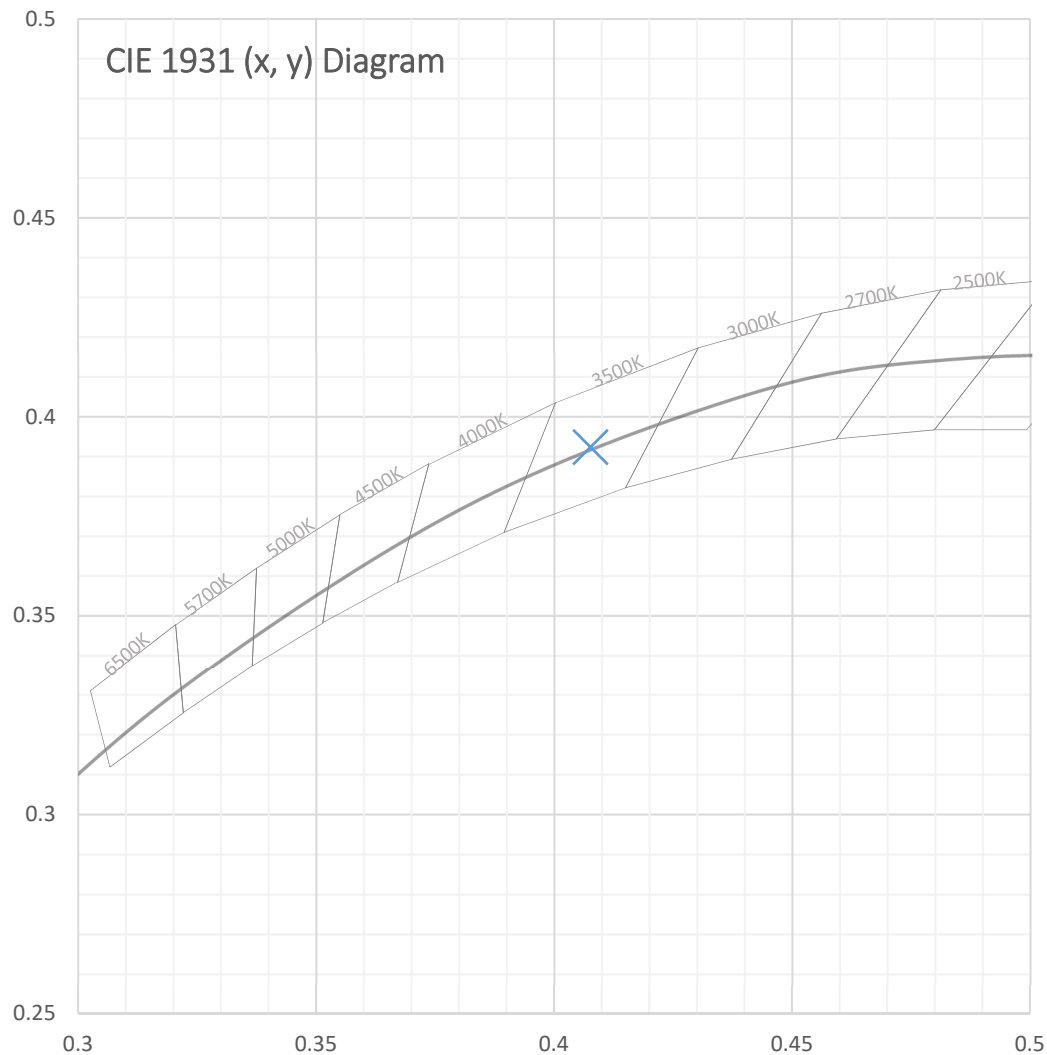
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**Spectral Data**

Total Radiant Flux	12.13 W
Total Luminous Flux	3959.9 Lm
Chromaticity CIE 1931 (x, y)	(0.4077, 0.3923)
Chromaticity CIE 1976 (u', v')	(0.2366, 0.5123)
Correlated Color Temperature (CCT)	3462 K
Color Rendering Index (Ra)	82
R1	81
R2	88
R3	95
R4	81
R5	80
R6	84
R7	85
R8	63
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)	0.0002
Scotopic/Photopic Ratio *	1.490

**Electrical Data**

Voltage	120.0 Vac
Current	0.2355 A
Power	28.18 W
Frequency	59.99 Hz
Power Factor	0.997
Current THD	5.7 %



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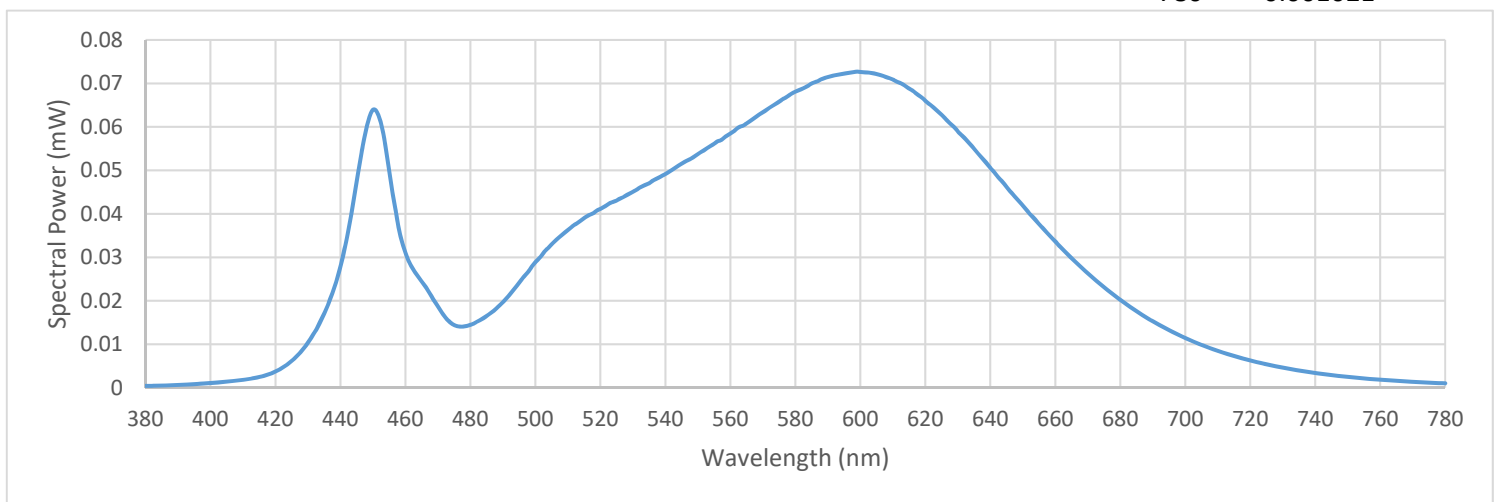
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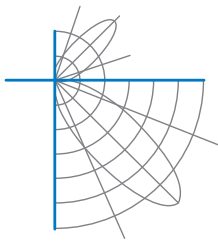
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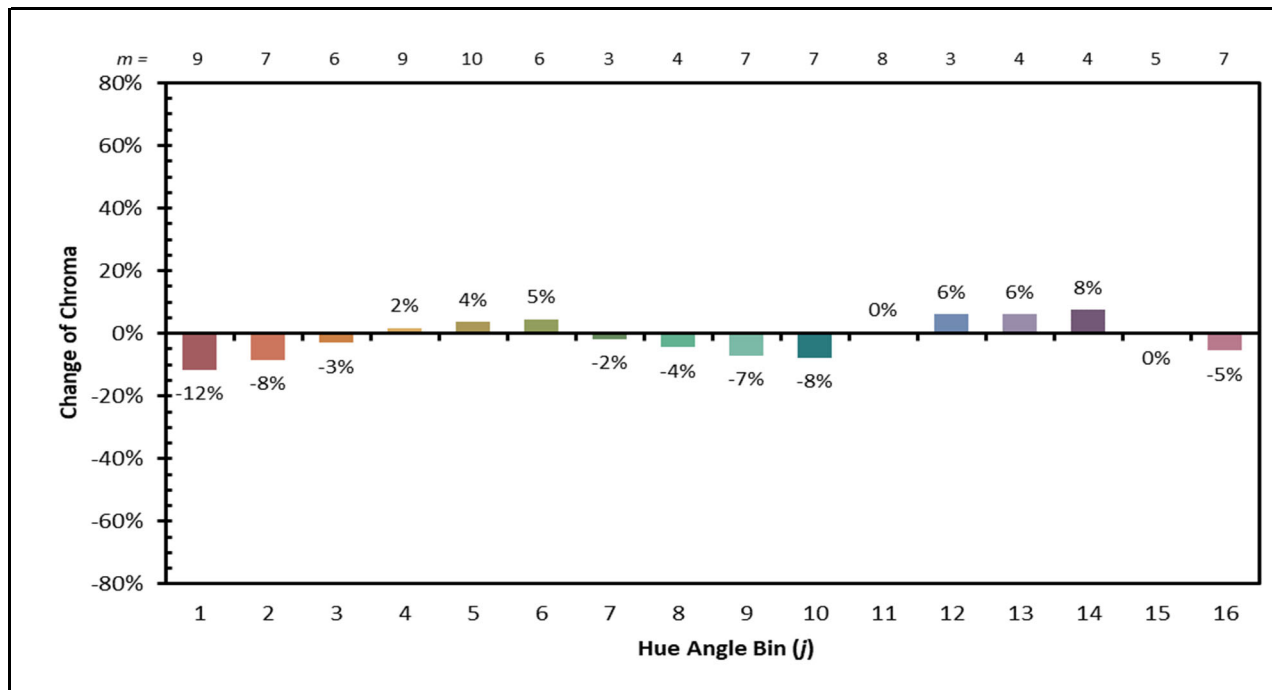
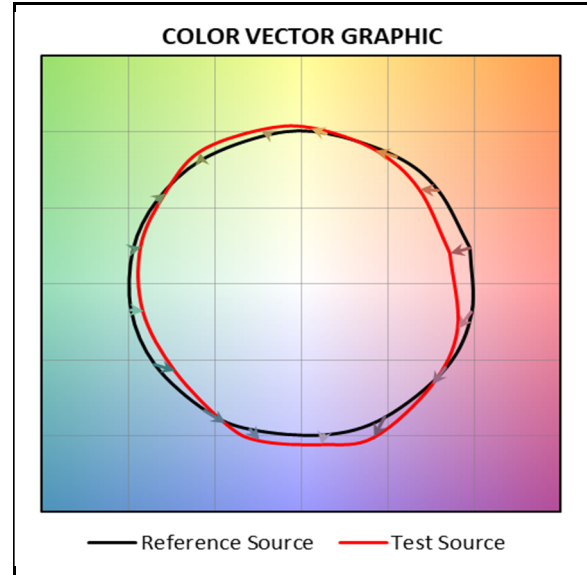
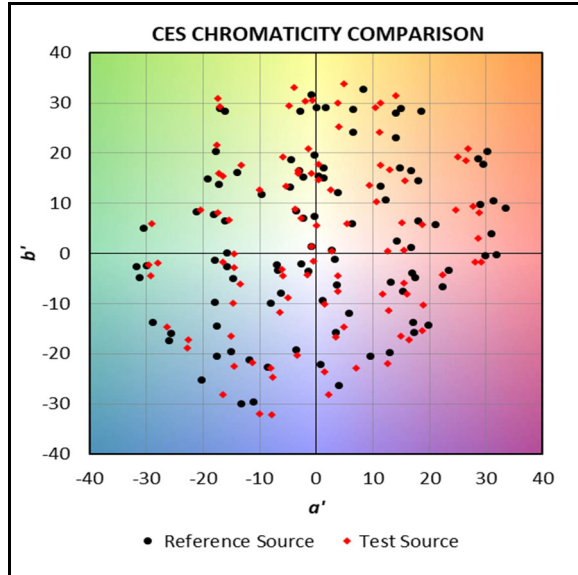
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000441	480	0.014487	580	0.068114	680	0.020215
385	0.000502	485	0.016531	585	0.069985	685	0.017638
390	0.000642	490	0.019670	590	0.071416	690	0.015302
395	0.000836	495	0.024118	595	0.072238	695	0.013261
400	0.001094	500	0.028887	600	0.072635	700	0.011462
405	0.001403	505	0.032976	605	0.072158	705	0.009865
410	0.001814	510	0.036208	610	0.070888	710	0.008475
415	0.002474	515	0.039005	615	0.068801	715	0.007320
420	0.003731	520	0.041146	620	0.066006	720	0.006294
425	0.006156	525	0.043073	625	0.062809	725	0.005397
430	0.010402	530	0.045060	630	0.058939	730	0.004643
435	0.017135	535	0.047030	635	0.054953	735	0.003968
440	0.027883	540	0.049162	640	0.050566	740	0.003394
445	0.047349	545	0.051533	645	0.046178	745	0.002924
450	0.063937	550	0.053750	650	0.041880	750	0.002499
455	0.049924	555	0.056103	655	0.037596	755	0.002147
460	0.031118	560	0.058455	660	0.033684	760	0.001861
465	0.024416	565	0.060816	665	0.029817	765	0.001595
470	0.018631	570	0.063334	670	0.026285	770	0.001372
475	0.014403	575	0.065758	675	0.023130	775	0.001184
						780	0.001021





IES TM-30 Details





**Test Report Number: LLIA001116-005B**

Catalog Number: MLP5-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 $\pi$  geometry

**Test Temperature:** 25.2 °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.