



# Report of Test

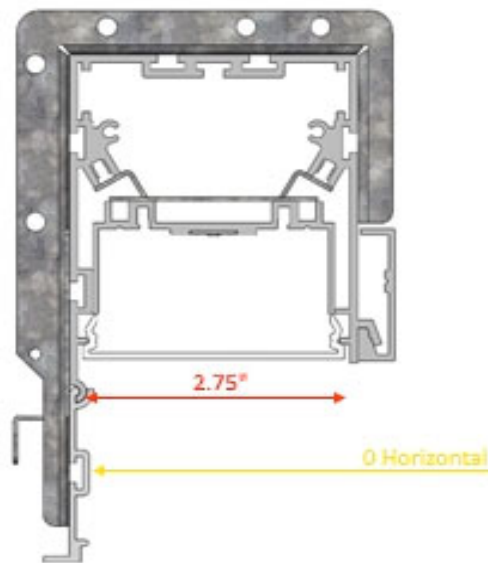
## LLIA001084-002A

Catalog Number: PS3-A-MO-K40-80-4-XX-XX-LOH-UNV-XXX

Recessed mounted, extruded aluminum housing, formed  
white enamel aluminum LED tray, frosted plastic enclosure.

One PAL-Lighting LED board with 88 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver labeled as 480mA  
120.0Vac, 60.00Hz, 0.1566A, 18.70W, 0.995PF, 5.1%THD(i)



### Performance Summary

Total Light Output	1988 lm
Luminaire Power	18.7 W
Luminous Efficacy	106.3 lm/W

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



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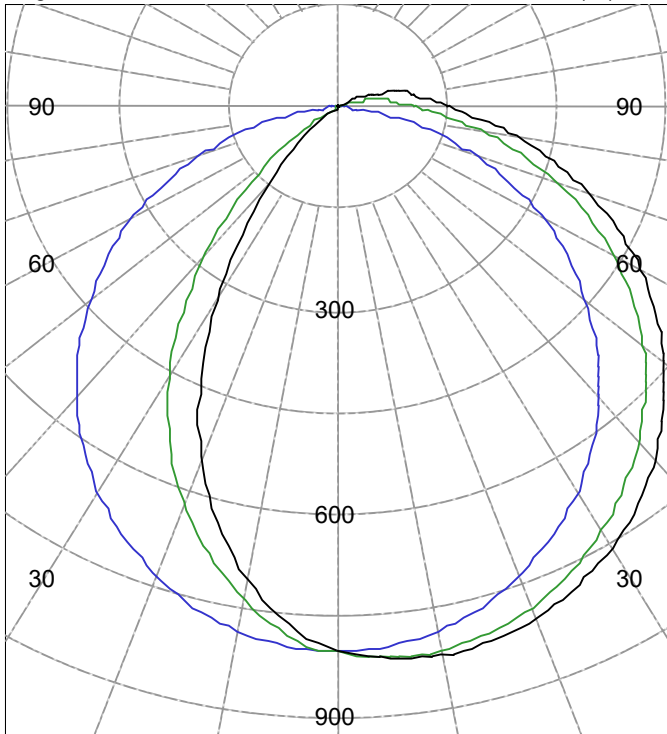
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Legend: C0/C180-Black, C45/C225-Green, C90/C270-Blue (cd)



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

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

Gamma	C0	C45	C90
45.0	6230	6597	8495
55.0	5432	5786	7853
65.0	4583	4867	6930
75.0	3680	3807	5349
85.0	2754	2719	2522

**INTENSITY SUMMARY (cd)**

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	804	804	804	804	804	
5.0	817	818	815	801	798	75
10.0	821	820	814	794	784	
15.0	815	813	803	780	763	209
20.0	800	794	784	756	733	
25.0	777	770	754	725	697	298
30.0	749	739	721	688	654	
35.0	715	703	682	645	607	332
40.0	676	663	640	598	555	
45.0	632	618	595	548	499	316
50.0	585	569	545	496	442	
55.0	533	517	492	442	382	266
60.0	479	463	435	387	320	
65.0	421	405	376	329	257	205
70.0	362	347	315	268	193	
75.0	304	290	256	207	130	138
80.0	249	235	200	147	74	
85.0	196	184	150	95	27	77
90.0	154	143	108	55	0	

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	582	N / A	29.3
0-40	914	N / A	46.0
0-60	1496	N / A	75.2
0-90	1915	N / A	96.3
40-90	1002	N / A	50.4
60-90	420	N / A	21.1
90-180	73	N / A	3.7
0-180	1988	N / A	100.0

Total Light Output = 1,988 lm

Signed:

Authorized Signatory

Spacing Criterion: 0-180 1.4  
Spacing Criterion: 90-270 1.2

Date of test 25-Feb-2019  
Date of report 1-Mar-2019



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	804	804	804	804	804
2.5	810	813	812	801	801
5.0	817	818	815	801	798
7.5	820	821	816	799	792
10.0	821	820	814	794	784
12.5	819	818	809	788	775
15.0	815	813	803	780	763
17.5	808	804	794	769	748
20.0	800	794	784	756	733
22.5	789	783	769	741	716
25.0	777	770	754	725	697
27.5	763	755	739	707	676
30.0	749	739	721	688	654
32.5	733	722	702	667	631
35.0	715	703	682	645	607
37.5	697	684	661	622	581
40.0	676	663	640	598	555
42.5	655	641	618	573	527
45.0	632	618	595	548	499
47.5	609	594	571	522	471
50.0	585	569	545	496	442
52.5	559	543	519	468	412
55.0	533	517	492	442	382
57.5	507	490	464	415	352
60.0	479	463	435	387	320
62.5	450	434	405	358	289
65.0	421	405	376	329	257
67.5	392	376	346	299	224
70.0	362	347	315	268	193
72.5	334	318	285	238	161
75.0	304	290	256	207	130
77.5	276	262	227	177	101
80.0	249	235	200	147	74
82.5	222	209	174	120	49
85.0	196	184	150	95	27
87.5	171	159	126	74	8
90.0	154	143	108	55	0



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	154	143	108	55	0
92.5	143	131	96	41	0
95.0	127	114	80	35	0
97.5	112	102	74	25	0
100.0	106	97	66	17	0
102.5	99	88	55	12	0
105.0	89	77	41	4	0
107.5	75	61	32	3	0
110.0	58	49	26	2	0
112.5	49	40	21	2	0
115.0	39	32	11	2	0
117.5	33	28	3	0	0
120.0	28	20	2	0	0
122.5	19	6	2	0	0
125.0	4	0	0	0	0
127.5	0	0	0	0	0
130.0	0	0	0	0	0
132.5	0	0	0	0	0
135.0	0	0	0	0	0
137.5	0	0	0	0	0
140.0	0	0	0	0	0
142.5	0	0	0	0	0
145.0	0	0	0	0	0
147.5	0	0	0	0	0
150.0	0	0	0	0	0
152.5	0	0	0	0	0
155.0	0	0	0	0	0
157.5	0	0	0	0	0
160.0	0	0	0	0	0
162.5	0	0	0	0	0
165.0	0	0	0	0	0
167.5	0	0	0	0	0
170.0	0	0	0	0	0
172.5	0	0	0	0	0
175.0	0	0	0	0	0
177.5	0	0	0	0	0
180.0	0	0	0	0	0



**Test Report No. LLIA001084-002A**

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One PAL-Lighting LED board with 88 LEDs

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**Intensity data (cd)**

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
0.0	804	804	804	804	804
2.5	801	795	799	794	789
5.0	798	787	781	771	765
7.5	792	774	760	745	737
10.0	784	758	737	716	707
12.5	775	740	711	684	672
15.0	763	721	682	648	634
17.5	748	698	651	609	592
20.0	733	674	618	567	547
22.5	716	649	582	522	497
25.0	697	622	544	472	443
27.5	676	593	504	420	388
30.0	654	564	461	367	333
32.5	631	533	416	315	280
35.0	607	501	370	264	230
37.5	581	468	324	217	185
40.0	555	434	278	174	143
42.5	527	400	235	134	107
45.0	499	365	193	99	74
47.5	471	329	154	68	44
50.0	442	292	118	40	18
52.5	412	254	86	15	0
55.0	382	217	57	0	0
57.5	352	180	32	0	0
60.0	320	145	10	0	0
62.5	289	110	2	0	0
65.0	257	79	2	0	0
67.5	224	51	0	0	0
70.0	193	27	0	0	0
72.5	161	8	0	0	0
75.0	130	2	0	0	0
77.5	101	2	0	0	0
80.0	74	0	0	0	0
82.5	49	0	0	0	0
85.0	27	0	0	0	0
87.5	8	0	0	0	0
90.0	0	0	0	0	0



**Test Report No. LLIA001084-002A**

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One PAL-Lighting LED board with 88 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver labeled as 480mA  
120.0Vac, 60.00Hz, 0.1566A, 18.70W, 0.995PF, 5.1%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
90.0	0	0	0	0	0
92.5	0	0	0	0	0
95.0	0	0	0	0	0
97.5	0	0	0	0	0
100.0	0	0	0	0	0
102.5	0	0	0	0	0
105.0	0	0	0	0	0
107.5	0	0	0	0	0
110.0	0	0	0	0	0
112.5	0	0	0	0	0
115.0	0	0	0	0	0
117.5	0	0	0	0	0
120.0	0	0	0	0	0
122.5	0	0	0	0	0
125.0	0	0	0	0	0
127.5	0	0	0	0	0
130.0	0	0	0	0	0
132.5	0	0	0	0	0
135.0	0	0	0	0	0
137.5	0	0	0	0	0
140.0	0	0	0	0	0
142.5	0	0	0	0	0
145.0	0	0	0	0	0
147.5	0	0	0	0	0
150.0	0	0	0	0	0
152.5	0	0	0	0	0
155.0	0	0	0	0	0
157.5	0	0	0	0	0
160.0	0	0	0	0	0
162.5	0	0	0	0	0
165.0	0	0	0	0	0
167.5	0	0	0	0	0
170.0	0	0	0	0	0
172.5	0	0	0	0	0
175.0	0	0	0	0	0
177.5	0	0	0	0	0
180.0	0	0	0	0	0



**Test Number: LLIA001084-002A**

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**Coefficients Of Utilization - Zonal Cavity Method**

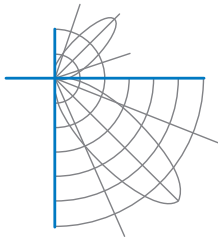
Effective Floor Cavity Reflectance 0.20

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
0	118	118	118	118	115	115	115	115	109	109	109	104	104	104	99	99	99	96
1	107	102	98	94	104	100	96	92	95	91	88	90	88	85	86	84	82	80
2	98	90	83	77	95	87	81	76	83	78	73	79	75	71	76	72	69	67
3	89	79	71	64	87	77	70	64	74	67	62	70	65	60	67	63	59	57
4	82	70	62	55	80	69	61	54	66	59	53	63	57	52	60	55	51	49
5	76	63	54	48	73	62	54	47	59	52	46	57	51	46	55	49	45	43
6	70	57	48	42	68	56	48	42	54	46	41	52	45	40	50	44	40	38
7	65	52	43	37	63	51	43	37	49	42	37	47	41	36	46	40	36	34
8	61	48	39	34	59	47	39	33	45	38	33	44	37	32	42	36	32	30
9	57	44	36	30	55	43	35	30	42	35	30	40	34	29	39	33	29	27
10	54	41	33	28	52	40	33	28	39	32	27	38	31	27	36	31	27	25

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	22.3	6.56	7.28
8.0	12.6	8.75	9.70
10.0	8.0	10.94	12.13
12.0	5.6	13.12	14.55
14.0	4.1	15.31	16.98
16.0	3.1	17.50	19.40



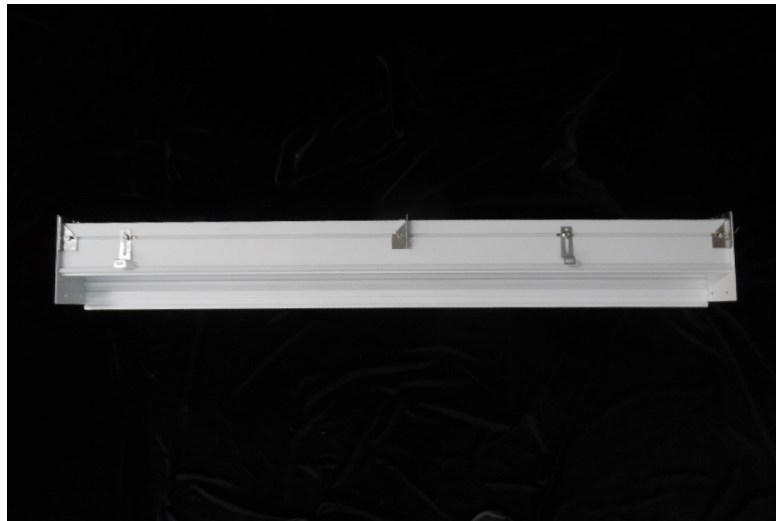
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Recessed mounted, extruded aluminum housing, formed white enamel aluminum LED tray, frosted plastic enclosure.

One PAL-Lighting LED board with 88 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver labeled as 480mA  
120.0Vac, 60.00Hz, 0.1566A, 18.70W, 0.995PF, 5.1%THD(i)







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120.0Vac, 60.00Hz, 0.1566A, 18.70W, 0.995PF, 5.1%THD(i)

**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.



## Report of Test

**LLIA001084-002B**

Integrating Sphere Report

Catalog Number: PS3-A-MO-K40-80-4-XX-XX-LOH-UNV-XXX

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One PAL-Lighting LED board with 88 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver labeled as 480mA



### Performance Summary

Voltage	120.0 Vac
Current	0.1565 A
Power	18.68 W
Frequency	59.97 Hz
Power Factor	0.995
Current THD	5.2 %

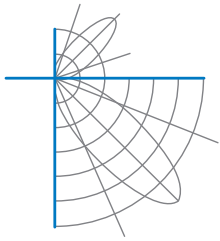
Total Luminous Flux	2005.4 lm
Efficacy	107.4 lm/W
Chromaticity (x,y)	(0.3814, 0.3789)
(u',v')	(0.2249, 0.5027)
Duv	0.0007
CCT	3989 K
CRI (Ra)	83
R9	15
TM-30: Rf	82
TM-30: Rg	96

Prepared For:

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

Test date: 02/26/2019

Report date: 03/01/2019



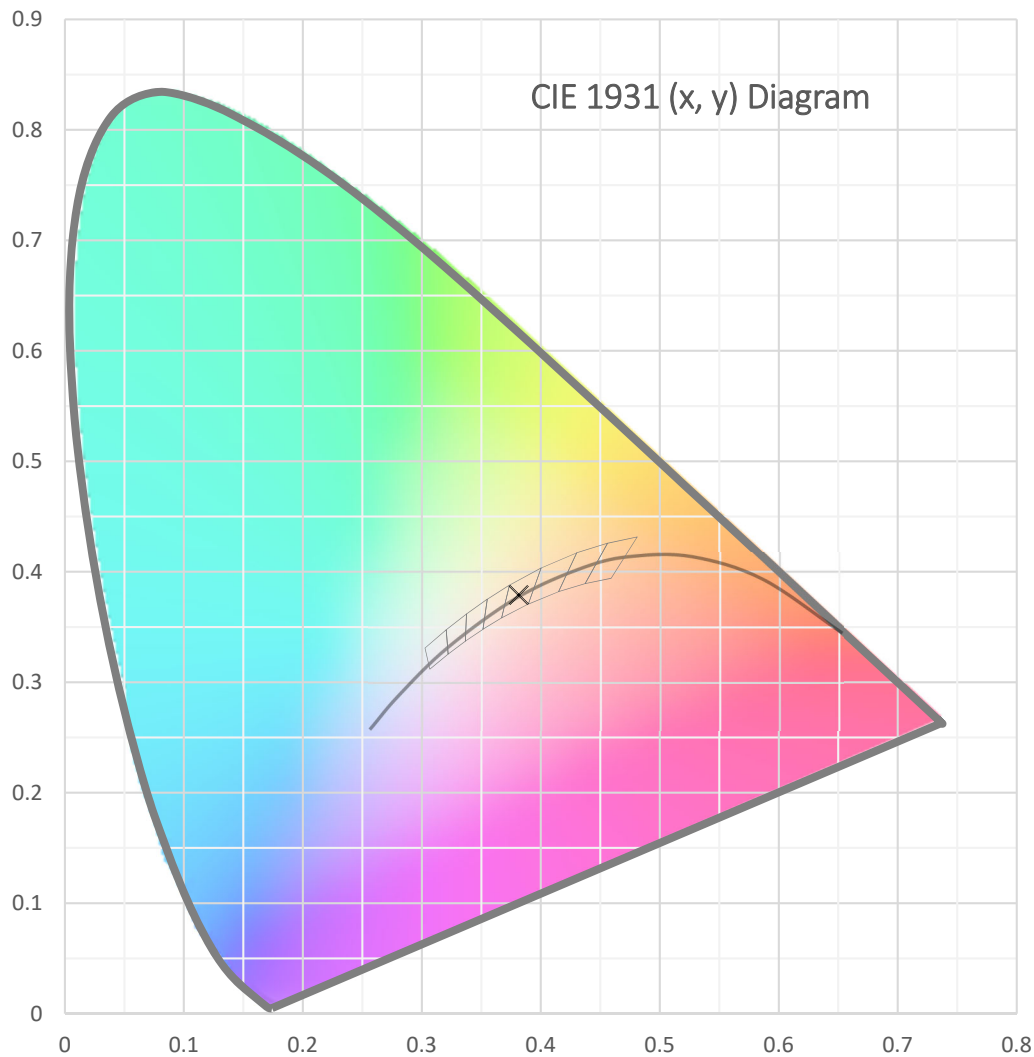
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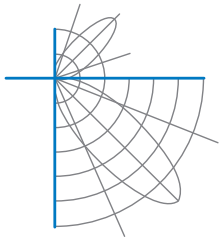
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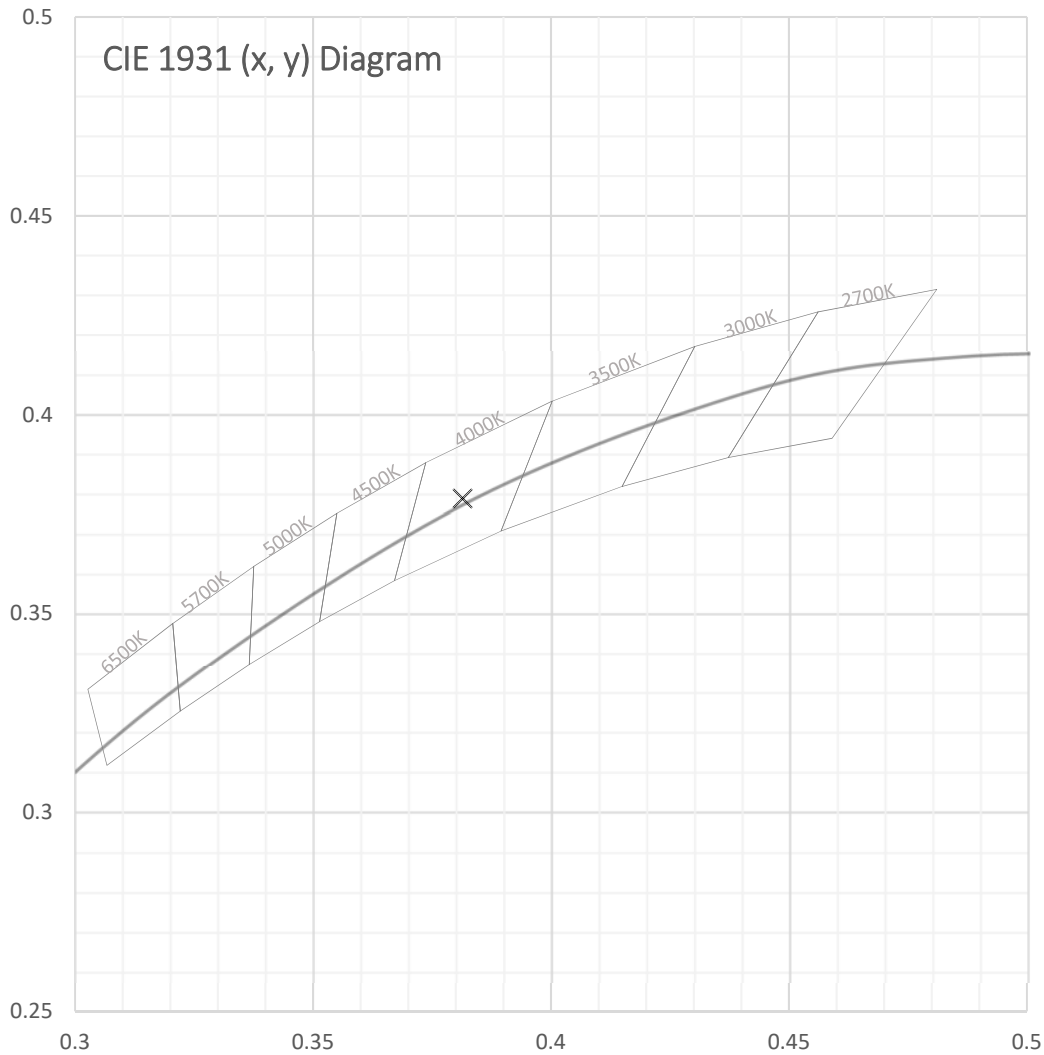
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**Spectral Data**

Total Radiant Flux	6.202 W
Total Luminous Flux	2005.4 Lm
Chromaticity CIE 1931 (x, y)	(0.3814, 0.3789)
Chromaticity CIE 1976 (u', v')	(0.2249, 0.5027)
Correlated Color Temperature (CCT)	3989 K
Color Rendering Index (Ra)	83
R1	82
R2	89
R3	94
R4	82
R5	82
R6	84
R7	87
R8	67
R9	15
R10	74
R11	81
R12	60
R13	84
R14	97
TM-30: Rf	82
TM-30: Rg	96
Distance from Planckian Locus (Duv)	0.0007
Scotopic/Photopic Ratio *	1.682

**Electrical Data**

Voltage	120.0 Vac
Current	0.1565 A
Power	18.68 W
Frequency	59.97 Hz
Power Factor	0.995
Current THD	5.2 %



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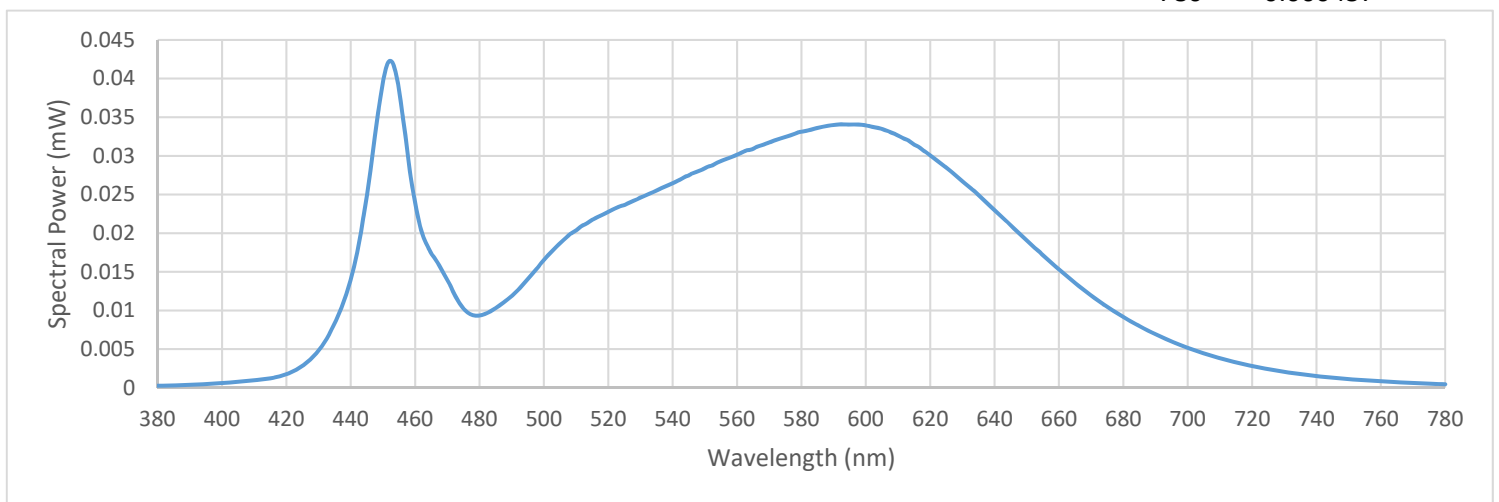
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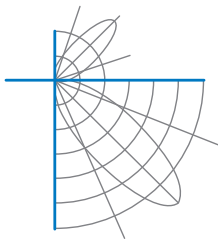
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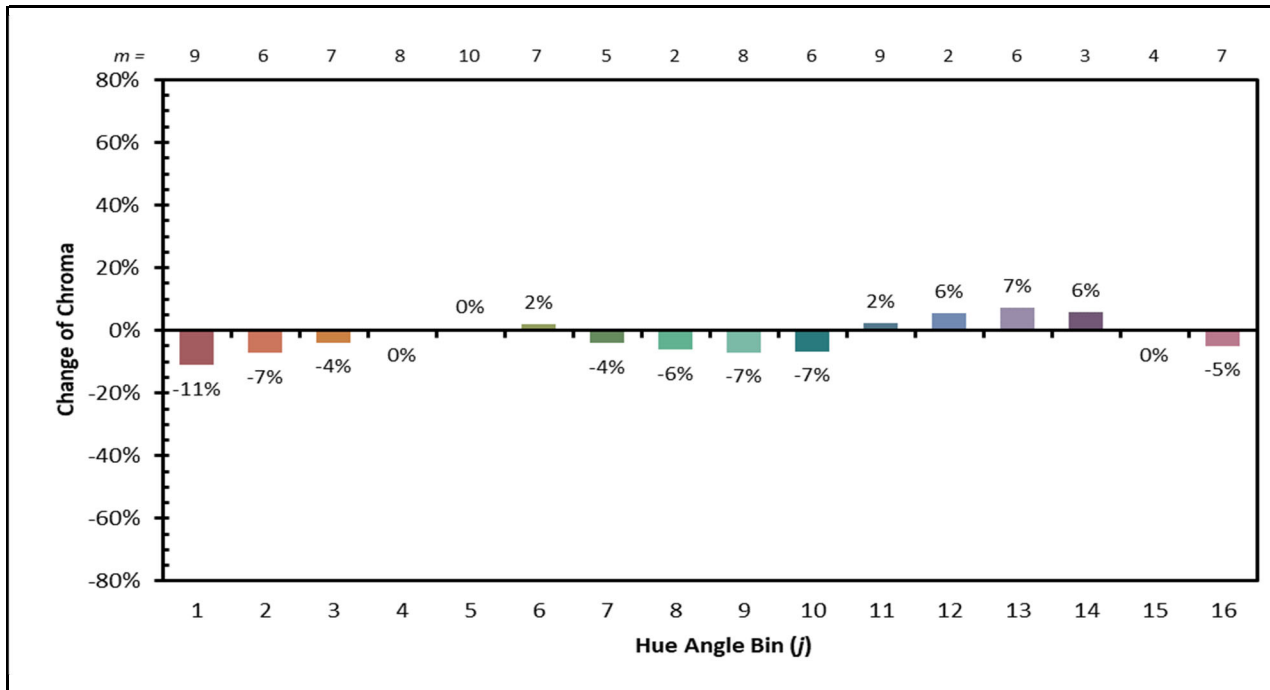
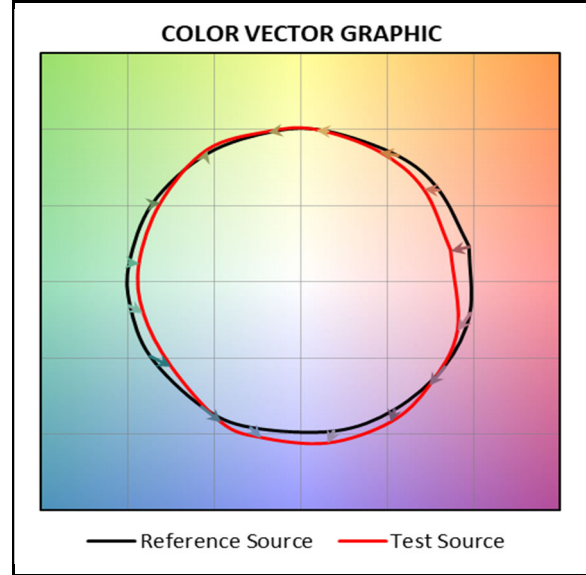
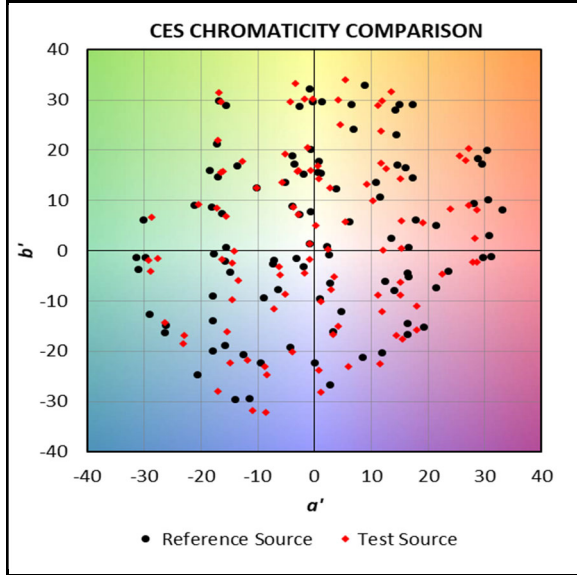
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000268	480	0.009345	580	0.033131	680	0.009143
385	0.000286	485	0.010302	585	0.033630	685	0.007986
390	0.000366	490	0.011868	590	0.033989	690	0.006931
395	0.000476	495	0.014050	595	0.034055	695	0.005983
400	0.000619	500	0.016547	600	0.033928	700	0.005176
405	0.000779	505	0.018696	605	0.033494	705	0.004451
410	0.000951	510	0.020353	610	0.032622	710	0.003819
415	0.001219	515	0.021725	615	0.031465	715	0.003288
420	0.001770	520	0.022762	620	0.030040	720	0.002816
425	0.002836	525	0.023643	625	0.028482	725	0.002411
430	0.004839	530	0.024622	630	0.026693	730	0.002069
435	0.008344	535	0.025516	635	0.024919	735	0.001769
440	0.014026	540	0.026462	640	0.022965	740	0.001516
445	0.024830	545	0.027474	645	0.021006	745	0.001307
450	0.039481	550	0.028398	650	0.019050	750	0.001117
455	0.038570	555	0.029318	655	0.017146	755	0.000964
460	0.023923	560	0.030150	660	0.015346	760	0.000833
465	0.017378	565	0.030910	665	0.013548	765	0.000718
470	0.013933	570	0.031730	670	0.011920	770	0.000615
475	0.010236	575	0.032427	675	0.010489	775	0.000532
						780	0.000457





IES TM-30 Summary





**Test Report Number: LLIA001084-002B**

Catalog Number: PS3-A-MO-K40-80-4-XX-XX-LOH-UNV-XXX

Recessed mounted, extruded aluminum housing, formed  
white enamel aluminum LED tray, frosted plastic enclosure.

One PAL-Lighting LED board with 88 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver labeled as 480mA

**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:** 25.7 °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.





## Report of Test

**LLIA001084-002C**

Electrical Test Report

Catalog Number: PS3-A-MO-K40-80-4-XX-XX-LOH-UNV-XXX

Recessed mounted, extruded aluminum housing, formed white enamel aluminum LED tray, frosted plastic enclosure.

One PAL-Lighting LED board with 88 LEDs

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver labeled as 480mA



### Performance Summary

Voltage	277.0 Vac
Current	0.0813 A
Power	20.58 W
Frequency	60.00 Hz
Power Factor	0.913
Current THD	16.5 %
 Ambient Temperature:	 24.8 °C

Prepared For:

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

Tested in accordance with the applicable sections of C82.77-10-2014. 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. 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.

Test date: 02/25/2019

Report date: 03/01/2019

Electrical Report Template V1-2