



# Report of Test

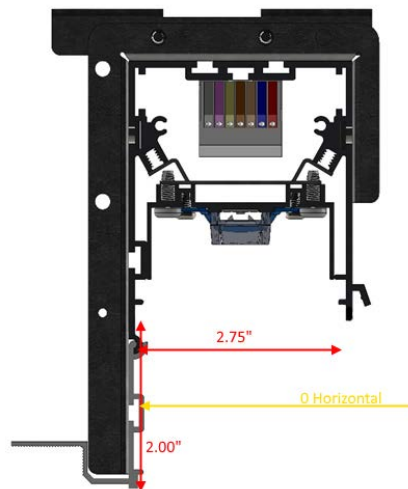
## LLIA000977-003A

Catalog Number: PSWG3-HO-K40-80-4-XXX-XX-OP-UNV-XXX

Recessed mounted, extruded aluminum housing, no enclosure.

One PAL-Lighting LED board with 88 LEDs and clear plastic lenses below LEDs.

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver  
120.0Vac, 60.00Hz, 0.2354A, 28.16W, 0.997PF, 5.8%THD(i)



### Performance Summary

Total Light Output	3685 lm
Luminaire Power	28.2 W
Luminous Efficacy	130.7 lm/W

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



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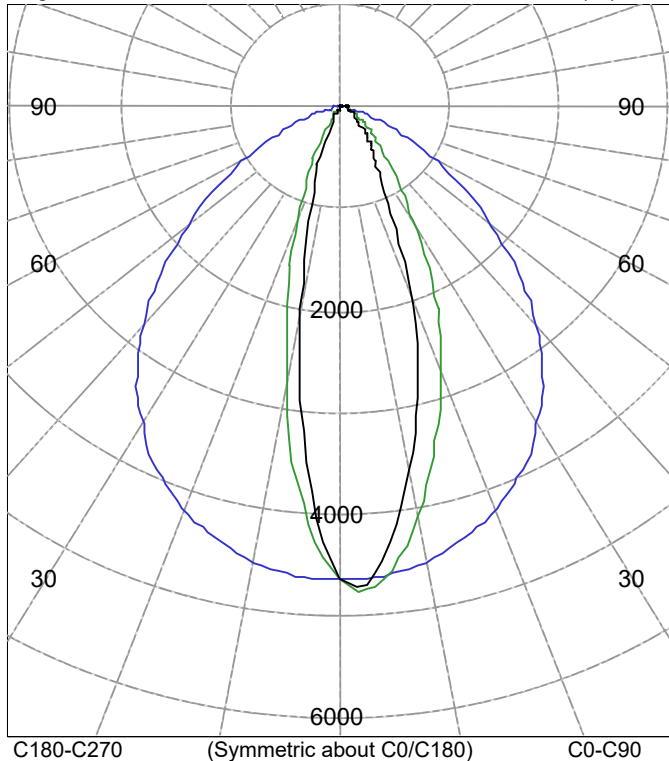
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Legend: C0/C180-Black, C45/C225-Green, C90/C270-Blue (cd)



**INTENSITY SUMMARY (cd)**

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	4634	4634	4634	4634	4634	
5.0	4464	4524	4660	4692	4627	385
10.0	3616	3727	4081	4519	4545	
15.0	2779	2926	3397	4129	4371	791
20.0	1831	2091	2696	3657	4193	
25.0	1033	1248	2039	3113	3925	778
30.0	666	771	1417	2583	3596	
35.0	507	538	982	2051	3224	634
40.0	411	421	678	1565	2782	
45.0	317	336	474	1166	2300	473
50.0	212	247	351	860	1809	
55.0	152	166	271	642	1355	295
60.0	137	140	200	476	953	
65.0	126	124	137	354	624	167
70.0	113	112	108	255	383	
75.0	101	101	94	152	211	82
80.0	90	87	81	71	101	
85.0	81	80	70	53	35	39
90.0	74	72	59	38	0	

**ZONAL FLUX AND PERCENTAGES**

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1953	N / A	53.0
0-40	2588	N / A	70.2
0-60	3355	N / A	91.1
0-90	3644	N / A	98.9
40-90	1056	N / A	28.7
60-90	288	N / A	7.8
90-180	41	N / A	1.1
0-180	3685	N / A	100.0

Total Light Output = 3,685 lm

Signed:

Authorized Signatory

Date of test

30-Apr-2018

Date of report

2-May-2018



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	4634	4634	4634	4634	4634
2.5	4715	4740	4759	4678	4638
5.0	4464	4524	4660	4692	4627
7.5	4045	4136	4411	4629	4587
10.0	3616	3727	4081	4519	4545
12.5	3193	3322	3744	4347	4468
15.0	2779	2926	3397	4129	4371
17.5	2334	2525	3039	3890	4294
20.0	1831	2091	2696	3657	4193
22.5	1365	1638	2364	3390	4052
25.0	1033	1248	2039	3113	3925
27.5	812	971	1716	2856	3787
30.0	666	771	1417	2583	3596
32.5	571	633	1172	2305	3420
35.0	507	538	982	2051	3224
37.5	456	474	816	1802	2994
40.0	411	421	678	1565	2782
42.5	368	377	564	1360	2530
45.0	317	336	474	1166	2300
47.5	262	291	404	1003	2046
50.0	212	247	351	860	1809
52.5	173	206	307	746	1575
55.0	152	166	271	642	1355
57.5	145	148	236	557	1147
60.0	137	140	200	476	953
62.5	130	132	156	410	776
65.0	126	124	137	354	624
67.5	119	119	120	305	492
70.0	113	112	108	255	383
72.5	107	106	102	207	289
75.0	101	101	94	152	211
77.5	94	94	88	90	149
80.0	90	87	81	71	101
82.5	88	86	74	62	65
85.0	81	80	70	53	35
87.5	79	77	65	45	14
90.0	74	72	59	38	0



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**Intensity data (cd)**

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
90.0	74	72	59	38	0
92.5	70	67	54	29	0
95.0	64	61	46	26	0
97.5	57	55	44	19	0
100.0	55	53	40	14	0
102.5	52	49	33	12	0
105.0	47	43	26	6	0
107.5	40	35	22	0	0
110.0	32	29	18	0	0
112.5	27	24	15	0	0
115.0	22	20	9	0	0
117.5	19	18	0	0	0
120.0	17	13	0	0	0
122.5	11	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	2	2	2	2	2



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120.0Vac, 60.00Hz, 0.2354A, 28.16W, 0.997PF, 5.8%THD(i)

**Intensity data (cd)**

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
0.0	4634	4634	4634	4634	4634
2.5	4638	4459	4353	4224	4174
5.0	4627	4268	3924	3616	3508
7.5	4587	4015	3403	2902	2735
10.0	4545	3737	2833	2213	2025
12.5	4468	3414	2283	1625	1431
15.0	4371	3066	1799	1159	1003
17.5	4294	2716	1372	838	717
20.0	4193	2382	1043	617	503
22.5	4052	2049	803	355	243
25.0	3925	1745	624	189	108
27.5	3787	1481	459	96	76
30.0	3596	1243	262	74	61
32.5	3420	1030	151	62	57
35.0	3224	860	90	57	50
37.5	2994	721	70	51	43
40.0	2782	603	60	43	33
42.5	2530	507	55	33	25
45.0	2300	371	48	24	17
47.5	2046	268	41	18	16
50.0	1809	176	32	16	12
52.5	1575	88	24	13	0
55.0	1355	57	18	0	0
57.5	1147	48	16	0	0
60.0	953	42	12	0	0
62.5	776	36	0	0	0
65.0	624	28	0	0	0
67.5	492	21	0	0	0
70.0	383	17	0	0	0
72.5	289	13	0	0	0
75.0	211	0	0	0	0
77.5	149	0	0	0	0
80.0	101	0	0	0	0
82.5	65	0	0	0	0
85.0	35	0	0	0	0
87.5	14	0	0	0	0
90.0	0	0	0	0	0



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**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	2	2	2	2	2



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120.0Vac, 60.00Hz, 0.2354A, 28.16W, 0.997PF, 5.8%THD(i)

**Coefficients Of Utilization - Zonal Cavity Method**

Effective Floor Cavity Reflectance 0.20

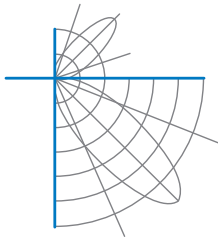
RC	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	119	119	119	119	116	116	116	116	110	110	110	106	106	106	101	101	101	99
1	111	108	105	102	109	106	103	100	101	99	97	97	95	94	94	92	91	89
2	104	98	93	89	102	96	92	88	93	89	85	89	86	83	86	84	81	80
3	98	90	83	78	95	88	82	78	85	80	76	82	78	75	80	77	74	72
4	91	82	76	70	89	81	75	70	79	73	69	76	72	68	74	70	67	65
5	86	76	69	64	84	75	68	63	73	67	63	71	66	62	69	65	61	60
6	81	70	63	58	79	70	63	58	68	62	57	66	61	57	65	60	56	55
7	76	66	59	54	75	65	58	53	63	57	53	62	57	53	61	56	52	51
8	72	61	54	50	71	61	54	50	59	54	49	58	53	49	57	52	49	47
9	69	58	51	46	67	57	51	46	56	50	46	55	50	46	54	49	46	44
10	65	54	48	43	64	54	48	43	53	47	43	52	47	43	51	46	43	41

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	128.7	2.63	6.97
8.0	72.4	3.51	9.30
10.0	46.3	4.39	11.62
12.0	32.2	5.26	13.94
14.0	23.6	6.14	16.27
16.0	18.1	7.02	18.59





**Test Report No. LLIA000977-003A**

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One PAL-Lighting LED board with 88 LEDs and clear plastic lenses below LEDs.

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120.0Vac, 60.00Hz, 0.2354A, 28.16W, 0.997PF, 5.8%THD(i)







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120.0Vac, 60.00Hz, 0.2354A, 28.16W, 0.997PF, 5.8%THD(i)

**Test Distance**            9.5 m  
**Test Temperature**      24.6 °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.

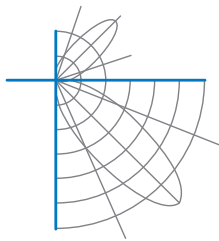
Prorating the performance of the sample for the use of other component combinations (such as lamp / LED / Ballast / driver), or for use in different environmental conditions than that tested, may produce erroneous results.

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

**LLIA000977-003B**

Integrating Sphere Report

Catalog Number: PSWG3-HO-K40-80-4-XXX-XX-OP-UNV-XXX

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One PAL-Lighting LED board with 88 LEDs and clear plastic lenses below LEDs.

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver



### Performance Summary

Voltage	120.0 Vac
Current	0.2358 A
Power	28.19 W
Frequency	59.97 Hz
Power Factor	0.997
Current THD	5.9 %

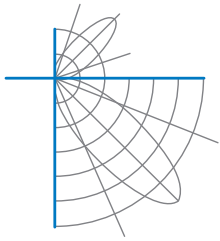
Total Luminous Flux	3753.5 lm
Efficacy	133.2 lm/W
Chromaticity (x,y)	(0.3797, 0.3766)
(u',v')	(0.2247, 0.5014)
Duv	0.0001
CCT	4019 K
CRI (Ra)	84
R9	16
TM-30: Rf	83
TM-30: Rg	95

Prepared For:

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

Test date: 04/27/2018

Report date: 05/02/2018



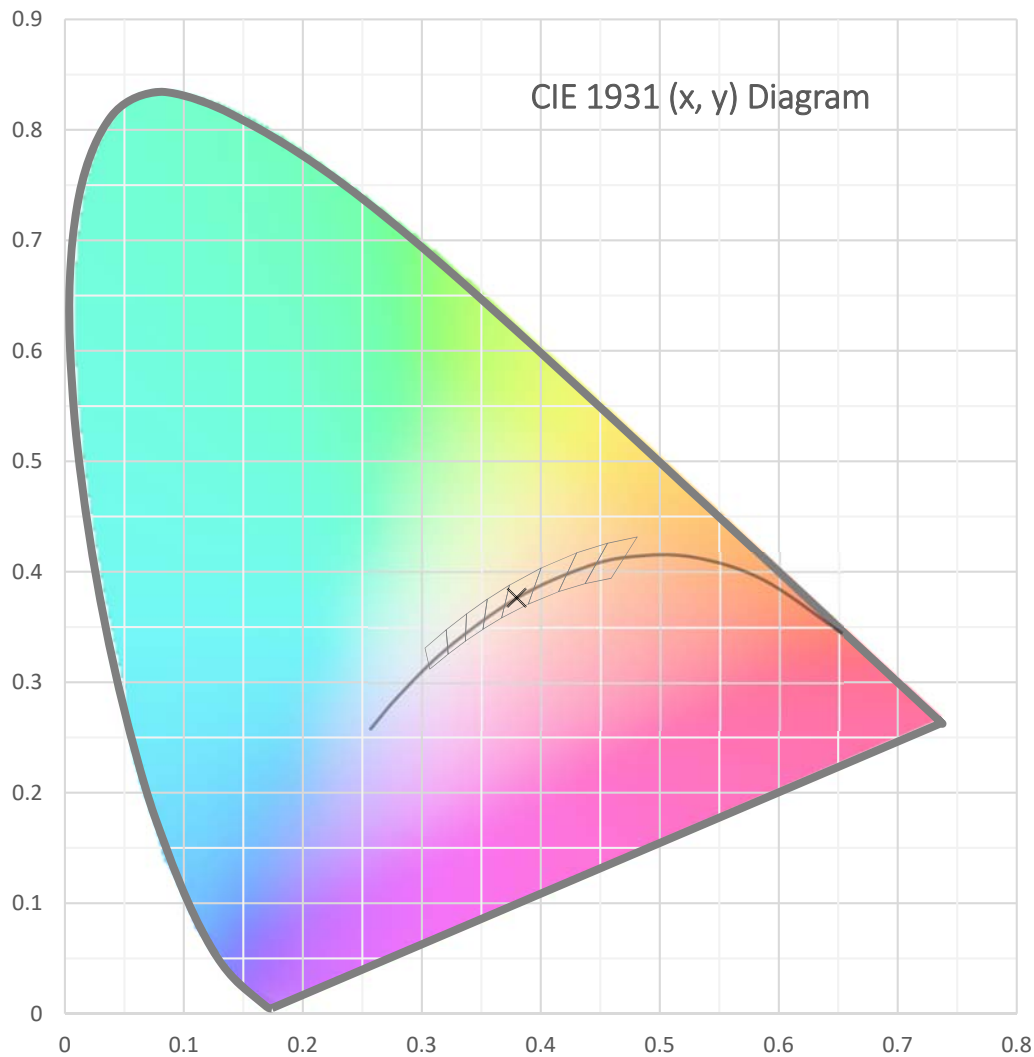
**Test Report Number: LLIA000977-003B**

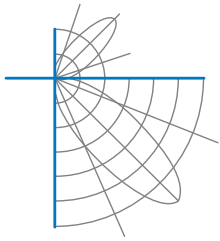
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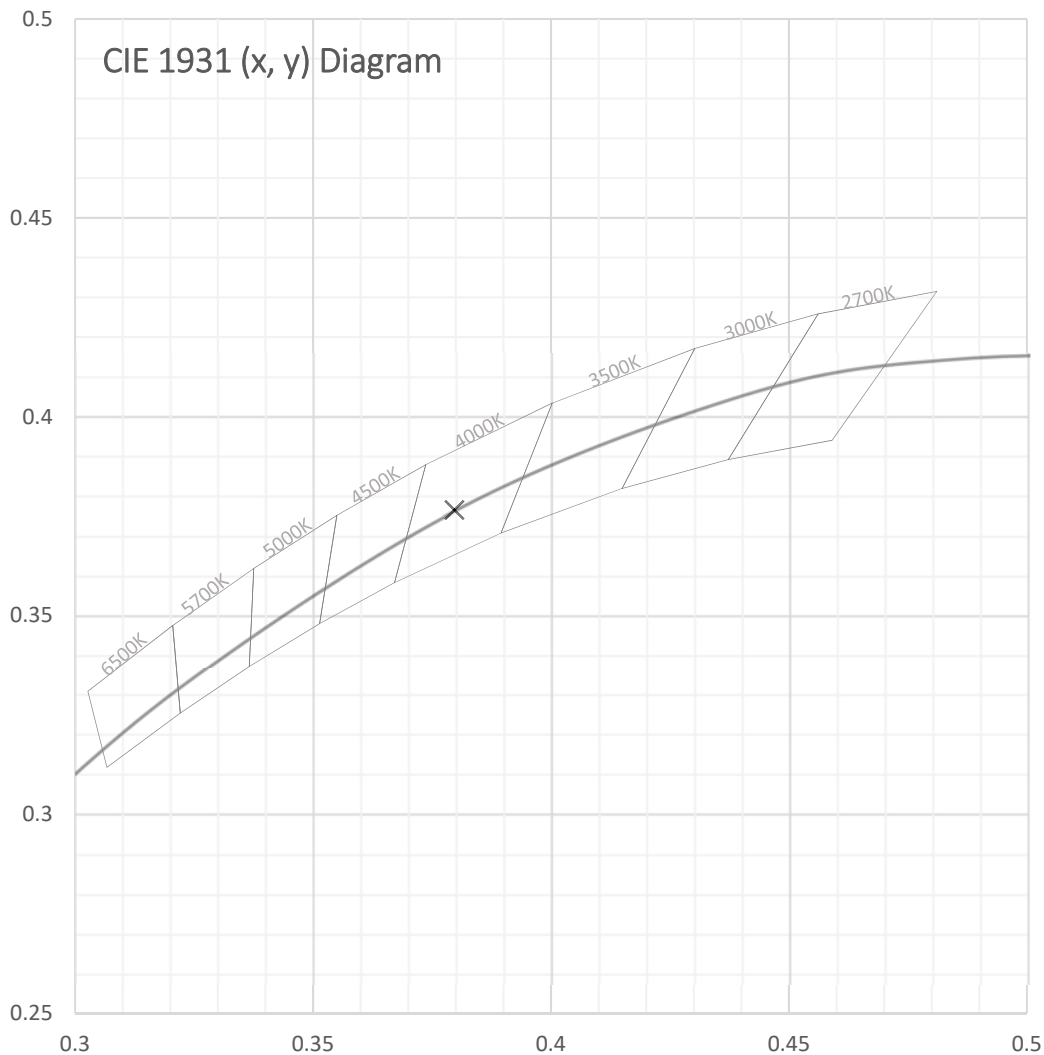
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**Spectral Data**

Total Radiant Flux	11.64 W
Total Luminous Flux	3753.5 Lm
Chromaticity CIE 1931 (x, y)	(0.3797, 0.3766)
Chromaticity CIE 1976 (u', v')	(0.2247, 0.5014)
Correlated Color Temperature (CCT)	4019 K
Color Rendering Index (Ra)	84
R1	83
R2	90
R3	95
R4	82
R5	82
R6	86
R7	87
R8	67
R9	16
R10	77
R11	81
R12	61
R13	85
R14	98
TM-30: Rf	83
TM-30: Rg	95
Distance from Planckian Locus (Duv)	0.0001
Scotopic/Photopic Ratio *	1.710

**Electrical Data**

Voltage	120.0 Vac
Current	0.2358 A
Power	28.19 W
Frequency	59.97 Hz
Power Factor	0.997
Current THD	5.9 %



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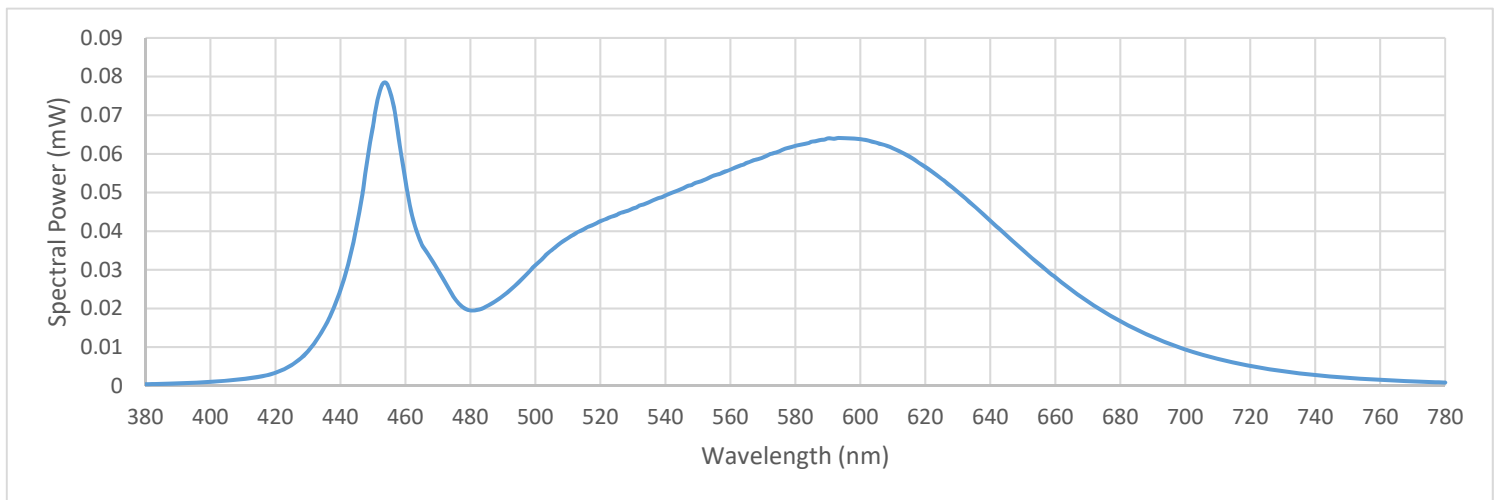
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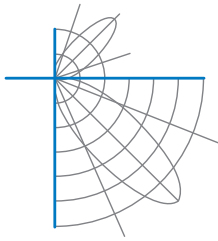
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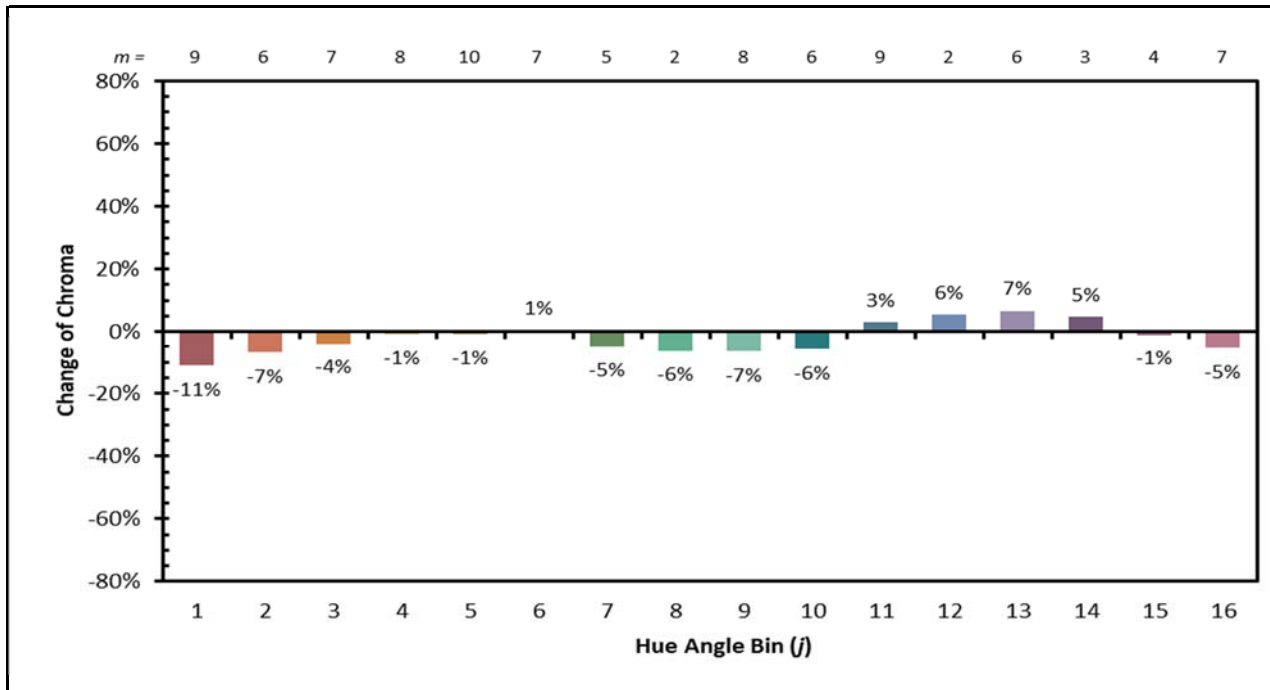
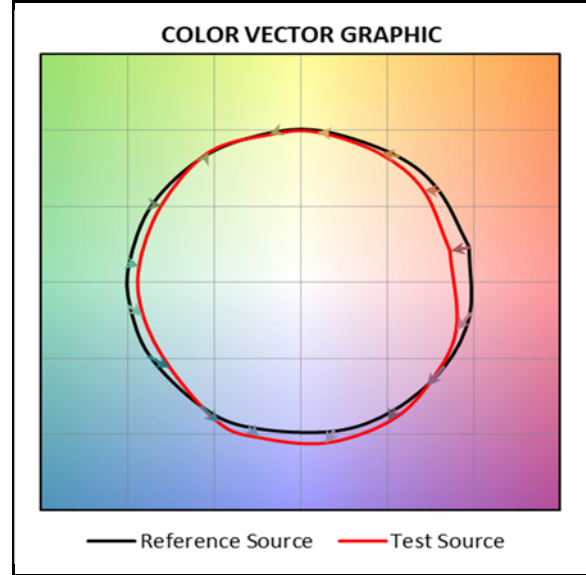
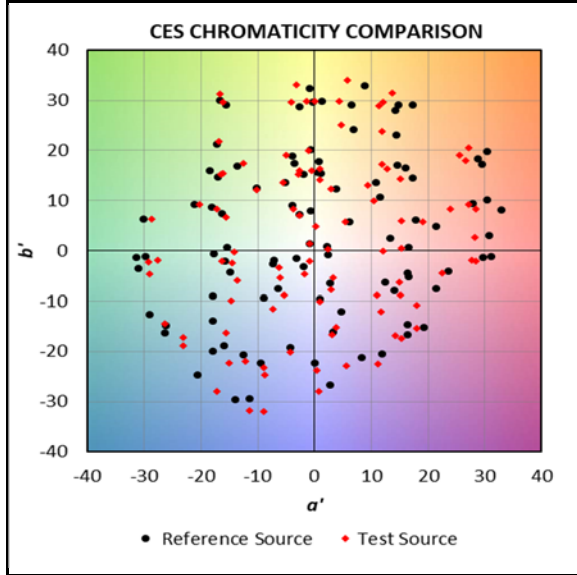
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000433	480	0.019486	580	0.062058	680	0.016695
385	0.000482	485	0.020587	585	0.063156	685	0.014565
390	0.000592	490	0.023251	590	0.064006	690	0.012600
395	0.000775	495	0.026910	595	0.064033	695	0.010888
400	0.001032	500	0.031212	600	0.063801	700	0.009425
405	0.001344	505	0.035105	605	0.062898	705	0.008085
410	0.001733	510	0.038163	610	0.061452	710	0.006932
415	0.002307	515	0.040547	615	0.059366	715	0.005986
420	0.003399	520	0.042594	620	0.056604	720	0.005130
425	0.005359	525	0.044193	625	0.053509	725	0.004405
430	0.009011	530	0.045872	630	0.050092	730	0.003774
435	0.015059	535	0.047532	635	0.046562	735	0.003234
440	0.024637	540	0.049198	640	0.042710	740	0.002773
445	0.041438	545	0.050905	645	0.038923	745	0.002390
450	0.067045	550	0.052687	650	0.035122	750	0.002051
455	0.076836	555	0.054421	655	0.031481	755	0.001767
460	0.053213	560	0.055900	660	0.028126	760	0.001533
465	0.036613	565	0.057668	665	0.024774	765	0.001320
470	0.029954	570	0.059069	670	0.021816	770	0.001134
475	0.022751	575	0.060616	675	0.019155	775	0.000979
						780	0.000843





IES TM-30 Summary







**Test Report Number: LLIA000977-003B**

Catalog Number: PSWG3-HO-K40-80-4-XXX-XX-OP-UNV-XXX

Recessed mounted, extruded aluminum housing, no enclosure.

One PAL-Lighting LED board with 88 LEDs and clear plastic lenses below LEDs.

One Osram Optotronic OTi30/120-277/1A0 DIM-1 L LED driver

**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:** 24.6 °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.