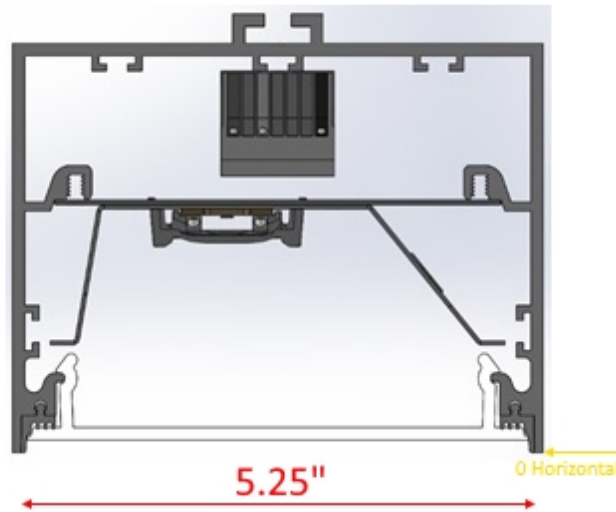




Report of Test

LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X
Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.
120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.
One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.
120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)



Performance Summary

Total Light Output	3233 lm
Luminaire Power	34.6 W
Luminous Efficacy	93.4 lm/W

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



Test Report No. LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

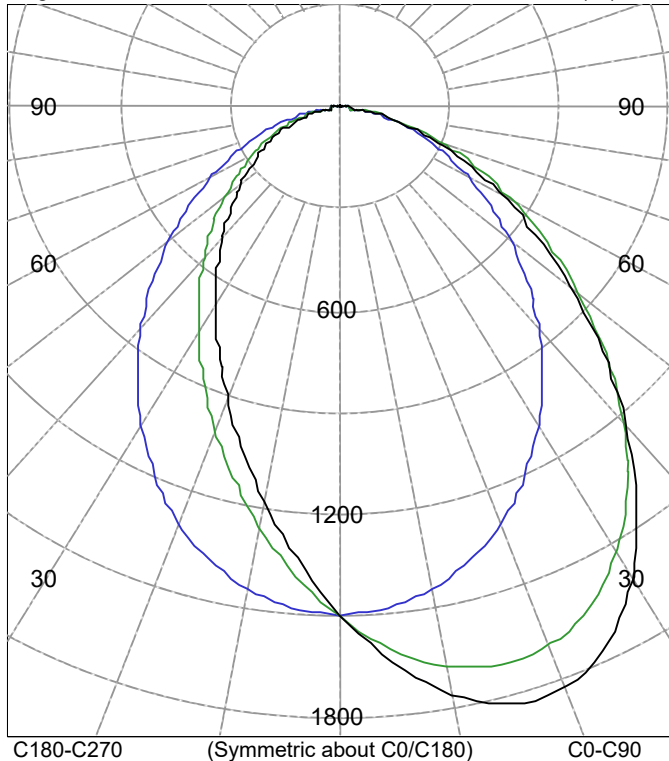
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120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)

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



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

AVERAGE LUMINANCE (cd/m²)

Gamma	C0	C45	C90
45.0	9469	9596	6743
55.0	7531	7933	5772
65.0	5866	6348	4870
75.0	4257	4774	3863
85.0	1810	2508	2494

INTENSITY SUMMARY (cd)

Gamma	C-Plane					Flux (lm)
	C0	C22.5	C45	C67.5	C90	
0.0	1499	1499	1499	1499	1499	
5.0	1643	1639	1606	1539	1482	141
10.0	1759	1743	1674	1557	1443	
15.0	1822	1797	1704	1545	1381	396
20.0	1816	1789	1687	1499	1297	
25.0	1739	1715	1621	1422	1198	569
30.0	1600	1585	1512	1318	1085	
35.0	1418	1412	1368	1191	965	623
40.0	1216	1219	1202	1051	842	
45.0	1013	1022	1027	905	721	569
50.0	824	836	853	762	607	
55.0	654	666	688	626	501	448
60.0	505	517	539	499	402	
65.0	375	387	406	382	311	301
70.0	264	273	289	275	228	
75.0	167	175	187	180	151	152
80.0	86	92	100	100	85	
85.0	24	27	33	36	33	33
90.0	0	0	0	0	0	

ZONAL FLUX AND PERCENTAGES

Zone	Flux (lm)	% Lamp	% Luminaire
0-30	1107	N / A	34.2
0-40	1730	N / A	53.5
0-60	2747	N / A	85.0
0-90	3233	N / A	100.0
40-90	1503	N / A	46.5
60-90	486	N / A	15.0
90-180	0	N / A	0.0
0-180	3233	N / A	100.0

Total Light Output = 3,233 lm

Signed:

Authorized Signatory

Date of test

11-Jul-2018

Date of report

13-Jul-2018



Test Report No. LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
0.0	1499	1499	1499	1499	1499
2.5	1571	1575	1559	1519	1491
5.0	1643	1639	1606	1539	1482
7.5	1706	1696	1644	1552	1465
10.0	1759	1743	1674	1557	1443
12.5	1798	1777	1695	1555	1414
15.0	1822	1797	1704	1545	1381
17.5	1828	1801	1701	1526	1341
20.0	1816	1789	1687	1499	1297
22.5	1787	1760	1660	1464	1250
25.0	1739	1715	1621	1422	1198
27.5	1676	1657	1571	1373	1143
30.0	1600	1585	1512	1318	1085
32.5	1513	1503	1443	1257	1026
35.0	1418	1412	1368	1191	965
37.5	1318	1318	1287	1122	904
40.0	1216	1219	1202	1051	842
42.5	1113	1120	1115	978	781
45.0	1013	1022	1027	905	721
47.5	916	927	939	833	663
50.0	824	836	853	762	607
52.5	736	748	769	693	553
55.0	654	666	688	626	501
57.5	577	589	612	561	451
60.0	505	517	539	499	402
62.5	437	450	470	439	356
65.0	375	387	406	382	311
67.5	317	328	346	327	268
70.0	264	273	289	275	228
72.5	213	222	236	226	188
75.0	167	175	187	180	151
77.5	124	131	142	138	117
80.0	86	92	100	100	85
82.5	53	57	64	66	57
85.0	24	27	33	36	33
87.5	3	4	7	14	15
90.0	0	0	0	0	0



Test Report No. LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C0	C22.5	C45	C67.5	C90
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 Report No. LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)

Intensity data (cd)

Gamma	C-Plane				
	C90	C112.5	C135	C157.5	C180
0.0	1499	1499	1499	1499	1499
2.5	1491	1460	1447	1428	1416
5.0	1482	1422	1386	1353	1337
7.5	1465	1380	1322	1277	1258
10.0	1443	1333	1257	1203	1182
12.5	1414	1283	1192	1130	1107
15.0	1381	1231	1128	1060	1037
17.5	1341	1176	1064	992	969
20.0	1297	1120	1001	928	904
22.5	1250	1063	941	867	843
25.0	1198	1006	882	808	785
27.5	1143	949	826	752	730
30.0	1085	892	771	699	678
32.5	1026	836	719	649	628
35.0	965	781	668	601	581
37.5	904	728	621	556	538
40.0	842	675	575	513	496
42.5	781	625	531	473	457
45.0	721	577	490	435	420
47.5	663	531	450	399	386
50.0	607	487	412	365	353
52.5	553	445	375	333	322
55.0	501	404	341	302	292
57.5	451	365	307	272	263
60.0	402	327	275	244	236
62.5	356	290	244	216	209
65.0	311	255	214	190	183
67.5	268	221	185	164	157
70.0	228	187	157	139	133
72.5	188	155	130	115	110
75.0	151	125	104	92	87
77.5	117	96	80	70	66
80.0	85	70	58	50	47
82.5	57	46	38	32	30
85.0	33	26	20	17	15
87.5	15	10	6	3	3
90.0	0	0	0	0	0



Test Report No. LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%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: LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,

formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below. One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)

Coefficients Of Utilization - Zonal Cavity Method

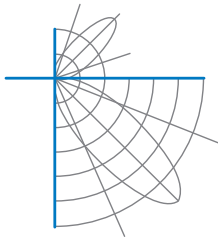
Effective Floor Cavity Reflectance 0.20

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	111	111	111	106	106	106	102	102	102	100
1	110	106	102	98	107	103	100	97	99	96	94	95	93	91	92	90	88	86
2	101	93	87	82	98	92	86	81	88	83	79	85	81	77	82	79	76	74
3	93	83	76	70	90	82	75	69	79	73	68	76	71	67	73	69	66	63
4	86	74	66	60	83	73	65	60	71	64	59	68	63	58	66	61	57	55
5	79	67	59	52	77	66	58	52	64	57	52	62	56	51	60	55	51	49
6	73	61	52	46	72	60	52	46	58	51	46	57	50	45	55	49	45	43
7	68	56	47	41	67	55	47	41	53	46	41	52	45	41	51	45	40	39
8	64	51	43	37	62	50	43	37	49	42	37	48	41	37	47	41	37	35
9	60	47	39	34	58	46	39	34	45	38	34	44	38	33	43	38	33	32
10	56	44	36	31	55	43	36	31	42	35	31	41	35	31	40	35	30	29

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	41.6	6.48	6.59
8.0	23.4	8.64	8.79
10.0	15.0	10.80	10.99
12.0	10.4	12.96	13.19
14.0	7.6	15.12	15.39
16.0	5.9	17.29	17.59



Test Report No. LLIA000998-002A

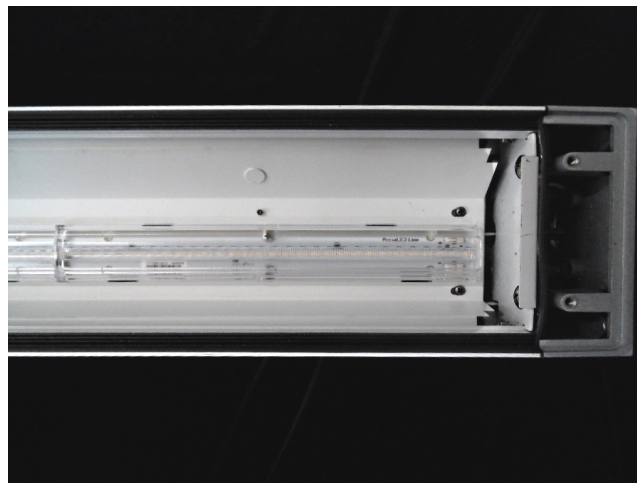
Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)





Test Report No. LLIA000998-002A

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
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One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

120.0Vac, 60.00Hz, 0.2894A, 34.63W, 0.997PF, 5.9%THD(i)

Test Distance 9.5 m
Test Temperature 25.1 °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

LLIA000998-002B

Integrating Sphere Report

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.



Performance Summary

Voltage	120.0 Vac
Current	0.2893 A
Power	34.61 W
Frequency	59.97 Hz
Power Factor	0.997
Current THD	5.9 %

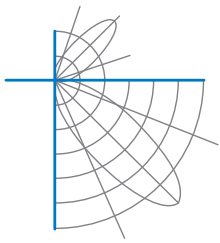
Total Luminous Flux	3334.9 lm
Efficacy	96.4 lm/W
Chromaticity (x,y)	(0.3775, 0.3746)
(u',v')	(0.2240, 0.5002)
Duv	-0.0001
CCT	4065 K
CRI (Ra)	83
R9	17
TM-30: Rf	82
TM-30: Rg	96

Prepared For:

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

Test date: 07/11/2018

Report date: 07/13/2018



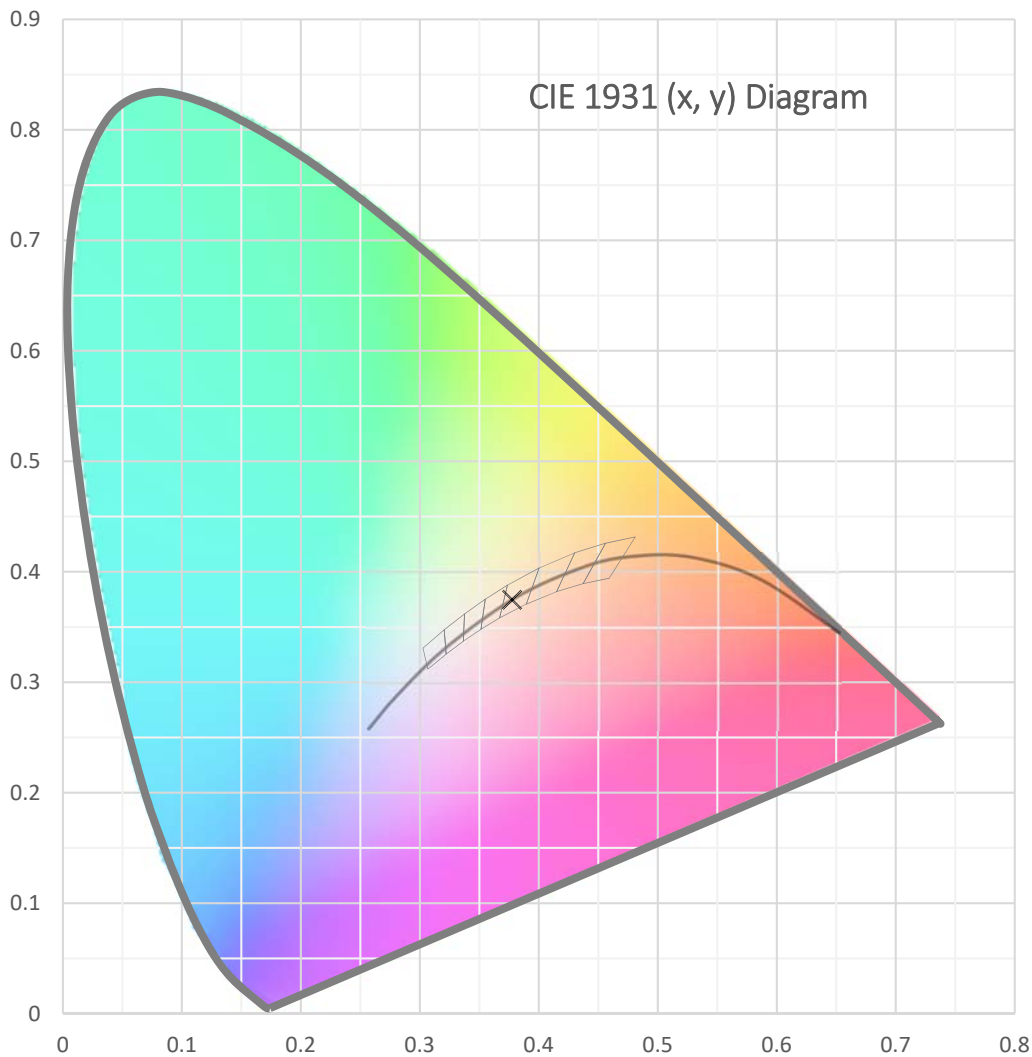
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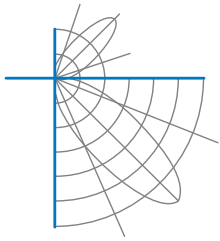
Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.





Test Report Number: LLIA000998-002B

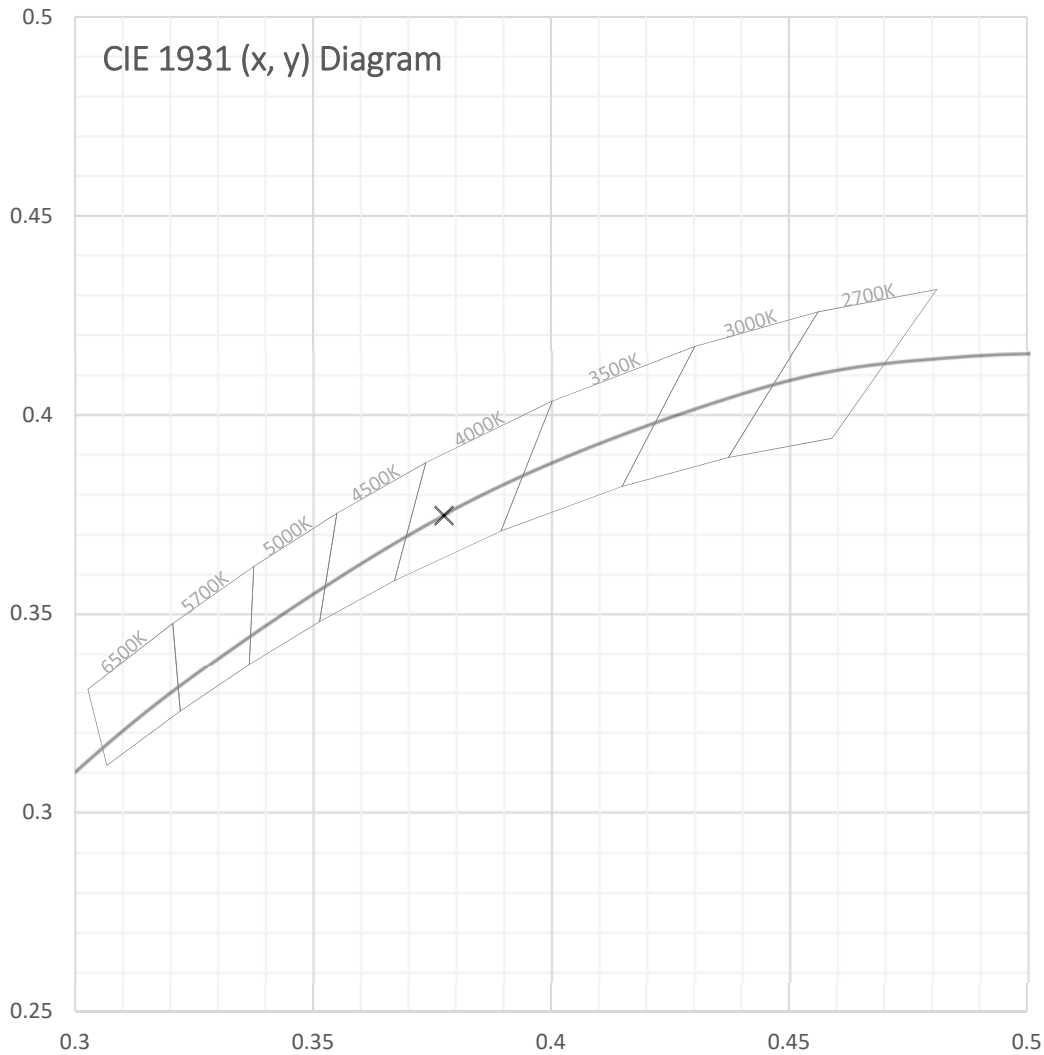
Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,

formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.





Test Report Number: LLIA000998-002B

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,

formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

Spectral Data	Total Radiant Flux	10.37 W
	Total Luminous Flux	3334.9 Lm
	Chromaticity CIE 1931 (x, y)	(0.3775, 0.3746)
	Chromaticity CIE 1976 (u', v')	(0.2240, 0.5002)
	Correlated Color Temperature (CCT)	4065 K
	Color Rendering Index (Ra)	83
	R1	82
	R2	89
	R3	93
	R4	82
	R5	81
	R6	83
	R7	88
	R8	68
	R9	17
	R10	72
	R11	81
	R12	58
	R13	84
	R14	96
	TM-30: Rf	82
	TM-30: Rg	96
	Distance from Planckian Locus (Duv)	-0.0001
	Scotopic/Photopic Ratio *	1.690

Electrical Data

Voltage	120.0 Vac
Current	0.2893 A
Power	34.61 W
Frequency	59.97 Hz
Power Factor	0.997
Current THD	5.9 %



Test Report Number: LLIA000998-002B

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

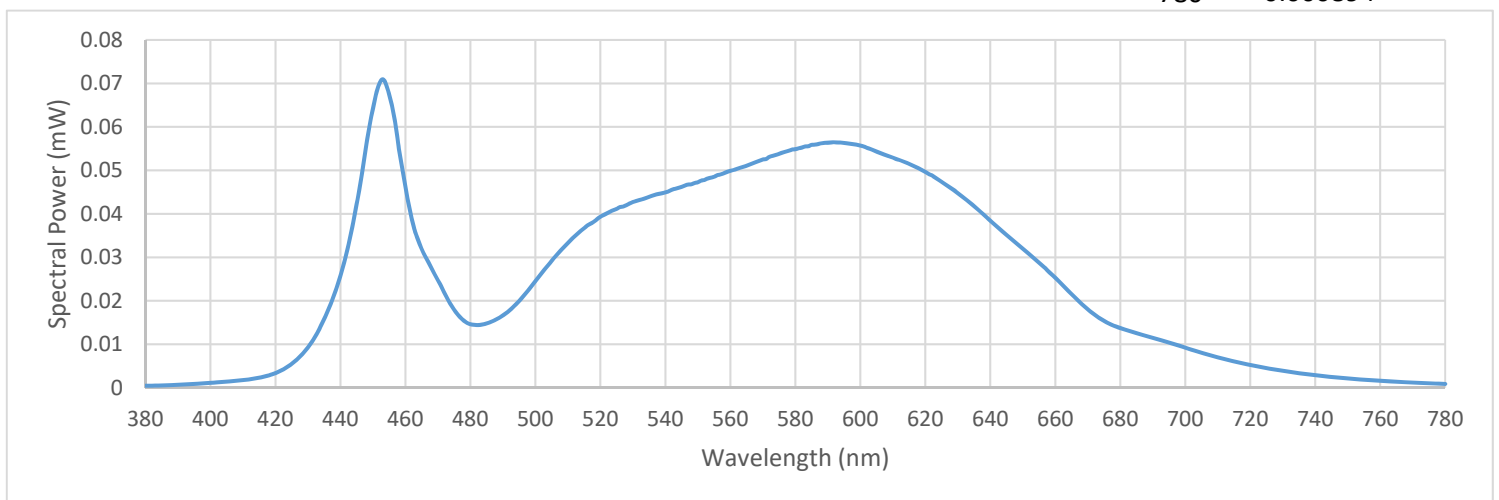
Pendant mounted, extruded white enamel aluminum housing,
formed white enamel aluminum reflector tray, frosted plastic enclosure.

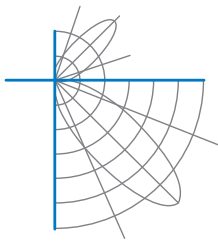
120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 DIM L LED driver labeled as 720mA.

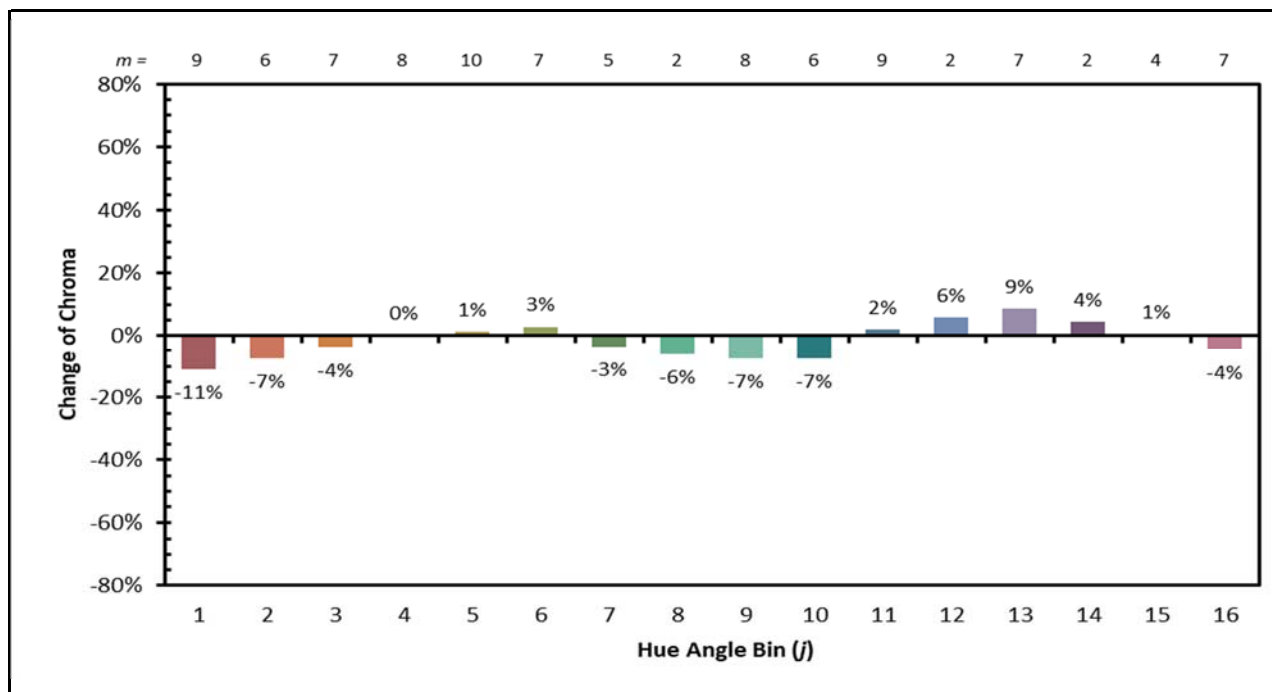
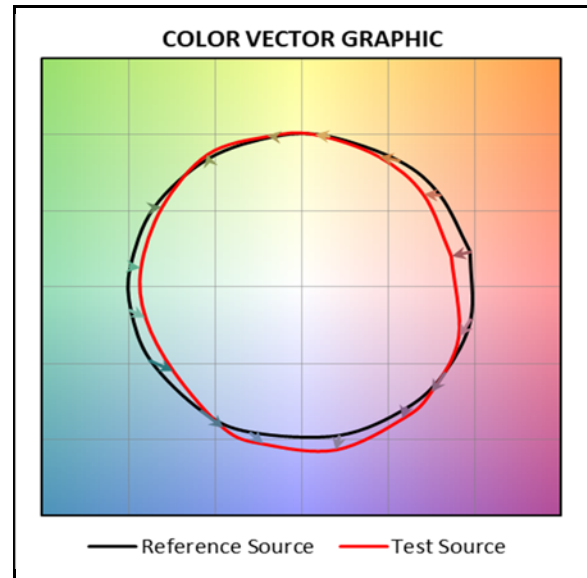
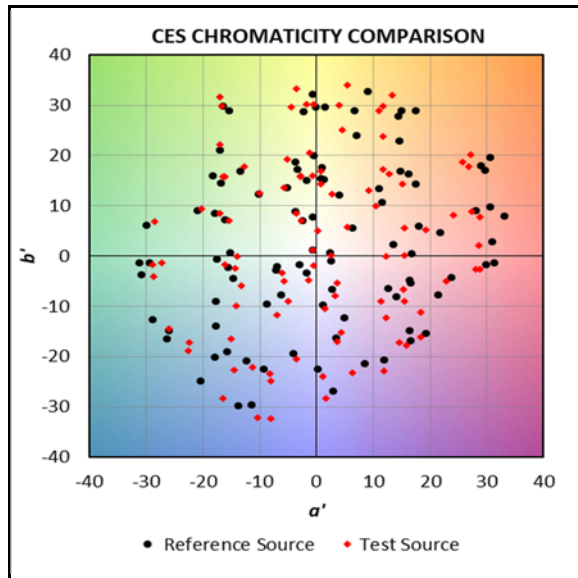
Summary Spectral Power Distribution (wavelength - nm, spectral power - mW)

380	0.000475	480	0.014609	580	0.054854	680	0.013683
385	0.000534	485	0.014839	585	0.055865	685	0.012569
390	0.000693	490	0.016628	590	0.056337	690	0.011506
395	0.000888	495	0.019947	595	0.056269	695	0.010369
400	0.001128	500	0.024578	600	0.055671	700	0.009223
405	0.001420	505	0.029179	605	0.054317	705	0.008040
410	0.001758	510	0.033278	610	0.052970	710	0.006966
415	0.002313	515	0.036677	615	0.051512	715	0.006060
420	0.003401	520	0.039350	620	0.049606	720	0.005264
425	0.005458	525	0.041141	625	0.047322	725	0.004528
430	0.009362	530	0.042706	630	0.044697	730	0.003909
435	0.015785	535	0.043896	635	0.041803	735	0.003353
440	0.025778	540	0.044943	640	0.038406	740	0.002867
445	0.042261	545	0.046205	645	0.035203	745	0.002479
450	0.064233	550	0.047267	650	0.031982	750	0.002143
455	0.067439	555	0.048530	655	0.028729	755	0.001855
460	0.046305	560	0.049874	660	0.025358	760	0.001610
465	0.031859	565	0.051075	665	0.021567	765	0.001392
470	0.024719	570	0.052505	670	0.018037	770	0.001196
475	0.017937	575	0.053777	675	0.015386	775	0.001034
						780	0.000894





IES TM-30 Summary





Test Report Number: LLIA000998-002B

Catalog Number: ML5WL-D-HO-ASY-K40-4-X-VR-X

Pendant mounted, extruded white enamel aluminum housing,

formed white enamel aluminum reflector tray, frosted plastic enclosure.

120 White LEDs, two Osram PrevaLED Line boards with 60 LEDs each, prismatic plastic optics below.

One Osram Optotronic OTi 50/120-277/1A 4 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: 24.8 °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.