



# IESNA LM79-2008 Test Report

TÜV SÜD America

## Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

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**Sample Tested:** MLLWP60LED50-150  
**Sample Description:** LED Outdoor Wall Pack  
**Manufacturer:** Maxlite, Inc.

**Technical Report Number:** JI1309102-03-LM79  
**Report Issue Date:** October 1<sup>st</sup> 2013  
**Total Number of Pages:** 9 (including this page)

**Report Prepared by:**

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**Report Reviewed by:**

**Bryan Cubitt**  
TÜV SÜD Program Manager



# IESNA LM79-2008 TEST REPORT

October 1, 2013

## Summary of Key Test Results

Model# **MLLWP60LED50-150**

Manufacturer **Maxlite, Inc.**

TÜV Sample# 930-3

Date of Test September 12<sup>th</sup> 2013

Notes: Tested in intended orientation  
(Horizontal)



<b>Parameter</b>	<b>Measured Result</b>
Luminous Flux	<b>4,870 Lumens</b>
Input Power	<b>55.30 Watts</b>
Efficacy	<b>88.07 Lumens/Watt</b>
C.C.T.	<b>5372 K</b>
C.R.I. (R <sub>a</sub> )	<b>86.7</b>
Beam Angle	<b>83.3°</b>
Stabilization Time	<b>70 minutes</b>
In-Situ Temp Test (ISTMT)**	<b>58.4°C</b>

The above results are recorded / derived from measurements in accordance with LM79-08

\*\*ISTMT in accordance with “Energy Star Program Requirements for Luminaires – Version 1.2”.



# IESNA LM79-2008 TEST REPORT

October 1, 2013

## TABLE OF CONTENTS

Test Results ..... 4

Spectral Flux and Chromaticity Diagram ..... 5

Zonal Lumen Summary ..... 5

Illuminance Plots ..... 6

Candela Plots ..... 6

Candela Tabulation ..... 7

ISTMT Temperature Measurement ..... 8

Photometric Testing Information ..... 9

Equipment List: ..... 10



# IESNA LM79-2008 TEST REPORT

October 1, 2013

## Test Results –

The following results were obtained after stabilization of the sample in accordance with the requirements set forth in section 5.0 of IES LM79-2008. Stability is achieved when the variation of 3 readings of light output and electrical power over a period of 30 minutes, taken 15 minutes apart, is less than 0.5%.

Photometric Results	Maxlite- MLLWP60LED50-150	
	Integrating Sphere	Goniophotometer
Total Luminous Flux (Lumens)	4,870	4,967
Luminous Efficacy (Lumens/Watt)	88.07	89.59
Total Radiant Flux (Watts)	16.3	-
Correlated Color Temperature (CCT)	5372	-
Color Rendering Index (CRI – R <sub>a</sub> )	86.7	-
R <sub>9</sub> Value	35.6	-
Chromaticity (Chroma x / Chroma y)	0.3353 / 0.3419	-
Chromaticity (Chroma u / Chroma v)	0.2085 / 0.3189	-
Chromaticity (Chroma u' / Chroma v')	0.2085 / 0.4784	-
D <sub>uv</sub> Value	0.0001	-

Electrical Results (120V unless stated otherwise)	Maxlite- MLLWP60LED50-150	
	Integrating Sphere	Goniophotometer
Input Power (Watts)	55.30	55.44
Input Voltage (Volts AC)	120.02	119.99
Input Current (Amps)	0.461	0.460
Power Factor @120VAC	0.997	0.998
Power Factor @277VAC	0.971	N/A
Input Frequency (Hertz)	60.0	60.0
A-THD @120VAC (Current %)	4.45 %	4.34 %
A-THD @277VAC (Current %)	13.45 %	N/A

Additional Parameters	Maxlite- MLLWP60LED50-150	
	Integrating Sphere	Goniophotometer
Stabilization Time (Light and Power)	75 minutes	71 minutes
Test Geometry Configuration	4π	Type C
Ambient Temperature	25.2°C	25.3°C
ISTMT (In-Situ Temperature Measurement)	58.4°C	
Spacing Criteria	1.96 (0° – 180°) / 1.14 (90° – 270°)	

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Page 4

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Report# JI1309102-03-LM79

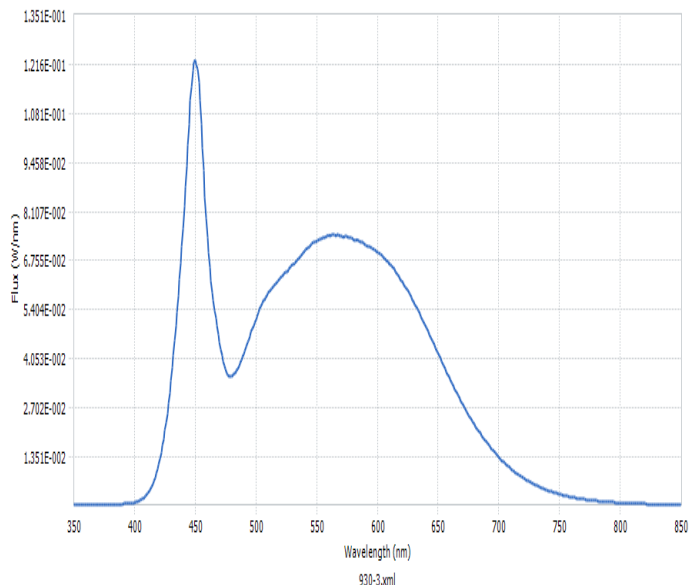
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## Spectral Flux and Chromaticity Diagram

### Spectral Flux

### Chromaticity Diagram

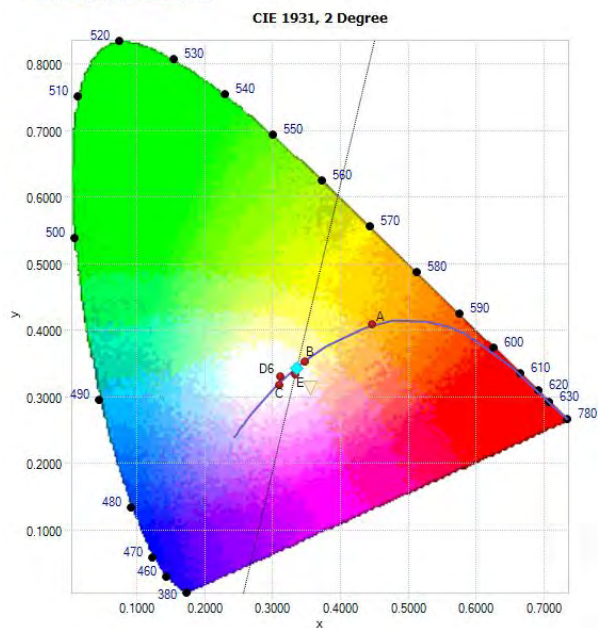
▼ SPECTRAL FLUX GRAPH:



Spectral response of the Radiant Flux

(350nm to 850nm)

▼ CHROMATICITY DIAGRAM:



Tristimulus values (from page 5):

$x / y = 0.3353 / 0.3419$

The locations on the diagram of the tristimulus coordinates are indicated by the blue diamond.

## Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	2,985.3	60.1 %
60 - 90	1,506.7	30.3 %
0 - 90	4,492.0	90.4 %
90 - 180	475.0	9.6 %
0 - 180	4,967.0	100 %

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Page 5

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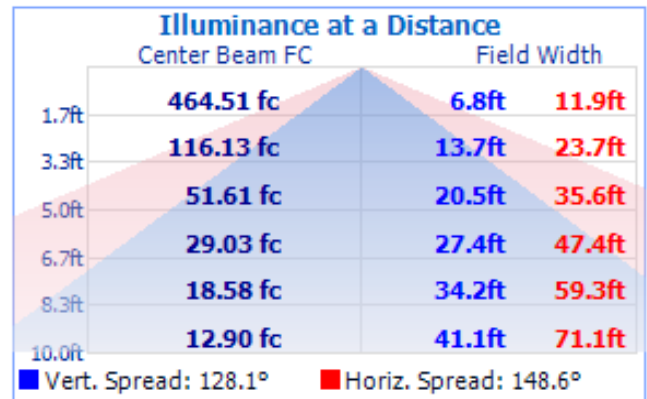
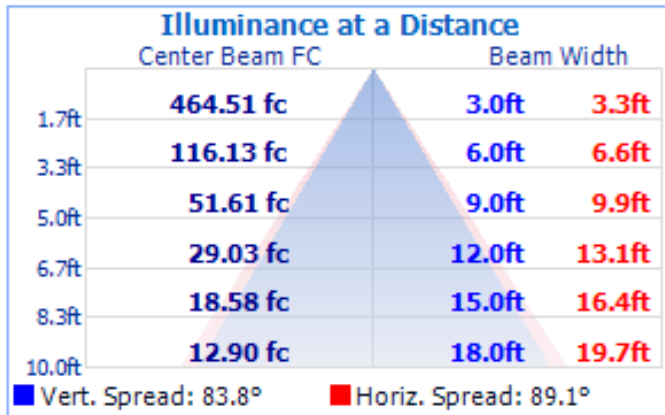


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October 1, 2013

## Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.

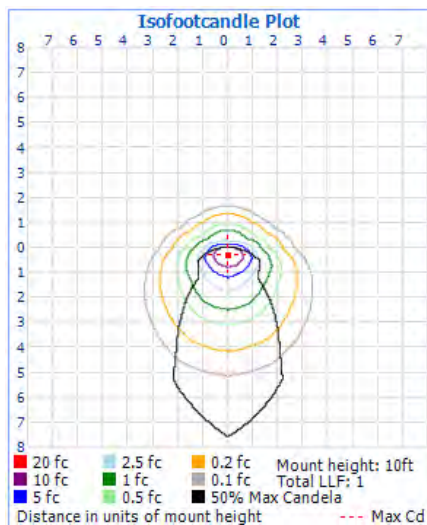


Beam Angle = 83.8°

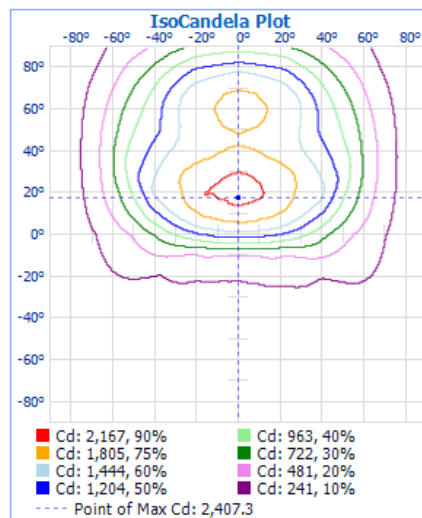
Field Angle = 128.1°

## Test Results – Candela Plots

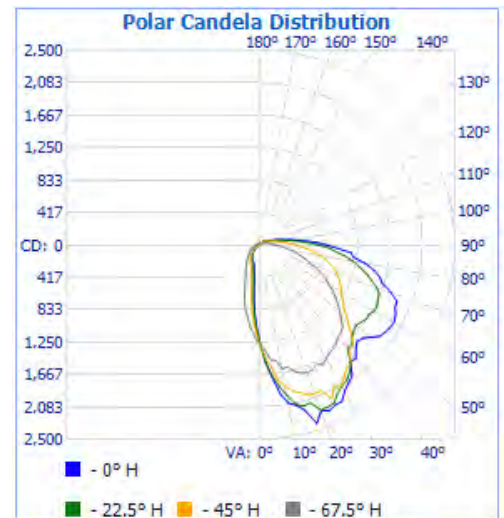
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela



# IESNA LM79-2008 TEST REPORT

October 1, 2013

## Test Results – Candela Tabulation

The table below displays the tabulated Candela measurements from the IES file:

Horizontal (lateral) angles are shown in **red** across the top of the table, in increments of 22.5°.

Vertical (longitudinal) angles are shown in **blue** down the side of the table, in increments of 2.5°.

	0.0	22.5	45.0	67.5	90.0	112.5	135.0	157.5	180.0	202.5	225.0	247.5	270.0	292.5	315.0	337.5	360.0
0.0	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290	1290
2.5	1516	1520	1461	1362	1282	1198	1157	1120	1080	1102	1167	1226	1321	1390	1462	1494	1516
5.0	1712	1687	1571	1480	1325	1154	972	914	870	922	985	1129	1288	1429	1604	1702	1712
7.5	1930	1834	1767	1502	1260	1028	862	683	644	703	853	1053	1282	1528	1718	1913	1929
10.0	2066	1971	1839	1619	1270	958	665	497	458	509	684	956	1281	1589	1880	1999	2066
12.5	2112	2101	1932	1605	1260	848	529	403	373	407	539	873	1258	1639	1880	2034	2110
15.0	2203	2145	1960	1686	1194	758	423	340	311	348	443	784	1230	1698	1984	2108	2201
17.5	<b>2407</b>	2130	2024	1729	1197	654	371	292	273	303	388	685	1206	1741	1998	2165	2406
20.0	2272	2262	2036	1751	1147	551	326	262	252	273	343	591	1169	1738	2014	2268	2271
22.5	2307	2257	2034	1739	1097	485	291	245	236	254	311	520	1138	1728	2054	2251	2305
25.0	2272	2243	2178	1695	1068	427	271	232	226	240	287	460	1100	1735	2091	2174	2271
27.5	2268	2145	2044	1733	1020	386	250	222	222	228	268	414	1057	1718	2029	2163	2268
30.0	2166	2096	2091	1688	964	351	236	216	218	221	253	381	1010	1675	2031	2071	2165
32.5	2107	2063	2004	1647	912	322	224	208	214	213	238	349	957	1655	1939	2034	2108
35.0	2055	1996	1932	1630	861	298	211	198	199	201	224	323	903	1611	1911	1981	2055
37.5	1893	1912	1914	1594	803	277	199	186	185	190	211	298	847	1584	1829	1865	1893
40.0	1908	1736	1774	1550	741	255	185	169	162	173	198	273	783	1588	1785	1777	1908
42.5	1812	1742	1761	1534	684	233	171	150	147	157	182	251	717	1541	1700	1730	1812
45.0	1756	1668	1672	1490	623	214	158	140	133	144	169	230	658	1456	1614	1655	1755
47.5	1778	1627	1538	1402	567	196	145	125	126	132	154	212	605	1382	1468	1656	1778
50.0	1848	1606	1446	1332	513	181	131	115	118	120	140	196	556	1308	1388	1634	1848
52.5	1934	1632	1350	1254	467	168	119	106	108	111	128	182	512	1213	1335	1678	1934
55.0	1959	1661	1298	1177	426	157	107	95	98	101	116	171	473	1147	1274	1705	1959
57.5	1980	1659	1242	1100	386	147	96	83	88	89	104	160	436	1056	1236	1718	1980
60.0	1985	1694	1197	1011	350	135	85	73	76	77	92	148	398	972	1204	1730	1985
62.5	1959	1692	1166	946	314	125	74	62	62	66	82	137	360	896	1168	1732	1960
65.0	1909	1663	1125	866	282	113	64	50	46	54	71	124	322	788	1138	1705	1909
67.5	1899	1648	1088	755	251	101	54	36	33	40	61	112	285	722	1095	1686	1899
70.0	1780	1586	1040	679	220	89	44	23	18	26	52	99	246	651	1044	1604	1782
72.5	1638	1487	991	602	189	77	35	12	15	19	42	86	209	578	990	1498	1639
75.0	1585	1407	918	531	158	66	26	12	15	19	35	75	171	508	922	1414	1585
77.5	1489	1295	852	461	128	55	21	12	15	19	32	65	136	442	847	1303	1490
80.0	1364	1204	766	396	101	46	20	12	15	19	31	56	107	375	766	1210	1365
82.5	1203	1088	691	334	78	39	18	12	15	19	29	50	84	316	685	1079	1204
85.0	1167	967	613	276	59	35	17	13	15	19	28	47	66	264	598	985	1168
87.5	982	880	528	226	44	32	17	13	15	19	27	45	54	220	518	870	983
90.0	845	739	449	186	36	30	16	13	15	19	26	43	48	186	445	725	848

Maximum Candela = **2,407** at Horizontal: 17.5°, Vertical: 0.0°

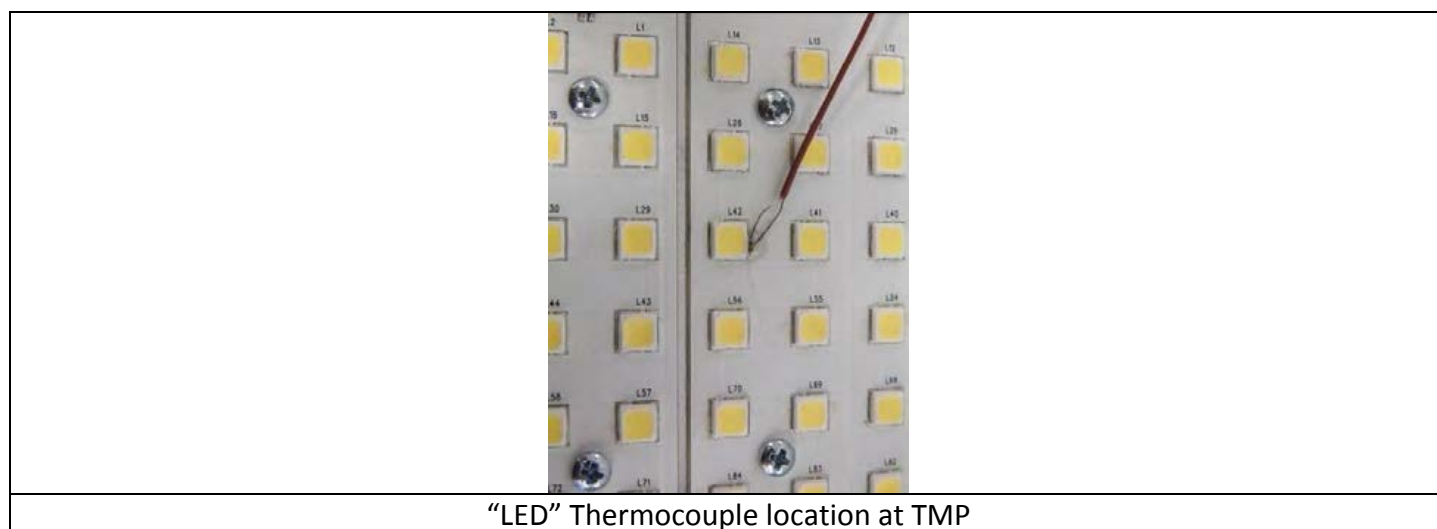


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## ISTMT Temperature Measurement

ISTMT temperature measurement at thermal stabilization (8 hours continuous operation). Thermocouple locations (shown below) are in accordance with manufacturers recommended / stated guidelines for TMP - Temperature Measurement Point.



## Test Results for MLLWP60LED50-150

<b>LED TMP Temperature @ 120V</b>	<b>58.4°C</b>
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Reported temperatures are maximum temperatures. All temperatures are normalized to 25°C ambient.

## Test Equipment

Description	Manufacturer / Model#	TÜV SÜD Ref#	Calibration Due Date
Thermometer	Fluke 52-II	ATLE0008	11/17/2013
Power Analyzer	Yokogawa WT210	ATLE0058	3/7/2014
Power Source	Chroma 61602	AC003	N/A

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## TÜV SÜD Photometric Testing Information

Testing is performed in accordance with the procedures outlined in IESNA LM79-2008. The sample is evaluated for photometric and electrical characteristics using an integrating sphere and a goniophotometer, located in an accredited, temperature and humidity-controlled, draft free photometric laboratory.

### *Sphere Geometry*

The integrating spheres used for measurement utilize a “ $4\pi$  geometry” configuration in accordance with section 9 of IES LM-79-2008 and is applicable for all types of SSL products (directional and non-directional light projections). The spectroradiometer is an array-type detector manufactured and calibrated by Labsphere (Model# CDS1100).

### *Self-Absorption Correction*

The integrating sphere uses self-absorption correction to eliminate errors due to mismatches between the standard reference lamp and the test samples being measured. This auxiliary correction lamp is a halogen type lamp powered by a calibrated Lamp Power Supply manufactured and calibrated by Labsphere (model LPS150). Ambient temperature is measured using a thermocouple located inside the integrating sphere at the same height as the sample under test (UUT) and not more than 1 meter in horizontal distance away from the sample (section 2.2 of LM79-2008). The thermocouple is located behind a baffle in order to eliminate any direct optical radiation from the sample under test.

### *Sample Stabilization*

The sample (UUT) is placed inside the integrating sphere and powered by a regulated and conditioned alternating or direct current supply. The stabilization times shown on the results pages of this report denote the time of the 3<sup>rd</sup> measurement (of the 3 consecutive readings) since this is the minimum time that the sample is assumed to have taken to reach stabilization in accordance with section 5.0 of LM79-2008.

### *Sphere Calibration*

The integrating sphere is calibrated using a quartzline halogen lamp with the following specifications:

Manufacturer: EYE Lighting International

Model# J94/JD28V75W

Voltage = 28.0 Volts DC

Wattage = 75.0 Watts

Calibration Current = 2.679 Amperes

Luminous Flux = 1685 Lumens

Calibration Date = 2-17-2011 (calibrated by Labsphere – NIST traceable).

Continued.....

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Page 9

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## TÜV SÜD Photometric Testing Information (continued)

### Goniophotometer

The Goniophotometer is a Mirror based Type C optical measurement system in accordance with section 9.3.1 of IESNA LM79-2008.

### Goniophotometer Calibration

The Goniophotometer is calibrated using a frosted tungsten filament FDS/DZE lamp with the following specifications:

- Manufacturer: General Electric
- Part Number: CSB-110
- Lamp Number: 112-A
- Voltage: 16.52 Volts DC
- Wattage: 150.0 Watts
- Calibration Current: 4.816 Amperes
- Luminous Intensity: 151.5 Candelas
- Calibration Date: 02-13-2011 (NIST traceable)

## TÜV SÜD Test Equipment List:

TÜV SÜD Sphere System – contains the following:			
Description	Manufacturer / Model#	TÜV SÜD Ref#	Calibration Due Date
Integrating Sphere	Labsphere LM760	SPH003	weekly
Spectroradiometer	Labsphere CDS1100	ATLE0048	9/7/2016
Power Analyzer	Yokogawa WT210	ATLE0058	3/7/2014
Power Source	Chroma 61602	AC003	N/A
Thermometer	Fluke 52-II	ATLE0008	11/17/2014
TÜV SÜD Mirror Goniophotometer System – contains the following:			
Goniophotometer	M.E. GONC02	GON002	Weekly
Spectroradiometer	Gigahertz Optik P9801	GIG002	Weekly
Power Analyzer	Yokogawa WT210	ATLE0031	11/16/2014
Power Source	Chroma 61603	AC007	N/A

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Page 10  
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