



# 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:** ELLF180UM50  
**Sample Description:** Architectural Flood and Spot Luminaires  
**Manufacturer:** Maxlite, Inc.

**Technical Report Number:** JI1404143-01-LM79  
**Report Issue Date:** April 25<sup>th</sup>, 2014  
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April 25, 2014

## Summary of Key Test Results

Model# **ELLF180UM50**

Manufacturer **Maxlite, Inc.**

TÜV Sample# 1307-1

Date of Test April 18<sup>th</sup> 2014

Notes: Tested in intended orientation  
(Horizontal)



<b>Parameter</b>	<b>Measured Result</b>
Luminous Flux	<b>18,000 Lumens</b>
Input Power	<b>177.51 Watts</b>
Efficacy	<b>101.4 Lumens/Watt</b>
C.C.T.	<b>5747 K</b>
C.R.I. (R <sub>a</sub> )	<b>75.8</b>
Beam Angle	<b>58.1°</b>
Stabilization Time	<b>60 minutes</b>
In-Situ Temp Test (ISTMT) **	<b>82.6°C (LED)</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”.



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**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- ELLF180UM50	
	Integrating Sphere	
Total Luminous Flux (Lumens)	18,000	
Luminous Efficacy (Lumens/Watt)	101.40	
Total Radiant Flux (Watts)	56.1	
Correlated Color Temperature (CCT)	5747	
Color Rendering Index (CRI – R <sub>a</sub> )	75.8	
R <sub>9</sub> Value	-24.3	
Chromaticity (Chroma x / Chroma y)	0.3268 / 0.3437	
Chromaticity (Chroma u / Chroma v)	0.2020 / 0.3187	
Chromaticity (Chroma u' / Chroma v')	0.2020 / 0.4780	
D <sub>uv</sub> Value	0.00390	

Electrical Results (120V unless stated otherwise)	Maxlite- ELLF180UM50	
	Integrating Sphere	
Input Power (Watts)	177.51	
Input Voltage (Volts AC)	120.01	
Input Current (Amps)	1.485	
Power Factor @120VAC	0.996	
Power Factor @277VAC	0.936	
Input Frequency (Hertz)	60.0	
A-THD @120VAC (Current %)	5.57 %	
A-THD @277VAC (Current %)	10.75 %	

Additional Parameters	Maxlite- ELLF180UM50	
	Integrating Sphere	Goniophotometer
Stabilization Time (Light and Power)	60 minutes	51 minutes
Test Geometry Configuration	4π	Type C
Ambient Temperature	25.4°C	25.2°C
ISTMT (In-Situ Temperature Measurement)	82.6°C (LED)	
Spacing Criteria	0.90 (0° – 180°) / 0.88 (90° – 270°)	



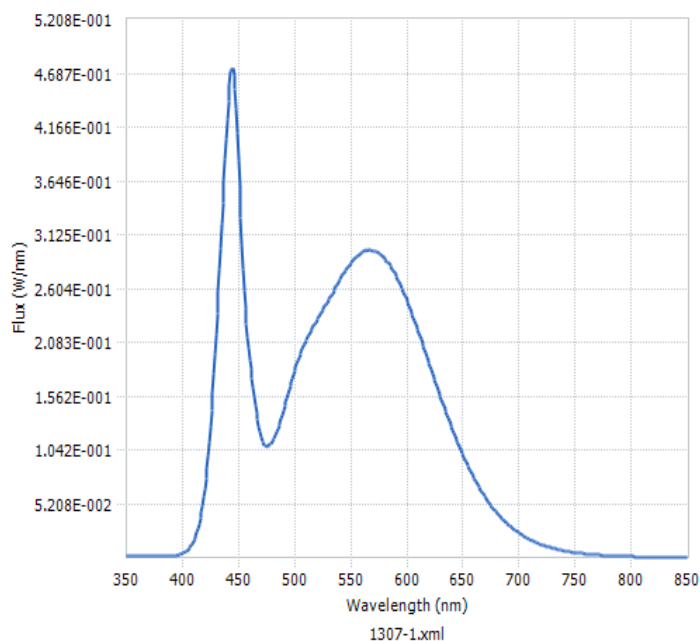
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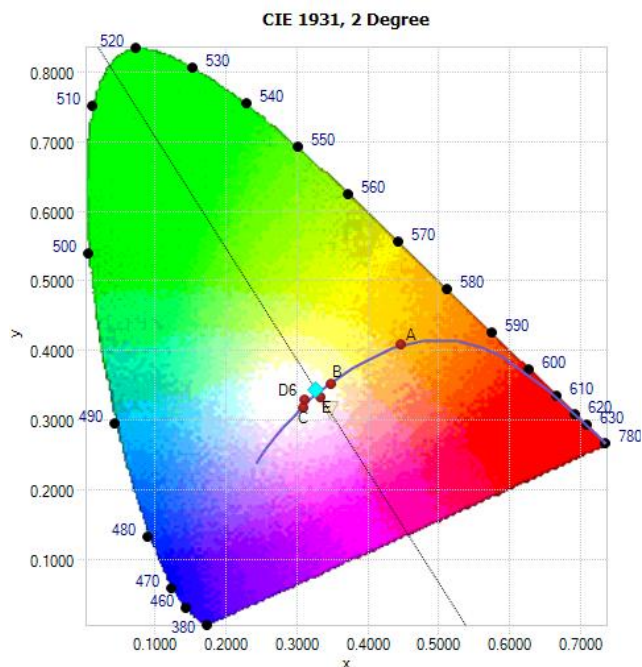
## Spectral Flux and Chromaticity Diagram

### Spectral Flux



**Spectral response of the Radiant Flux  
(350nm to 850nm)**

### Chromaticity Diagram



**Tristimulus values (from page 4):**

**$x / y = 0.3268 / 0.3437$**

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

## Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0 - 60	17,948.6	98.6 %
60 - 90	263.3	1.4 %
0 - 90	18,211.9	100 %
90 - 180	0.0	0.0 %
0 - 180	18,211.9	100 %

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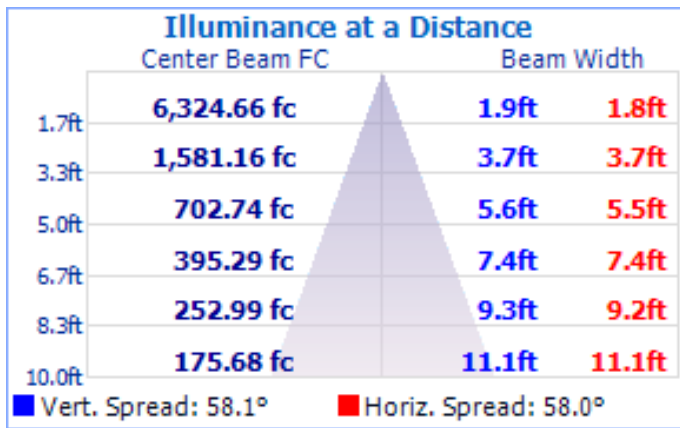


# IESNA LM79-2008 TEST REPORT

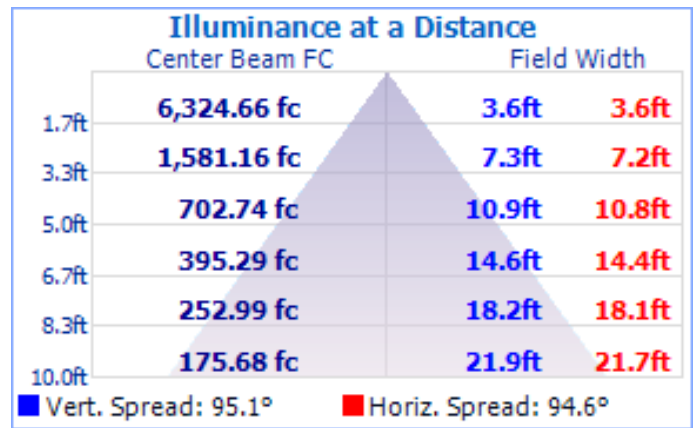
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## Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.



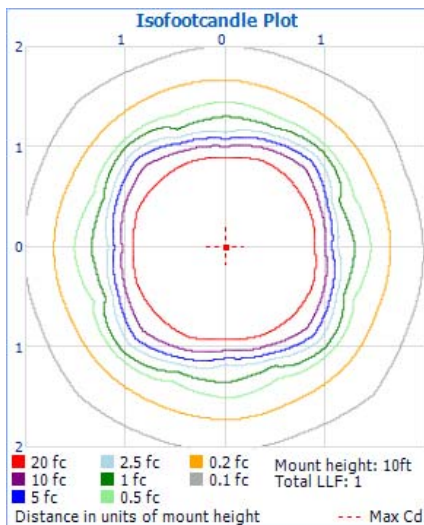
Beam Angle = 58.1°



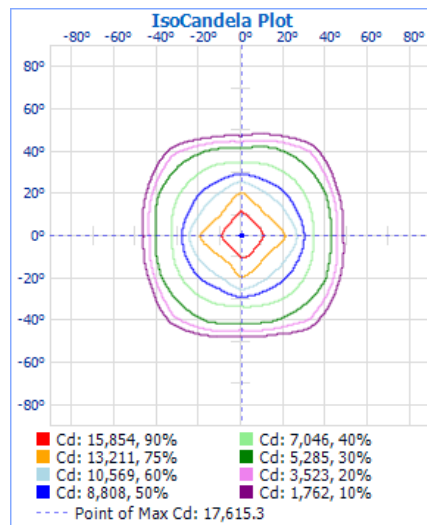
Field Angle = 95.1°

## Test Results – Candela Plots

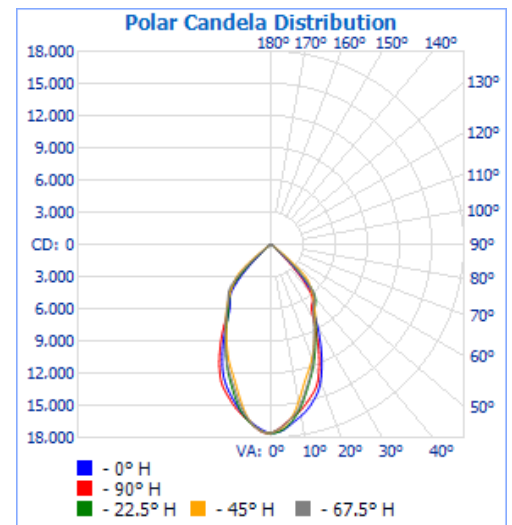
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

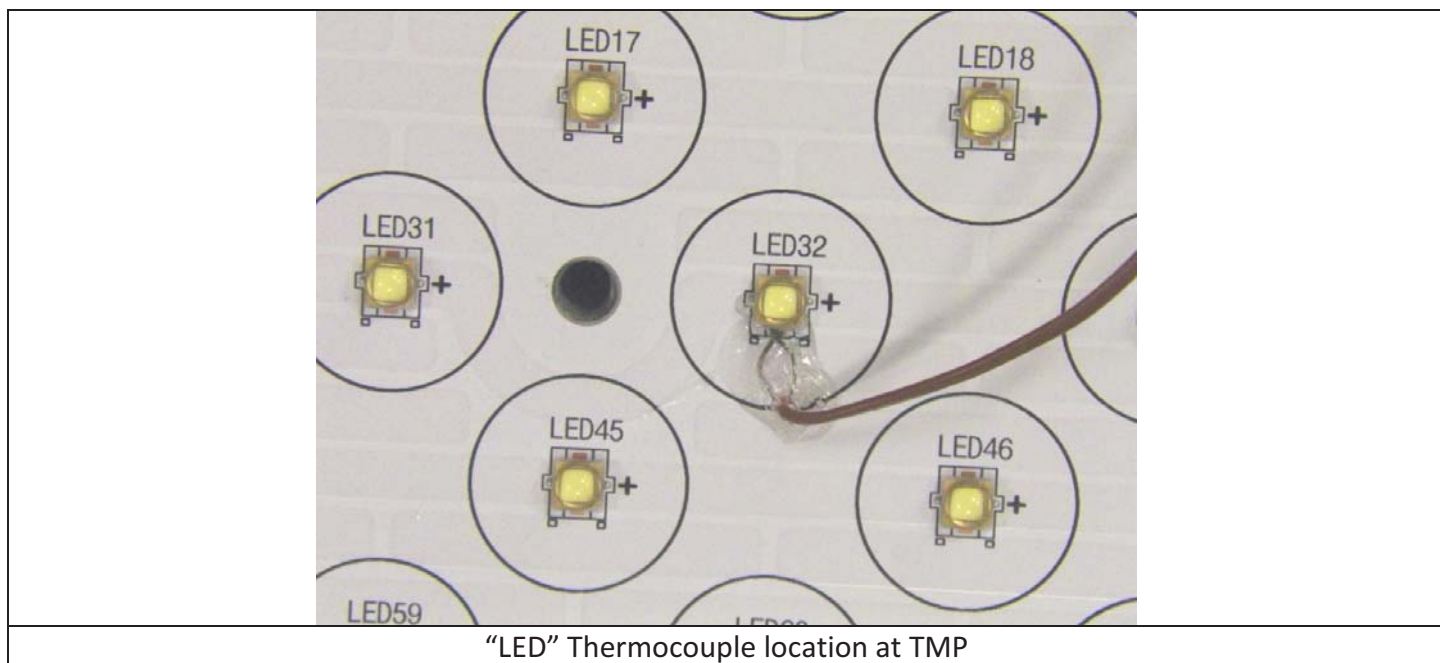
Maximum Candela = 17,615.3 at Horizontal: 270.0°, Vertical: 1.0°

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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 Maxlite- ELLF180UM50

<b>LED TMP Temperature</b>	<b>82.6°C</b>
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All temperatures are normalized to 25°C ambient.

## Test Equipment

Description	Manufacturer / Model#	TÜV SÜD Ref#	Calibration Due Date
Thermometer	Fluke 52-II	ATLE0118	1/16/2015



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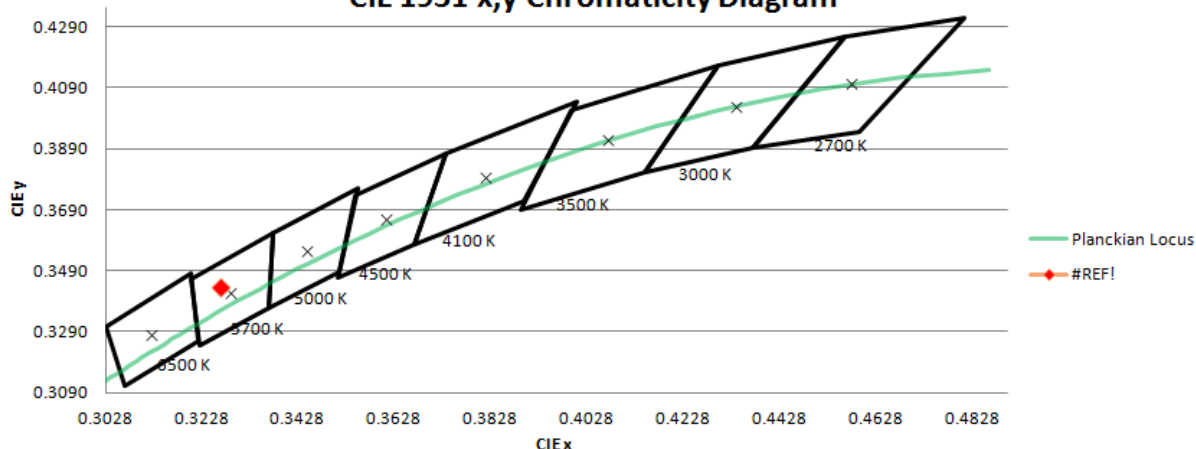
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## Addendum A (DLC Program Results) –

DesignLights Consortium Product Qualification Criteria, Technical Requirements Table, v2.1

08	Architectural Flood and Spot Luminaires	Nominal Requirements	Tolerance	Actual Requirement	Measured Results
	Minimum Light Output	1,000 lm	-10%	<b>900 lm</b>	<b>18,000 lm</b>
	Zonal Lumen Requirements	≥85%: 0-90°	-3%	<b>≥82%</b>	<b>100%</b>
	Minimum Luminaire Efficacy	75 lm/W	-3%	<b>72.75 lm/W</b>	<b>101.4 lm/W</b>
	Allowable CCTs (ANSI C78.377-2008)	≤5700K	Defined by ANSI C78.377	<b>≤5700K</b>	<b>5747 (ANSI max = 6020)</b>
	Minimum CRI	65	-2 points	<b>63</b>	<b>75.8</b>
	L70 Lumen Maintenance	50,000 hrs	None	<b>50,000 hrs</b>	
	Minimum Luminaire Warranty	5 years	None	<b>5 Years</b>	
	Power Factor 120 / 277VAC	≥ 0.9	-3%	<b>0.873</b>	<b>0.996 / 0.936</b>
	Total Harmonic Distortion (THD-A%)	≤20%	+5%	<b>25%</b>	<b>5.57 / 10.75</b>

**CIE 1931 x,y Chromaticity Diagram**







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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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## 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	9/7/2014
Power Analyzer	Yokogawa WT210	ATLE0032	11/21/2014
Power Source	Chroma 61602	AC003	N/A
Thermometer	Fluke 52-II	ATLE0118	1/16/2015
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	11/21/2014
Power Source	Chroma 61603	AC007	N/A

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