



# IESNA LM79-2008 TEST REPORT

TÜV SÜD America, Inc.

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

Report Prepared for:

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<b>Model Tested:</b>	<b>ELLF1804N50</b>
<b>Model Description:</b>	<b>LED HIGH OUTPUT FLOOD</b>
<b>Manufacturer:</b>	<b>MaxLite</b>
<b>Technical Report Number:</b>	<b>72121499-01-LM79</b>
<b>Report Issue Date:</b>	<b>November 4, 2016</b>
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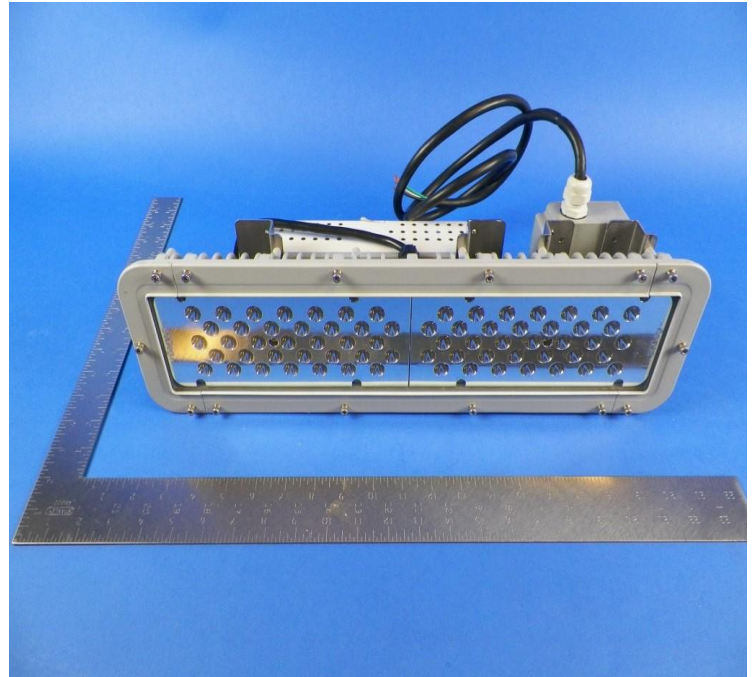
**Bryan Cubitt**

TÜV SÜD Operations Manager



## Summary of Key Test Results

Model# **ELLF1804N50**  
 Manufacturer **MaxLite**  
 TÜV Sample# **2499-1**  
 Date of Test **November 3, 2016**



### Notes:

Tested in intended orientation  
 (Aperture Down)  
 Driver Model#  
 Fine Technix PSU185H-4836W

Parameter	Measured Result
Luminous Flux (Lumens)	<b>19,040</b>
Input Power (Watts)	<b>173.92</b>
Efficacy (Lumens/Watt)	<b>109.48</b>
Color Temperature (CCT K)	<b>5464</b>
Color Rendering Index (CRI)	<b>77.5</b>
Beam Angle	<b>24.1° (V) / 24.5° (H)</b>
Stabilization Time (Min)	<b>75</b>
In-Situ Temp Test**	<b>77.9 °C / 58.4 °C (LED/Driver)</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

Report# 72121499-01-LM79

November 4, 2016

## TABLE OF CONTENTS

<u>Test Results:</u>	<u>4</u>
<u>Spectral Flux and Chromaticity Diagram:</u>	<u>5</u>
<u>Zonal Lumen Summary:</u>	<u>5</u>
<u>Illuminance Plots:</u>	<u>6</u>
<u>Candela Plots:</u>	<u>6</u>
<u>ISTMT Temperature Measurement:</u>	<u>7</u>
<u>Photometric Testing Information:</u>	<u>8</u>
<u>Equipment List:</u>	<u>9</u>



TEST REPORT

November 4, 2016

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%.

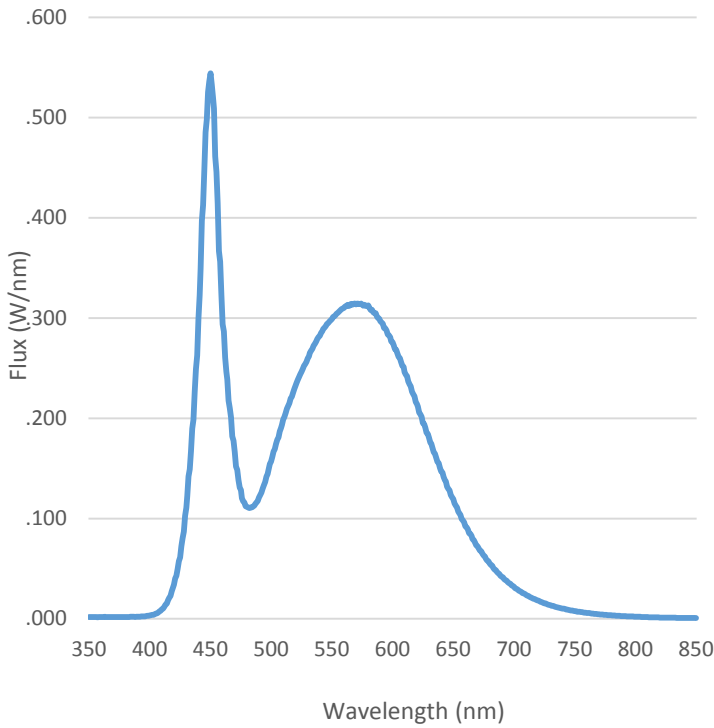
Photometric Results (120V Only)	ELLF1804N50	
	Integrating Sphere	
Total Luminous Flux (Lumens)	19,040	
Luminous Efficacy (Lumens/Watt)	109.48	
Correlated Color Temperature (CCT K)	5464	
Color Rendering Index (CRI-Ra)	77.5	
R9 Value	-12.5	
Total Radiant Flux (Watts)	59.3	
Chromaticity (Chroma x / Chroma y)	0.3332	0.3433
Chromaticity (Chroma u / Chroma v)	0.2065	0.3192
Chromaticity (Chroma u' / Chroma v')	0.2065	0.4788
Duv Value	0.00085	

Electrical Results	ELLF1804N50	
	Integrating Sphere (347V / 480V )	
Input Power (Watts)	173.92	173.49
Input Voltage (Volts AC)	347.13	480.08
Input Current (Amps)	0.513	0.393
Power Factor	0.976	0.920
A-THD% (Current %)	4.04	7.31
Input Frequency (Hz)	60.0	60.0
LED Drive Current (Milliamps)*	Not Stated	

\* Manufacturer Reported Data

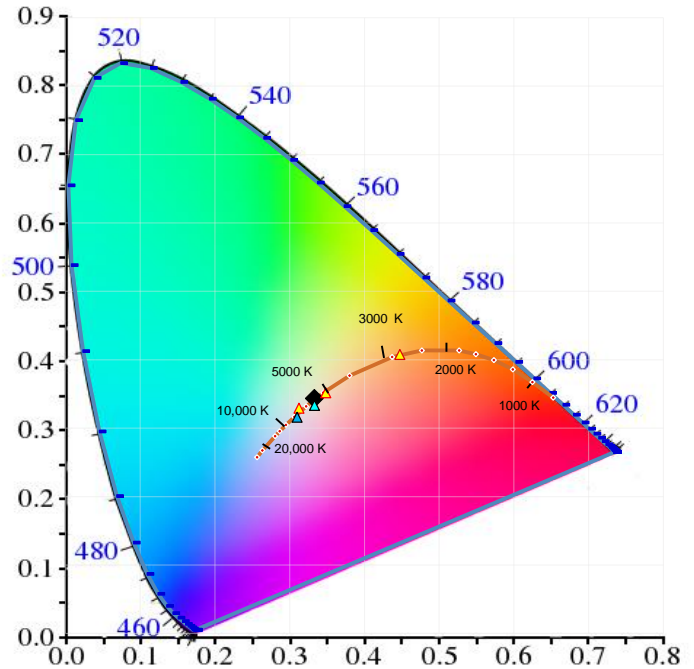
Additional Parameters	ELLF1804N50	
	Integrating Sphere	Goniophotometer
Stabilization Time (Light and Power)	75 Minutes	76 minutes
Test Geometry Configuration	4π	Type C
Spectroradiometer	Labsphere CDS1100	Gigahertz Optik P9801
Ambient Temperature	24.4 °C	24.7 deg C
In-Situ Temp Test (LED <sub>TMP</sub> / Driver <sub>TMP</sub> )	LED <sub>TMP</sub> 77.9 °C	DRIVER <sub>TMP</sub> 58.4 °C
Spacing Criteria	N/A	

Spectral Flux and Chromaticity Diagram



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

$\lambda$ (Peak): 449.8 nm       $\lambda$ (Dom): 554.4 nm



Chromaticity Diagram, CIE 1931, 2 Degree

Tristimulus Values: x/y = 0.3332 / 0.3433

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

Zonal Lumen Summary

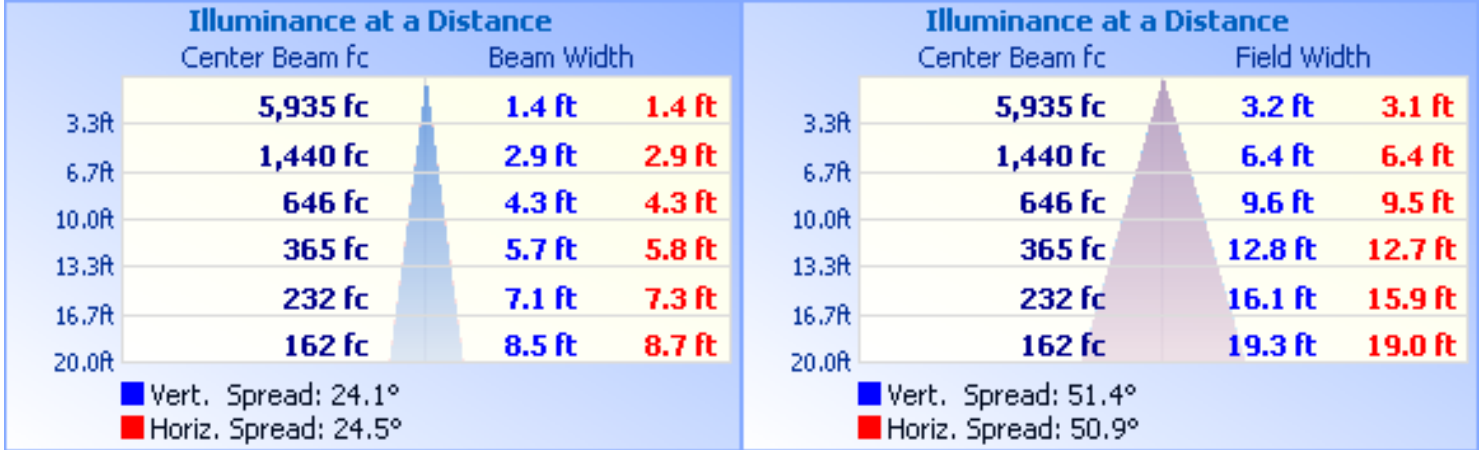
Zone	Lumens	% Lamp \ Luminaire
0-60	18,862.9	99.7%
60-90	55.0	0.3%
0-90	18,918.0	100.0%
90-180	0.0	0.0
0-180	18,918.0	100.0%

TEST REPORT

November 4, 2016

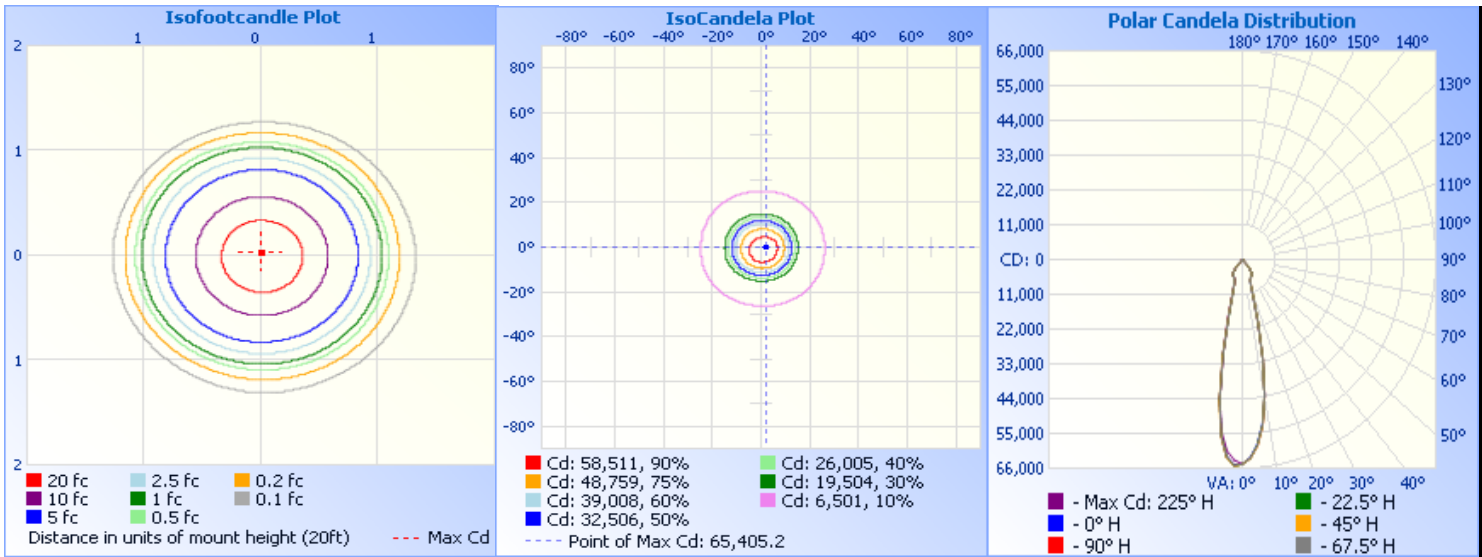
Test Results - Illuminance Plots

The following images depict the illuminance characteristics of the luminaire:



Test Results - Candela Plots

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



ISOfootcandle Plot

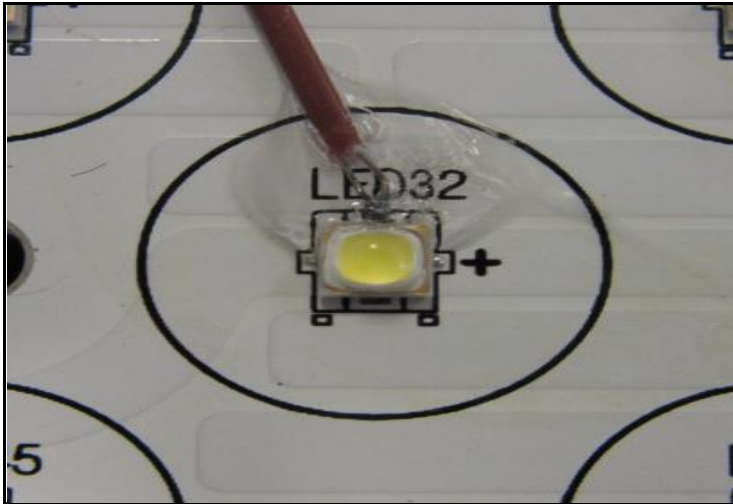
ISO Candela Plot

Polar Candela

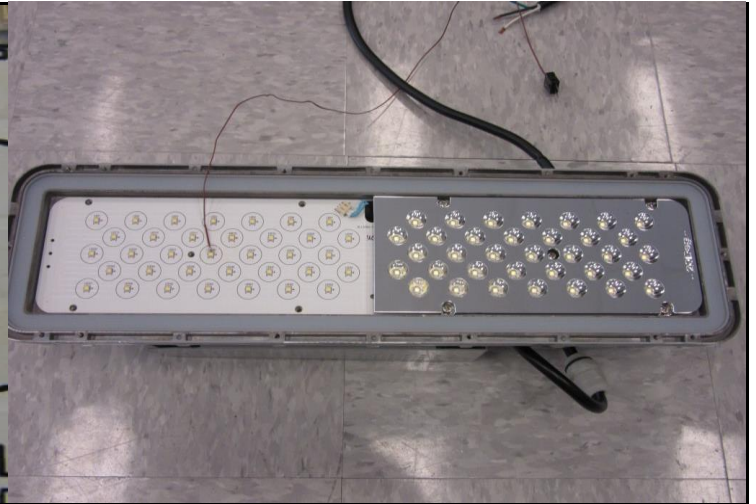
Maximum Candela = 65,405.2 at Horizontal: 225.0°, Vertical: 2.5°

**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.



"LED" Thermocouple Location at Tc



Sample Overview (LED<sub>TMP</sub> Location)

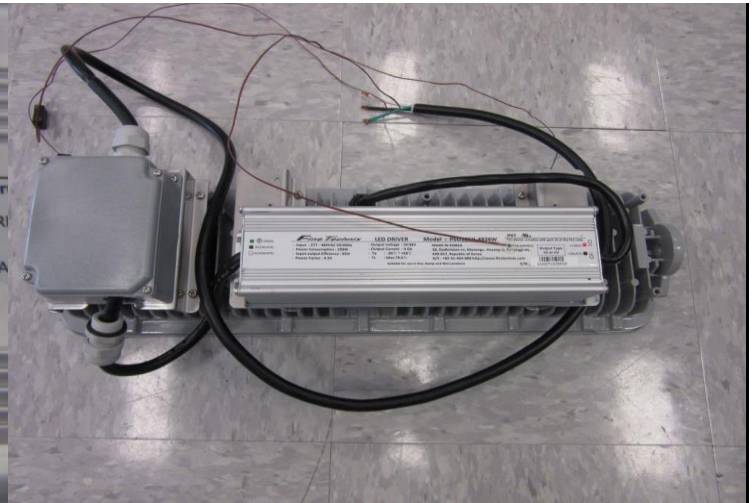
**LED Test Results for MaxLite : ELLF1804N50**

<b>LED<sub>TMP</sub> Temperature</b>	<b>77.9°C</b>
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All temperatures are normalized to 25°C ambient.



"Driver" Thermocouple Location at Tc



Sample Overview (DRIVER<sub>TMP</sub> Location)

**Driver Test Results for MaxLite : ELLF1804N50**

<b>DVR<sub>TMP</sub> Temperature</b>	<b>58.4°C</b>
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All temperatures are normalized to 25°C ambient.



TEST REPORT

November 4, 2016

TUV SUD 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 "4π 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 3rd 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 Volts DC
- Wattage = 75 Watts
- Calibration Current = 2.679 Amperes
- Luminous Flux = 1685 Lumens
- Calibration Date = 2/17/2011 Labsphere - NIST traceable

Continued.....







TEST REPORT

November 4, 2016

TUV SUD 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 Watts
Calibration Current = 4.816 Amperes
Luminous Intensity = 151.5 Candelas
Calibration Date = 2/13/2011 (NIST Traceable)

TUV SUD Test Equipment List:

Table with 4 columns: Description, Manufacturer / Model#, TUV SUD Ref#, Calibration Due Date. It lists equipment for the TUV SUD Sphere System, TUV SUD Mirror Goniophotometer System, and TUV SUD ISTMT Testing.

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Page 9 of 9
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