



IESNA LM79-2008 Test Report

TÜV SÜD America

Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

Michael Prainito
Marketing Manager

Global Tech LED LLC
8901 Quality Road
Bonita Springs, FL 34135
United States

Telephone: (877) 748-5533

Sample Tested: GTSOL50-PAR38-WW-WFL
Description: LED PAR38 Lamp Module
Manufacturer: Global Tech LED LLC

Technical Report Number: 72106528-03-LM79
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Report Prepared by:

Laymond Drummond
TÜV SÜD Project Handler

Report Reviewed by:

Bryan Cubitt
TÜV SÜD Program Manager

Summary of Key Test Results

Model# **GTSOL50-PAR38-WW-WFL**
 Manufacturer **Global Tech LED LLC**
 TÜV Sample# **1939-3**
 Date of Test **June 30, 2015**



Notes:

Tested in FBU orientation (Fixture Base Up)
 THIS IS A TEST OF THE NEW GTSOL50 AC DRIVEN LAMP W/75
 DEGREE LENS

| Parameter | Measured Result |
|------------------------------|------------------------------|
| Luminous Flux | 2,651 Lumens |
| Input Power | 46.15 Watts |
| Efficacy | 57.44 Lumens/Watt |
| C.C.T. | 2733 K |
| C.R.I. (R _a) | 84.1 |
| Beam Angle | 72.2° (V) / 75.3° (H) |
| Stabilization Time | 34 minutes |
| In-Situ Temp Test (ISTMT) ** | Not tested |

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 | GTSOL50-PAR38-WW-WFL | |
|---|----------------------|--------|
| | Integrating Sphere | |
| Total Luminous Flux (Lumens) | 2,651.0 | |
| Luminous Efficacy (Lumens/Watt) | 57.44 | |
| Correlated Color Temperature (CCT) | 2733 | |
| Color Rendering Index (CRI – R _a) | 84.1 | |
| R ₉ Value | 21.7 | |
| Total Radiant Flux (Watts) | 8.8 | |
| Chromaticity (Chroma x / Chroma y) | 0.4555 | 0.4072 |
| Chromaticity (Chroma u / Chroma v) | 0.2612 | 0.3502 |
| Chromaticity (Chroma u' / Chroma v') | 0.2612 | 0.5254 |
| D _{uv} Value | -0.00088 | |

| Electrical Results | GTSOL50-PAR38-WW-WFL | |
|--------------------------|----------------------------------|--------|
| | Integrating Sphere (120V / 277V) | |
| Input Power (Watts) | 46.15 | 46.05 |
| Input Voltage (Volts AC) | 120.07 | 277.01 |
| Input Current (Amps) | 0.416 | 0.184 |
| Power Factor | 0.924 | 0.903 |
| A-THD (Current %) | 33.42 | 38.20 |
| Input Frequency (Hertz) | 60.0 | 60.0 |

| Additional Parameters | GTSOL50-PAR38-WW-WFL | |
|---|----------------------|-----------------|
| | Integrating Sphere | Goniophotometer |
| Stabilization Time (Light and Power) | 32 minutes | 34 minutes |
| Test Geometry Configuration | 4π | Type C |
| Ambient Temperature | 25°C | 24.4°C |
| ISTMT (In-Situ Temperature Measurement) | Not Tested | |
| Spacing Criteria | N/A | |





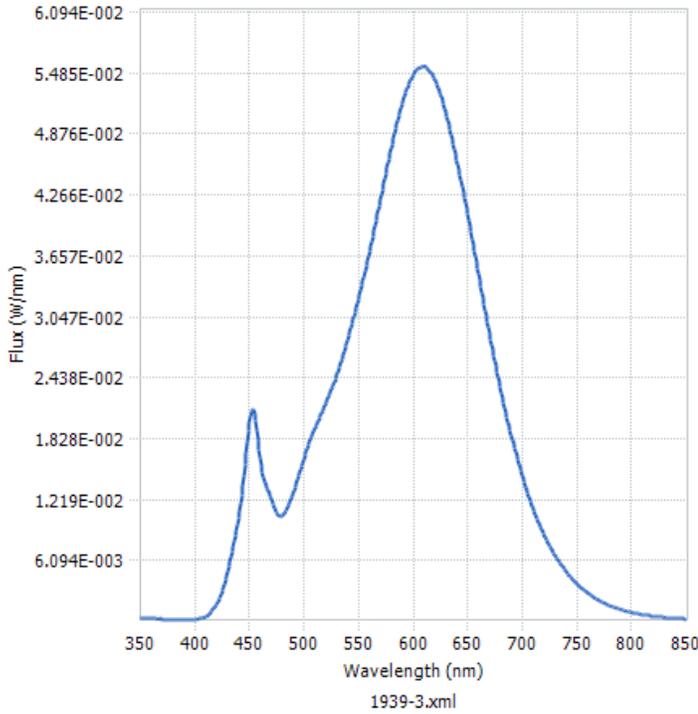
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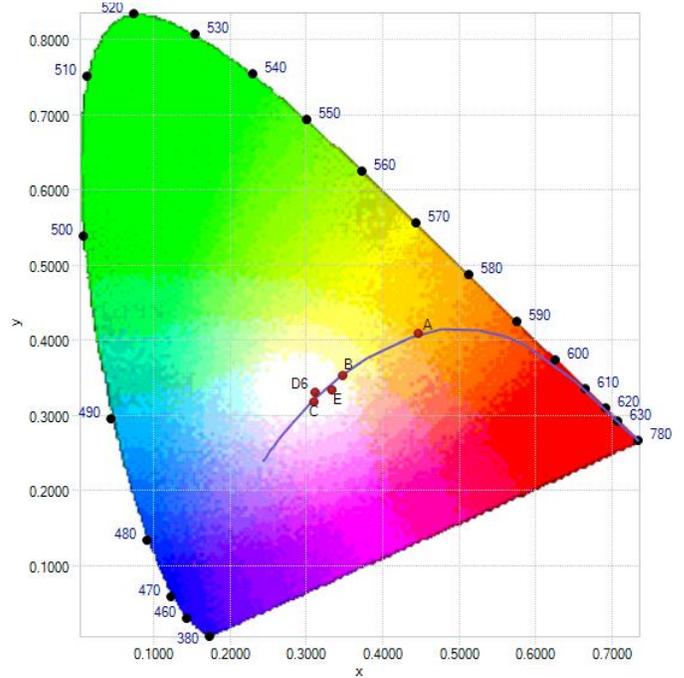
Spectral Flux and Chromaticity Diagram

Spectral Flux



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

Chromaticity Diagram



Tristimulus values (from page 4):

$x / y = 0.4555 / 0.4072$

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

Zonal Lumen Summary

| Zone | Lumens | % Lamp / Luminaire |
|-------|----------|--------------------|
| 0-40 | 1,842.80 | 69.70% |
| 0-60 | 2,544.30 | 96.20% |
| 60-90 | 101 | 3.80% |
| 0-90 | 2,645.30 | 100% |

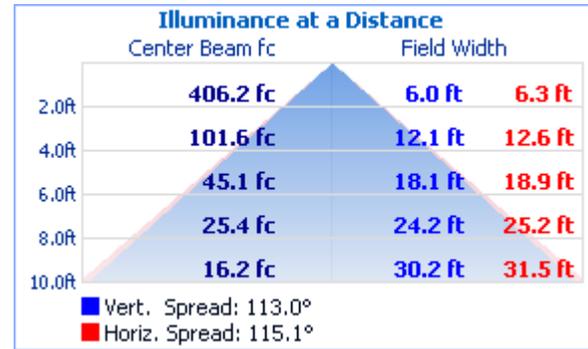
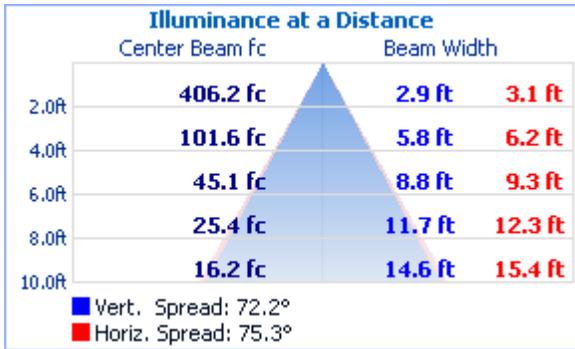


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Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.

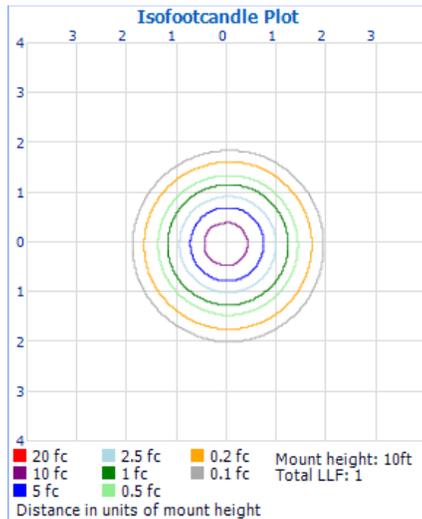


Beam Angle = 72.2° (V) / 75.3° (H)

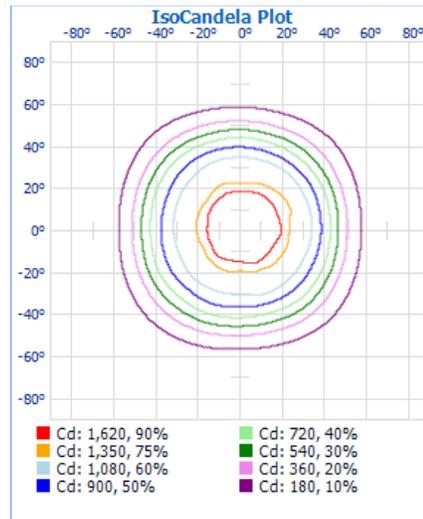
Field Angle = 113.0° (V) / 115.1° (H)

Test Results – Candela Plots

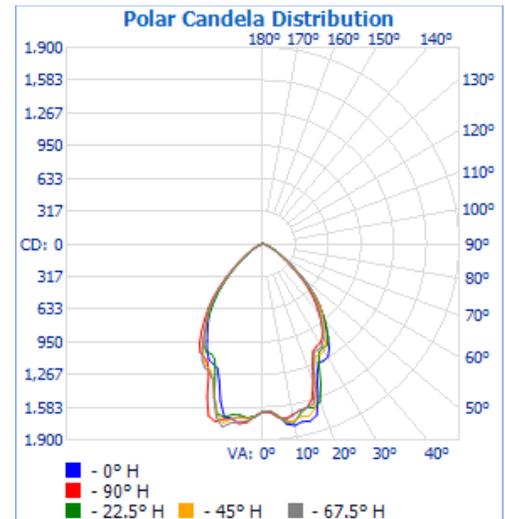
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

Maximum Candela = **1,818.6** at Horizontal: 292.5°, Vertical: 15.0°



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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 “ 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 = 28.0 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.....

TÜV SÜD America, Inc.

5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

Telephone: 678-341-5900 www.tuvamerica.com

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TÜV SÜD Photometric Testing Information (continued)

Goniophotometer

The Goniophotometer is a 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: 105-A
- Voltage: 16.71 Volts DC
- Wattage: 150.0 Watts
- Calibration Current: 4.847 Amperes
- Luminous Intensity: 166.3 Candelas
- Calibration Date: 11-07-2011 (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 | 9/7/2015 |
| Power Analyzer | Yokogawa WT210 | ATLE0052 | 1/16/2016 |
| Power Source | Chroma 61602 | AC003 | N/A |
| Thermometer | Fluke 52-II | ATLE0118 | 11/15/2015 |
| TÜV SÜD Goniophotometer System – contains the following: | | | |
| Goniophotometer | M.E. GONC01 | GON001 | weekly |
| Spectroradiometer | Gigahertz Optik P9801 | GIG001 | weekly |
| Power Analyzer | Yokogawa WT210 | ATLE0034 | 11/16/2015 |
| Power Source | Chroma 61602 | AC006 | N/A |

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TÜV SÜD America, Inc.
5945 Cabot Parkway, Suite 100,
Alpharetta GA 30005

Telephone: 678-341-5900 www.tuvamerica.com



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