



IESNA LM79-2008 Test Report

TÜV SÜD America

Photometric Testing and Evaluation in Accordance with LM79-2008

Report Prepared for:

Michael Prainito
CFO / CTO

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


Telephone: (877) 748-5533

Model Tested: GTSOL112-HI-GR-NL
Sample Description: LED Module – No Optics
Manufacturer: Global Tech LED LLC


Reference Fixture for testing: N/A
Driver(s) used for testing: LV150-24N-UNV-BB (x2) HATCH

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Report Prepared by:


Stan Mushyakov
TÜV SÜD Project Handler

Report Reviewed by:

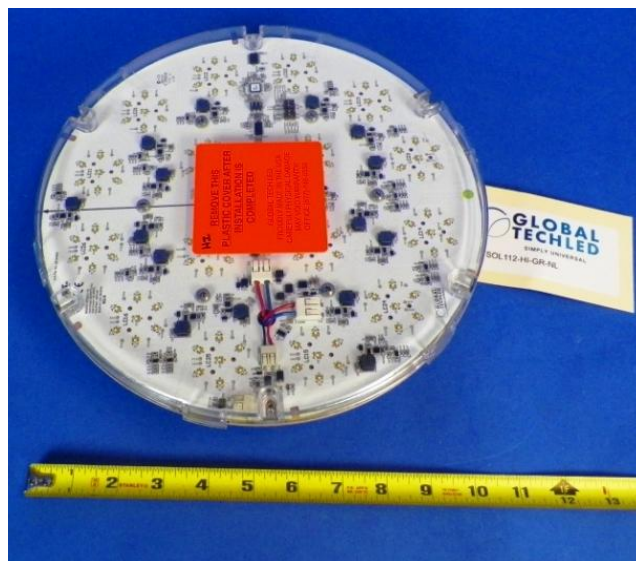

Bryan Cubitt
TÜV SÜD Operations Manager

Summary of Key Test Results

Model# **GTSOL112-HI-GR-NL**
 Manufacturer **Global Tech LED LLC**
 TÜV Sample# **2176-2 (Test Plan#2)**
 Date of Test **January 12, 2016**

Notes: Tested in intended orientation
 “Aperture Down, Cover Removed”.
 (cover shown attached in image)

Driver: **HATCH LV150-24N-UNV-BB (x2)**
 LED Chip: **Lumileds Luxeon Zes**



Parameter	Measured Result
Luminous Flux	28,270 Lumens
Input Power	277.70 Watts
Efficacy	101.8 Lumens/Watt
C.C.T.	5036 K
C.R.I. (R _a)	73.4
Beam Angle	121.0° (V) / 120.8° (H)
Stabilization Time	45 minutes
In-Situ Temp Test (ISTMT)**	N/A

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	GTSOL112-HI-GR-NL	
	Integrating Sphere	
Total Luminous Flux (Lumens)	28,270	
Luminous Efficacy (Lumens/Watt)	101.8	
Correlated Color Temperature (CCT)	5036	
Color Rendering Index (CRI – R _a)	73.4	
R ₉ Value	-23.7	
Total Radiant Flux (Watts)	85.6	
Chromaticity (Chroma x / Chroma y)	0.3442	0.3536
Chromaticity (Chroma u / Chroma v)	0.2101	0.3237
Chromaticity (Chroma u' / Chroma v')	0.2101	0.4855
D _{uv} Value	0.00132	

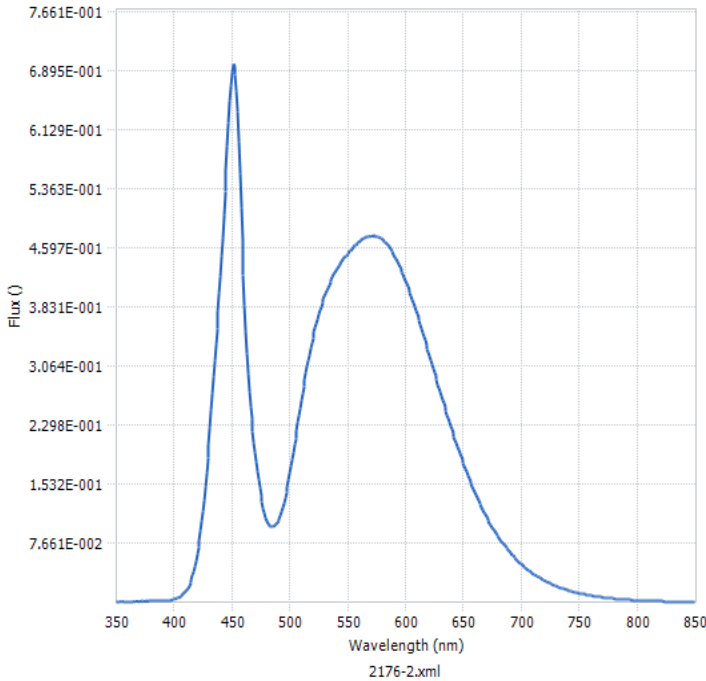
Electrical Results	GTSOL112-HI-GR-NL	
	Integrating Sphere (120V / 277V)	
Input Power (Watts)	277.70	273.13
Input Voltage (Volts AC)	120.08	276.99
Input Current (Amps)	2.321	1.053
Power Factor	0.997	0.937
A-THD (Current %)	4.67	11.59
Input Frequency (Hertz)	60.0	60.0

Additional Parameters	GTSOL112-HI-GR-NL	
	Integrating Sphere	Goniophotometer
Stabilization Time (Light and Power)	45 minutes	48 minutes
Test Geometry Configuration	4π	Type C
Spectroradiometer	Labsphere CDS1100	Gigahertz Optik P9801
Ambient Temperature	25.0°C	24.7°C
ISTMT (In-Situ Temperature Measurement)	N/A	
Spacing Criteria	N/A	



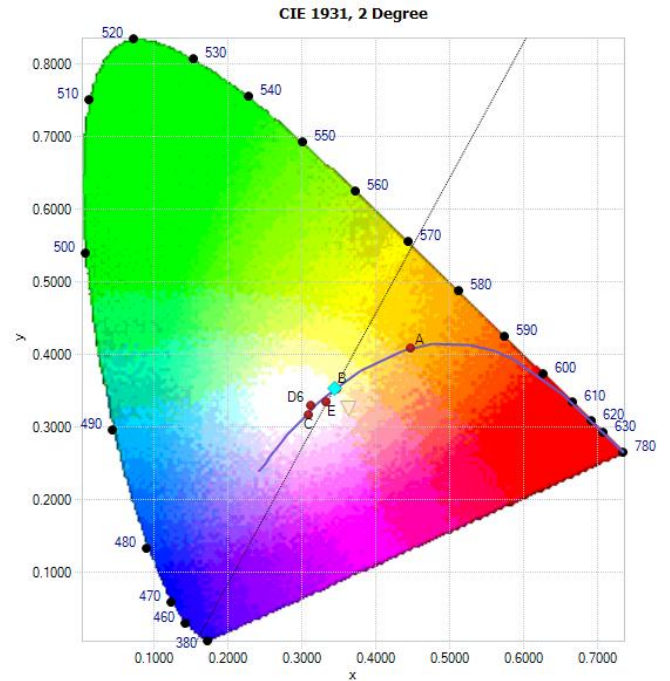
Spectral Flux and Chromaticity Diagram

Spectral Flux



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

Chromaticity Diagram



Tristimulus values (from page 4):

$$x / y = 0.3442 / 0.3536$$

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

Zonal Lumen Summary

Zone	Lumens	% Lamp / Luminaire
0-60	21,297.9	77.2%
60-90	6,307.2	22.8%
0-90	27,605.1	100%
90-180	0.0	0.0%
0-180	27,605.1	100%

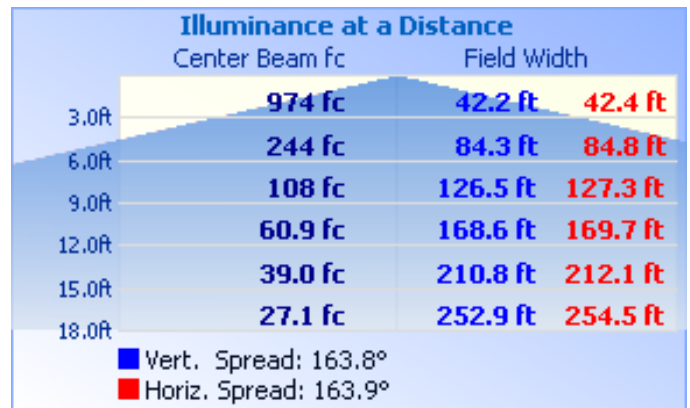
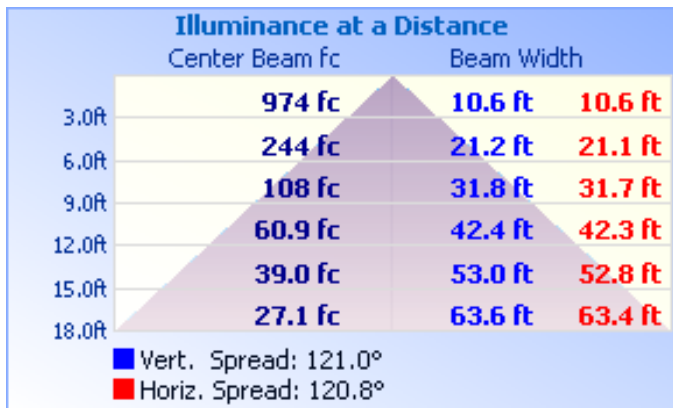


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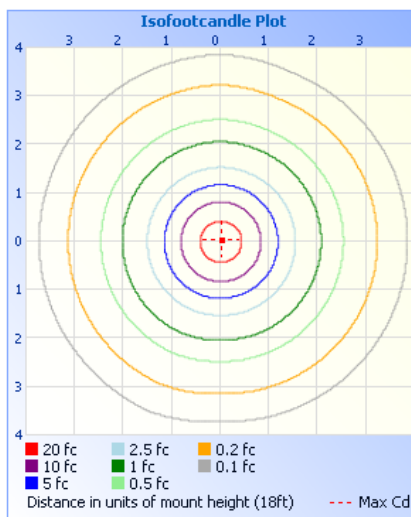
Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the Luminaire at a mount height of 18ft.

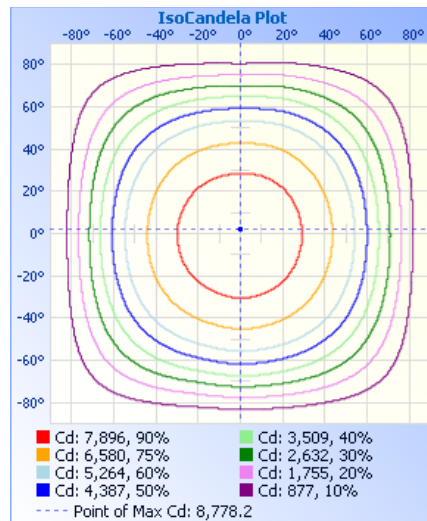


Test Results – Candela Plots

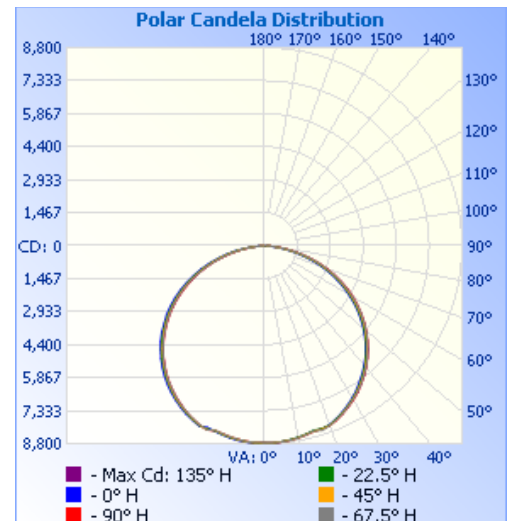
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

Maximum Candela = **8,778.2** at Horizontal: 135°, Vertical: 2.5°





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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.....



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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	3/7/2016
Power Source	Chroma 61602	AC003	N/A
Thermometer	Fluke 52-II	ATLE0118	1/30/2016
TÜV SÜD Mirror Goniophotometer System – contains the following:			
Goniophotometer	M.E. GONC02	GON002	weekly
Spectroradiometer	Gigahertz Optik P9801	GIG002	weekly
Power Analyzer	Yokogawa WT210	ATLE0076	7/09/2016
Power Source	Chroma 61603	AC007	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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