



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: CHW-xx-RP-LED14/8-NON-DIM-UNV
Description: LED Wall Mounted Luminaire
Manufacturer: Hèmèra

Technical Report Number: 72110109-05-LM79
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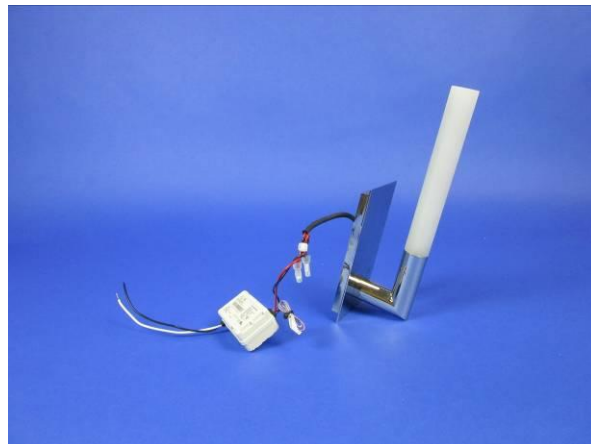
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Summary of Key Test Results

Model# **CHW-xx-RP-LED14/8-NON-DIM-UNV**
 Manufacturer **Hèmèrà**
 TÜV Sample# **2109-5**
 Date of Test **September 23rd, 2015**

Notes:

Tested in intended orientation



| Parameter | Measured Result |
|-----------------------------|--------------------------------|
| Luminous Flux | 549.8 Lumens |
| Input Power | 9.36 Watts |
| Efficacy | 58.74 Lumens/Watt |
| C.C.T. | 3007 K |
| C.R.I. (R _a) | 89.8 |
| Beam Angle | 110.3° (V) / 170.1° (H) |
| Stabilization Time | 66 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 | | | | | CHW-xx-RP-LED14/8-NON-DIM-UNV | | | | | | | | | |
|---|----------------|----------------|----------------|----------------|-------------------------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|
| | | | | | Integrating Sphere | | | | | | | | | |
| Total Luminous Flux (Lumens) | | | | | 549.8 | | | | | | | | | |
| Luminous Efficacy (Lumens/Watt) | | | | | 58.74 | | | | | | | | | |
| Correlated Color Temperature (CCT) | | | | | 3007 | | | | | | | | | |
| Color Rendering Index (CRI – R _a) | | | | | 89.8 | | | | | | | | | |
| Total Radiant Flux (Watts) | | | | | 1.9 | | | | | | | | | |
| | | | | | | | | | | | | | | |
| R ₁ | R ₂ | R ₃ | R ₄ | R ₅ | R ₆ | R ₇ | R ₈ | R ₉ | R ₁₀ | R ₁₁ | R ₁₂ | R ₁₃ | R ₁₄ | |
| 89.6 | 96.0 | 97.3 | 88.7 | 89.9 | 95.2 | 88.2 | 74.1 | 43.3 | 90.1 | 89.1 | 83.7 | 91.4 | 99.3 | |
| | | | | | | | | | | | | | | |
| Chromaticity (Chroma x / Chroma y) | | | | | 0.4347 | | | | | 0.4005 | | | | |
| Chromaticity (Chroma u / Chroma v) | | | | | 0.2507 | | | | | 0.3464 | | | | |
| Chromaticity (Chroma u' / Chroma v') | | | | | 0.2507 | | | | | 0.5196 | | | | |
| D _{uv} Value | | | | | -0.00116 | | | | | | | | | |

| Electrical Results | | CHW-xx-RP-LED14/8-NON-DIM-UNV | |
|--------------------------|--|----------------------------------|--------|
| | | Integrating Sphere (120V / 277V) | |
| Input Power (Watts) | | 9.36 | 9.77 |
| Input Voltage (Volts AC) | | 120.09 | 277.04 |
| Input Current (Amps) | | 0.081 | 0.041 |
| Power Factor | | 0.964 | 0.859 |
| A-THD (Current %) | | 17.11 | 33.85 |
| Input Frequency (Hertz) | | 60.0 | 60.0 |

| Additional Parameters | | CHW-xx-RP-LED14/8-NON-DIM-UNV | |
|---|--|------------------------------------|-----------------|
| | | Integrating Sphere | Goniophotometer |
| Stabilization Time (Light and Power) | | 60 minutes | 65 minutes |
| Test Geometry Configuration | | 4 π | Type C |
| Ambient Temperature | | 24.3°C | 24.5°C |
| ISTMT (In-Situ Temperature Measurement) | | Not Tested | |
| Spacing Criteria | | N/A (0° – 180°) / N/A (90° – 270°) | |

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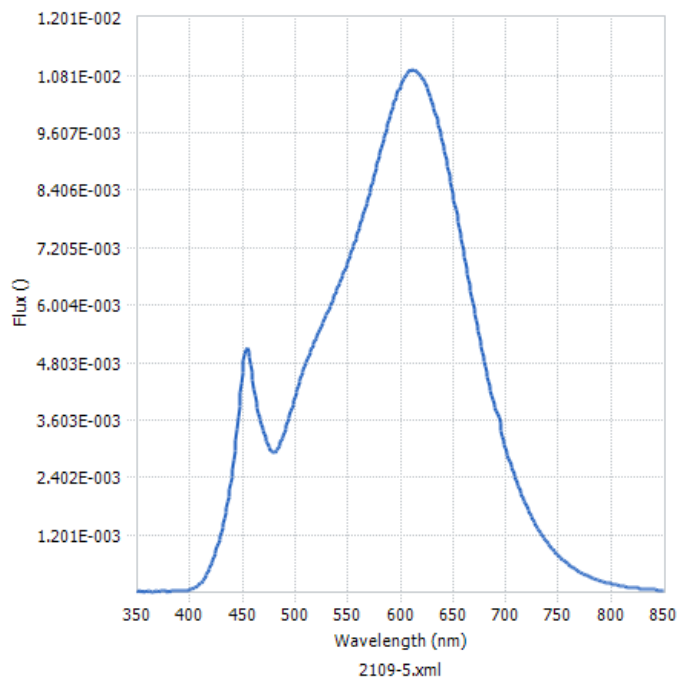
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Spectral Flux and Chromaticity Diagram

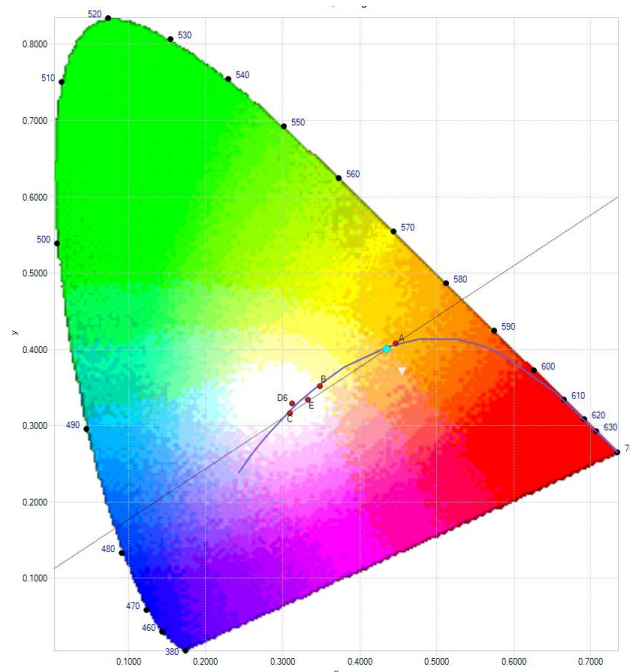
Spectral Flux



Spectral response of the Radiant Flux

(350nm to 850nm)

Chromaticity Diagram



Tristimulus values (from page 4):

$x / y = 0.4347 / 0.4005$

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

Zonal Lumen Summary

| Zone | Lumens | % Lamp / Luminaire |
|----------|--------|--------------------|
| 0 - 60 | 98.4 | 18.2% |
| 60 - 90 | 167.1 | 31.0% |
| 0 - 90 | 265.5 | 49.2% |
| 90 - 180 | 273.7 | 50.8% |
| 0 - 180 | 539.1 | 100.0% |

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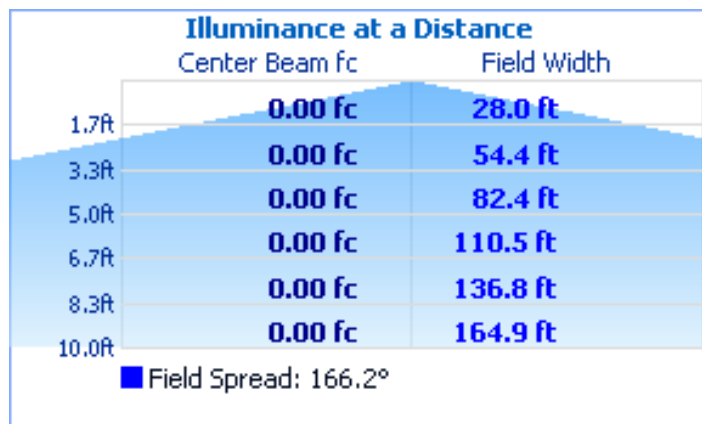
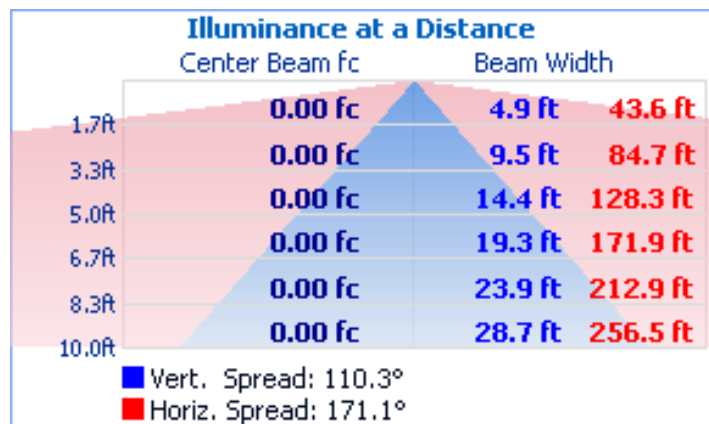


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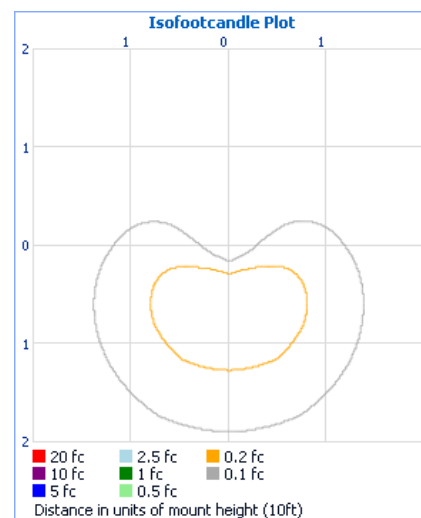
Test Results – Illuminance Plots

The following images depict the illuminance characteristics of the luminaire.

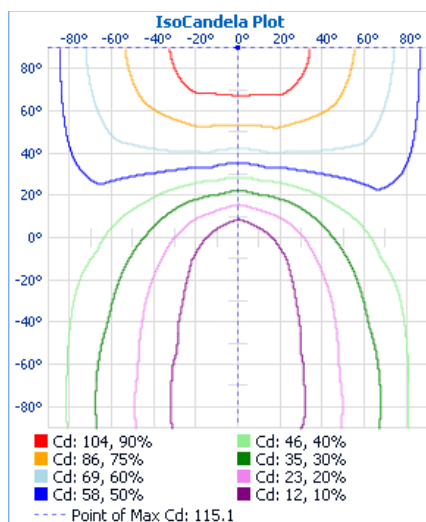


Test Results – Candela Plots

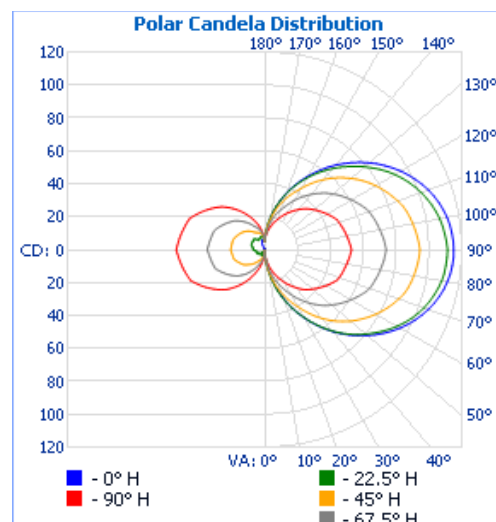
The following images depict the luminous intensity distribution characteristics of the luminaire:



Isofootcandle Plot



Isocandela Plot



Polar Candela

Maximum Candela = **115.1** at Horizontal: 0°, Vertical: 90°



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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 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 | 9/7/2016 |
| 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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