



LM-79-08 Test Report

for

Maxlite Inc.

12 York Ave West Caldwell NJ 07006

LED Flush Mount

Model: ML2LA23LTRBNI927

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

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Report No.: HZ15040022ac

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by:

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May 19, 2015

Approved by:



Manager: Jim Zhang
May 19, 2015

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government

Test Summary

Sample Tested: **ML2LA23LTRBNI927**

| Luminous Efficacy (Lumens /Watt) | Total Luminous Flux (Lumens) | Power (Watts) | Power Factor |
|-------------------------------------|---------------------------------|---------------------------------------|--------------|
| 67.3 | 1617.0 | 24.02 | 0.9860 |
| CCT (K) | CRI | Stabilization Time (Light & Power) | |
| 2748 | 90.9 | 65 | |

Table 1: Executive Data Summary

Note: The above results are recorded/ derived from measurements made using an Integrating Sphere.

Test specifications:

| | |
|---------------------------|---|
| Date of Receipt | : Apr. 27, 2015 |
| Date of Test | : May 12, 2015 |
| Test item | : Total Luminous Flux, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters |
| Reference Standard | : IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products |

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Sample Photo



Sample view

Equipment Under Test (EUT)

| | |
|----------------------------|---|
| Name | : LED Flush Mount |
| Model | : ML2LA23LTRBNI927 |
| Electrical Ratings | : 120Vac, 50/60Hz, 23W |
| Product Description | : 2700K, Dimmable, CRI90, Frosted Glass Cover Model of LED light source: Luxeon 3030 2D Manufacturer of light source: Philips Quantity LED light source: 46PCS |
| Manufacturer | : Maxlite Inc. |
| Address | : 12 York Ave West Caldwell NJ07006 |

TEST RESULTS

Test ambient temperature was 24.8°C.

Test orientation was Light down. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 65 minutes, and the total operating time including stabilization was 70 minutes.

| Parameter | Result |
|---------------------------------------|--------|
| Test Voltage (V) | 120.0 |
| Voltage frequency (Hz) | 60 |
| Test Current (A) | 0.203 |
| Power Factor | 0.9860 |
| Test Power (W) | 24.02 |
| THD A% | 16.63 |
| Luminous Efficacy (lm/W) | 67.3 |
| Total Luminous Flux (lm) | 1617.0 |
| Color Rendering Index (CRI) | 90.9 |
| R9 | 49.3 |
| Correlated Color Temperature (CCT)(K) | 2748 |
| Chromaticity Chroma x | 0.4577 |
| Chromaticity Chroma y | 0.4131 |
| Chromaticity Chroma u | 0.2600 |
| Chromaticity Chroma v | 0.3520 |
| Duv | 0.0009 |
| Chromaticity Chroma u' | 0.2600 |
| Chromaticity Chroma v' | 0.5280 |

| Special Color Rendering Indices | |
|---------------------------------|------|
| R1 | 90.5 |
| R2 | 95.8 |
| R3 | 98.9 |
| R4 | 89.7 |
| R5 | 90.1 |
| R6 | 95.5 |
| R7 | 89.8 |
| R8 | 76.6 |
| R9 | 49.3 |
| R10 | 89.4 |
| R11 | 90.2 |
| R12 | 81 |
| R13 | 91.8 |
| R14 | 99.4 |

Table 2: Test data per Sphere-Spectroradiometer Method

Note: According to CIE 1976 (u',v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Spectral Power Distribution - Sphere Spectroradiometer Method

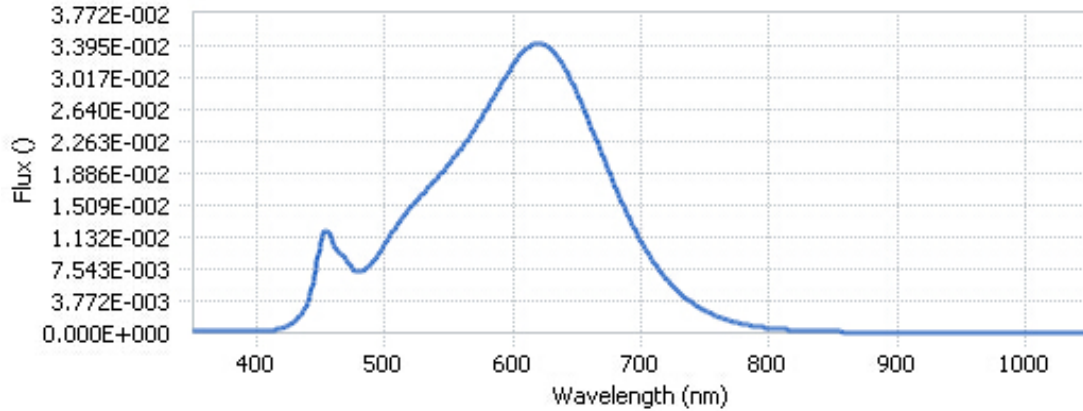
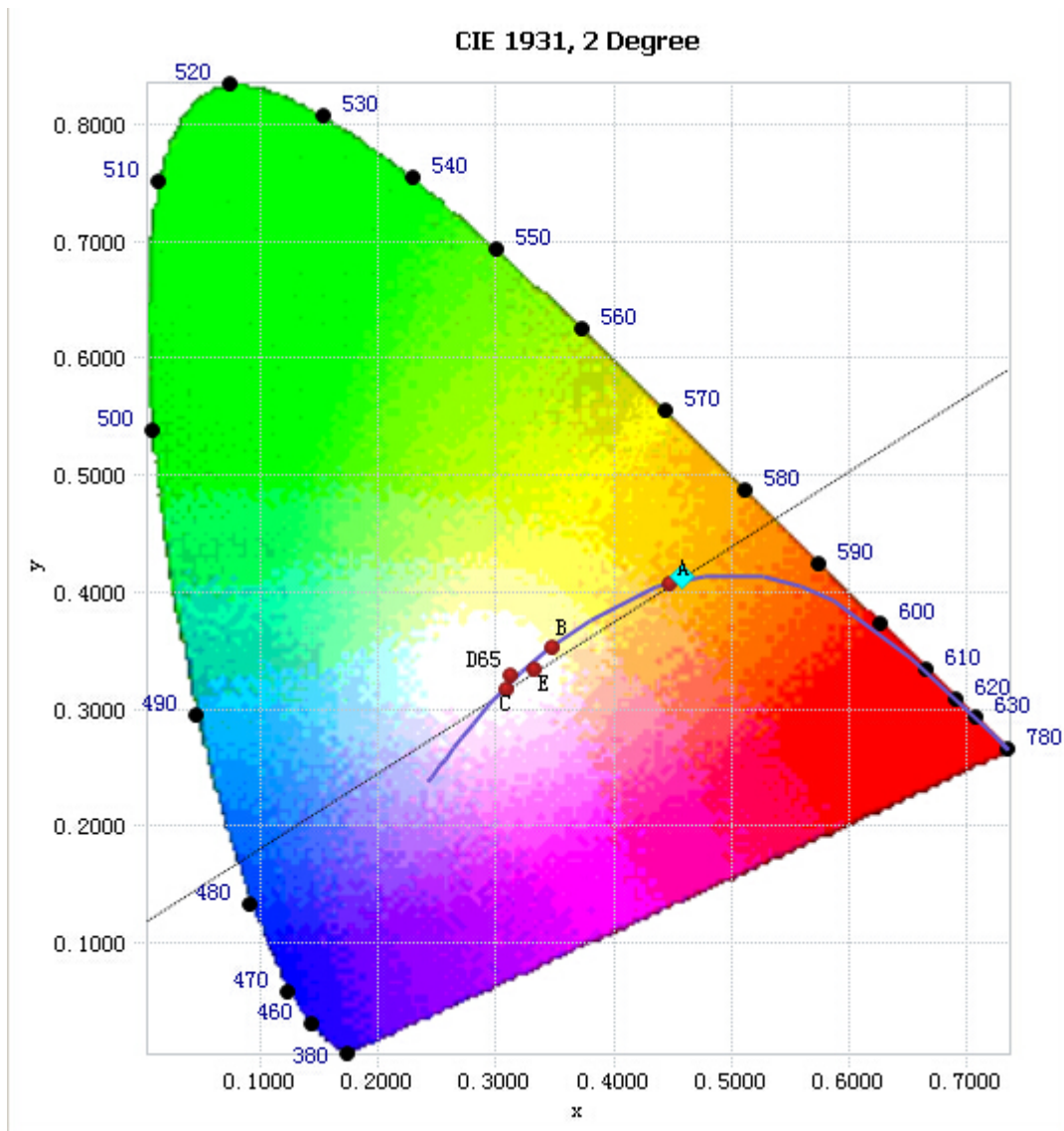


Chart 1: Spectral Power Distribution

| Spectral Distribution over Visible Wavelength | | | | | | | |
|---|----------------|--------|----------------|--------|----------------|--------|----------------|
| WL(nm) | Radiant(Watts) | WL(nm) | Radiant(Watts) | WL(nm) | Radiant(Watts) | WL(nm) | Radiant(Watts) |
| 380 | 1.61E-04 | 485 | 7.56E-03 | 590 | 2.92E-02 | 695 | 1.23E-02 |
| 385 | 1.70E-04 | 490 | 8.28E-03 | 595 | 3.05E-02 | 700 | 1.08E-02 |
| 390 | 1.52E-04 | 495 | 9.32E-03 | 600 | 3.18E-02 | 705 | 9.51E-03 |
| 395 | 1.59E-04 | 500 | 1.05E-02 | 605 | 3.29E-02 | 710 | 8.32E-03 |
| 400 | 1.68E-04 | 505 | 1.18E-02 | 610 | 3.36E-02 | 715 | 7.28E-03 |
| 405 | 2.15E-04 | 510 | 1.29E-02 | 615 | 3.41E-02 | 720 | 6.36E-03 |
| 410 | 2.62E-04 | 515 | 1.39E-02 | 620 | 3.42E-02 | 725 | 5.53E-03 |
| 415 | 3.87E-04 | 520 | 1.49E-02 | 625 | 3.40E-02 | 730 | 4.76E-03 |
| 420 | 5.83E-04 | 525 | 1.58E-02 | 630 | 3.35E-02 | 735 | 4.08E-03 |
| 425 | 9.03E-04 | 530 | 1.66E-02 | 635 | 3.26E-02 | 740 | 3.53E-03 |
| 430 | 1.42E-03 | 535 | 1.74E-02 | 640 | 3.14E-02 | 745 | 3.06E-03 |
| 435 | 2.31E-03 | 540 | 1.82E-02 | 645 | 3.00E-02 | 750 | 2.63E-03 |
| 440 | 3.85E-03 | 545 | 1.91E-02 | 650 | 2.83E-02 | 755 | 2.23E-03 |
| 445 | 6.82E-03 | 550 | 2.00E-02 | 655 | 2.66E-02 | 760 | 1.96E-03 |
| 450 | 1.07E-02 | 555 | 2.10E-02 | 660 | 2.47E-02 | 765 | 1.64E-03 |
| 455 | 1.21E-02 | 560 | 2.20E-02 | 665 | 2.28E-02 | 770 | 1.42E-03 |
| 460 | 1.04E-02 | 565 | 2.29E-02 | 670 | 2.08E-02 | 775 | 1.22E-03 |
| 465 | 9.39E-03 | 570 | 2.41E-02 | 675 | 1.90E-02 | 780 | 1.04E-03 |
| 470 | 8.60E-03 | 575 | 2.53E-02 | 680 | 1.72E-02 | | |
| 475 | 7.52E-03 | 580 | 2.65E-02 | 685 | 1.54E-02 | | |
| 480 | 7.19E-03 | 585 | 2.79E-02 | 690 | 1.38E-02 | | |

Table 3: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y) : (0.4577, 0.4131)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

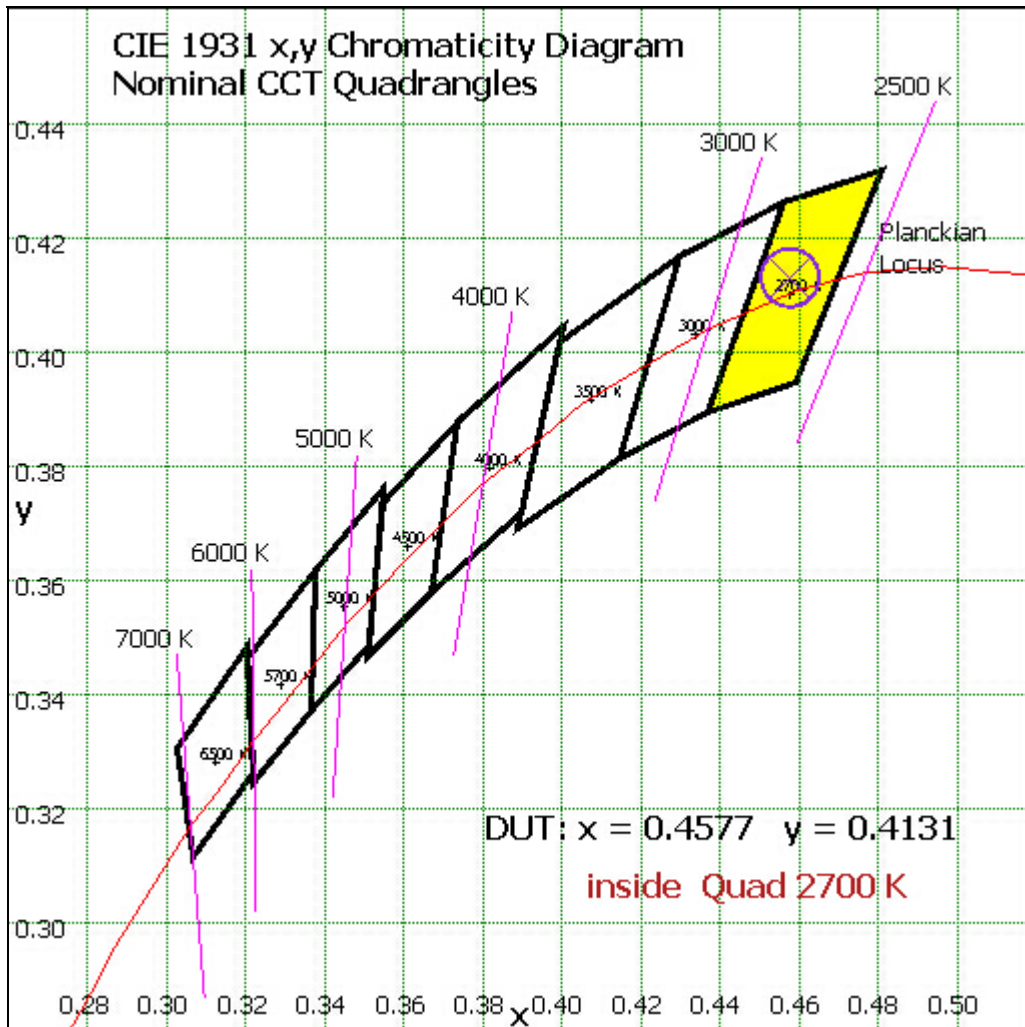


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

EQUIPMENT LIST

| Test Equipment | Model | Equipment No. | Calibration Date | Calibration Due date |
|-----------------------------------|----------|---------------|------------------|----------------------|
| Integrate Sphere system | 2M | HZTE015-01 | Sep. 18, 2014 | Sep. 17, 2015 |
| Digital Power Meter | WT210 | HZTE008-01 | Sep. 18, 2014 | Sep. 17, 2015 |
| AC Power Supply | PCR 500L | HZTE001-07 | Sep. 18, 2014 | Sep. 17, 2015 |
| DC Power Supply | 6154 | HZTE004-04 | Sep. 18, 2014 | Sep. 17, 2015 |
| Temperature and humidity recorder | JR900 | HZTE018-01 | Sep. 18, 2014 | Sep. 17, 2015 |
| Standard source | SCL-1400 | HZTE012-02 | Sep. 18, 2014 | Sep. 17, 2015 |

Table 4: Test Equipment List

TEST METHODS

Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning. Therefore, no seasoning was performed.

Sphere-Spectroradiometer Method- Photometric and Electrical Measurements

A Labsphere Model CDS 2100 Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit. The coating reflectance of each sphere is 98%. The measure geometry is 4π . Self-absorption correction is conducted in testing. Bandwidth of spectroradiometer is 350nm-1050nm.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (small integrated LED lamps) to 2 or more hours for large SSL luminaires). It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The standard reference of the integrated sphere system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Standards and Technology.

The uncertainty of integrating sphere system reported in this document is expanded uncertainty is 1.06% with a coverage factor $k=2$.

*** End of Report ***

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