



REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100082487

Date: April 28, 2010

REPORT NO. 100082487CRT-007

TEST OF ONE LED LAMP
MODEL NO. AE26PAR307QW60

RENDERED TO

NEXXUS LIGHTING INC.
124 FLOYD SMITH DRIVE
SUITE 300
CHARLOTTE, NC 28262

TEST: Electrical and Photometric tests as required to the IESNA test standard.

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for SSL by US DOE's CALiPER program.

AUTHORIZATION: The testing performed was authorized by signed quote number 500222294.

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79: 2008 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products
ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted 10 samples of model number AE26PAR307QW60. The samples were received by Intertek on April 1, 2010, in undamaged condition, and 10 samples were tested as received. The sample designations were N4794LP through N4803LP.

DATES OF TESTS: April 21, 2010 through April 28, 2010

SUMMARY

| | |
|--------------|--------------------|
| Model No.: | AE26PAR307QW60 |
| Description: | LED PAR30/R30 LAMP |

| Criteria | Result |
|------------------------------------|-----------------------|
| Total Lumen Output | 519.2 |
| Total Power | 8.040W |
| Luminaire Efficacy | 64.58 |
| Power Factor | 0.9251 |
| Color Rendering Index (CRI) | 90.27 |
| Correlated Color Temperature (CCT) | 2813K |
| Chromaticity Coordinate (x) | 0.458 |
| Chromaticity Coordinate (y) | 0.421 |
| Chromaticity Coordinate (u') | 0.257 |
| Chromaticity Coordinate (v') | 0.531 |
| Color Spatial Uniformity | max Δ = 0.0104 |

EQUIPMENT LIST

| Equipment Used | Model Number | Control Number | Last Calibration Date | Calibration Due Date |
|---|--------------|--------------------|-----------------------|----------------------|
| Elgar AC Power Supply | 1001SX | --- | --- | --- |
| Xitron Power Analyzer | 2503H | E235 | 04/09/10 | 04/09/11 |
| Elgar AC Power Supply | CW1251 | -- | -- | -- |
| Yokogawa Power Analyzer | WT1600 | E462 | 06/02/09 | 06//02/10 |
| Labsphere Diode Array | DAS 1100 | N714 | Before Use | Before Use |
| Leeds & Northup Standard Resistor | Manganin | Y089 | 02/10/10 | 02/10/11 |
| Data Precision Digital Voltmeter | 3600 | V124 | 02/10/10 | 02/10/11 |
| Fluke Multimeter | 45 | M133 | 02/10/10 | 02/10/11 |
| Fluke Temperature Meter | 52 | T801 | 06/09/09 | 06/09/10 |
| Kikusui DC Power Supply | 35-10L | E160 | --- | --- |
| Sorenson DC Power Supply | DLM150-20E | -- | --- | --- |
| UDT Optometer | S370 | N301 | Before Use | Before Use |
| ITS Two Meter Diameter Integrating Sphere | --- | N308 | Before Use | Before Use |
| ITS Ten Foot Diameter Integrating Sphere | --- | N307 | Before Use | Before Use |
| NIST Luminous Flux Standard Sources | --- | 150-25, 8036, 3062 | 12/09/08 | 12/09/09 |
| NIST Spectral Flux Standard Source | RF0605 | --- | 11/29/06 | 100 hours of use |
| LSI High Speed Mirror Goniophotometer | 6440 | -- | Before Use | Before Use |
| Labsphere CDS 1100 CCD Spectroradiometer | CDS1100 | -- | Before Use | Before Use |
| Optronics Spectroradiometer | EL750D | E288 | Before Use | Before Use |

TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

Photometric and Electrical measurements – Distribution Method

A LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model DAS 1100 Diode Array Spectroradiometer and Two Meter or Ten Foot Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit.

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. Each SSL unit was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

Color Spatial Uniformity

The spatial distribution of chromaticity coordinates (u' v') were measured within two vertical planes (CIE), 0° and 90° in vertical 10° increments until the light output dropped to below 10% of the maximum light output. The averaged weighted chromaticity coordinate was calculated from these points. The data was then analyzed to check for delta color differences of the u' , v' chromaticity coordinates.

Estimated Total Operating Time

10 HOURS

RESULTS OF TESTS

Photometric Measurements at 25°C – Integrating Sphere Method

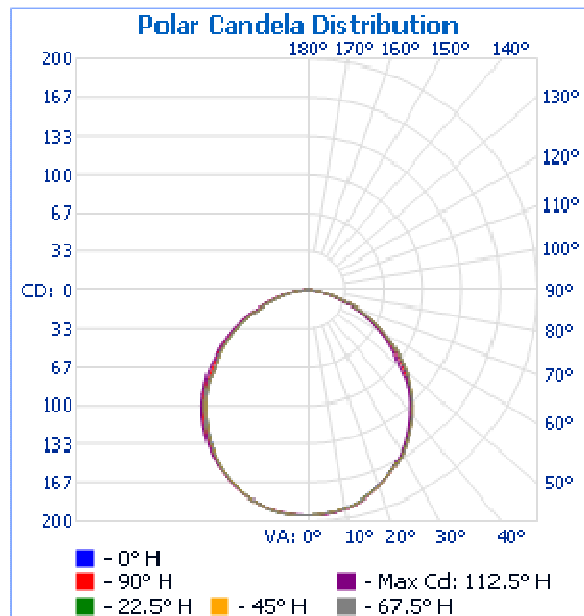
| Intertek Sample No. | Correlated Color Temperature (K) | CRI | CIE 31' Chromaticity Coordinate (x) | CIE 31' Chromaticity Coordinate (y) | CIE 76' Chromaticity Coordinate (u') | CIE 76' Chromaticity Coordinate (v') |
|---------------------|----------------------------------|-------|-------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|
| AE26PAR307QW60 | | | | | | |
| N4794LP | 2815 | 90.00 | 0.453 | 0.422 | 0.256 | 0.531 |
| N4795LP | 2814 | 90.10 | 0.457 | 0.420 | 0.256 | 0.530 |
| N4796LP | 2778 | 91.20 | 0.459 | 0.420 | 0.258 | 0.531 |
| N4797LP | 2827 | 90.00 | 0.457 | 0.421 | 0.256 | 0.531 |
| N4798LP | 2855 | 91.20 | 0.461 | 0.421 | 0.259 | 0.531 |
| N4799LP | 2771 | 89.20 | 0.462 | 0.423 | 0.258 | 0.532 |
| N4800LP | 2760 | 91.50 | 0.461 | 0.421 | 0.259 | 0.532 |
| N4801LP | 2849 | 89.80 | 0.454 | 0.420 | 0.255 | 0.530 |
| N4802LP | 2807 | 90.00 | 0.459 | 0.423 | 0.257 | 0.532 |
| N4803LP | 2855 | 89.70 | 0.454 | 0.420 | 0.255 | 0.530 |
| Average | 2813 | 90.27 | 0.458 | 0.421 | 0.257 | 0.531 |

Photometric and Electrical Measurements – Distribution Method

| Intertek Sample No. | Base Orientation | Input Voltage (Vac) | Input Current (mA) | Input Power (Watts) | Input Power Factor | Absolute Luminous Flux (Lumens) | Lumen Efficacy (Lumens Per Watt) |
|---------------------|------------------|---------------------|--------------------|---------------------|--------------------|---------------------------------|----------------------------------|
| AE26PAR307QW60 | | | | | | | |
| N4794LP | UP | 120.0 | 72.41 | 8.040 | 0.9251 | 519.2 | 64.58 |

Intensity (Candlepower) Summary at 25°C - Candelas

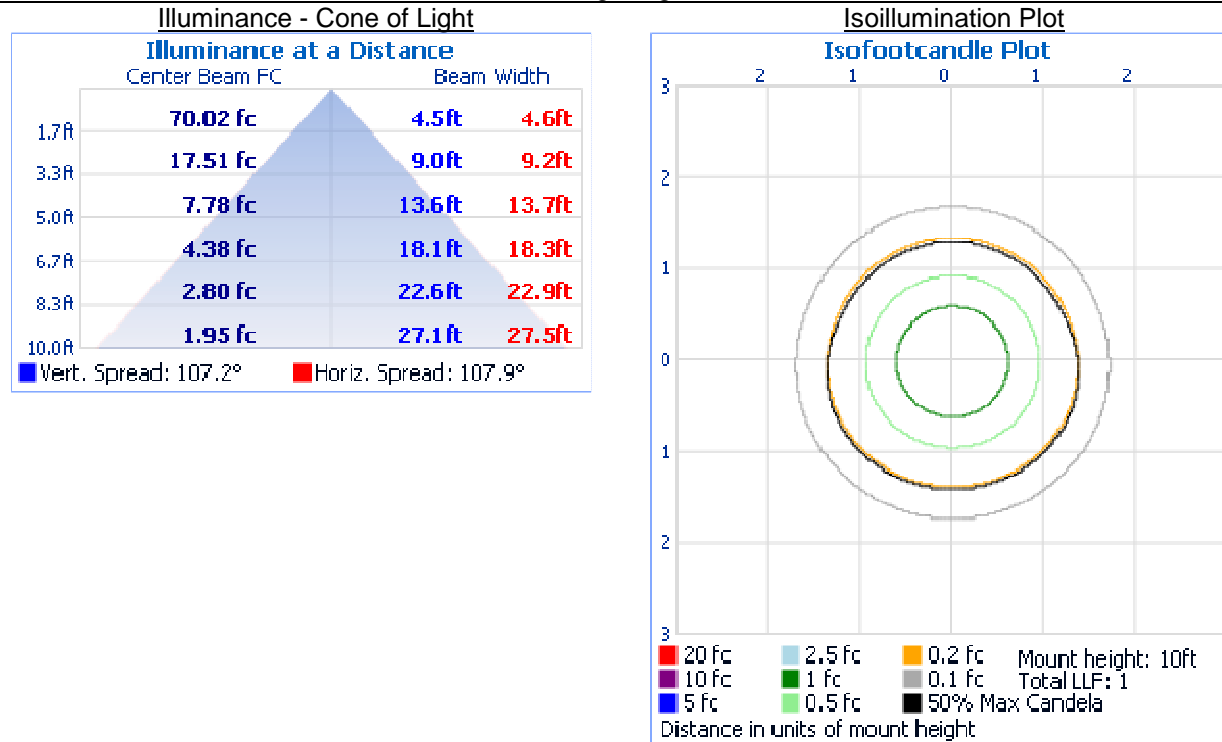
| Angle | 0 | 22.5 | 45 | 67.5 | 90 |
|----------------|-----|------|-----|------|-----|
| AE26PAR307QW60 | | | | | |
| 0 | 194 | 194 | 194 | 194 | 194 |
| 5 | 193 | 193 | 193 | 194 | 194 |
| 10 | 191 | 191 | 192 | 192 | 192 |
| 15 | 187 | 187 | 187 | 187 | 187 |
| 20 | 181 | 181 | 181 | 182 | 181 |
| 25 | 172 | 172 | 173 | 173 | 173 |
| 30 | 164 | 164 | 164 | 165 | 164 |
| 35 | 153 | 153 | 153 | 154 | 152 |
| 40 | 141 | 141 | 142 | 142 | 139 |
| 45 | 127 | 127 | 128 | 128 | 126 |
| 50 | 112 | 113 | 113 | 113 | 109 |
| 55 | 96 | 96 | 96 | 96 | 94 |
| 60 | 79 | 79 | 80 | 80 | 76 |
| 65 | 63 | 62 | 63 | 63 | 60 |
| 70 | 46 | 46 | 46 | 46 | 44 |
| 75 | 29 | 29 | 30 | 30 | 28 |
| 80 | 15 | 15 | 15 | 15 | 13 |
| 85 | 4 | 4 | 5 | 5 | 4 |
| 90 | 0 | 0 | 0 | 0 | 0 |



RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: AE26PAR307QW60
Mounting Height: 10 ft.



Zonal Lumen Summary and Percentages at 25°C

| Zone | Lumens | % Luminaire |
|----------------|--------|-------------|
| AE26PAR307QW60 | | |
| 0-30 | 150.7 | 29.0 |
| 0-40 | 245.6 | 47.3 |
| 0-60 | 425.1 | 81.9 |
| 60-90 | 93.8 | 18.1 |
| 0-90 | 518.9 | 99.9 |
| 90-180 | 0.3 | 0.1 |
| 0-180 | 519.2 | 100.0 |

Reflector Summary

| | Efficiency (%) | Lumens | Horizontal Spread (°) | Vertical Spread (°) |
|----------------|----------------|--------|-----------------------|---------------------|
| AE26PAR307QW60 | | | | |
| Field (10%): | 98.1 | 509.6 | 155.6 | 155.4 |
| Beam (50%): | 72.2 | 374.7 | 107.9 | 107.2 |
| Total: | 100.0 | 519.0 | | |

RESULTS OF TESTS (cont'd)

Color Spatial Uniformity

Sample No: AE26PAR307QW60

Model No.: N4794LP

| Vertical Angle (°) | Horizontal Angle = 0° | | | Horizontal Angle = 90° | | |
|--------------------|-----------------------|---------------------------|---------------------------|------------------------|---------------------------|---------------------------|
| | Candlepower (cd) | CIE' 1976 Chromaticity u' | CIE' 1976 Chromaticity v' | Candlepower (cd) | CIE' 1976 Chromaticity u' | CIE' 1976 Chromaticity v' |
| 0 | 195 | 0.2463 | 0.5289 | 195 | 0.2463 | 0.5289 |
| 10 | 192 | 0.2467 | 0.5286 | 191 | 0.2461 | 0.5286 |
| 20 | 181 | 0.2465 | 0.5285 | 181 | 0.2474 | 0.5291 |
| 30 | 164 | 0.2500 | 0.5297 | 164 | 0.2496 | 0.53 |
| 40 | 139 | 0.2526 | 0.5308 | 141 | 0.2522 | 0.5312 |
| 50 | 109 | 0.2563 | 0.5318 | 112 | 0.2552 | 0.5323 |
| 60 | 77 | 0.2599 | 0.5328 | 79 | 0.2618 | 0.5334 |
| 70 | 44 | 0.2632 | 0.5336 | 46 | 0.264 | 0.534 |

Weighted Average

| | |
|--------|--------|
| u' | v' |
| 0.2536 | 0.5311 |

| Vertical Angle (°) | Horz. 0 Δu' | Horiz. 0 Δv' | Horz. 90 Δu' | Horiz. 90 Δv' |
|--------------------|-------------|--------------|--------------|---------------|
| 0 | -0.0073 | -0.0022 | -0.0073 | -0.0022 |
| 10 | -0.0069 | -0.0025 | -0.0075 | -0.0025 |
| 20 | -0.0071 | -0.0026 | -0.0062 | -0.0020 |
| 30 | -0.0036 | -0.0014 | -0.0040 | -0.0011 |
| 40 | -0.0010 | -0.0003 | -0.0014 | 0.0001 |
| 50 | 0.0027 | 0.0007 | 0.0016 | 0.0012 |
| 60 | 0.0063 | 0.0017 | 0.0082 | 0.0023 |
| 70 | 0.0096 | 0.0025 | 0.0104 | 0.0029 |

Pictures (not to scale)



CONCLUSION

The results tabulated in this report are representative of the actual test samples submitted for this report only. The data is provided to the client for further evaluation. Compliance to the referenced specification requirements was not determined in this report.

In Charge Of Tests:

Handwritten signature of Jeffrey Davis in black ink.

Jeffrey Davis
Associate Engineer
Lighting Division

Report Reviewed By:

Handwritten signature of Jacki Swiernik in black ink.

Jacki Swiernik
Project Engineer
Lighting Division

Attachment: None