



REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100082487

Original Issue Date: April 26, 2010

Revision Date: July 14, 2010

REPORT NO. 100082487CRT-004

TEST OF ONE LED LAMP
MODEL NO. AG10R163060

RENDERED TO

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

REVISION NOTE JULY 14, 2010: This report was revised to change the model number by client request.

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 AG10R163060. The samples were received by Intertek on April 9, 2010, in undamaged condition, and 10 samples were tested as received. The sample designations were N4837LP through N4846LP

DATES OF TESTS: April 13, 2010 through April 19, 2010.

SUMMARY

Model No.: AG10R163060
Description: LED MR16 LAMP

Criteria	Result
Total Lumen Output	169.2
Total Power	2.683W
Luminaire Efficacy	63.06
Power Factor	0.9238
Color Rendering Index (CRI)	83.98
Correlated Color Temperature (CCT)	3019K
Chromaticity Coordinate (x)	0.439
Chromaticity Coordinate (y)	0.411
Chromaticity Coordinate (u')	0.249
Chromaticity Coordinate (v')	0.524
Color Spatial Uniformity	max Δ = 0.0026

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

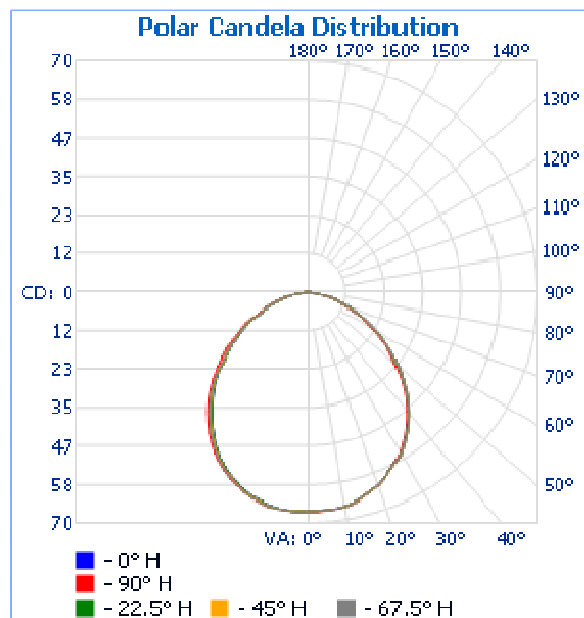
Intertek Sample No.	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
AG10R163060						
N4837LP	3034	84.00	0.438	0.410	0.249	0.524
N4838LP	3000	84.00	0.441	0.413	0.249	0.526
N4839LP	3030	84.00	0.438	0.410	0.249	0.524
N4840LP	3024	84.00	0.439	0.411	0.249	0.524
N4841LP	3037	84.00	0.437	0.410	0.248	0.524
N4842LP	3045	83.80	0.437	0.409	0.248	0.523
N4843LP	3001	84.00	0.440	0.411	0.250	0.525
N4844LP	3006	84.00	0.440	0.412	0.249	0.525
N4845LP	3005	84.00	0.440	0.411	0.250	0.525
N4846LP	3010	84.00	0.440	0.412	0.249	0.525
Average	3019	83.98	0.439	0.411	0.249	0.524

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)
AG10R163060							
N4837Lp	UP	120.0	24.202	2.683	0.9238	169.2	63.06

Intensity (Candlepower) Summary at 25°C - Candelas

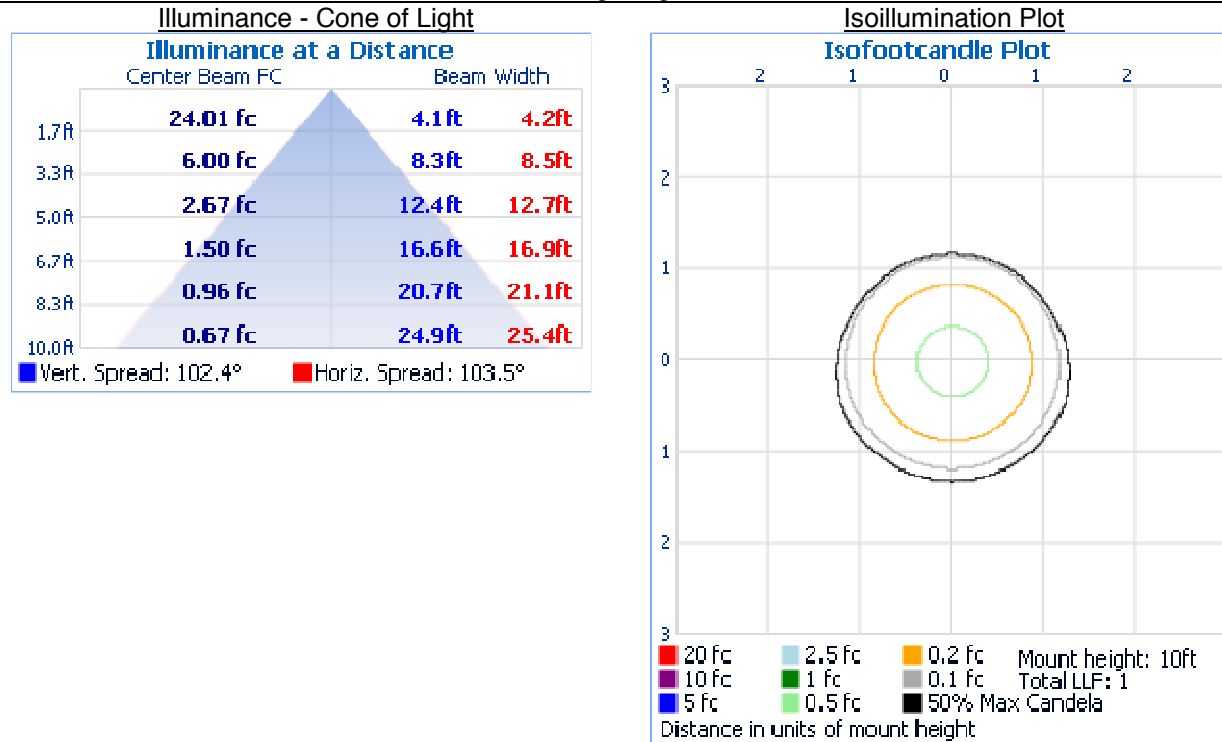
Angle	0	22.5	45	67.5	90
AG10R163060					
0	67	67	67	67	67
5	66	66	66	66	66
10	66	66	66	66	66
15	64	64	64	64	64
20	62	62	62	62	62
25	59	59	60	60	60
30	57	57	57	57	56
35	52	52	52	52	52
40	48	48	48	48	47
45	42	42	42	42	42
50	37	36	36	37	35
55	31	30	30	30	30
60	25	24	24	24	24
65	19	19	19	19	18
70	14	14	14	13	13
75	9	9	8	8	8
80	4	4	4	4	4
85	1	1	1	1	1
90	0	0	0	0	0



RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: AG10R163060
Mounting Height: 10 ft.



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
AG10R163060		
0-30	51.8	30.6
0-40	84.0	49.6
0-60	141.8	83.8
60-90	27.4	16.2
0-90	169.2	100.0
90-180	0.0	0.0
0-180	169.2	100.0

Reflector Summary

	Efficiency (%)	Lumens	Horizontal Spread (°)	Vertical Spread (°)
AG10R163060				
Field (10%):	98.1	166.0	152.9	152.6
Beam (50%):	70.9	119.9	103.5	102.4
Total:	100.0	169.2		

RESULTS OF TESTS (cont'd)

Color Spatial Uniformity

Sample No: AG10R163060

Model No.: N4837Lp

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	67	0.2472	0.5213	67	0.2472	0.5213
10	66	0.2474	0.5212	66	0.2473	0.5216
20	62	0.2473	0.522	62	0.2475	0.5219
30	56	0.2478	0.523	57	0.2479	0.523
40	47	0.2486	0.5234	48	0.2465	0.5241
50	35	0.2483	0.5244	37	0.2492	0.5254
60	24	0.2482	0.5247	25	0.2491	0.5262
70	13	0.2476	0.525	14	0.2486	0.5264

Weighted Average

u'	v'
0.2480	0.5238

Vertical Angle (°)	Horz. 0 Δu'	Horiz. 0 Δv'	Horz. 90 Δu'	Horiz. 90 Δv'
0	-0.0008	-0.0025	-0.0008	-0.0025
10	-0.0006	-0.0026	-0.0007	-0.0022
20	-0.0007	-0.0018	-0.0005	-0.0019
30	-0.0002	-0.0008	-0.0001	-0.0008
40	0.0006	-0.0004	-0.0015	0.0003
50	0.0003	0.0006	0.0012	0.0016
60	0.0002	0.0009	0.0011	0.0024
70	-0.0004	0.0012	0.0006	0.0026

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