



# REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100082487

Date: May 4, 2010

REPORT NO. 100082487CRT-005

TEST OF ONE LED LAMP  
MODEL NO. AACMR16WW25

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 AACMR16WW25. The samples were received by Intertek on April 9, 2010, in undamaged condition, and 10 samples were tested as received. The sample designations were N4921LP.

DATES OF TESTS: April 19, 2010 through May 3, 2010

SUMMARY

Model No.: AACMR16WW25
Description: LED MR16 LAMP

Criteria	Result
Total Lumen Output	155.3
Total Power	3.3488W
Luminaire Efficacy	46.38
Power Factor	0.9533
Color Rendering Index (CRI)	84.05
Correlated Color Temperature (CCT)	3056K
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.409
Chromaticity Coordinate (u')	0.248
Chromaticity Coordinate (v')	0.523
Color Spatial Uniformity	max $\Delta$ = 0.0071

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),  $0^\circ$  and  $90^\circ$  in vertical  $10^\circ$  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

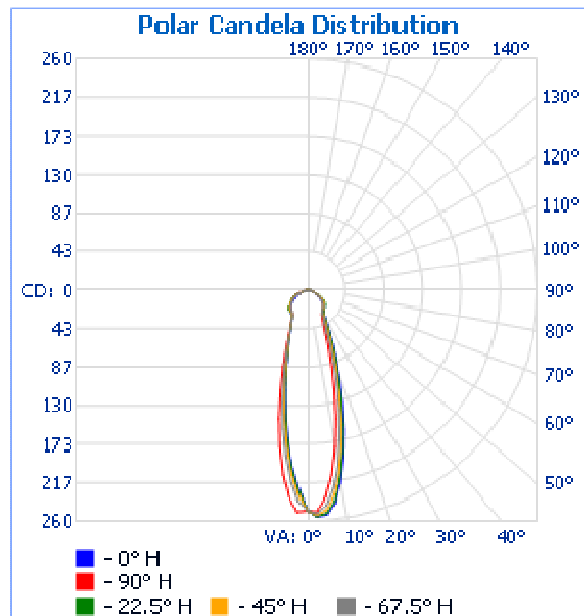
Intertek Sample No.	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
AACMR16WW25						
N4921LP	3054	84.00	0.436	0.409	0.248	0.523
N4922LP	3051	84.00	0.436	0.409	0.248	0.523
N4923LP	3057	84.10	0.436	0.409	0.248	0.523
N4924LP	3065	84.00	0.435	0.408	0.248	0.523
N4925LP	3054	84.00	0.436	0.410	0.248	0.523
N4926LP	3084	84.30	0.433	0.407	0.247	0.522
N4927LP	3046	83.90	0.437	0.410	0.248	0.524
N4928LP	3045	84.10	0.437	0.410	0.248	0.524
N4929LP	3058	84.10	0.436	0.409	0.248	0.523
N4930LP	3050	84.00	0.437	0.410	0.248	0.524
AVERAGE	3056	84.05	0.436	0.409	0.248	0.523

### 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)
AACMR16WW25							
N4921LP	UP	12.024	291.61	3.3488	0.9533	155.3	46.38

### Intensity (Candlepower) Summary at 25°C - Candelas

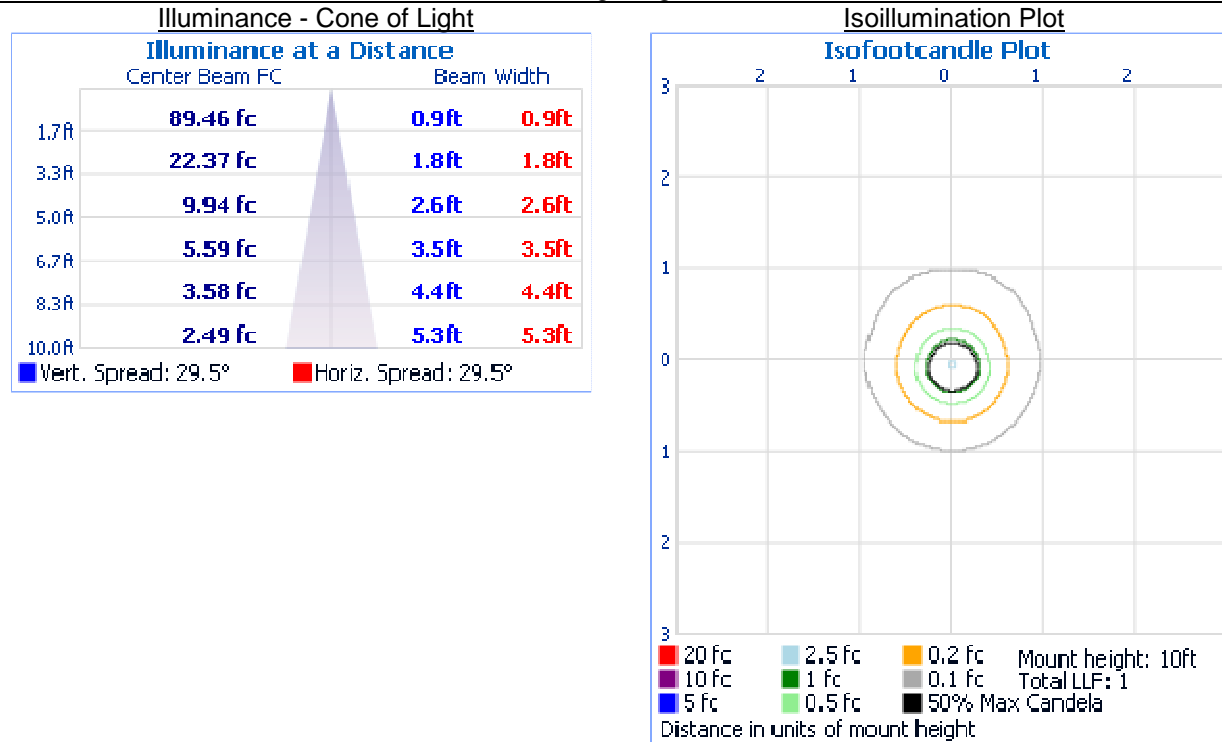
Angle	0	22.5	45	67.5	90
AACMR16WW25					
0	248	248	248	248	248
5	254	252	248	243	234
10	220	216	208	200	179
15	162	157	149	139	117
20	109	104	96	86	70
25	68	65	59	52	44
30	44	42	39	36	33
35	32	32	30	29	29
40	29	28	28	27	28
45	27	27	26	25	26
50	24	26	24	23	23
55	19	23	22	20	20
60	14	19	17	16	16
65	11	14	13	12	12
70	8	9	9	9	9
75	6	6	6	6	6
80	4	4	4	4	3
85	2	2	2	2	2
90	1	1	1	1	0



## RESULTS OF TESTS (cont'd)

### Illumination Plots

Model No.: AACMR16WW25  
Mounting Height: 10 ft.



### Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
AACMR16WW25		
0-30	77.7	50.0
0-40	97.0	62.4
0-60	135.6	87.3
60-90	19.6	12.6
0-90	155.2	99.9
90-180	0.1	0.1
0-180	155.3	100.0

### Reflector Summary

	Efficiency (%)	Lumens	Horizontal Spread (°)	Vertical Spread (°)
AACMR16WW25				
Field (10%):	72.3	112.3	92.9	95.3
Beam (50%):	24.1	37.4	29.5	29.5
Total:	100.0	155.3		

RESULTS OF TESTS (cont'd)

Color Spatial Uniformity

Sample No: AACMR16WW25  
 Model No.: N4921LP

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	249	0.2442	0.5159	249	0.2442	0.5159
10	179	0.2465	0.5192	220	0.2454	0.5194
20	70	0.2522	0.5282	109	0.2447	0.521
30	33	0.2507	0.5285	44	0.2454	0.5234
40	28	0.2483	0.5265	29	0.2486	0.5264

Weighted Average

u'	v'
0.2474	0.5230

Vertical Angle (°)	Horz. 0 Δu'	Horiz. 0 Δv'	Horz. 90 Δu'	Horiz. 90 Δv'
0	-0.0032	-0.0071	-0.0032	-0.0071
10	-0.0009	-0.0038	-0.0020	-0.0036
20	0.0048	0.0052	-0.0027	-0.0020
30	0.0033	0.0055	-0.0020	0.0004
40	0.0009	0.0035	0.0012	0.0034

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