



# REPORT

545 E. Algonquin Rd., Arlington Heights, IL 60005

Project No. G102406056

Date: March 11, 2016

REPORT NO. 102406056CHI-003

TEST OF ONE AR111 LAMP

MODEL NO. SR111-12-25D-927-03

LED MODEL NO. SORAA

DRIVER MODEL NO. SORAA

RENDERED TO

SORAA

6500 KAISER DR. SUITE 110

FREMONT, CA 94555

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

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00660665.

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: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number SR111-12-25D-927-03. The sample was received by Intertek on March 1, 2016, in undamaged condition and one sample was tested as received. The sample designation was AH03012016050546-3.

DATES OF TESTS: March 8, 2016 through March 11, 2016.

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SUMMARY

Model No.:	SR111-12-25D-927-03
Description:	AR111 Lamp

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	689.3	705.6
Total Power (W)	12.45	12.46
Luminaire Efficacy (LPW)	55.37	56.63

Criteria	Result
Power Factor	0.920
Current ATHD %	34.67
Correlated Color Temperature (CCT - K)	2722
Color Rendering Index (CRI - Ra)	94.7
Color Rendering Index (CRI - R9)	98.5
DUV	0.002
Chromaticity Coordinate (x)	0.455
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.262
Chromaticity Coordinate (v')	0.524

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/14/15	07/14/16	03/11/16
Omega Thermometer	DPI8-C24	146920	10/09/15	10/09/16	03/11/16
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	03/11/16
Newport Hygrometer	iServer	146956	01/04/16	01/04/17	03/11/16
Elgar, AC Power Supply	CW1251P	146918	VBU	VBU	03/11/16
2 Meter Sphere & Spectroradiometer	MS760/CDS11C	146137	VBU	VBU	03/08/16
Elgar AC Power Supply	CW1251M	146113	VBU	VBU	03/08/16
Sorenson DC Power Supply	XFR150-8	146847	VBU	VBU	03/08/16
Newport Humidity Recorder	iTHX-SD	146382	07/09/15	07/09/16	03/08/16
Yokogawa Power Meter	WT1600	146770	04/07/15	04/07/16	03/08/16
Omega Temperature Meter	MDSi8	146873	07/09/15	07/09/16	03/08/16



## TEST METHODS

### Seasoning in Sample Orientation – LED Products

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

### Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD 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.

### 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.

**RESULTS OF TEST**

**Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method**

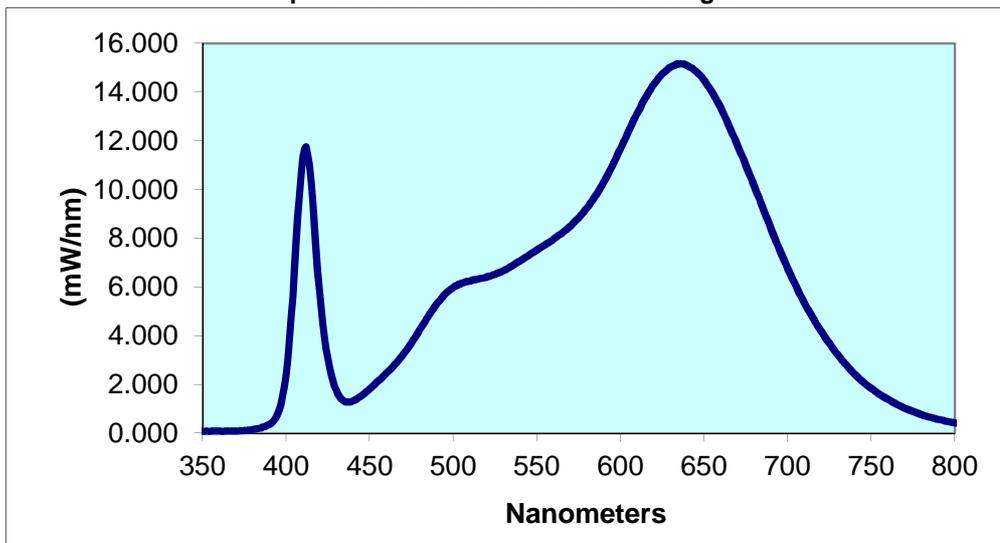
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH03012016050546-3	Up	12.0	1127	12.45	0.920	34.67	689.3	55.37

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
2722	94.7	98.5	0.002	0.455	0.405	0.262	0.524

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.083	440	1.321	530	6.668	620	14.32	710	5.354
355	0.082	445	1.528	535	6.857	625	14.75	715	4.749
360	0.080	450	1.814	540	7.066	630	15.03	720	4.182
365	0.088	455	2.134	545	7.294	635	15.16	725	3.682
370	0.076	460	2.467	550	7.524	640	15.09	730	3.216
375	0.101	465	2.822	555	7.737	645	14.86	735	2.803
380	0.144	470	3.229	560	7.970	650	14.49	740	2.432
385	0.213	475	3.701	565	8.211	655	13.99	745	2.110
390	0.351	480	4.255	570	8.498	660	13.37	750	1.839
395	0.785	485	4.792	575	8.840	665	12.62	755	1.597
400	2.404	490	5.291	580	9.260	670	11.83	760	1.389
405	6.688	495	5.709	585	9.754	675	11.00	765	1.197
410	11.36	500	5.982	590	10.32	680	10.14	770	1.029
415	10.31	505	6.158	595	10.95	685	9.282	775	0.887
420	5.804	510	6.236	600	11.66	690	8.400	780	0.764
425	3.054	515	6.327	605	12.41	695	7.570		
430	1.760	520	6.410	610	13.12	700	6.784		
435	1.300	525	6.516	615	13.76	705	6.040		

**Spectral Data Over Visible Wavelengths**



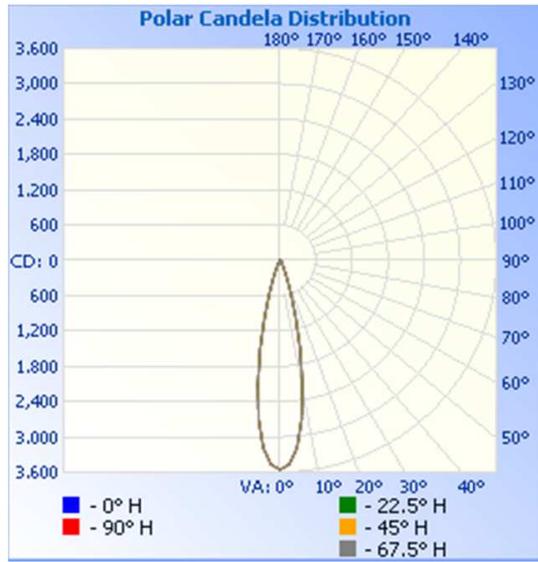
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – 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 (LPW)
AH03012016050546-3	Up	12.1	1120	12.46	0.921	705.6	56.63

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3554	3554	3554	3554	3554
5	3202	3202	3202	3202	3202
10	2134	2134	2134	2134	2134
15	998	998	998	998	998
20	362	362	362	362	362
25	136	136	136	136	136
30	67	67	67	67	67
35	43	43	43	43	43
40	32	32	32	32	32
45	25	25	25	25	25
50	21	21	21	21	21
55	18	18	18	18	18
60	15	15	15	15	15
65	12	12	12	12	12
70	9	9	9	9	9
75	6	6	6	6	6
80	3	3	3	3	3
85	1	1	1	1	1
90	0	0	0	0	0

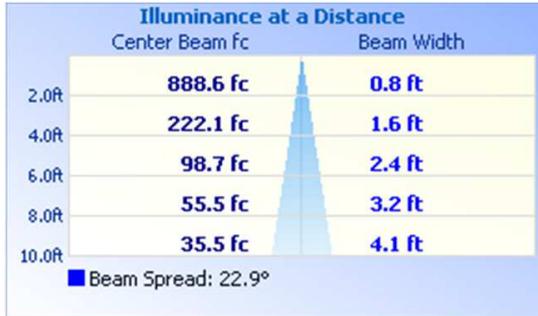


RESULTS OF TEST (cont'd)

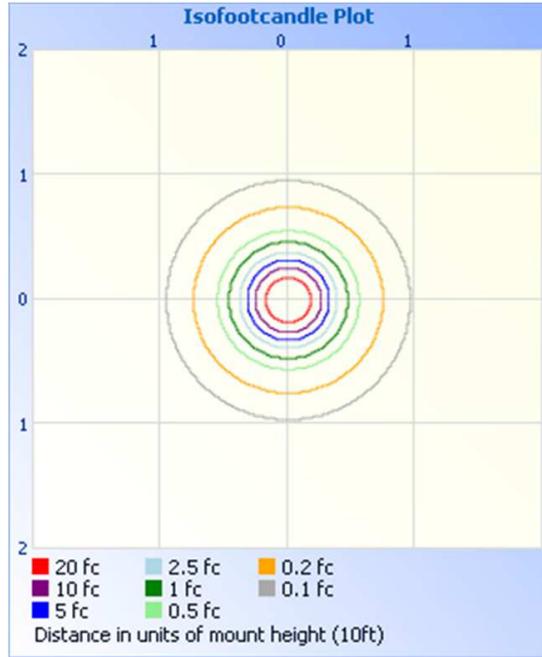
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



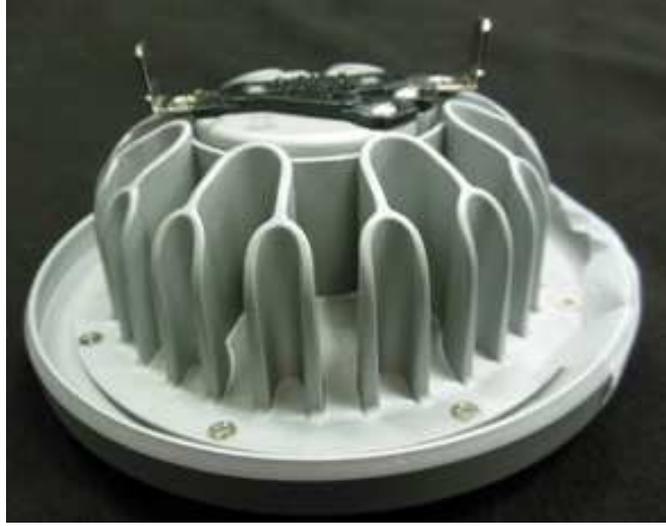
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	622.7	88.3
0-40	650.8	92.2
0-60	686.8	97.3
60-90	18.8	2.7
0-90	705.6	100.0
90-180	0.0	0.0
0-180	705.6	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	268.6	38.1
10-20	282.3	40.0
20-30	71.9	10.2
30-40	28.1	4.0
40-50	19.8	2.8
50-60	16.2	2.3
60-70	11.6	1.6
70-80	5.9	0.8
80-90	1.3	0.2

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:



Timothy Quigley  
Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Kenda Branch  
Team Lead  
Lighting Division