



# REPORT

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

Project No. G101438970

Date: December 17, 2013

REPORT NO. 101438970CHI-003

TEST OF ONE LED RECESSED FIXTURE 4" APERTURE

MODEL NO. E4SF-XI3060AN  
LED MODEL NO. XSM8030-2000-C  
DRIVER MODEL NO. LTF DA30W900C  
TRIM MODEL NO. E4SFB-OW

RENDERED TO

GENERATION BRANDS  
7400 LINDER AVENUE  
SKOKIE, IL 60077

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 500495420.

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 E4SF-XI3060AN. The sample was received by Intertek on November 26, 2013, in undamaged condition and one sample was tested as received. The sample designation was 11262013020235.

DATES OF TESTS: December 13, 2013 through December 16, 2013.

## SUMMARY

Model No.:	E4SF-XI3060AN
Description:	LED Recessed Fixture 4" Aperture

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1607	1609
Total Power (W)	29.94	30.04
Luminaire Efficacy (LPW)	53.67	53.56

Criteria	Result
Power Factor	0.990
Current ATHD %	8.86
Correlated Color Temperature (CCT - K)	2948
Color Rendering Index (CRI - Ra)	81.6
Color Rendering Index (CRI - R9)	14.3
DUV	0.001
Chromaticity Coordinate (x)	0.442
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.252
Chromaticity Coordinate (v')	0.524

## EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU
3 Meter Sphere	SPR600	CHI0088	VBU	VBU
Elgar AC Power Supply	CW1251M	146112	VBU	VBU
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
Newport Humidity Recorder	iTHX-SD	146382	08/26/13	08/26/14
Yokogawa Power Meter	WT1600	146769	05/17/13	05/17/14
Omega Temperature Meter	MDSi8	146139	06/20/13	06/20/14
Yokogawa Power Meter	WT210	146919	09/06/13	09/06/14
Omega Thermometer	DPI8-C24	146920	08/26/13	08/26/14
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
Newport Hygrometer	iServer	146960	02/21/13	02/21/14
Elgar, AC Power Supply	CW1251P	146918	VBU	VBU
Cole-Parmer Triple Timer	94440-00	CHI0041	06/20/13	06/20/14



## 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 Three Meter 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

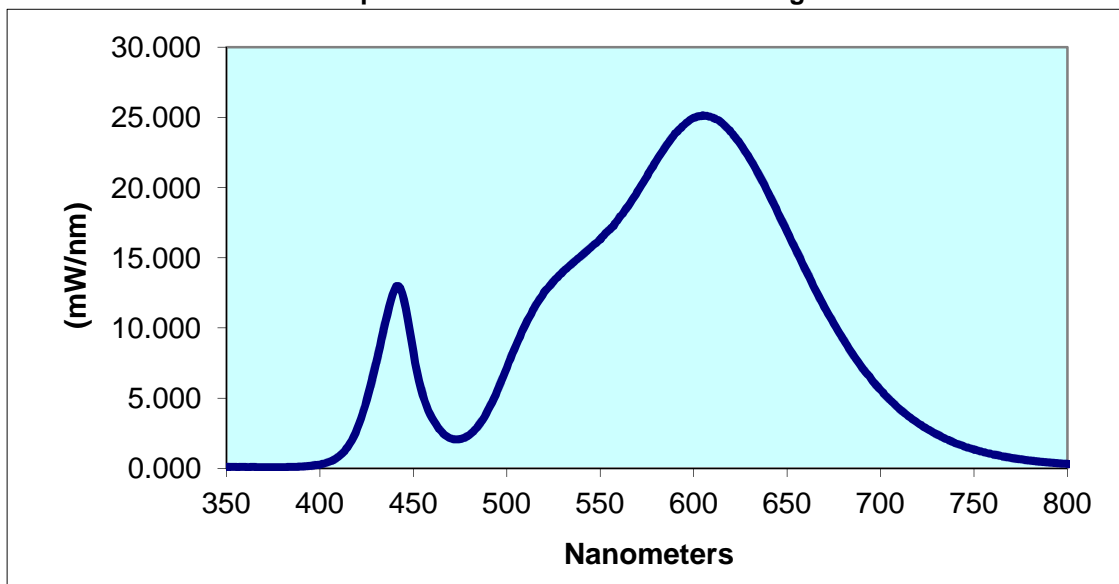
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
11262013020235	UP	120.0	252.2	29.94	0.990	8.86	1607	53.67

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')
2948	81.6	14.3	0.001	0.442	0.408	0.252	0.524

### Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.08	440	12.74	530	14.00	620	23.96	710	4.252
355	0.092	445	11.99	535	14.58	625	23.10	715	3.702
360	0.087	450	8.253	540	15.14	630	22.07	720	3.221
365	0.086	455	5.21	545	15.73	635	20.90	725	2.797
370	0.08	460	3.587	550	16.31	640	19.61	730	2.417
375	0.075	465	2.62	555	17.00	645	18.23	735	2.082
380	0.081	470	2.122	560	17.81	650	16.84	740	1.796
385	0.093	475	2.077	565	18.70	655	15.47	745	1.542
390	0.121	480	2.388	570	19.74	660	14.10	750	1.334
395	0.173	485	3.063	575	20.80	665	12.76	755	1.152
400	0.266	490	4.132	580	21.92	670	11.48	760	0.998
405	0.455	495	5.552	585	22.94	675	10.29	765	0.858
410	0.835	500	7.163	590	23.86	680	9.199	770	0.738
415	1.542	505	8.795	595	24.49	685	8.168	775	0.634
420	2.83	510	10.24	600	24.98	690	7.205	780	0.546
425	4.88	515	11.5	605	25.15	695	6.370		
430	7.493	520	12.55	610	25.00	700	5.573		
435	10.41	525	13.32	615	24.63	705	4.872		

Spectral Data Over Visible Wavelengths



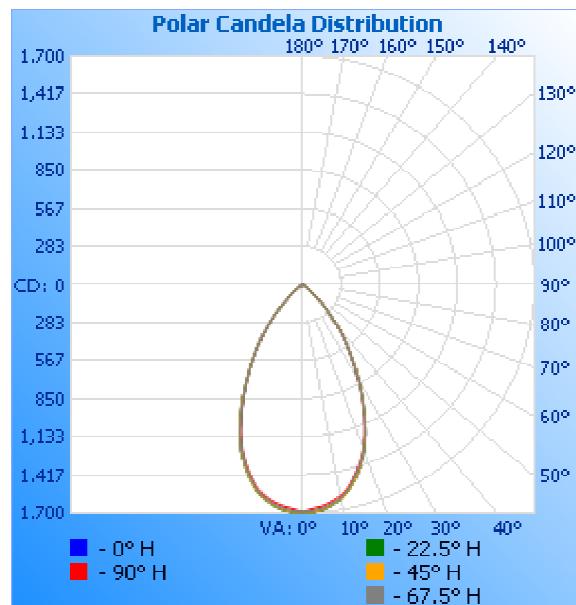
## RESULTS OF TEST (cont'd)

### 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 (Lumens Per Watt)
11262013020235	UP	120.0	253.6	30.04	0.987	1609	53.56

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

Angle	0	22.5	45	67.5	90
0	1690	1690	1690	1690	1690
5	1680	1682	1678	1668	1655
10	1620	1623	1621	1610	1598
15	1495	1498	1496	1481	1474
20	1315	1317	1315	1307	1300
25	1079	1080	1082	1074	1069
30	826	826	828	821	817
35	592	594	598	593	590
40	391	390	391	388	386
45	210	209	206	209	208
50	70	69	69	73	75
55	2	1	0	0	0
60	0	0	0	0	0
65	0	0	0	0	0
70	0	0	0	0	0
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

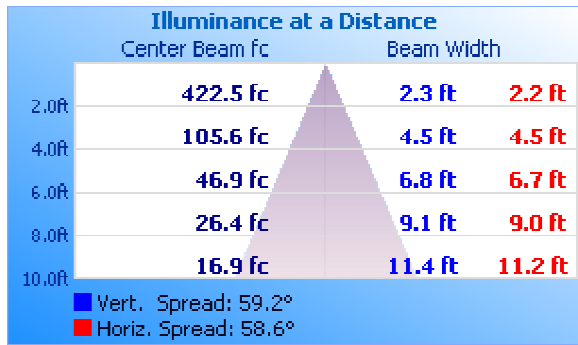


## RESULTS OF TEST (cont'd)

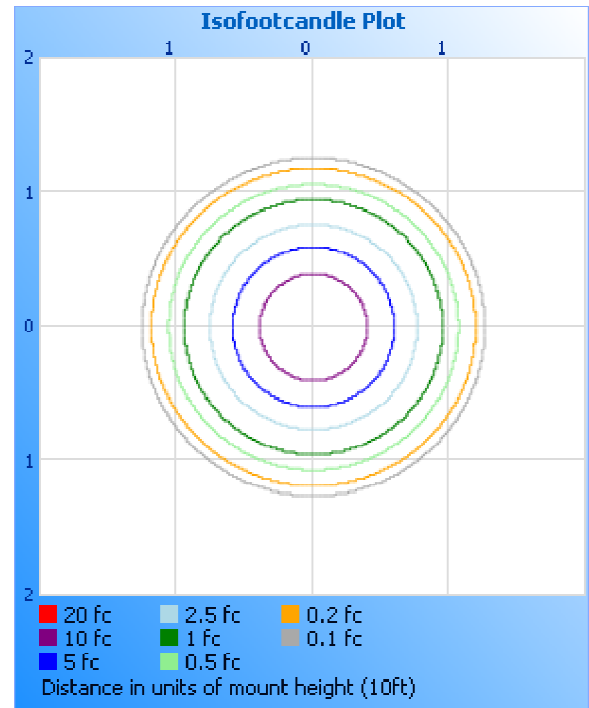
### Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



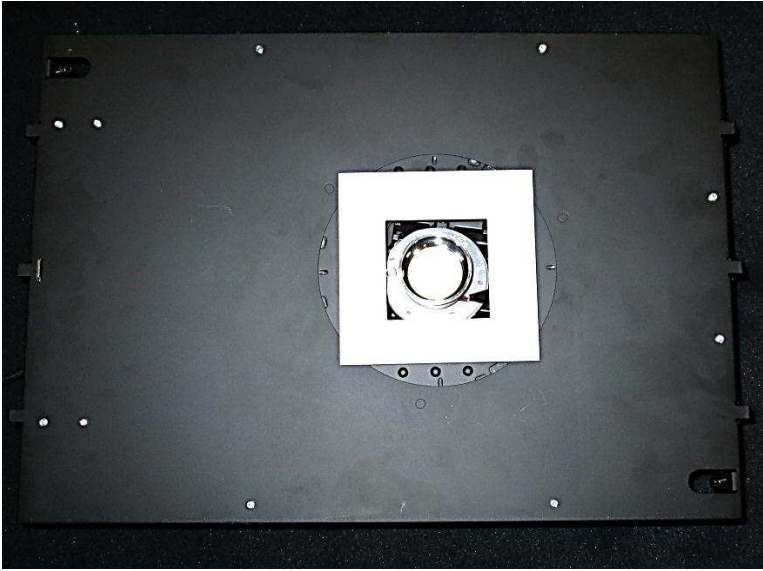
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1062	66.0
0-40	1432	89.0
0-60	1609	100.0
60-90	0.0	0.0
0-90	1609	100.0
90-180	0.0	0.0
0-180	1609	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	157.8	9.8
10-20	415.0	25.8
20-30	489.4	30.4
30-40	370.3	23.0
40-50	164.1	10.2
50-60	12.1	0.8
60-70	0.0	0.0
70-80	0.0	0.0
80-90	0.0	0.0

PICTURE (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:



Tim Quigley  
Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Joe Schledorn  
Project Engineer  
Lighting Division