



# REPORT

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

Project No. G101438970

Date: December 17, 2013

REPORT NO. 101438970CHI-001

TEST OF ONE LED RECESSED FIXTURE 4" APERTURE

MODEL NO. E4SF-XI3021AN  
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-XI3021AN. The sample was received by Intertek on November 26, 2013, in undamaged condition and one sample was tested as received. The sample designation was 11262013020256.

DATES OF TESTS: December 13, 2013 through December 17, 2013.

## SUMMARY

Model No.:	E4SF-XI3021AN
Description:	LED Recessed Fixture 4" Aperture

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1645	1626
Total Power (W)	29.55	29.62
Luminaire Efficacy (LPW)	55.67	54.9

Criteria	Result
Power Factor	0.989
Current ATHD %	9.09
Correlated Color Temperature (CCT - K)	2938
Color Rendering Index (CRI - Ra)	81.5
Color Rendering Index (CRI - R9)	13.6
DUV	0.000
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	VBV	VBV
3 Meter Sphere	SPR600	CHI0088	VBV	VBV
Elgar AC Power Supply	CW1251M	146112	VBV	VBV
Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV
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	VBV	VBV
Newport Hygrometer	iServer	146960	02/21/13	02/21/14
Elgar, AC Power Supply	CW1251P	146918	VBV	VBV
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

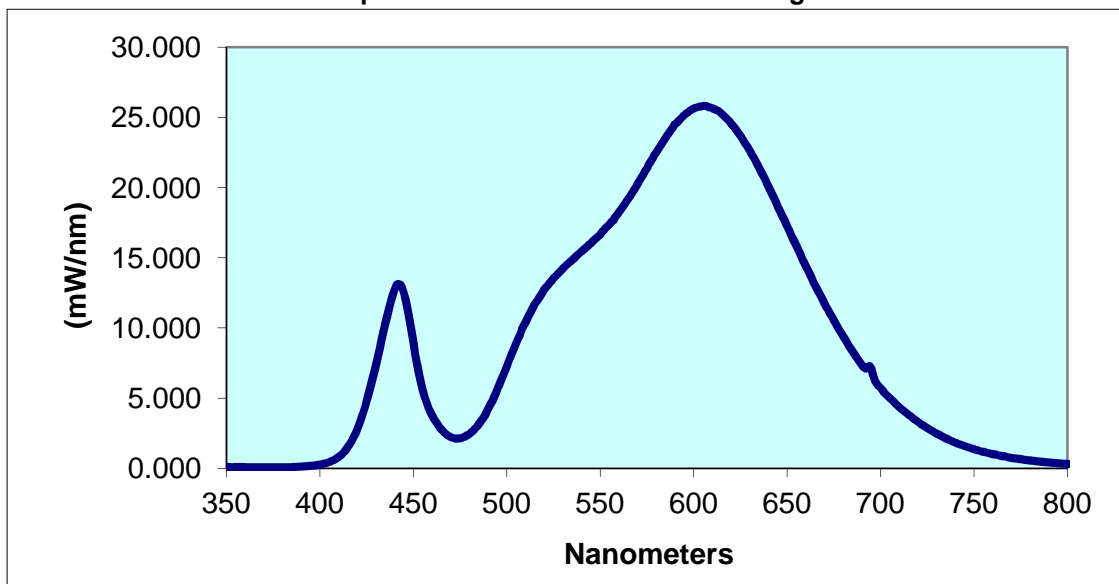
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
11262013020256	UP	120.0	249.0	29.55	0.989	9.09	1645	55.67

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')
2938	81.5	13.6	0.000	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	0.09	440	12.77	530	14.23	620	24.58	710	4.358
355	0.094	445	12.47	535	14.83	625	23.7	715	3.82
360	0.078	450	8.943	540	15.44	630	22.63	720	3.303
365	0.075	455	5.559	545	16.03	635	21.42	725	2.859
370	0.074	460	3.767	550	16.66	640	20.09	730	2.469
375	0.074	465	2.767	555	17.4	645	18.67	735	2.126
380	0.08	470	2.21	560	18.24	650	17.23	740	1.829
385	0.084	475	2.133	565	19.19	655	15.83	745	1.571
390	0.115	480	2.446	570	20.26	660	14.41	750	1.352
395	0.168	485	3.124	575	21.38	665	13.05	755	1.17
400	0.259	490	4.193	580	22.53	670	11.75	760	1.01
405	0.448	495	5.634	585	23.58	675	10.53	765	0.872
410	0.81	500	7.259	590	24.52	680	9.402	770	0.745
415	1.507	505	8.916	595	25.15	685	8.336	775	0.642
420	2.777	510	10.39	600	25.64	690	7.358	780	0.548
425	4.797	515	11.68	605	25.82	695	7.146		
430	7.384	520	12.73	610	25.66	700	5.698		
435	10.31	525	13.55	615	25.27	705	4.992		

Spectral Data Over Visible Wavelengths



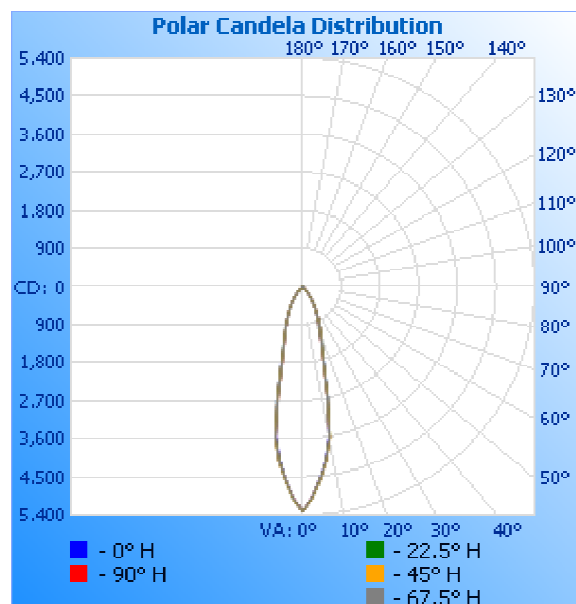
## RESULTS OF TEST (cont'd)

### 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)
11262013020256	UP	120.1	250.0	29.62	0.986	1626	54.9

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

Angle	0	22.5	45	67.5	90
0	5306	5306	5306	5306	5306
5	4584	4595	4600	4591	4590
10	3588	3622	3643	3632	3617
15	1916	1913	1892	1871	1880
20	1225	1233	1229	1224	1218
25	864	874	875	873	870
30	593	602	606	609	605
35	354	361	362	365	364
40	150	152	151	154	154
45	16	15	12	19	12
50	0	0	0	0	0
55	0	0	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

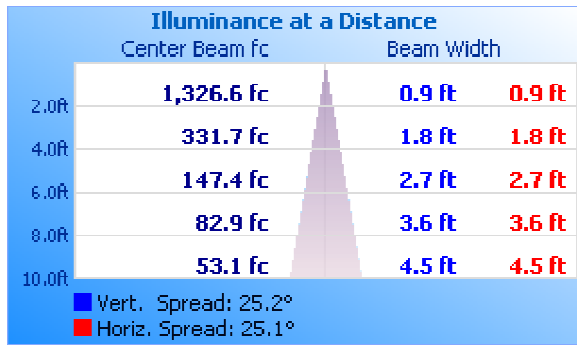


## RESULTS OF TEST (cont'd)

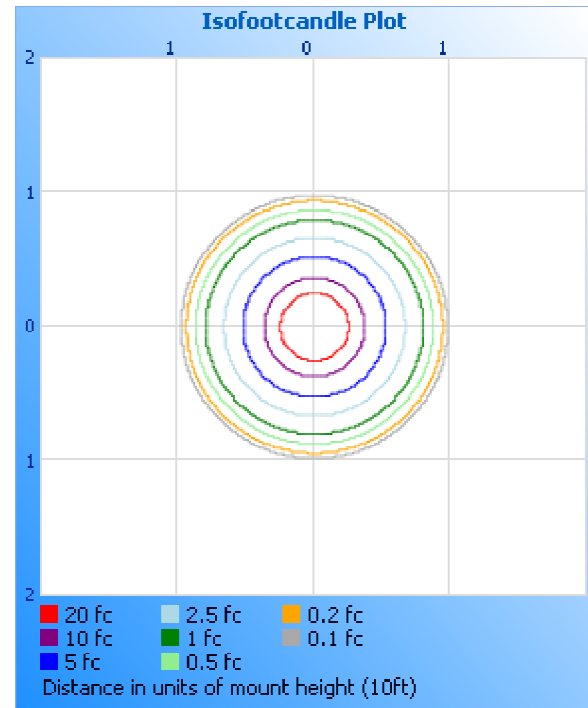
### Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1372	84.4
0-40	1597	98.2
0-60	1626	100.0
60-90	0.0	0.0
0-90	1626	100.0
90-180	0.0	0.0
0-180	1626	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	407.8	25.1
10-20	562.6	34.6
20-30	401.4	24.7
30-40	225.0	13.8
40-50	29.0	1.8
50-60	0.0	0.0
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