



# REPORT

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

Project No. G101518786

Date: February 3, 2014

REPORT NO. 101518786CHI-003

TEST OF ONE LED RECESSED FIXTURE 4" APERTURE

MODEL NO. E4SF-LXWD60AN  
LED MODEL NO. LUMENETIX CTM 019  
DRIVER MODEL NO. LTF DA35W24VBF-0000  
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 500506211.

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-LXWD60AN. The sample was received by Intertek on January 27, 2014, in undamaged condition and one sample was tested as received. The sample designation was 01272014035228.

DATES OF TESTS: January 29, 2014 through January 31, 2014.



SUMMARY

Model No.:	E4SF-LXWD60AN
Description:	LED Recessed Fixture 4" Aperture

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	923.2	920.0
Total Power (W)	23.87	23.87
Luminaire Efficacy (LPW)	38.68	38.54

Criteria	Result
Power Factor	0.938
Current ATHD %	20.60
Correlated Color Temperature (CCT - K)	3037
Color Rendering Index (CRI - Ra)	94.3
Color Rendering Index (CRI - R9)	87.0
DUV	0.001
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.249
Chromaticity Coordinate (v')	0.522

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	12/04/13	12/04/14
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
Newport Hygrometer	iServer	146956	01/02/14	01/02/15
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**

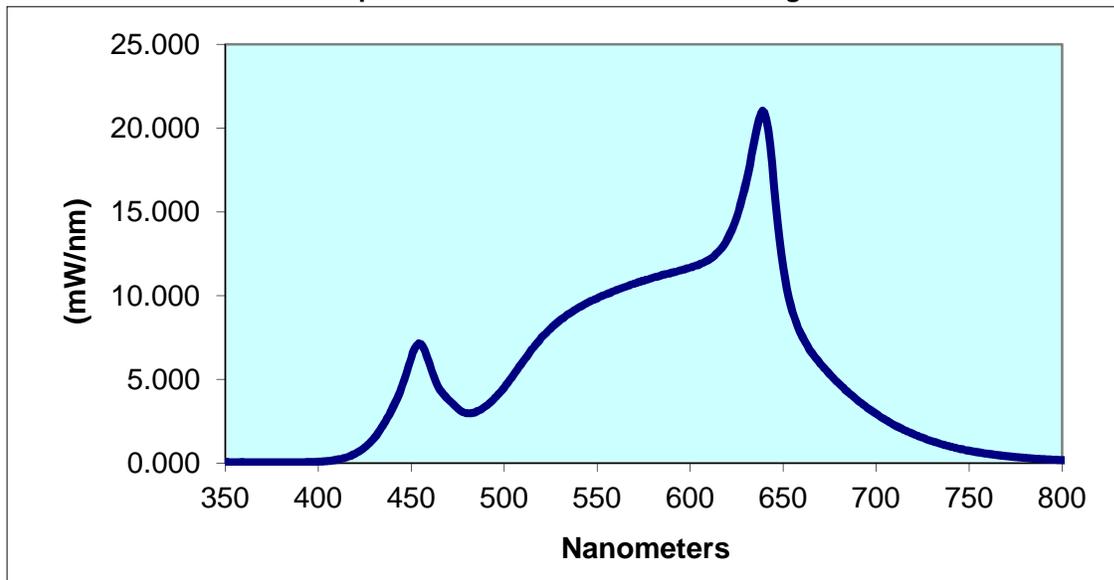
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
01272014035228	UP	120.0	212.1	23.87	0.938	20.60	923.2	38.68

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')
3037	94.3	87.0	0.001	0.435	0.405	0.249	0.522

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.03	440	3.286	530	8.517	620	13.37	710	2.255
355	0.049	445	4.558	535	8.926	625	14.69	715	1.969
360	0.046	450	6.303	540	9.28	630	16.75	720	1.728
365	0.039	455	7.112	545	9.577	635	19.52	725	1.505
370	0.041	460	5.852	550	9.836	640	20.92	730	1.302
375	0.036	465	4.456	555	10.08	645	16.68	735	1.131
380	0.037	470	3.781	560	10.31	650	11.66	740	0.974
385	0.038	475	3.249	565	10.51	655	9.033	745	0.839
390	0.04	480	2.969	570	10.71	660	7.601	750	0.728
395	0.053	485	3.069	575	10.88	665	6.66	755	0.63
400	0.072	490	3.391	580	11.07	670	5.917	760	0.549
405	0.112	495	3.879	585	11.23	675	5.297	765	0.474
410	0.192	500	4.517	590	11.36	680	4.738	770	0.406
415	0.325	505	5.262	595	11.5	685	4.224	775	0.352
420	0.565	510	6.032	600	11.67	690	3.751	780	0.302
425	0.936	515	6.806	605	11.87	695	3.318		
430	1.48	520	7.491	610	12.13	700	2.93		
435	2.29	525	8.032	615	12.61	705	2.577		

**Spectral Data Over Visible Wavelengths**



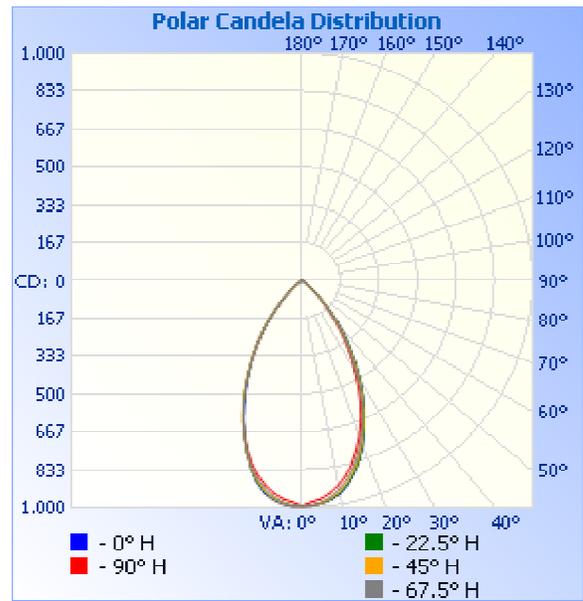
RESULTS OF TEST (cont'd)

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)
01272014035228	UP	120.0	212.2	23.87	0.937	920.0	38.54

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	992	992	992	992	992
5	985	984	983	980	964
10	952	950	944	934	915
15	877	876	868	856	836
20	769	768	760	747	728
25	639	637	630	618	600
30	501	499	491	478	461
35	365	362	353	340	326
40	241	236	227	216	207
45	126	124	122	113	111
50	40	40	38	37	39
55	1	1	2	3	4
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

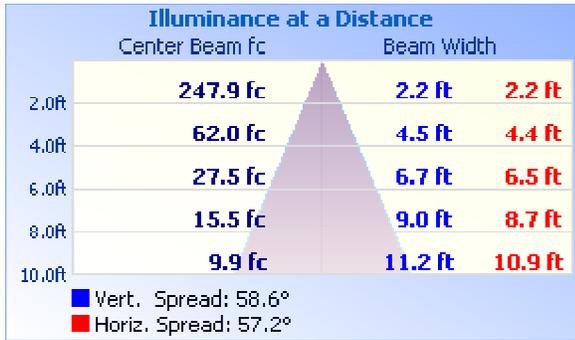


RESULTS OF TEST (cont'd)

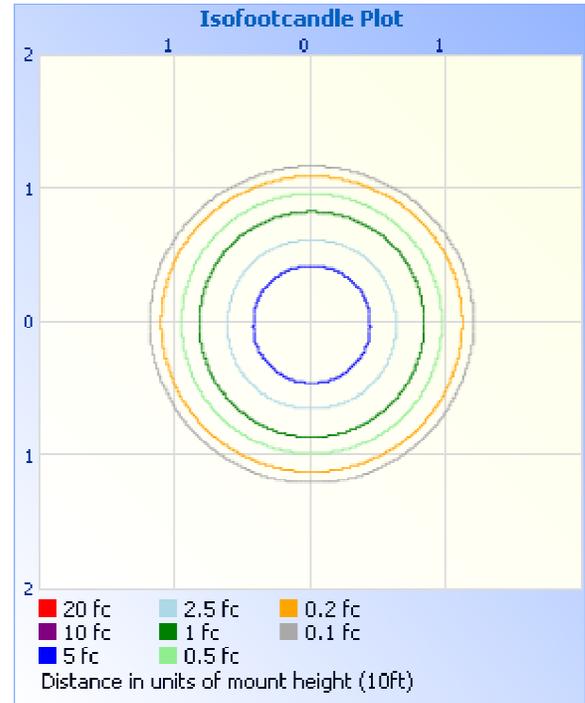
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



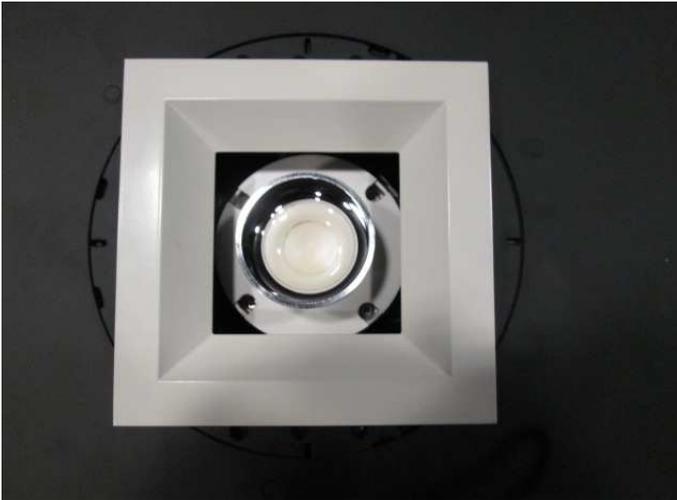
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	609.3	66.2
0-40	821.2	89.3
0-60	919.9	100.0
60-90	0.2	0.0
0-90	920.0	100.0
90-180	0.0	0.0
0-180	920.0	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	92.1	10.0
10-20	238.1	25.9
20-30	279.0	30.3
30-40	211.9	23.0
40-50	91.7	10.0
50-60	7.0	0.8
60-70	0.1	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:



Mark Razvi  
Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Joe Schledorn  
Project Engineer  
Lighting Division