



# REPORT

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

Project No. G103017649

Date: May 22, 2017

REPORT NO. 103017649CHI-032

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH9301AN  
LED MODEL NO. CITIZEN CLU038-1205C4-303H5K2  
DRIVER MODEL NO. LTF DA18W440C40BF  
TRIM MODEL NO. E3SFB-OW

RENDERED TO

GENERATION BRANDS  
7400 LINDER AVE  
SKOKIE, IL 60077

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

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00779063-2.

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 E3SFF-LH9301AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-032.

DATES OF TESTS: May 16, 2017 through May 22, 2017.

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SUMMARY

Model No.:	E3SFF-LH9301AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1327	1285
Total Power (W)	17.97	17.95
Luminaire Efficacy (LPW)	73.85	71.59

Criteria	Result
Power Factor	0.976
Current ATHD %	12.10
Correlated Color Temperature (CCT - K)	3145
Color Rendering Index (CRI - Ra)	92.4
Color Rendering Index (CRI - R9)	68.3
DUV	0.001
Chromaticity Coordinate (x)	0.429
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.245
Chromaticity Coordinate (v')	0.521

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/11/16	07/11/17	05/22/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/22/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/22/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/22/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/22/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	05/16/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	05/16/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	05/16/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	05/16/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	05/16/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	05/16/17
Fluke J/K Temperature Meter	52	146004	01/10/17	01/10/18	05/16/17

## 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)
\\H04192017041604-03:	Up	120.0	153.5	17.97	0.976	12.10	1327	73.85

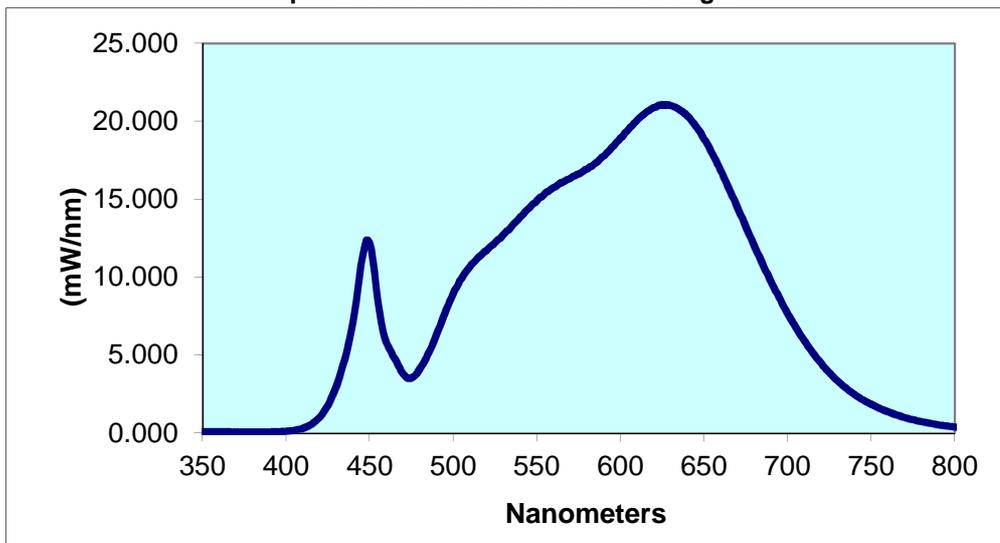
  

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3145	92.4	68.3	0.001	0.429	0.406	0.245	0.521

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.091	440	7.170	530	12.74	620	20.89	710	5.918
355	0.083	445	10.86	535	13.28	625	21.06	715	5.171
360	0.090	450	12.21	540	13.86	630	21.00	720	4.482
365	0.080	455	8.467	545	14.40	635	20.78	725	3.882
370	0.071	460	5.813	550	14.90	640	20.35	730	3.344
375	0.071	465	4.791	555	15.39	645	19.69	735	2.883
380	0.068	470	3.809	560	15.77	650	18.87	740	2.485
385	0.063	475	3.540	565	16.06	655	17.92	745	2.142
390	0.074	480	4.114	570	16.35	660	16.85	750	1.854
395	0.089	485	5.077	575	16.64	665	15.70	755	1.602
400	0.121	490	6.326	580	16.94	670	14.47	760	1.374
405	0.182	495	7.682	585	17.33	675	13.27	765	1.178
410	0.309	500	8.956	590	17.78	680	12.05	770	1.004
415	0.561	505	9.913	595	18.35	685	10.87	775	0.858
420	1.016	510	10.68	600	18.92	690	9.742	780	0.735
425	1.781	515	11.28	605	19.51	695	8.715		
430	2.988	520	11.72	610	20.06	700	7.671		
435	4.712	525	12.22	615	20.55	705	6.768		

**Spectral Data Over Visible Wavelengths**



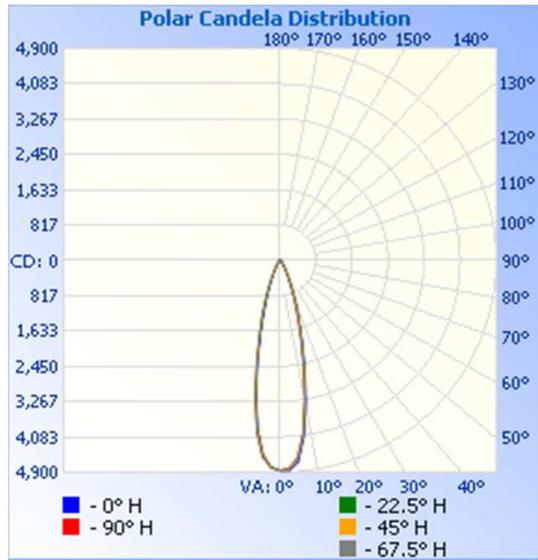
RESULTS OF TEST (cont'd)

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)
AH04192017041604-032	Up	120.0	153.4	17.95	0.976	1285	71.59

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	4856	4856	4856	4856	4856
5	4680	4611	4604	4584	4561
10	3358	3284	3268	3221	3231
15	1920	1877	1868	1793	1782
20	1032	1052	1057	946	917
25	495	512	540	458	432
30	243	245	240	226	210
35	136	136	127	130	119
40	87	89	86	84	79
45	61	61	62	58	53
50	34	39	44	32	31
55	22	24	28	21	22
60	12	14	15	11	10
65	3	3	6	3	2
70	2	2	2	2	2
75	2	2	1	2	1
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

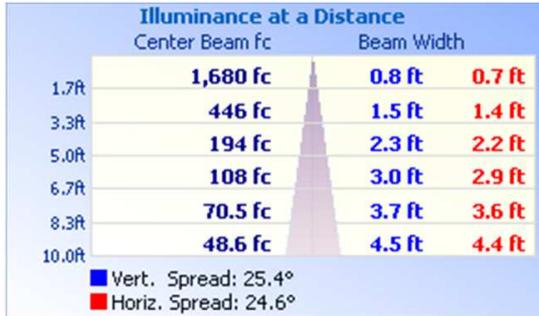


RESULTS OF TEST (cont'd)

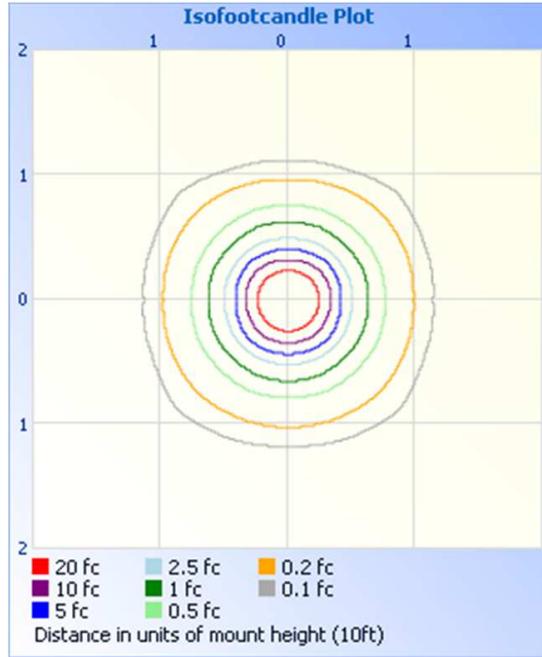
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



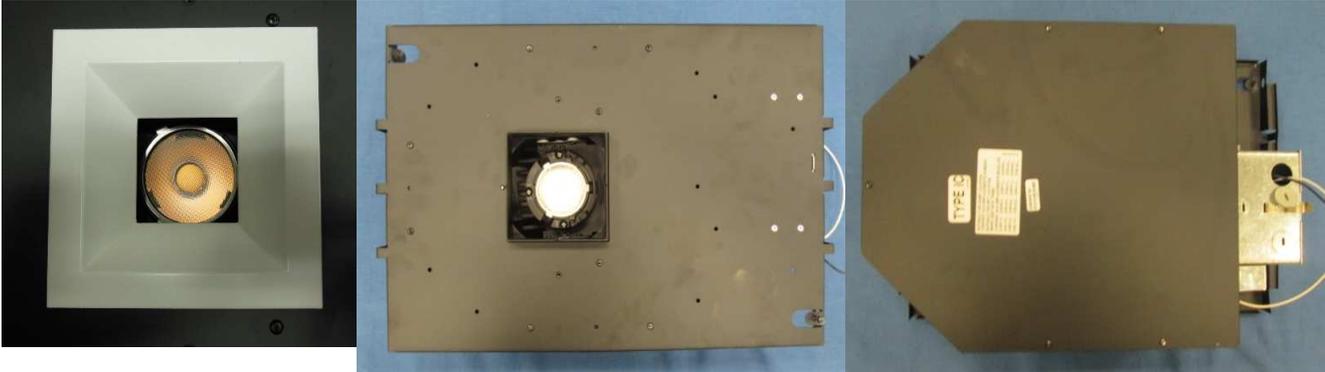
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1131	88.0
0-40	1215	94.6
0-60	1280	99.6
60-90	5.3	0.4
0-90	1285	100.0
90-180	0.0	0.0
0-180	1285	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	389.1	30.3
10-20	511.8	39.8
20-30	230.1	17.9
30-40	84.1	6.5
40-50	44.2	3.4
50-60	20.4	1.6
60-70	4.2	0.3
70-80	1.2	0.1
80-90	0.0	0.0

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:



Hector Huitron  
Associate Engineer  
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley  
Engineer  
Lighting Division