



# REPORT

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

Project No. G103017649

Date: May 24, 2017

REPORT NO. 103017649CHI-040

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH9354AN  
LED MODEL NO. CITIZEN CLU038-1205C4-353H5K2  
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-LH9354AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-040.

DATES OF TESTS: May 16, 2017 through May 24, 2017.

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SUMMARY

Model No.:	E3SFF-LH9354AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1666	1611
Total Power (W)	18.08	18.08
Luminaire Efficacy (LPW)	92.15	89.10

Criteria	Result
Power Factor	0.976
Current ATHD %	12.07
Correlated Color Temperature (CCT - K)	3507
Color Rendering Index (CRI - Ra)	92.5
Color Rendering Index (CRI - R9)	65.8
DUV	0.000
Chromaticity Coordinate (x)	0.405
Chromaticity Coordinate (y)	0.391
Chromaticity Coordinate (u')	0.235
Chromaticity Coordinate (v')	0.511

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	05/24/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/24/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/24/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/24/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/24/17
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)
\\H04192017041604-04\	Up	120.0	154.2	18.08	0.976	12.07	1666	92.15

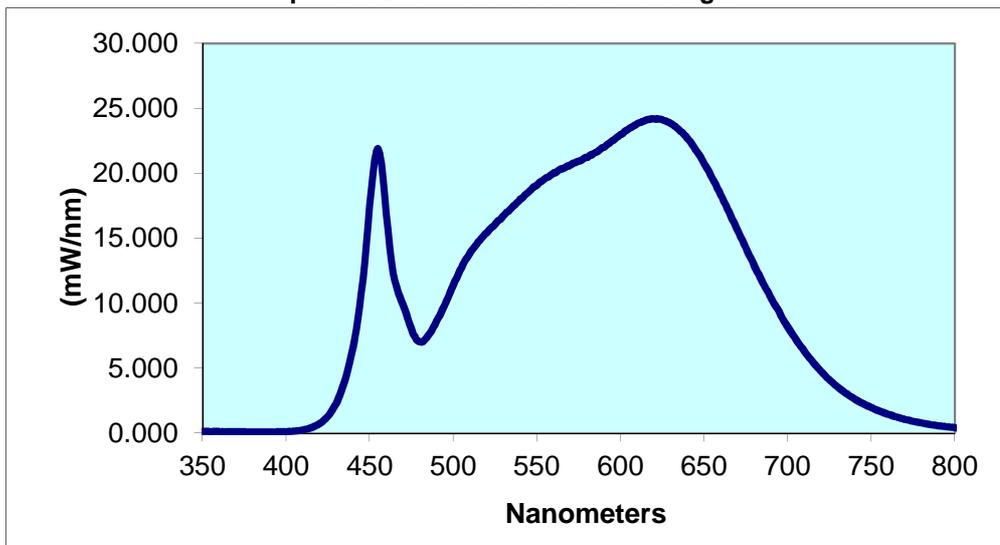
  

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3507	92.5	65.8	0.000	0.405	0.391	0.235	0.511

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.118	440	6.618	530	16.74	620	24.18	710	6.304
355	0.112	445	10.76	535	17.35	625	24.14	715	5.492
360	0.116	450	17.47	540	18.01	630	23.83	720	4.758
365	0.106	455	21.89	545	18.55	635	23.38	725	4.116
370	0.101	460	16.87	550	19.10	640	22.69	730	3.552
375	0.097	465	11.76	555	19.60	645	21.81	735	3.061
380	0.085	470	9.879	560	20.02	650	20.77	740	2.641
385	0.083	475	8.030	565	20.32	655	19.61	745	2.278
390	0.085	480	7.023	570	20.63	660	18.35	750	1.971
395	0.095	485	7.513	575	20.95	665	17.03	755	1.696
400	0.110	490	8.598	580	21.22	670	15.63	760	1.462
405	0.156	495	9.878	585	21.61	675	14.29	765	1.251
410	0.241	500	11.38	590	21.99	680	12.94	770	1.066
415	0.411	505	12.73	595	22.51	685	11.63	775	0.912
420	0.732	510	13.85	600	22.98	690	10.42	780	0.785
425	1.305	515	14.74	605	23.42	695	9.333		
430	2.299	520	15.41	610	23.80	700	8.179		
435	3.997	525	16.07	615	24.09	705	7.202		

**Spectral Data Over Visible Wavelengths**



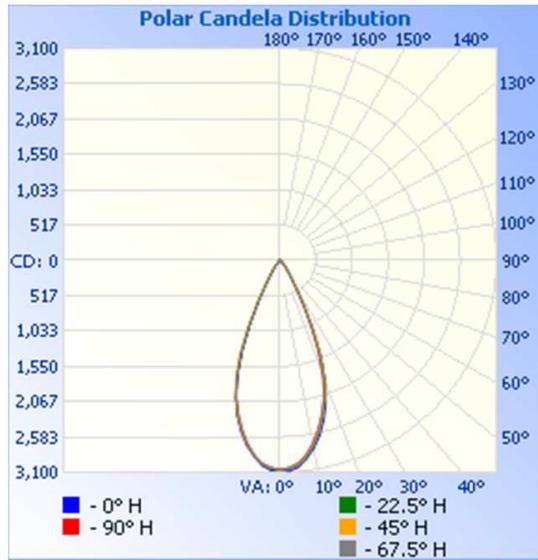
RESULTS OF TEST (cont'd)

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)
AH04192017041604-040	Up	120.0	154.3	18.08	0.976	1611	89.10

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3063	3063	3063	3063	3063
5	3034	3005	2993	2985	2975
10	2786	2760	2740	2721	2710
15	2412	2371	2356	2328	2319
20	1900	1869	1868	1830	1792
25	1117	1116	1155	1067	1041
30	458	456	487	456	435
35	206	212	201	202	190
40	109	113	109	107	99
45	58	61	63	58	51
50	24	31	36	24	21
55	13	14	20	13	10
60	4	6	8	5	3
65	2	2	3	2	1
70	1	1	1	1	1
75	1	1	1	1	1
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

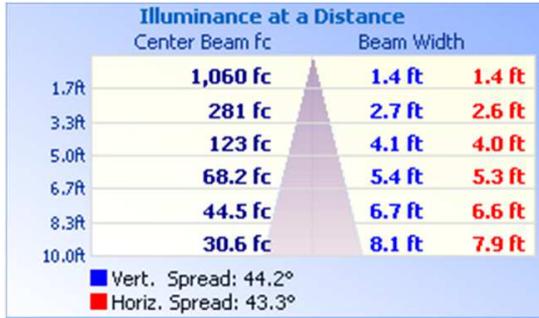


RESULTS OF TEST (cont'd)

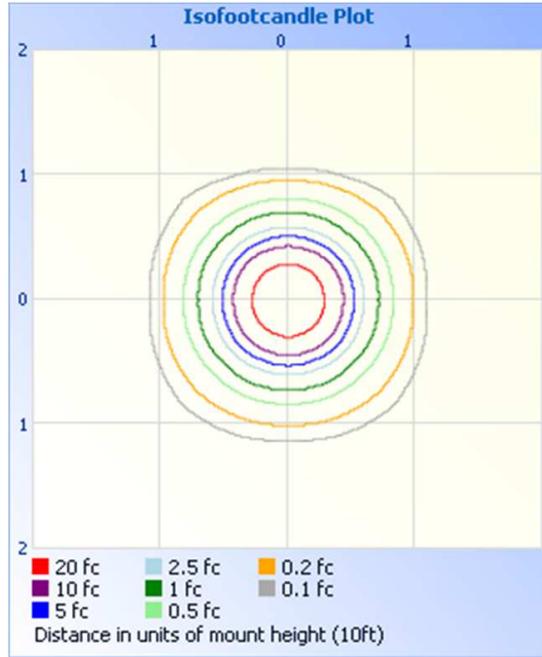
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



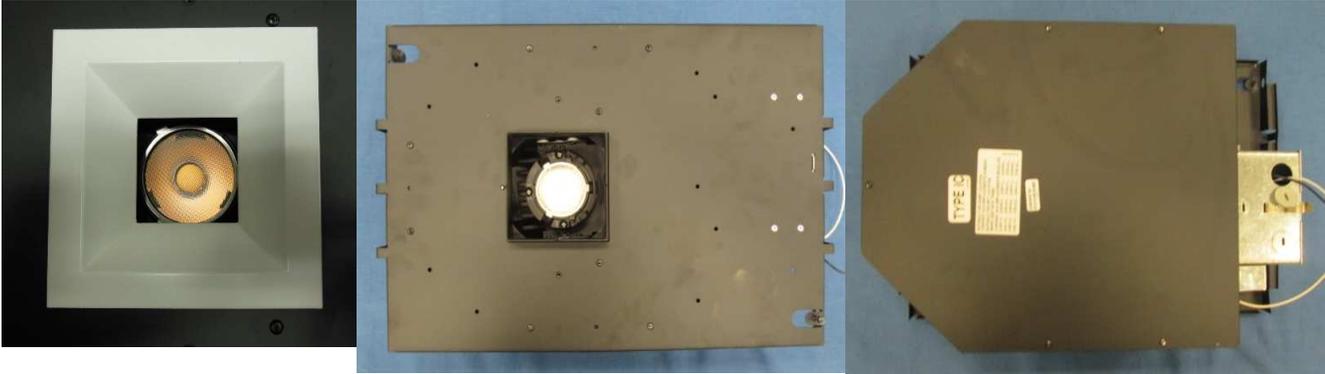
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1413	87.7
0-40	1551	96.3
0-60	1608	99.8
60-90	2.9	0.2
0-90	1611	100.0
90-180	0.0	0.0
0-180	1611	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	276.6	17.2
10-20	645.5	40.1
20-30	490.6	30.5
30-40	138.0	8.6
40-50	44.9	2.8
50-60	12.0	0.7
60-70	2.1	0.1
70-80	0.8	0.0
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