



# REPORT

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

Project No. G103017649

Date: May 23, 2017

REPORT NO. 103017649CHI-034

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH8274AN  
LED MODEL NO. CITIZEN CLU038-1205C4-273M2K1  
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-LH8274AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-034.

DATES OF TESTS: May 16, 2017 through May 23, 2017.

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SUMMARY

Model No.:	E3SFF-LH8274AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1766	1729
Total Power (W)	18.04	17.99
Luminaire Efficacy (LPW)	97.89	96.11

Criteria	Result
Power Factor	0.976
Current ATHD %	12.24
Correlated Color Temperature (CCT - K)	2763
Color Rendering Index (CRI - Ra)	82.5
Color Rendering Index (CRI - R9)	8.4
DUV	0.002
Chromaticity Coordinate (x)	0.452
Chromaticity Coordinate (y)	0.404
Chromaticity Coordinate (u')	0.260
Chromaticity Coordinate (v')	0.524

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	05/23/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/23/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/23/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/23/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/23/17
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	154.0	18.04	0.976	12.24	1766	97.89

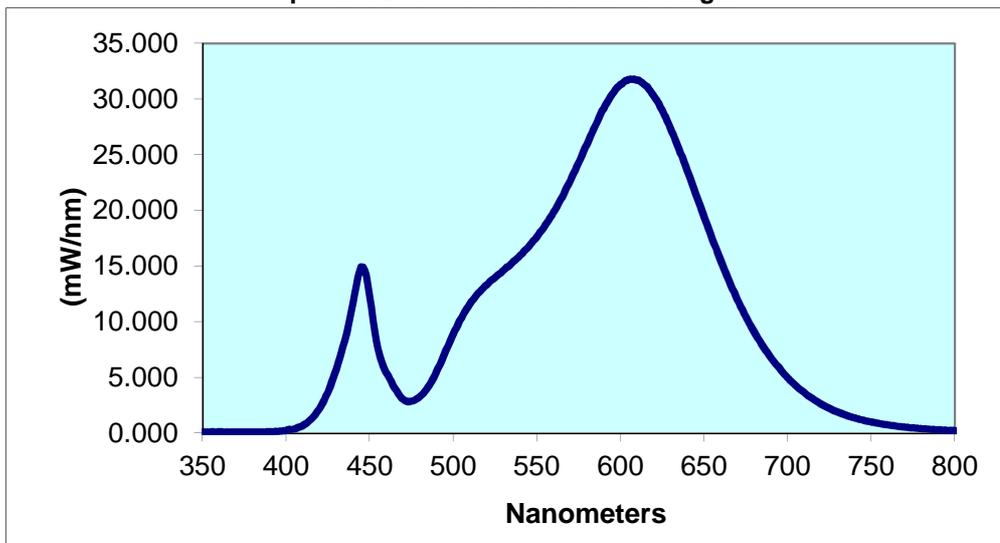
  

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
2763	82.5	8.4	0.002	0.452	0.404	0.260	0.524

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.095	440	11.74	530	14.62	620	30.28	710	3.632
355	0.111	445	14.93	535	15.25	625	29.01	715	3.092
360	0.106	450	12.37	540	15.97	630	27.35	720	2.617
365	0.110	455	7.599	545	16.72	635	25.54	725	2.230
370	0.095	460	5.429	550	17.62	640	23.57	730	1.890
375	0.090	465	4.055	555	18.68	645	21.51	735	1.608
380	0.090	470	3.036	560	19.86	650	19.44	740	1.367
385	0.093	475	2.867	565	21.15	655	17.42	745	1.169
390	0.115	480	3.283	570	22.67	660	15.50	750	1.004
395	0.153	485	4.158	575	24.30	665	13.69	755	0.858
400	0.231	490	5.516	580	25.95	670	11.99	760	0.740
405	0.381	495	7.176	585	27.63	675	10.48	765	0.631
410	0.691	500	8.880	590	29.13	680	9.086	770	0.538
415	1.254	505	10.36	595	30.46	685	7.853	775	0.464
420	2.204	510	11.61	600	31.32	690	6.767	780	0.400
425	3.683	515	12.59	605	31.76	695	5.869		
430	5.742	520	13.30	610	31.70	700	4.973		
435	8.285	525	13.97	615	31.23	705	4.257		

**Spectral Data Over Visible Wavelengths**



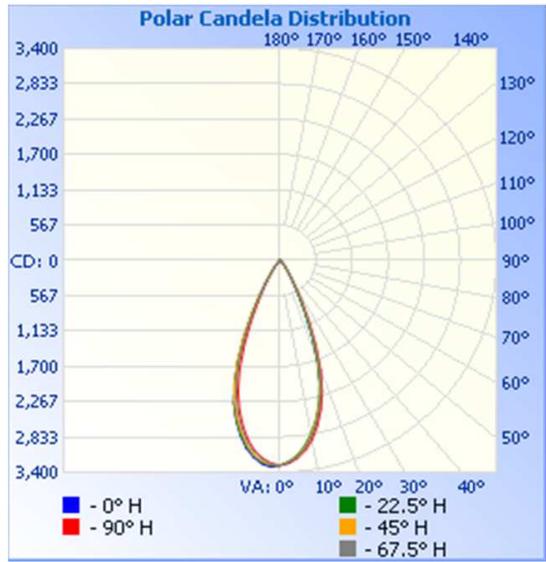
**RESULTS OF TEST (cont'd)**

**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)
AH04192017041604-034	Up	120.0	153.7	17.99	0.976	1729	96.11

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

Angle	0	22.5	45	67.5	90
0	3286	3286	3286	3286	3286
5	3155	3130	3145	3162	3183
10	2849	2812	2833	2866	2914
15	2393	2363	2380	2415	2476
20	1729	1709	1770	1807	1864
25	932	933	1025	1028	1089
30	413	416	453	480	505
35	196	199	198	220	228
40	99	104	106	114	113
45	50	54	60	58	53
50	24	25	33	24	23
55	12	14	16	12	9
60	4	5	8	4	2
65	2	2	2	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

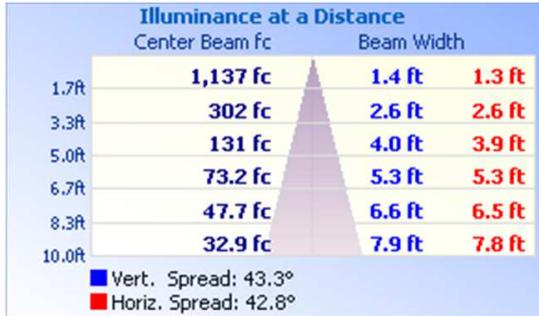


RESULTS OF TEST (cont'd)

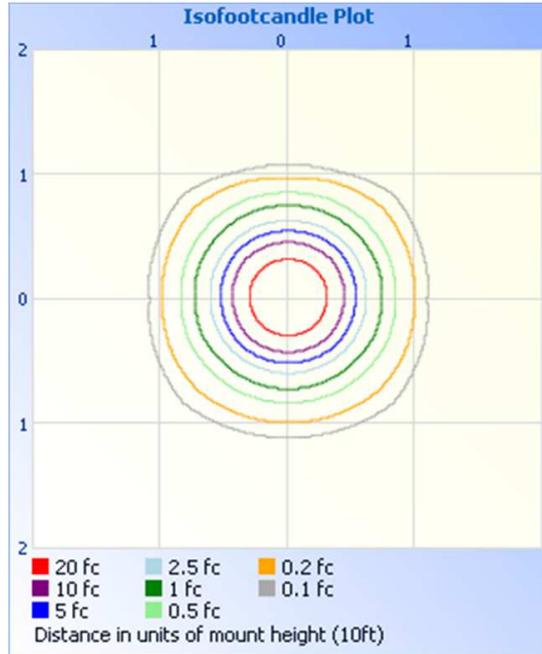
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



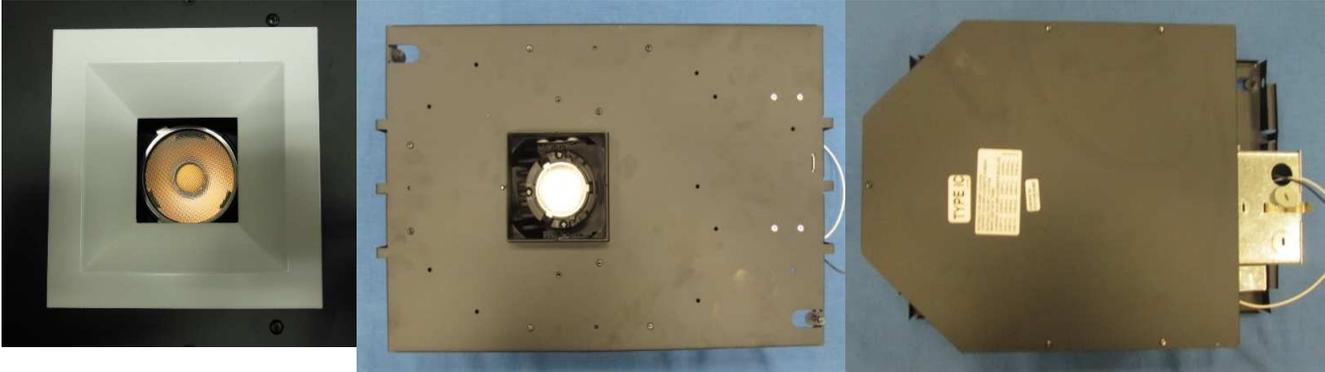
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1501	86.9
0-40	1666	96.4
0-60	1726	99.8
60-90	2.8	0.2
0-90	1729	100.0
90-180	0.0	0.0
0-180	1729	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	295.6	17.1
10-20	683.6	39.5
20-30	522.2	30.2
30-40	164.6	9.5
40-50	48.3	2.8
50-60	11.7	0.7
60-70	1.9	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