



REPORT

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

Project No. G103017649

Date: May 17, 2017

REPORT NO. 103017649CHI-031

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LO8301AN
LED MODEL NO. CITIZEN CLU038-1205C4-303M2K1
DRIVER MODEL NO. LTF DA15W300C2042BF-00HE
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-LO8301AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-031.

DATES OF TESTS: May 12, 2017 through May 17, 2017.

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

SUMMARY

Model No.:	E3SFF-LO8301AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	968.9	933.1
Total Power (W)	12.27	12.27
Luminaire Efficacy (LPW)	78.96	76.05

Criteria	Result
Power Factor	0.977
Current ATHD %	8.76
Correlated Color Temperature (CCT - K)	3089
Color Rendering Index (CRI - Ra)	93.1
Color Rendering Index (CRI - R9)	70.1
DUV	0.001
Chromaticity Coordinate (x)	0.432
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.247
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	05/17/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/17/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/17/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/17/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/17/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	05/12/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	05/12/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	05/12/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	05/12/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	05/12/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	05/12/17
Fluke J/K Temperature Meter	52	146004	01/10/17	01/10/18	05/12/17

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

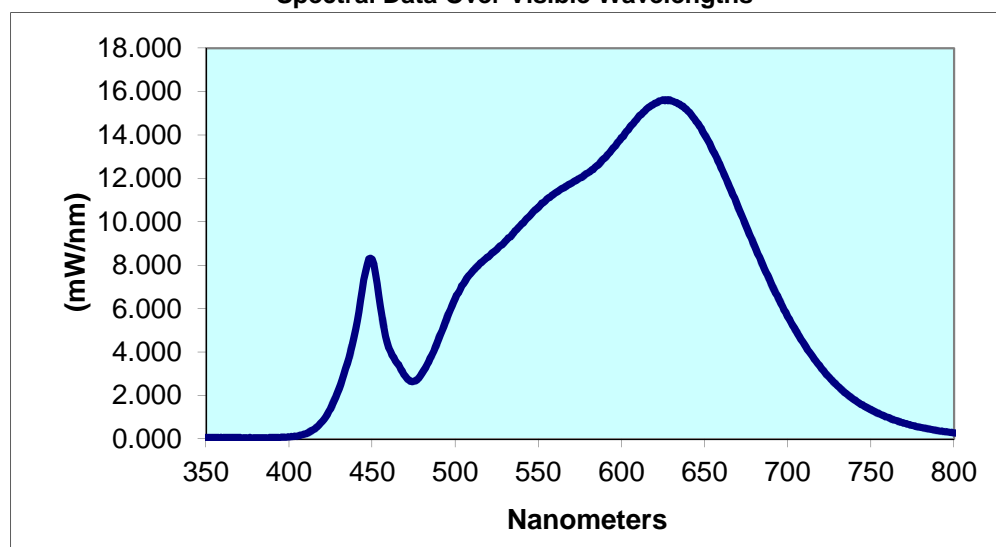
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-03	Up	120.0	104.6	12.27	0.977	8.76	968.9	78.96

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')
3089	93.1	70.1	0.001	0.432	0.405	0.247	0.521

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.060	440	5.038	530	9.099	620	15.45	710	4.346
355	0.065	445	7.325	535	9.489	625	15.62	715	3.786
360	0.067	450	8.270	540	9.910	630	15.57	720	3.281
365	0.061	455	6.100	545	10.29	635	15.42	725	2.837
370	0.054	460	4.204	550	10.67	640	15.10	730	2.441
375	0.053	465	3.503	555	11.04	645	14.61	735	2.101
380	0.048	470	2.889	560	11.32	650	14.00	740	1.808
385	0.051	475	2.649	565	11.56	655	13.28	745	1.558
390	0.056	480	3.027	570	11.78	660	12.48	750	1.348
395	0.070	485	3.721	575	12.03	665	11.62	755	1.160
400	0.093	490	4.600	580	12.26	670	10.71	760	0.998
405	0.138	495	5.570	585	12.58	675	9.809	765	0.854
410	0.243	500	6.471	590	12.95	680	8.897	770	0.726
415	0.446	505	7.153	595	13.41	685	8.014	775	0.622
420	0.810	510	7.683	600	13.87	690	7.176	780	0.530
425	1.402	515	8.102	605	14.35	695	6.398		
430	2.301	520	8.393	610	14.80	700	5.639		
435	3.478	525	8.734	615	15.19	705	4.970		

Spectral Data Over Visible Wavelengths



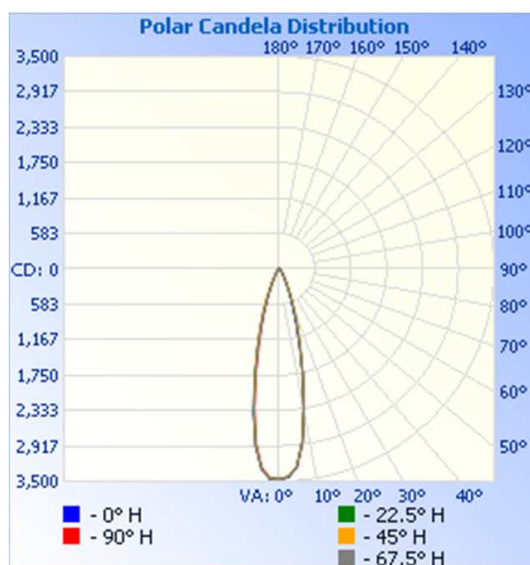
RESULTS OF TEST (cont'd)

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)
AH04192017041604-031	Up	120.0	104.6	12.27	0.977	933.1	76.05

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3462	3462	3462	3462	3462
5	3274	3259	3267	3271	3281
10	2305	2306	2305	2323	2329
15	1259	1287	1327	1303	1282
20	619	661	738	696	664
25	295	314	345	333	314
30	145	157	145	162	151
35	82	89	83	91	85
40	54	58	58	57	57
45	32	38	41	40	38
50	20	21	29	21	22
55	12	14	16	14	15
60	2	7	9	8	7
65	1	2	2	2	2
70	1	1	1	1	1
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

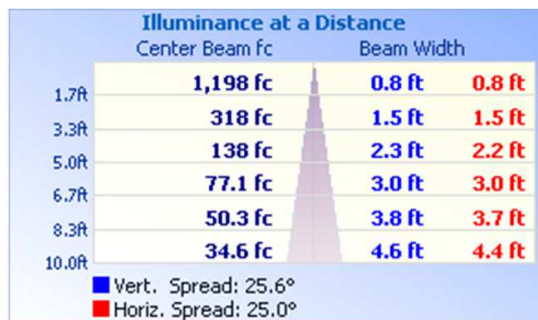


RESULTS OF TEST (cont'd)

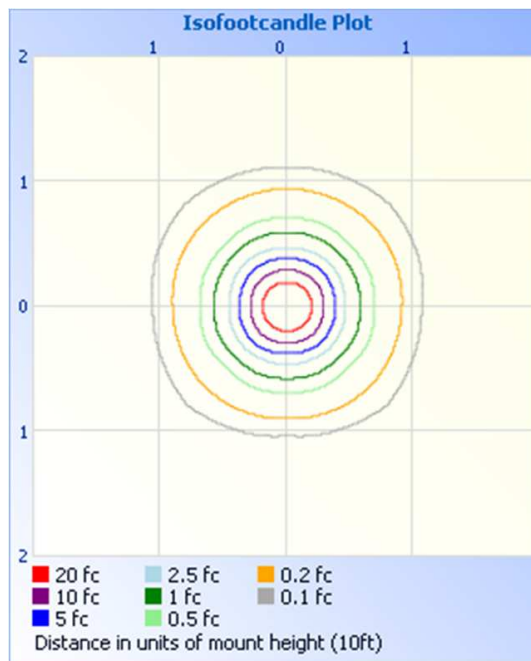
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



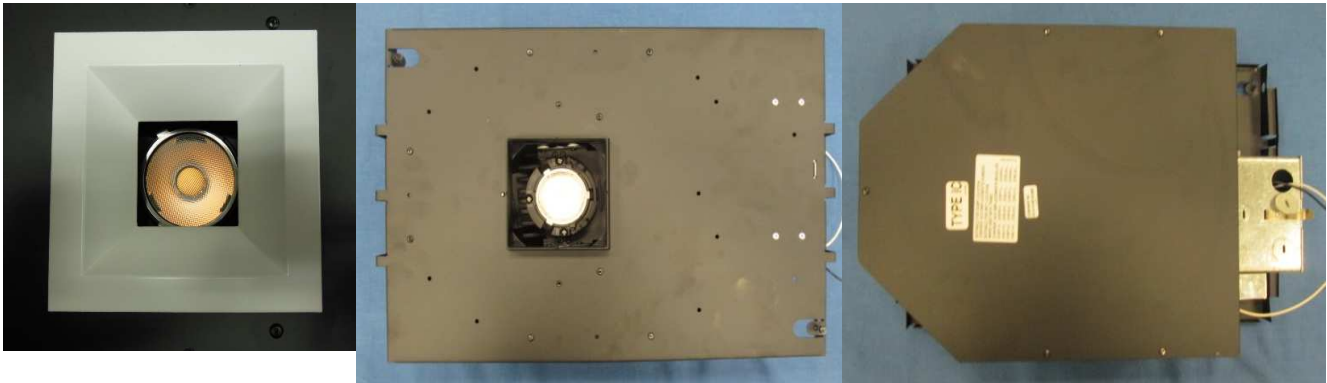
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	822.0	88.1
0-40	882.3	94.6
0-60	929.4	99.6
60-90	3.7	0.4
0-90	933.1	100.0
90-180	0.0	0.0
0-180	933.1	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	280.9	30.1
10-20	373.9	40.1
20-30	167.2	17.9
30-40	60.3	6.5
40-50	32.2	3.5
50-60	14.9	1.6
60-70	3.3	0.3
70-80	0.5	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