REPORT

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

Project No. G103017649 Date: May 19, 2017

REPORT NO. 103017649CHI-025

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LO9304AN
LED MODEL NO. CITIZEN CLU038-1205C4-303H5K2
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-LO9304AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-025.

DATES OF TESTS: May 11, 2017 through May 19, 2017.

SUMMARY

Model No.:	E3SFF-LO9304AN
Description:	LED RECESSED FIXTURE

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1124	1090
Total Power (W)	11.95	11.95
Luminaire Efficacy (LPW)	94.06	91.21

Criteria	Result
Power Factor	0.976
Current ATHD %	8.82
Correlated Color Temperature (CCT - K)	3141
Color Rendering Index (CRI - Ra)	92.8
Color Rendering Index (CRI - R9)	71.2
DUV	0.001
Chromaticity Coordinate (x)	0.429
Chromaticity Coordinate (y)	0.404
Chromaticity Coordinate (u')	0.245
Chromaticity Coordinate (v')	0.520

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	05/19/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/19/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/19/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/19/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/19/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	05/11/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	05/11/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	05/11/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	05/11/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	05/11/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	05/11/17
Fluke J/K Temperature Meter	52	146004	01/10/17	01/10/18	05/11/17

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

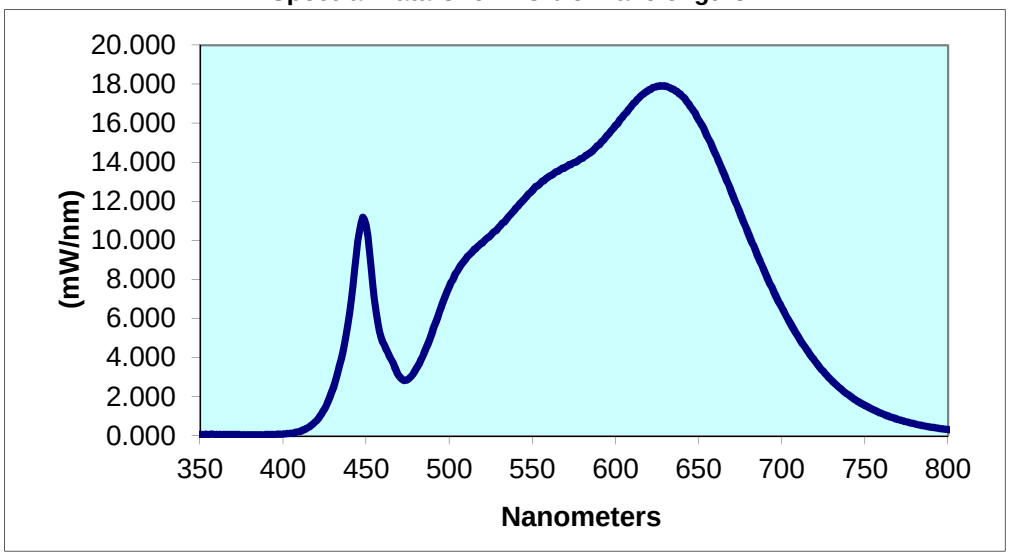
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-02!	Up	120.0	102.0	11.95	0.976	8.82	1124	94.06

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')
3141	92.8	71.2	0.001	0.429	0.404	0.245	0.520

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.076	440	6.320	530	10.70	620	17.70	710	5.057
355	0.073	445	9.960	535	11.16	625	17.90	715	4.411
360	0.080	450	10.79	540	11.66	630	17.89	720	3.822
365	0.070	455	6.988	545	12.10	635	17.74	725	3.305
370	0.071	460	4.805	550	12.56	640	17.39	730	2.844
375	0.059	465	3.937	555	12.97	645	16.86	735	2.443
380	0.058	470	3.052	560	13.29	650	16.18	740	2.109
385	0.059	475	2.884	565	13.53	655	15.37	745	1.812
390	0.062	480	3.424	570	13.76	660	14.46	750	1.567
395	0.073	485	4.272	575	13.99	665	13.47	755	1.348
400	0.094	490	5.368	580	14.21	670	12.43	760	1.159
405	0.141	495	6.562	585	14.52	675	11.40	765	0.989
410	0.237	500	7.643	590	14.90	680	10.34	770	0.841
415	0.426	505	8.450	595	15.39	685	9.321	775	0.720
420	0.778	510	9.067	600	15.89	690	8.354	780	0.617
425	1.399	515	9.546	605	16.41	695	7.439		
430	2.424	520	9.888	610	16.92	700	6.570		
435	3.943	525	10.27	615	17.38	705	5.786		

Spectral Data Over Visible Wavelengths



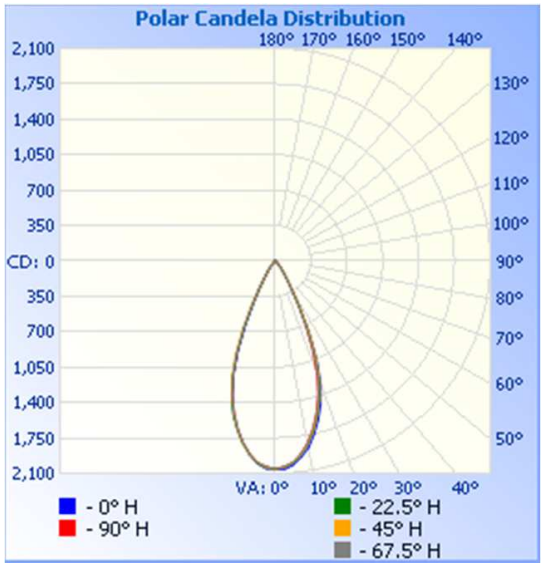
RESULTS OF TEST (cont'd)

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)
AH04192017041604-025	Up	120.0	102.0	11.95	0.976	1090	91.21

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	2054	2054	2054	2054	2054
5	2024	2003	1996	1994	1996
10	1873	1841	1834	1825	1821
15	1624	1590	1579	1564	1553
20	1293	1260	1254	1223	1199
25	787	758	781	729	707
30	317	314	337	327	317
35	139	144	142	148	142
40	75	77	76	78	73
45	40	41	43	42	37
50	16	20	25	17	15
55	8	9	13	9	7
60	3	4	6	3	2
65	1	1	2	1	1
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

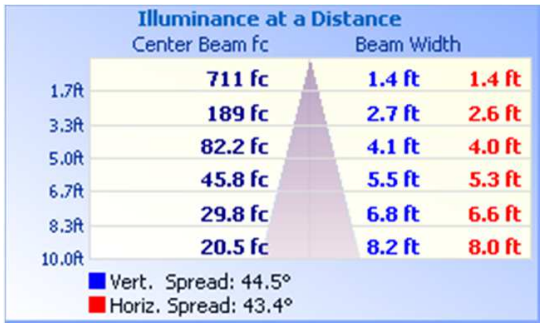


RESULTS OF TEST (cont'd)

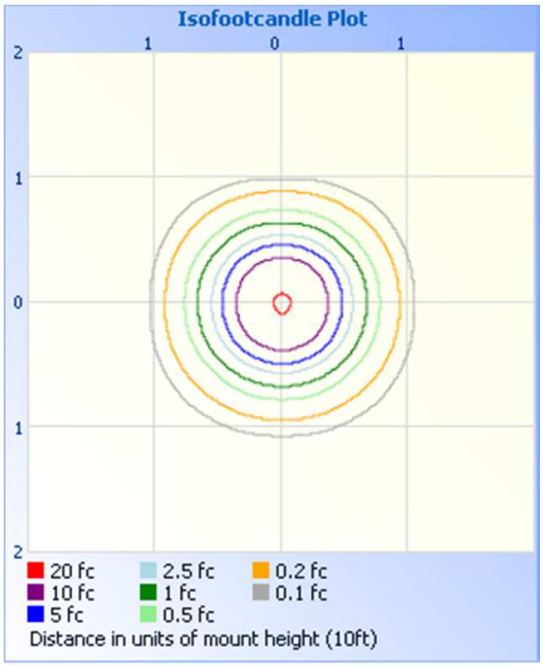
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



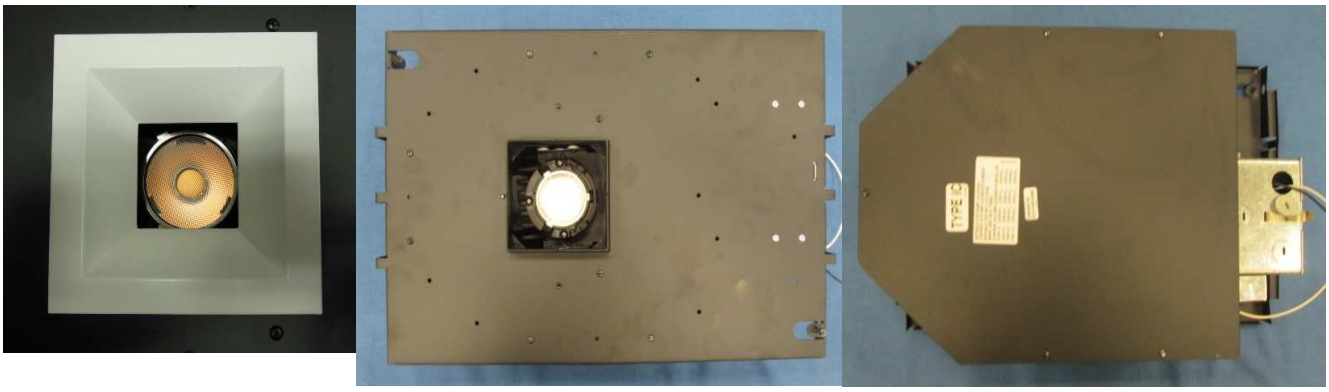
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	951.2	87.3
0-40	1048	96.2
0-60	1088	99.9
60-90	1.5	0.1
0-90	1090	100.0
90-180	0.0	0.0
0-180	1090	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	185.1	17.0
10-20	432.1	39.7
20-30	334.0	30.7
30-40	97.3	8.9
40-50	31.3	2.9
50-60	8.3	0.8
60-70	1.5	0.1
70-80	0.0	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:

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Report Reviewed By:

Timothy Quigley
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Lighting Division

Attachment: None