REPORT

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

Project No. G103017649 Date: May 24, 2017

REPORT NO. 103017649CHI-041

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LO9354AN
LED MODEL NO. CITIZEN CLU038-1205C4-353H5K2
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-LO9354AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-041.

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

SUMMARY

Model No.:	E3SFF-LO9354AN
Description:	LED RECESSED FIXTURE

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1185	1154
Total Power (W)	11.84	11.87
Luminaire Efficacy (LPW)	100.1	97.22

Criteria	Result
Power Factor	0.976
Current ATHD %	8.76
Correlated Color Temperature (CCT - K)	3519
Color Rendering Index (CRI - Ra)	92.6
Color Rendering Index (CRI - R9)	66.9
DUV	0.000
Chromaticity Coordinate (x)	0.405
Chromaticity Coordinate (y)	0.392
Chromaticity Coordinate (u')	0.235
Chromaticity Coordinate (v')	0.512

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

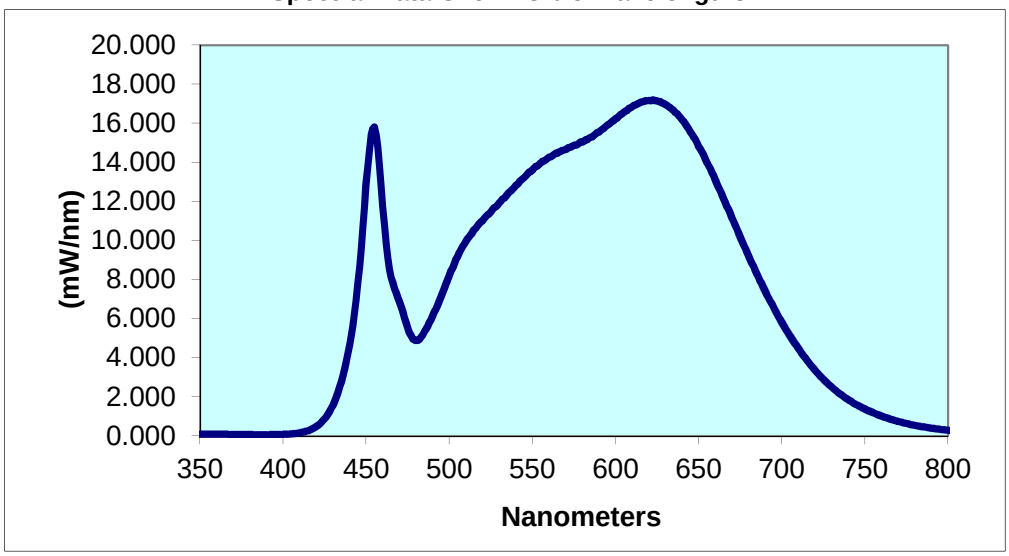
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-04:	Up	120.0	101.0	11.84	0.976	8.76	1185	100.1

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')
3519	92.6	66.9	0.000	0.405	0.392	0.235	0.512

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.091	440	4.672	530	11.92	620	17.17	710	4.468
355	0.084	445	7.782	535	12.37	625	17.16	715	3.892
360	0.080	450	12.85	540	12.82	630	16.96	720	3.363
365	0.078	455	15.80	545	13.23	635	16.66	725	2.906
370	0.069	460	11.72	550	13.62	640	16.19	730	2.505
375	0.068	465	8.133	555	13.98	645	15.57	735	2.156
380	0.061	470	6.877	560	14.27	650	14.83	740	1.857
385	0.058	475	5.543	565	14.47	655	14.01	745	1.599
390	0.059	480	4.886	570	14.67	660	13.11	750	1.381
395	0.064	485	5.326	575	14.87	665	12.16	755	1.190
400	0.076	490	6.149	580	15.04	670	11.17	760	1.024
405	0.105	495	7.109	585	15.29	675	10.20	765	0.874
410	0.161	500	8.209	590	15.55	680	9.231	770	0.746
415	0.272	505	9.171	595	15.91	685	8.297	775	0.638
420	0.486	510	9.955	600	16.24	690	7.425	780	0.546
425	0.882	515	10.57	605	16.56	695	6.605		
430	1.574	520	11.02	610	16.85	700	5.820		
435	2.772	525	11.48	615	17.07	705	5.114		

Spectral Data Over Visible Wavelengths



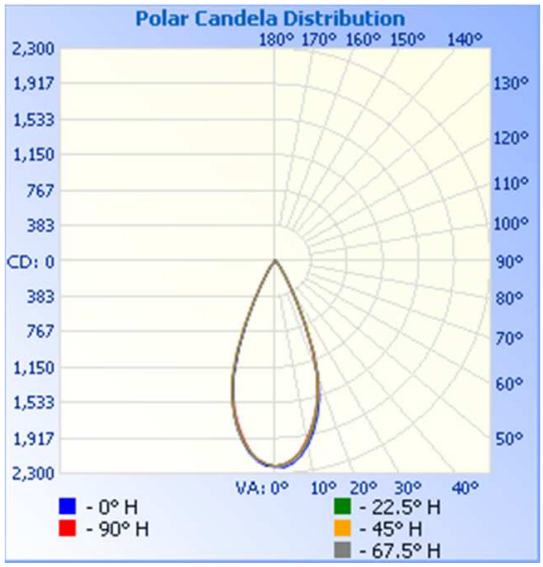
RESULTS OF TEST (cont'd)

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)
AH04192017041604-041	Up	120.0	101.4	11.87	0.976	1154	97.22

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	2222	2222	2222	2222	2222
5	2197	2170	2166	2158	2152
10	2020	1992	1980	1963	1954
15	1738	1709	1694	1677	1675
20	1352	1323	1329	1313	1298
25	775	768	792	740	735
30	340	326	334	308	297
35	147	148	137	137	130
40	78	78	74	72	67
45	41	43	43	39	34
50	18	22	25	16	14
55	9	10	13	8	6
60	3	4	6	3	2
65	1	1	2	1	1
70	1	1	1	1	1
75	1	1	1	1	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

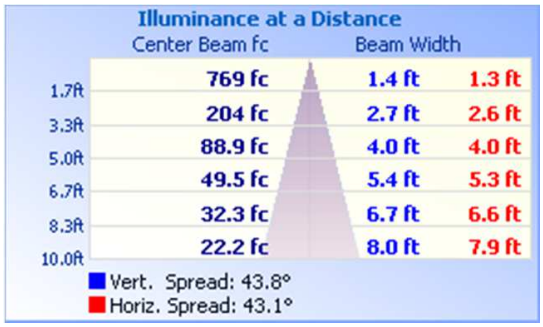


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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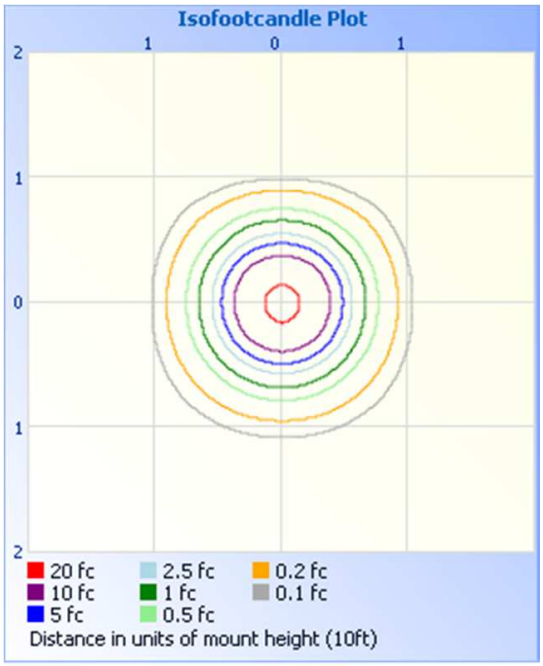


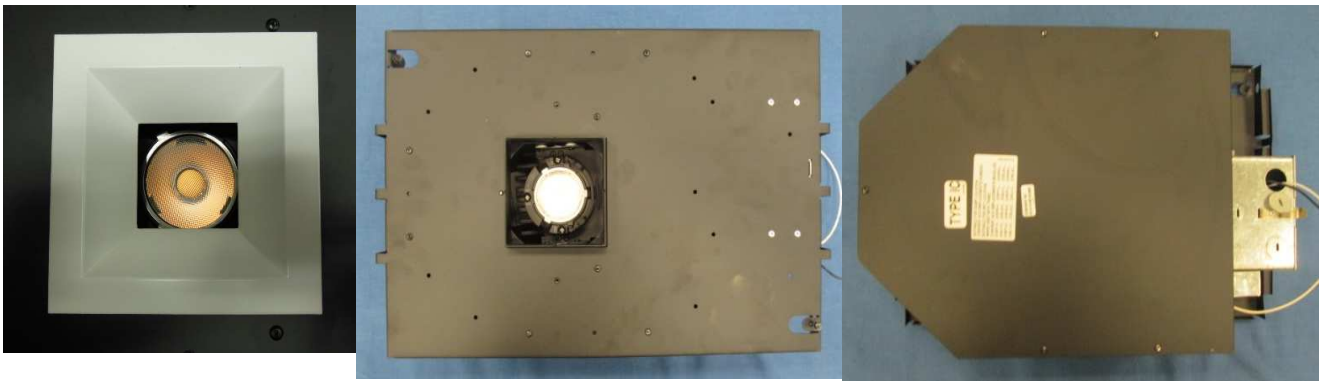
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1016	88.1
0-40	1113	96.5
0-60	1152	99.8
60-90	1.9	0.2
0-90	1154	100.0
90-180	0.0	0.0
0-180	1154	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	200.1	17.3
10-20	466.5	40.4
20-30	349.3	30.3
30-40	97.1	8.4
40-50	30.7	2.7
50-60	8.0	0.7
60-70	1.5	0.1
70-80	0.4	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:

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Lighting Division

Attachment: None