



REPORT

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

Project No. G103017649

Date: May 18, 2017

REPORT NO. 103017649CHI-029

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LO9302AN
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-LO9302AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-029.

DATES OF TESTS: May 11, 2017 through May 18, 2017.

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SUMMARY

Model No.:	E3SFF-LO9302AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1065	1032
Total Power (W)	12.10	12.10
Luminaire Efficacy (LPW)	88.02	85.29

Criteria	Result
Power Factor	0.976
Current ATHD %	8.80
Correlated Color Temperature (CCT - K)	3141
Color Rendering Index (CRI - Ra)	93.0
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	05/18/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/18/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/18/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/18/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/18/17
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

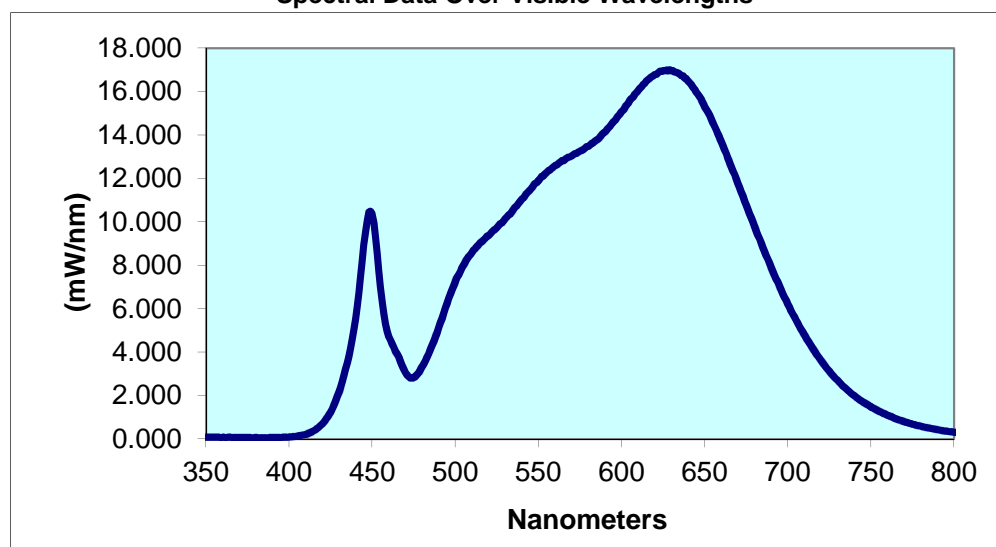
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\\H04192017041604-02\	Up	120.0	103.3	12.10	0.976	8.80	1065	88.02

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	93.0	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	0.071	440	5.554	530	10.14	620	16.78	710	4.795
355	0.072	445	8.942	535	10.58	625	16.97	715	4.177
360	0.070	450	10.36	540	11.05	630	16.95	720	3.618
365	0.069	455	7.010	545	11.47	635	16.82	725	3.119
370	0.063	460	4.720	550	11.90	640	16.49	730	2.693
375	0.056	465	3.918	555	12.29	645	15.97	735	2.315
380	0.055	470	3.070	560	12.60	650	15.32	740	1.993
385	0.053	475	2.829	565	12.82	655	14.56	745	1.718
390	0.058	480	3.314	570	13.04	660	13.70	750	1.483
395	0.066	485	4.109	575	13.26	665	12.76	755	1.275
400	0.088	490	5.114	580	13.48	670	11.77	760	1.098
405	0.128	495	6.223	585	13.78	675	10.79	765	0.937
410	0.212	500	7.243	590	14.14	680	9.787	770	0.798
415	0.382	505	8.003	595	14.60	685	8.824	775	0.683
420	0.694	510	8.578	600	15.07	690	7.905	780	0.585
425	1.245	515	9.039	605	15.58	695	7.058		
430	2.160	520	9.361	610	16.05	700	6.215		
435	3.511	525	9.727	615	16.48	705	5.479		

Spectral Data Over Visible Wavelengths



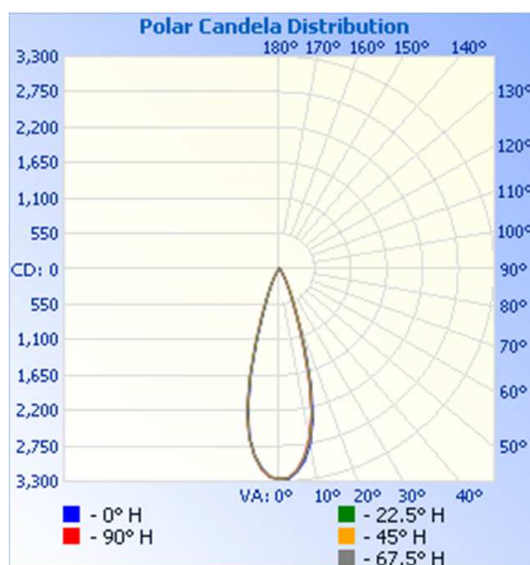
RESULTS OF TEST (cont'd)

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)
AH04192017041604-029	Up	120.0	103.3	12.10	0.976	1032	85.29

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3262	3262	3262	3262	3262
5	3168	3145	3146	3140	3128
10	2749	2705	2699	2683	2660
15	1893	1838	1816	1784	1758
20	874	864	863	797	770
25	396	417	429	370	353
30	192	198	207	180	166
35	93	97	89	90	82
40	54	55	52	52	49
45	34	35	35	32	28
50	15	20	23	16	14
55	9	10	13	9	8
60	4	5	6	4	3
65	1	2	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

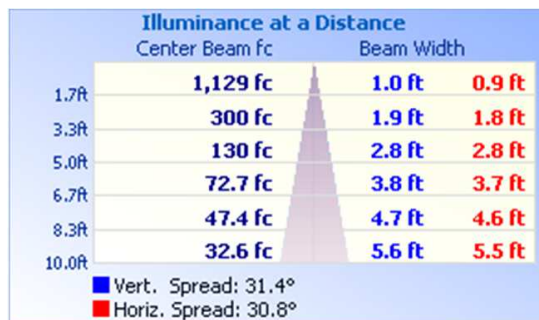


RESULTS OF TEST (cont'd)

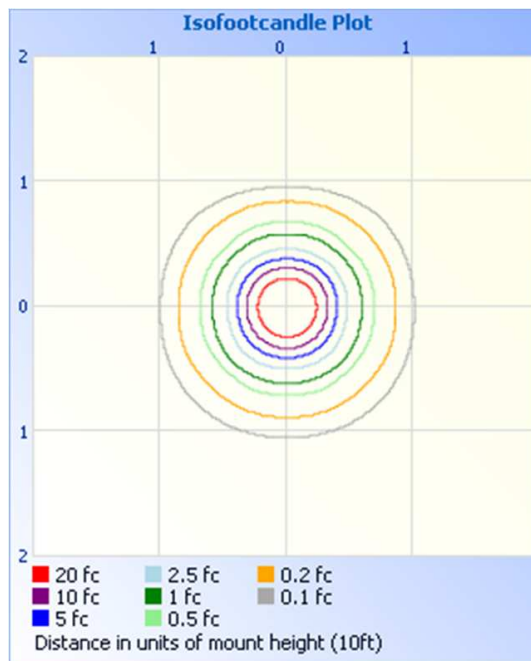
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



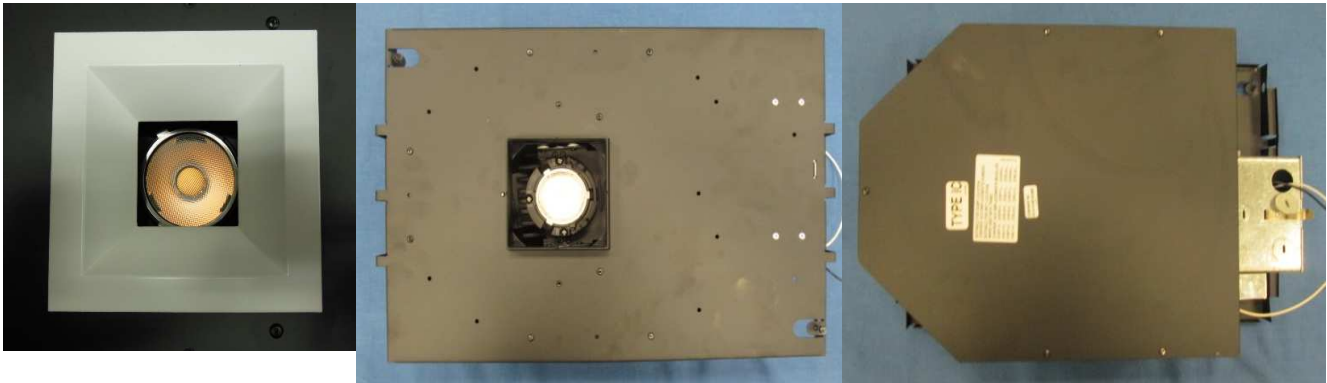
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	938.6	90.9
0-40	998.6	96.7
0-60	1031	99.8
60-90	1.6	0.2
0-90	1032	100.0
90-180	0.0	0.0
0-180	1032	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	283.3	27.4
10-20	469.1	45.4
20-30	186.2	18.0
30-40	60.0	5.8
40-50	24.2	2.3
50-60	8.1	0.8
60-70	1.6	0.2
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:



Hector Huitron
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley
Engineer
Lighting Division