



REPORT

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

Project No. G103017649

Date: May 22, 2017

REPORT NO. 103017649CHI-024

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH9304AN
LED MODEL NO. CITIZEN CLU038-1205C4-303H5K2
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-LH9304AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-024.

DATES OF TESTS: May 11, 2017 through May 22, 2017.

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SUMMARY

Model No.:	E3SFF-LH9304AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1476	1437
Total Power (W)	18.10	18.09
Luminaire Efficacy (LPW)	81.55	79.44

Criteria	Result
Power Factor	0.975
Current ATHD %	12.15
Correlated Color Temperature (CCT - K)	3148
Color Rendering Index (CRI - Ra)	92.6
Color Rendering Index (CRI - R9)	68.5
DUV	0.002
Chromaticity Coordinate (x)	0.429
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.245
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	05/22/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/22/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/22/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/22/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/22/17
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

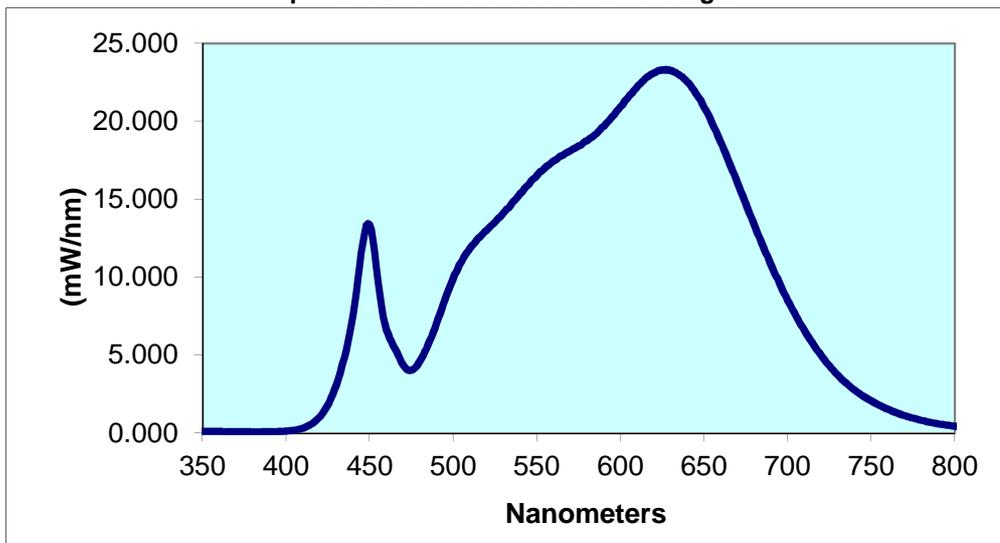
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-02.	Up	120.0	154.7	18.10	0.975	12.15	1476	81.55

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')
3148	92.6	68.5	0.002	0.429	0.406	0.245	0.521

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.100	440	7.587	530	14.13	620	23.10	710	6.590
355	0.101	445	11.57	535	14.72	625	23.32	715	5.753
360	0.101	450	13.38	540	15.37	630	23.24	720	4.995
365	0.096	455	9.805	545	15.94	635	23.01	725	4.320
370	0.088	460	6.647	550	16.52	640	22.53	730	3.724
375	0.077	465	5.444	555	17.04	645	21.81	735	3.209
380	0.074	470	4.391	560	17.48	650	20.92	740	2.772
385	0.075	475	4.041	565	17.79	655	19.86	745	2.387
390	0.081	480	4.618	570	18.11	660	18.67	750	2.064
395	0.096	485	5.687	575	18.43	665	17.39	755	1.778
400	0.125	490	7.042	580	18.75	670	16.05	760	1.536
405	0.191	495	8.540	585	19.18	675	14.72	765	1.311
410	0.320	500	9.940	590	19.67	680	13.37	770	1.123
415	0.575	505	11.01	595	20.30	685	12.06	775	0.960
420	1.026	510	11.86	600	20.93	690	10.82	780	0.825
425	1.816	515	12.51	605	21.59	695	9.685		
430	3.076	520	13.00	610	22.20	700	8.525		
435	4.905	525	13.54	615	22.75	705	7.520		

Spectral Data Over Visible Wavelengths



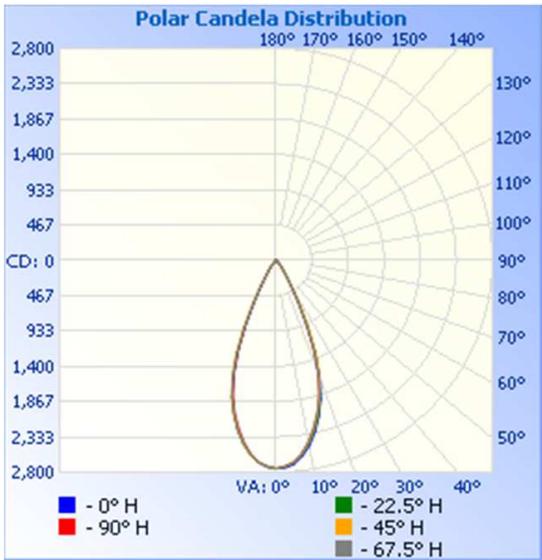
RESULTS OF TEST (cont'd)

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)
AH04192017041604-024	Up	120.0	154.6	18.09	0.975	1437	79.44

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	2749	2749	2749	2749	2749
5	2703	2680	2675	2669	2669
10	2485	2457	2440	2426	2426
15	2134	2115	2088	2065	2075
20	1650	1642	1644	1606	1594
25	965	972	1014	937	924
30	394	404	421	404	386
35	182	182	172	179	172
40	92	96	92	92	88
45	46	50	53	48	43
50	20	23	30	21	18
55	10	12	14	10	8
60	3	5	7	4	2
65	2	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)

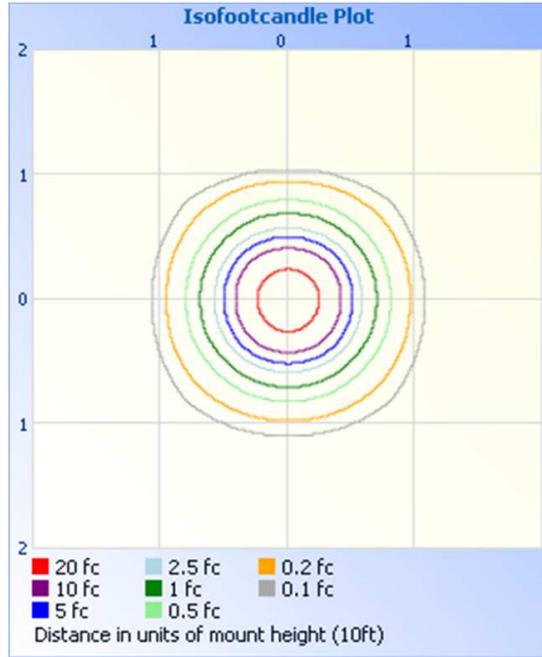
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1262	87.8
0-40	1387	96.5
0-60	1436	99.9
60-90	1.7	0.1
0-90	1437	100.0
90-180	0.0	0.0
0-180	1437	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	247.5	17.2
10-20	575.9	40.1
20-30	439.0	30.5
30-40	124.3	8.7
40-50	38.8	2.7
50-60	10.0	0.7
60-70	1.7	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:



Hector Huitron
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley
Engineer
Lighting Division