REPORT

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

Project No. G103017649 Date: May 17, 2017

REPORT NO. 103017649CHI-030

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH8301AN
LED MODEL NO. CITIZEN CLU038-1205C4-303M2K1
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-LH8301AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-030.

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

SUMMARY

Model No.:	E3SFF-LH8301AN
Description:	LED RECESSED FIXTURE

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1598	1535
Total Power (W)	18.13	18.11
Luminaire Efficacy (LPW)	88.14	84.76

Criteria	Result
Power Factor	0.977
Current ATHD %	11.99
Correlated Color Temperature (CCT - K)	3019
Color Rendering Index (CRI - Ra)	83.3
Color Rendering Index (CRI - R9)	10.5
DUV	0.000
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.250
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

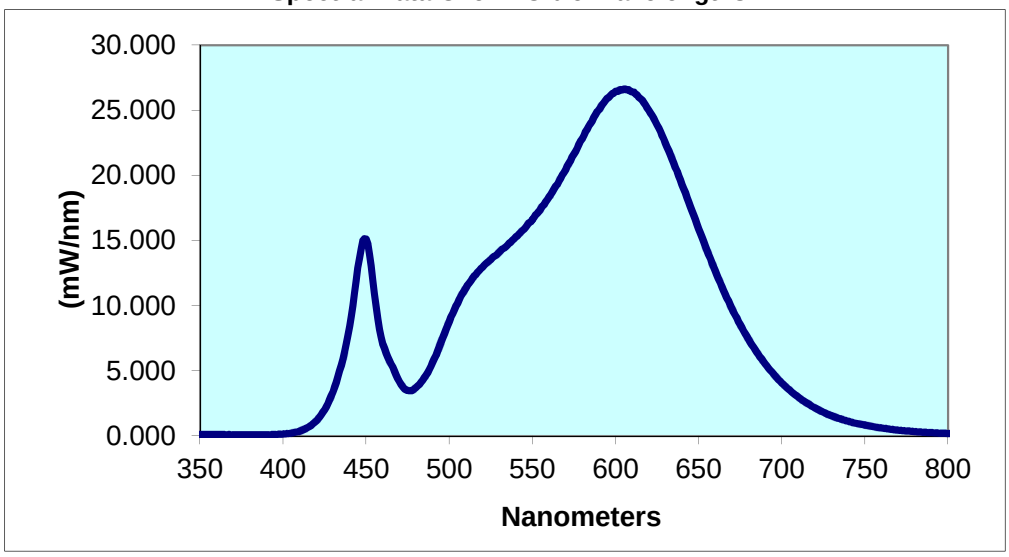
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-03(	Up	120.0	154.6	18.13	0.977	11.99	1598	88.14

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')
3019	83.3	10.5	0.000	0.436	0.405	0.250	0.521

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.098	440	8.432	530	14.12	620	25.03	710	2.971
355	0.098	445	12.90	535	14.66	625	23.89	715	2.529
360	0.096	450	15.12	540	15.28	630	22.48	720	2.154
365	0.096	455	10.93	545	15.88	635	20.95	725	1.826
370	0.087	460	7.093	550	16.62	640	19.30	730	1.549
375	0.078	465	5.537	555	17.46	645	17.61	735	1.319
380	0.074	470	4.185	560	18.37	650	15.90	740	1.126
385	0.081	475	3.483	565	19.33	655	14.25	745	0.962
390	0.089	480	3.721	570	20.45	660	12.67	750	0.828
395	0.106	485	4.477	575	21.66	665	11.18	755	0.710
400	0.140	490	5.641	580	22.84	670	9.800	760	0.610
405	0.218	495	7.169	585	24.01	675	8.551	765	0.522
410	0.373	500	8.783	590	25.04	680	7.427	770	0.446
415	0.665	505	10.18	595	25.92	685	6.416	775	0.383
420	1.166	510	11.36	600	26.44	690	5.538	780	0.329
425	2.017	515	12.29	605	26.61	695	4.772		
430	3.390	520	12.94	610	26.42	700	4.070		
435	5.431	525	13.55	615	25.90	705	3.482		

Spectral Data Over Visible Wavelengths



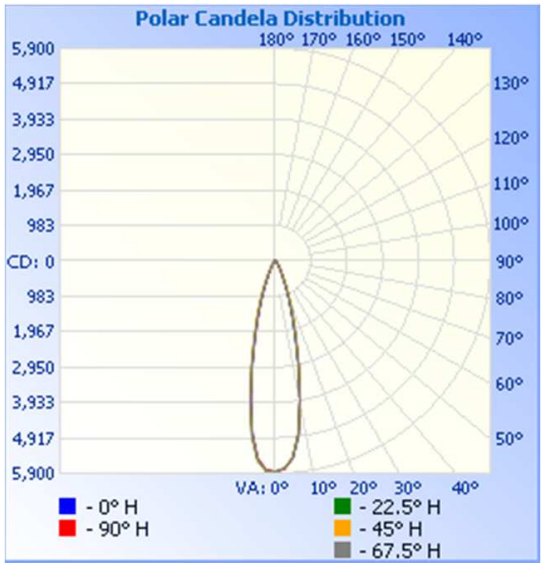
RESULTS OF TEST (cont'd)

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)
AH04192017041604-030	Up	120.0	154.5	18.11	0.977	1535	84.76

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	5848	5848	5848	5848	5848
5	5500	5479	5478	5477	5491
10	3919	3910	3944	3919	3905
15	2103	2139	2212	2184	2149
20	1058	1094	1199	1131	1075
25	507	530	548	539	508
30	250	267	237	267	250
35	148	155	140	148	141
40	93	97	98	97	94
45	51	60	69	65	61
50	33	34	46	37	37
55	21	24	27	25	24
60	4	8	15	13	10
65	2	2	3	2	2
70	2	2	2	2	2
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

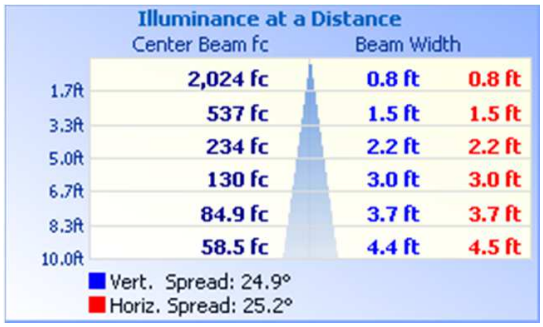


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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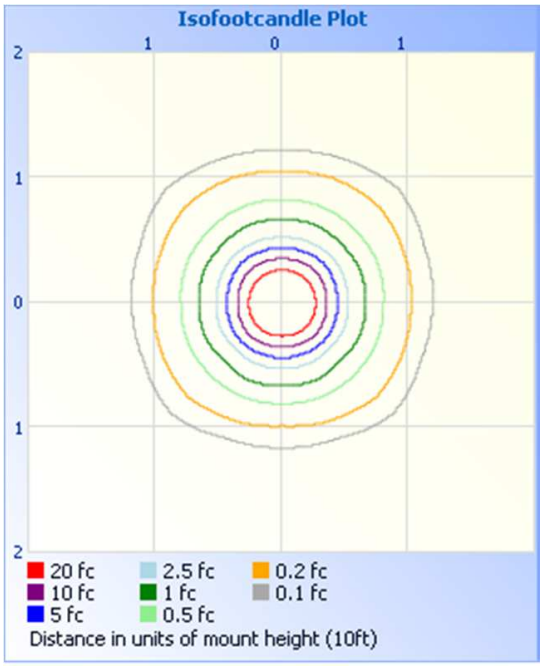


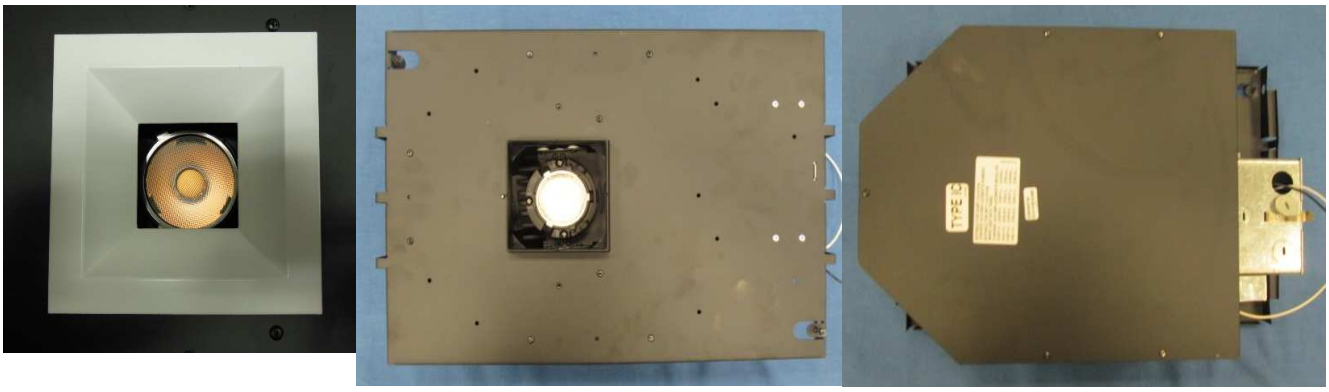
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1354	88.2
0-40	1453	94.7
0-60	1529	99.7
60-90	5.2	0.3
0-90	1535	100.0
90-180	0.0	0.0
0-180	1535	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	471.6	30.7
10-20	614.0	40.0
20-30	268.1	17.5
30-40	99.4	6.5
40-50	52.3	3.4
50-60	24.0	1.6
60-70	4.5	0.3
70-80	0.7	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