REPORT

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

Project No. G103017649 Date: May 23, 2017

REPORT NO. 103017649CHI-038

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH8354AN
LED MODEL NO. CITIZEN CLU038-1205C4-353M2K1
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-LH8354AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-038.

DATES OF TESTS: May 16, 2017 through May 23, 2017.

SUMMARY

Model No.:	E3SFF-LH8354AN
Description:	LED RECESSED FIXTURE

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1907	1848
Total Power (W)	18.18	18.20
Luminaire Efficacy (LPW)	104.9	101.5

Criteria	Result
Power Factor	0.977
Current ATHD %	12.01
Correlated Color Temperature (CCT - K)	3458
Color Rendering Index (CRI - Ra)	84.0
Color Rendering Index (CRI - R9)	13.1
DUV	0.000
Chromaticity Coordinate (x)	0.408
Chromaticity Coordinate (y)	0.393
Chromaticity Coordinate (u')	0.236
Chromaticity Coordinate (v')	0.513

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	05/23/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/23/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/23/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/23/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/23/17
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

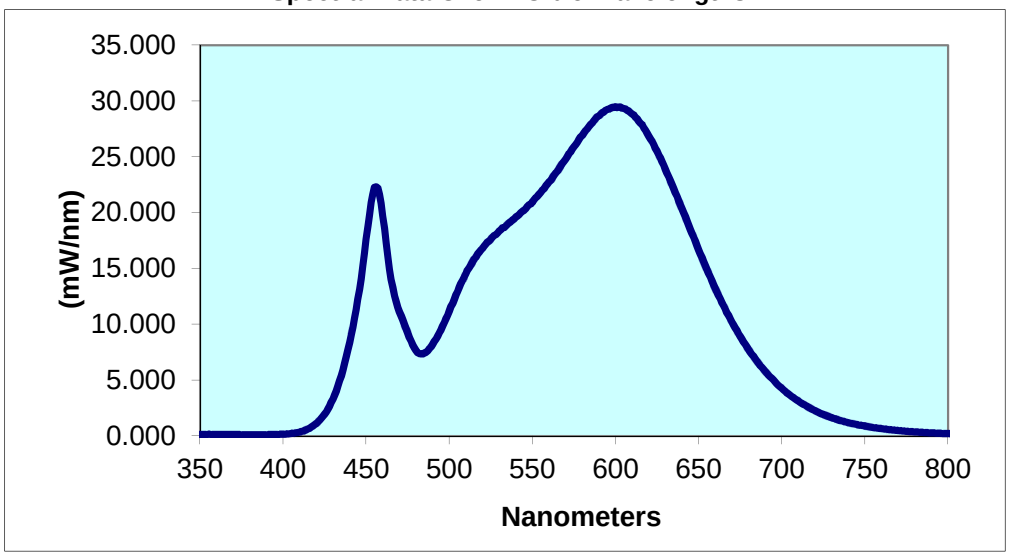
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-03	Up	120.0	155.1	18.18	0.977	12.01	1907	104.9

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')
3458	84.0	13.1	0.000	0.408	0.393	0.236	0.513

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.131	440	8.386	530	18.34	620	26.88	710	3.118
355	0.141	445	12.26	535	18.96	625	25.51	715	2.664
360	0.128	450	17.63	540	19.60	630	23.88	720	2.262
365	0.115	455	22.24	545	20.23	635	22.17	725	1.921
370	0.111	460	19.71	550	20.98	640	20.36	730	1.640
375	0.101	465	14.03	555	21.83	645	18.49	735	1.394
380	0.094	470	11.14	560	22.76	650	16.67	740	1.193
385	0.099	475	9.245	565	23.71	655	14.90	745	1.024
390	0.102	480	7.655	570	24.81	660	13.24	750	0.883
395	0.116	485	7.420	575	25.92	665	11.67	755	0.760
400	0.151	490	8.211	580	26.93	670	10.22	760	0.654
405	0.221	495	9.507	585	27.91	675	8.926	765	0.561
410	0.361	500	11.19	590	28.69	680	7.751	770	0.481
415	0.633	505	12.94	595	29.26	685	6.710	775	0.413
420	1.123	510	14.54	600	29.47	690	5.782	780	0.357
425	1.950	515	15.85	605	29.33	695	5.009		
430	3.306	520	16.81	610	28.84	700	4.267		
435	5.404	525	17.64	615	28.03	705	3.654		

Spectral Data Over Visible Wavelengths



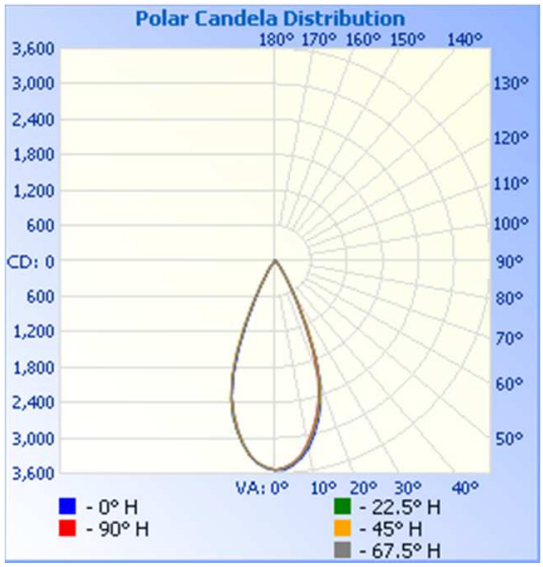
RESULTS OF TEST (cont'd)

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)
AH04192017041604-038	Up	120.0	155.3	18.20	0.977	1848	101.5

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3540	3540	3540	3540	3540
5	3474	3454	3446	3436	3429
10	3218	3175	3160	3140	3127
15	2784	2745	2735	2705	2680
20	2209	2179	2172	2139	2094
25	1297	1268	1336	1232	1177
30	570	552	575	526	493
35	235	237	223	225	209
40	118	122	118	117	107
45	64	65	68	63	56
50	25	32	39	27	22
55	13	14	20	14	11
60	4	6	9	5	3
65	2	2	3	2	2
70	1	1	1	1	1
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

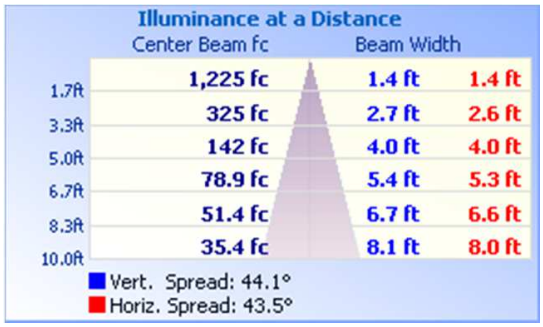


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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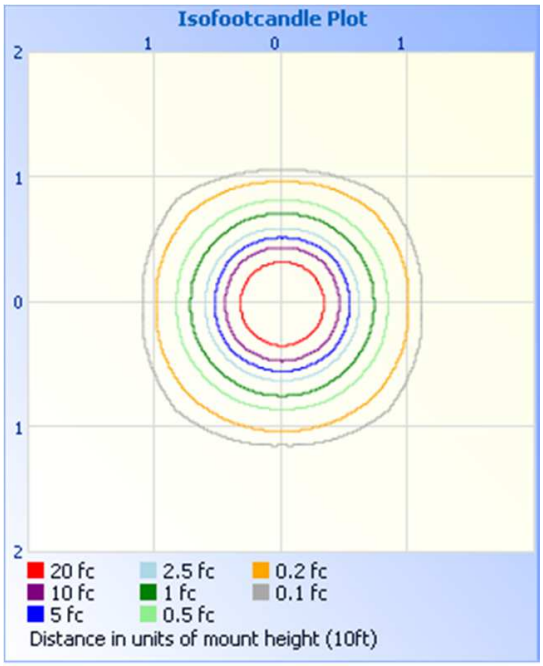


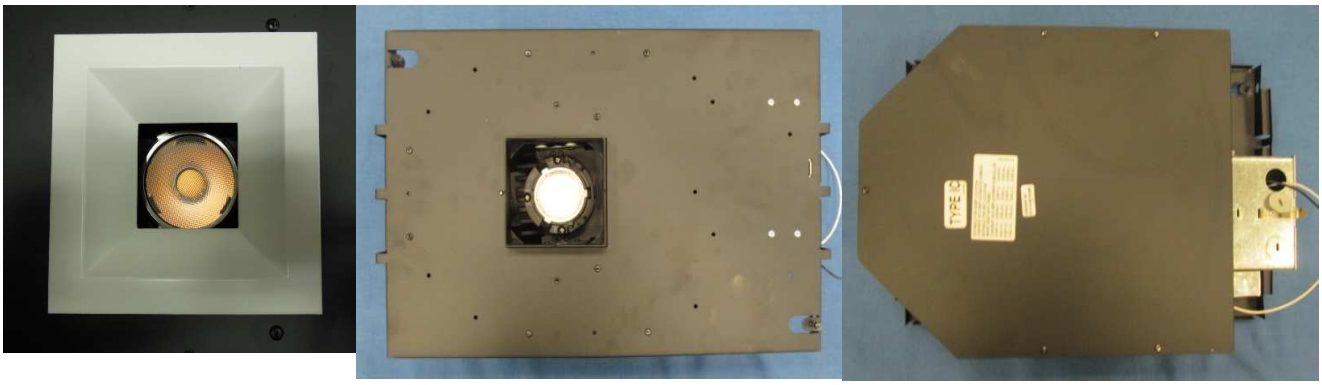
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1630	88.2
0-40	1784	96.5
0-60	1846	99.9
60-90	2.4	0.1
0-90	1848	100.0
90-180	0.0	0.0
0-180	1848	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	318.4	17.2
10-20	746.4	40.4
20-30	564.7	30.6
30-40	155.0	8.4
40-50	48.7	2.6
50-60	12.7	0.7
60-70	2.3	0.1
70-80	0.1	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