REPORT

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

Project No. G103017649 Date: May 22, 2017

REPORT NO. 103017649CHI-023

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LO8304AN
LED MODEL NO. CITIZEN CLU038-1205C4-303M2K1
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-LO8304AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-023.

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

SUMMARY

Model No.:	E3SFF-LO8304AN
Description:	LED RECESSED FIXTURE

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1319	1289
Total Power (W)	12.07	12.07
Luminaire Efficacy (LPW)	109.3	106.8

Criteria	Result
Power Factor	0.975
Current ATHD %	8.90
Correlated Color Temperature (CCT - K)	3018
Color Rendering Index (CRI - Ra)	83.2
Color Rendering Index (CRI - R9)	11.1
DUV	0.000
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.404
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	05/22/17
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

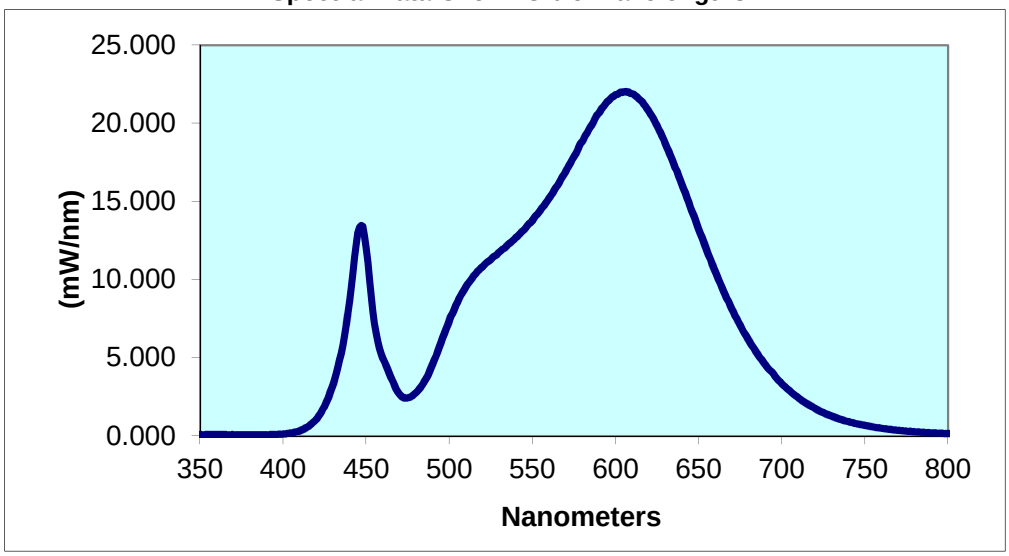
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-02:	Up	120.0	103.1	12.07	0.975	8.90	1319	109.3

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')
3018	83.2	11.1	0.000	0.436	0.404	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	0.088	440	8.668	530	11.76	620	20.79	710	2.440
355	0.085	445	12.96	535	12.20	625	19.86	715	2.074
360	0.081	450	12.09	540	12.70	630	18.69	720	1.760
365	0.079	455	7.213	545	13.19	635	17.43	725	1.490
370	0.075	460	4.981	550	13.79	640	16.08	730	1.263
375	0.072	465	3.733	555	14.48	645	14.65	735	1.072
380	0.065	470	2.676	560	15.22	650	13.23	740	0.914
385	0.066	475	2.441	565	16.01	655	11.85	745	0.780
390	0.072	480	2.776	570	16.92	660	10.52	750	0.671
395	0.089	485	3.475	575	17.87	665	9.276	755	0.574
400	0.123	490	4.590	580	18.83	670	8.121	760	0.493
405	0.193	495	5.966	585	19.81	675	7.086	765	0.419
410	0.336	500	7.370	590	20.67	680	6.146	770	0.360
415	0.601	505	8.556	595	21.39	685	5.299	775	0.308
420	1.072	510	9.541	600	21.84	690	4.562	780	0.265
425	1.910	515	10.29	605	22.01	695	3.967		
430	3.271	520	10.82	610	21.89	700	3.348		
435	5.309	525	11.29	615	21.49	705	2.861		

Spectral Data Over Visible Wavelengths



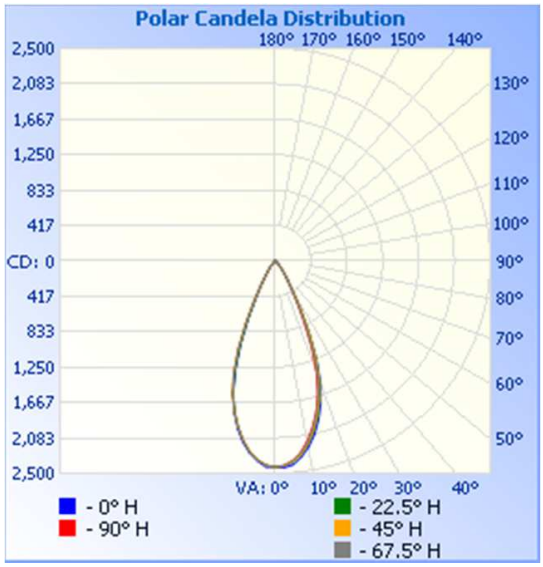
RESULTS OF TEST (cont'd)

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)
AH04192017041604-023	Up	120.0	103.1	12.07	0.975	1289	106.8

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	2424	2424	2424	2424	2424
5	2405	2377	2367	2358	2354
10	2224	2194	2183	2166	2146
15	1938	1904	1884	1852	1837
20	1534	1504	1489	1443	1401
25	929	932	936	852	801
30	417	418	434	385	353
35	197	200	187	183	168
40	107	109	102	98	90
45	59	61	60	54	47
50	25	32	35	24	20
55	13	14	19	12	10
60	4	6	8	5	3
65	2	2	3	2	1
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

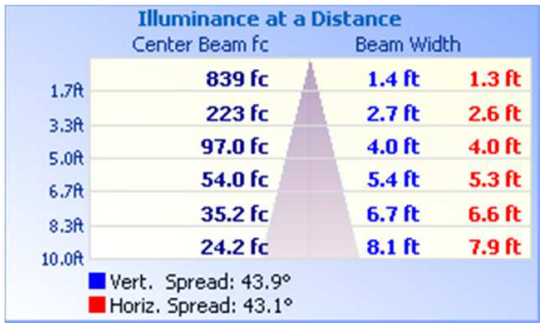


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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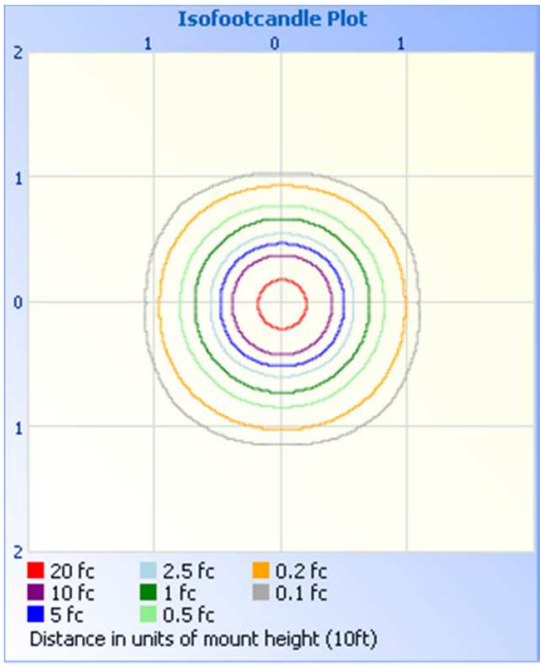


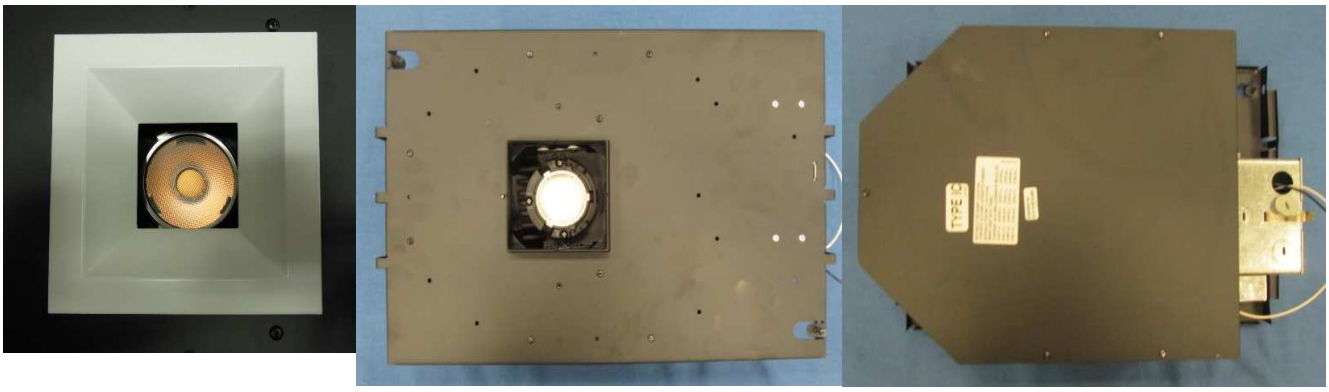
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1114	86.4
0-40	1234	95.7
0-60	1287	99.8
60-90	2.1	0.2
0-90	1289	100.0
90-180	0.0	0.0
0-180	1289	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	218.8	17.0
10-20	509.4	39.5
20-30	385.4	29.9
30-40	120.2	9.3
40-50	41.5	3.2
50-60	11.5	0.9
60-70	2.0	0.2
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:

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Attachment: None