



REPORT

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

Project No. G103017649

Date: May 22, 2017

REPORT NO. 103017649CHI-022

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E3SFF-LH8304AN
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-LH8304AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-022.

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

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SUMMARY

Model No.:	E3SFF-LH8304AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1811	1772
Total Power (W)	18.10	18.11
Luminaire Efficacy (LPW)	100.1	97.85

Criteria	Result
Power Factor	0.976
Current ATHD %	12.13
Correlated Color Temperature (CCT - K)	3051
Color Rendering Index (CRI - Ra)	82.2
Color Rendering Index (CRI - R9)	8.0
DUV	0.000
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.402
Chromaticity Coordinate (u')	0.249
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	05/22/17
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

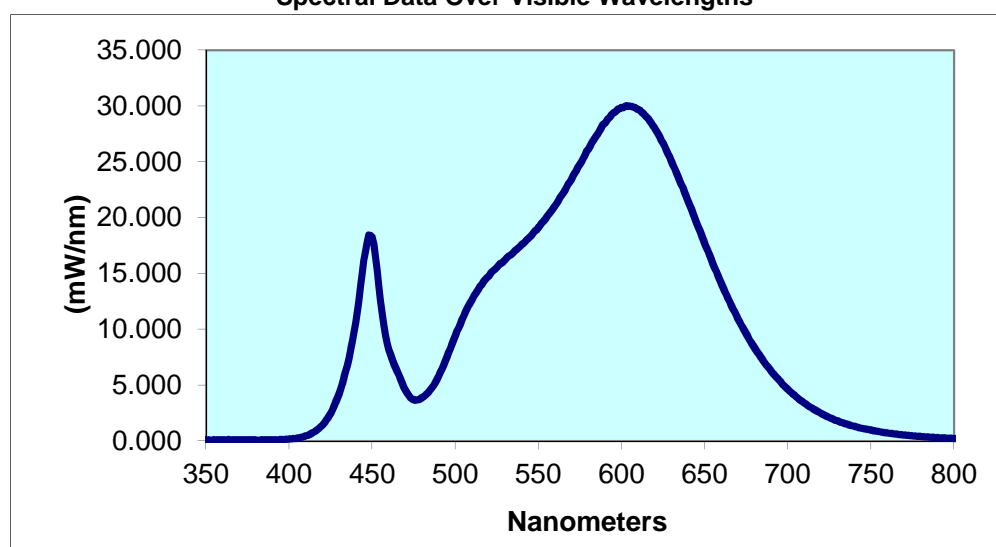
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

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	154.4	18.10	0.976	12.13	1811	100.1
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')	
3051	82.2	8.0	0.000	0.433	0.402	0.249	0.520	

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.105	440	10.59	530	16.24	620	28.01	710	3.400
355	0.121	445	16.13	535	16.90	625	26.68	715	2.900
360	0.088	450	18.25	540	17.60	630	25.05	720	2.478
365	0.101	455	12.61	545	18.29	635	23.32	725	2.106
370	0.087	460	8.200	550	19.12	640	21.50	730	1.797
375	0.096	465	6.249	555	20.07	645	19.60	735	1.527
380	0.080	470	4.549	560	21.09	650	17.70	740	1.311
385	0.088	475	3.704	565	22.22	655	15.87	745	1.126
390	0.098	480	3.873	570	23.46	660	14.13	750	0.968
395	0.119	485	4.585	575	24.79	665	12.49	755	0.832
400	0.167	490	5.809	580	26.12	670	10.95	760	0.713
405	0.242	495	7.526	585	27.39	675	9.603	765	0.614
410	0.450	500	9.414	590	28.46	680	8.335	770	0.526
415	0.807	505	11.14	595	29.39	685	7.243	775	0.450
420	1.422	510	12.63	600	29.88	690	6.257	780	0.392
425	2.462	515	13.87	605	29.98	695	5.429		
430	4.189	520	14.74	610	29.69	700	4.620		
435	6.770	525	15.55	615	29.03	705	3.972		

Spectral Data Over Visible Wavelengths



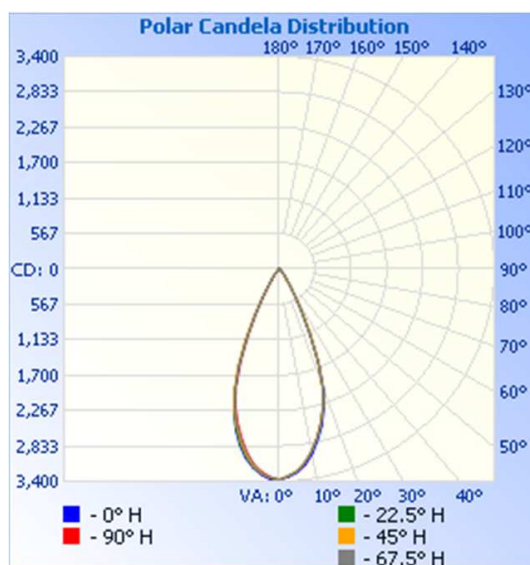
RESULTS OF TEST (cont'd)

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)
AH04192017041604-022	Up	120.0	154.6	18.11	0.976	1772	97.85

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	3369	3369	3369	3369	3369
5	3269	3244	3245	3246	3250
10	3006	2961	2955	2944	2962
15	2597	2551	2550	2539	2541
20	2046	2015	2013	1997	1999
25	1161	1157	1206	1159	1151
30	498	499	519	495	492
35	219	219	212	211	205
40	110	114	112	109	103
45	60	62	64	59	52
50	24	32	37	25	21
55	13	14	20	13	10
60	4	6	9	5	3
65	2	2	3	2	2
70	1	1	2	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

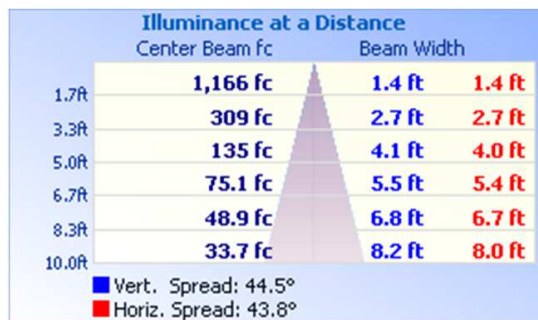


RESULTS OF TEST (cont'd)

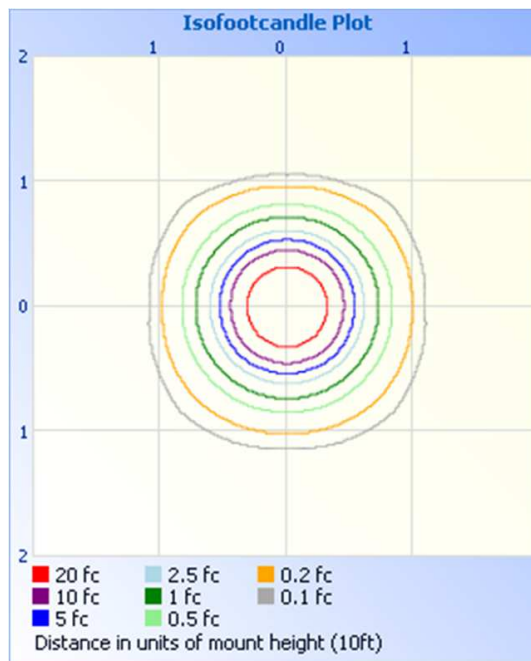
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



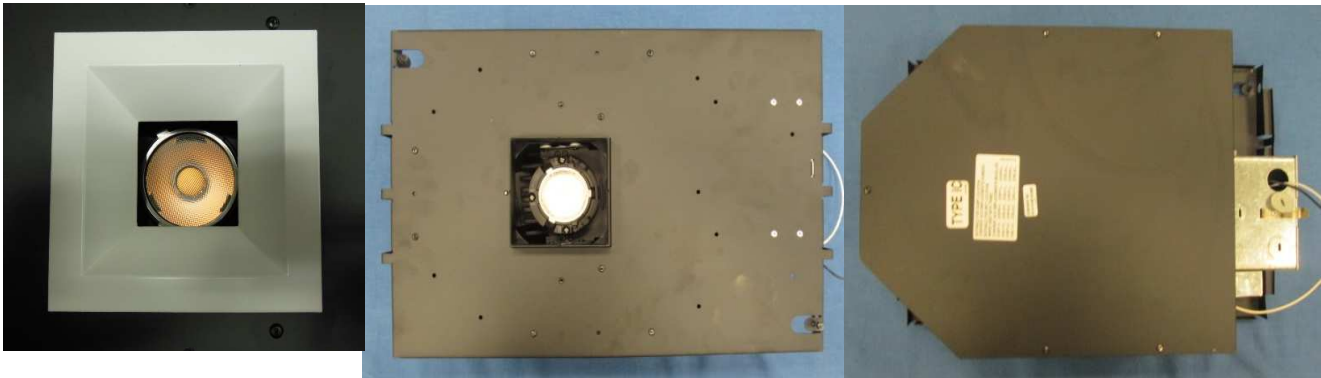
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1559	88.0
0-40	1711	96.5
0-60	1770	99.9
60-90	2.4	0.1
0-90	1772	100.0
90-180	0.0	0.0
0-180	1772	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	302.2	17.0
10-20	709.0	40.0
20-30	548.1	30.9
30-40	152.0	8.6
40-50	46.6	2.6
50-60	12.2	0.7
60-70	2.3	0.1
70-80	0.2	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