



# REPORT

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

Project No. G103017649

Date: May 5, 2017

REPORT NO. 103017649CHI-019

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E4SF-LH92740AN  
LED MODEL NO. CITIZEN CLU038-1205C4-273H5K2  
DRIVER MODEL NO. LTF DA30W750C40BF-0000  
TRIM MODEL NO. E4SFF-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 E4SF-LH92740AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-019.

DATES OF TESTS: May 3, 2017 through May 5, 2017.

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SUMMARY

Model No.:	E4SF-LH92740AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	2474	2400
Total Power (W)	32.85	32.85
Luminaire Efficacy (LPW)	75.31	73.06

Criteria	Result
Power Factor	0.987
Current ATHD %	8.35
Correlated Color Temperature (CCT - K)	2820
Color Rendering Index (CRI - Ra)	93.2
Color Rendering Index (CRI - R9)	67.4
DUV	0.000
Chromaticity Coordinate (x)	0.451
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.257
Chromaticity Coordinate (v')	0.526

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	05/05/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/05/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/05/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/05/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/05/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	05/03/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	05/03/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	05/03/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	05/03/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	05/03/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	05/03/17
Fluke J/K Temperature Meter	52	146004	01/10/17	01/10/18	05/03/17



## 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**

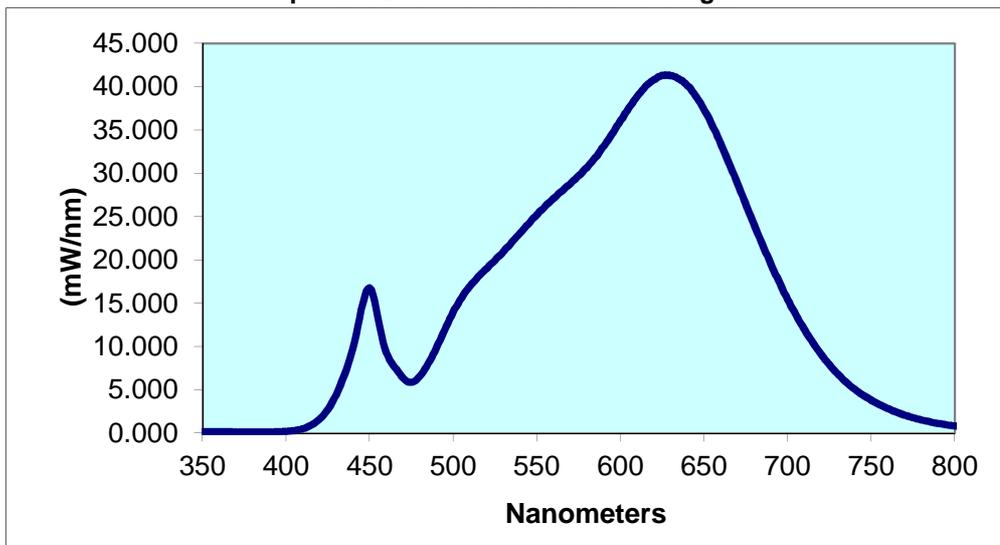
**Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method**

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)
\\H04192017041604-01	Up	120.0	277.3	32.85	0.987	8.35	2474	75.31
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')	
2820	93.2	67.4	0.000	0.451	0.410	0.257	0.526	

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.148	440	9.884	530	20.98	620	40.81	710	11.97
355	0.150	445	14.26	535	22.05	625	41.31	715	10.47
360	0.163	450	16.79	540	23.12	630	41.27	720	9.117
365	0.145	455	13.30	545	24.16	635	40.93	725	7.910
370	0.136	460	9.287	550	25.21	640	40.13	730	6.824
375	0.124	465	7.611	555	26.21	645	38.92	735	5.889
380	0.119	470	6.381	560	27.12	650	37.35	740	5.099
385	0.117	475	5.877	565	27.93	655	35.50	745	4.401
390	0.124	480	6.582	570	28.81	660	33.43	750	3.819
395	0.153	485	8.037	575	29.74	665	31.19	755	3.303
400	0.205	490	9.883	580	30.69	670	28.82	760	2.847
405	0.304	495	11.95	585	31.84	675	26.47	765	2.444
410	0.519	500	13.99	590	33.13	680	24.07	770	2.086
415	0.921	505	15.60	595	34.59	685	21.75	775	1.786
420	1.622	510	16.96	600	36.07	690	19.52	780	1.531
425	2.734	515	18.10	605	37.52	695	17.50		
430	4.433	520	18.99	610	38.86	700	15.46		
435	6.772	525	19.96	615	40.02	705	13.65		

**Spectral Data Over Visible Wavelengths**



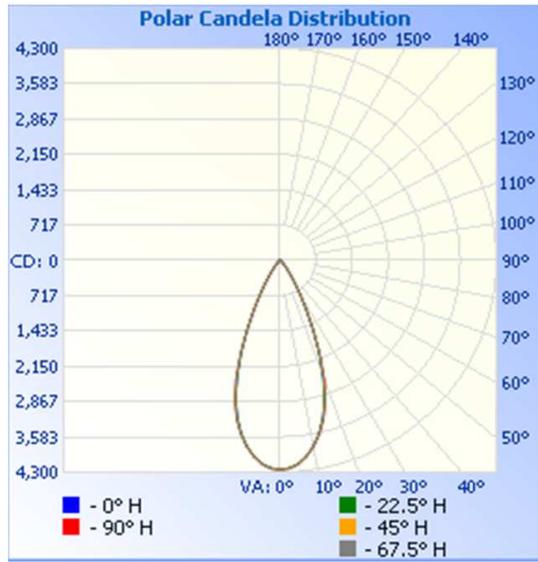
RESULTS OF TEST (cont'd)

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)
AH04192017041604-019	Up	120.0	277.3	32.85	0.987	2400	73.06

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	4241	4241	4241	4241	4241
5	4139	4138	4144	4150	4153
10	3823	3820	3830	3835	3834
15	3297	3301	3318	3330	3330
20	2501	2500	2533	2555	2564
25	1549	1558	1555	1548	1552
30	815	822	809	782	775
35	379	393	409	394	376
40	182	193	213	194	183
45	102	108	118	110	102
50	58	64	72	66	59
55	32	36	44	35	30
60	18	21	23	20	18
65	6	9	11	9	6
70	1	1	3	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

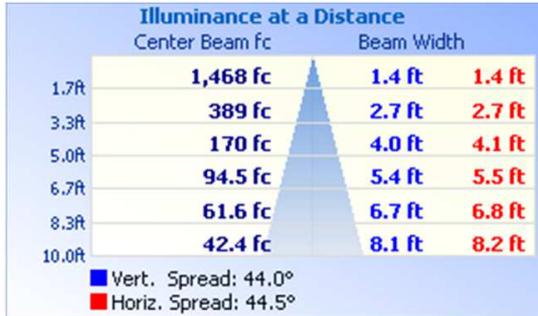


RESULTS OF TEST (cont'd)

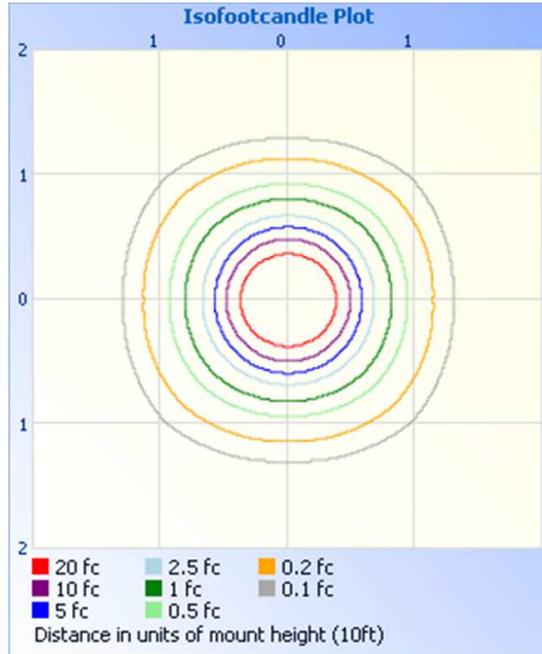
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2003	83.4
0-40	2266	94.4
0-60	2390	99.6
60-90	9.7	0.4
0-90	2400	100.0
90-180	0.0	0.0
0-180	2400	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	384.7	16.0
10-20	904.6	37.7
20-30	713.2	29.7
30-40	263.8	11.0
40-50	89.3	3.7
50-60	34.7	1.4
60-70	9.4	0.4
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