



REPORT

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

Project No. G103017649

Date: May 8, 2017

REPORT NO. 103017649CHI-016

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E4SF-LH93025AN
LED MODEL NO. CITIZEN CLU038-1205C4-303H5K2
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-LH93025AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-016.

DATES OF TESTS: May 3, 2017 through May 8, 2017.

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SUMMARY

Model No.:	E4SF-LH93025AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	2456	2451
Total Power (W)	32.75	32.83
Luminaire Efficacy (LPW)	74.99	74.66

Criteria	Result
Power Factor	0.987
Current ATHD %	8.79
Correlated Color Temperature (CCT - K)	3062
Color Rendering Index (CRI - Ra)	91.9
Color Rendering Index (CRI - R9)	63.7
DUV	0.002
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.409
Chromaticity Coordinate (u')	0.248
Chromaticity Coordinate (v')	0.523

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	05/08/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	05/08/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	05/08/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/08/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	05/08/17
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

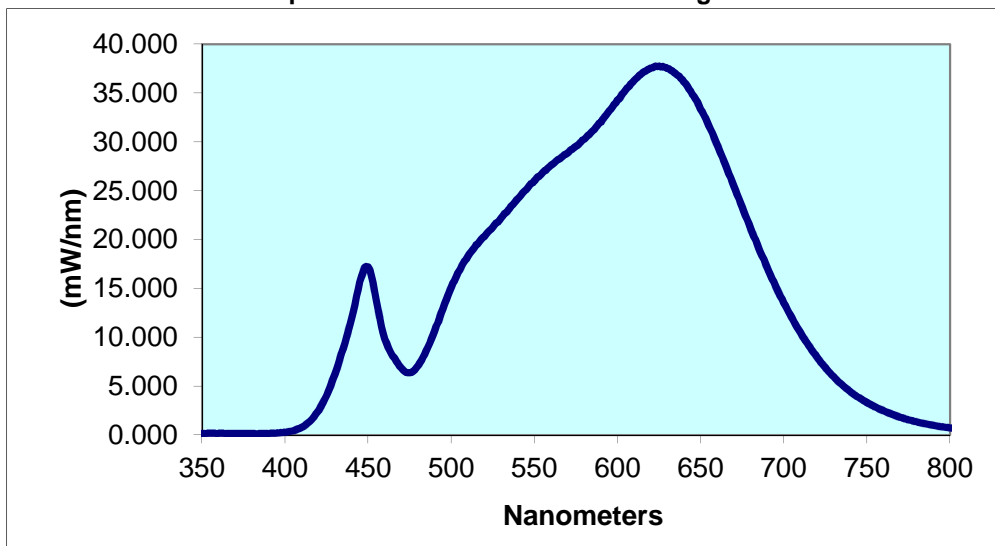
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Input Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\H04192017041604-01	Up	120.0	276.4	32.75	0.987	8.79	2456	74.99

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')
3062	91.9	63.7	0.002	0.436	0.409	0.248	0.523

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.152	440	11.96	530	22.23	620	37.55	710	10.48
355	0.156	445	15.67	535	23.18	625	37.73	715	9.150
360	0.157	450	17.21	540	24.19	630	37.52	720	7.966
365	0.150	455	13.74	545	25.12	635	37.00	725	6.901
370	0.141	460	9.835	550	26.00	640	36.12	730	5.954
375	0.125	465	8.048	555	26.88	645	34.87	735	5.143
380	0.124	470	6.842	560	27.63	650	33.37	740	4.439
385	0.135	475	6.367	565	28.24	655	31.63	745	3.836
390	0.148	480	7.096	570	28.88	660	29.69	750	3.325
395	0.191	485	8.645	575	29.57	665	27.63	755	2.876
400	0.268	490	10.67	580	30.26	670	25.48	760	2.484
405	0.440	495	12.91	585	31.12	675	23.35	765	2.124
410	0.775	500	15.10	590	32.03	680	21.18	770	1.817
415	1.420	505	16.85	595	33.19	685	19.09	775	1.558
420	2.467	510	18.28	600	34.28	690	17.15	780	1.339
425	4.055	515	19.45	605	35.32	695	15.31		
430	6.229	520	20.32	610	36.28	700	13.55		
435	8.888	525	21.27	615	37.07	705	11.95		

Spectral Data Over Visible Wavelengths



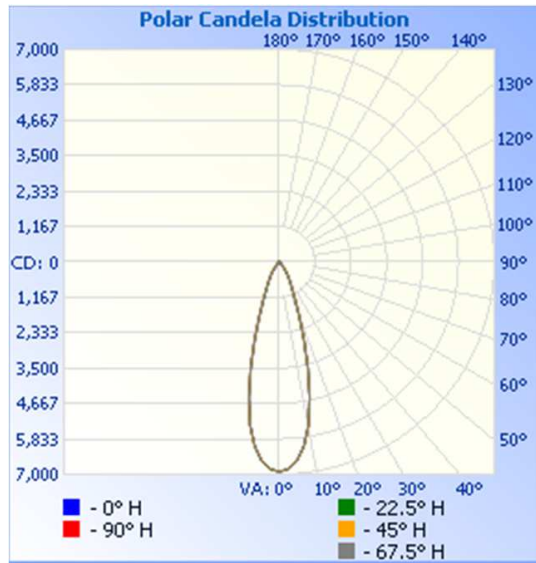
RESULTS OF TEST (cont'd)

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)
AH04192017041604-016	Up	120.0	277.1	32.83	0.987	2451	74.66

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	6907	6907	6907	6907	6907
5	6578	6580	6568	6568	6565
10	5455	5465	5476	5466	5467
15	3575	3574	3584	3605	3595
20	1856	1875	1910	1938	1947
25	997	1009	1040	1055	1057
30	623	638	654	662	660
35	330	388	433	409	358
40	153	191	276	202	165
45	88	102	149	107	96
50	57	63	73	66	61
55	32	38	44	40	35
60	19	22	25	23	21
65	8	11	12	12	9
70	0	2	4	2	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)

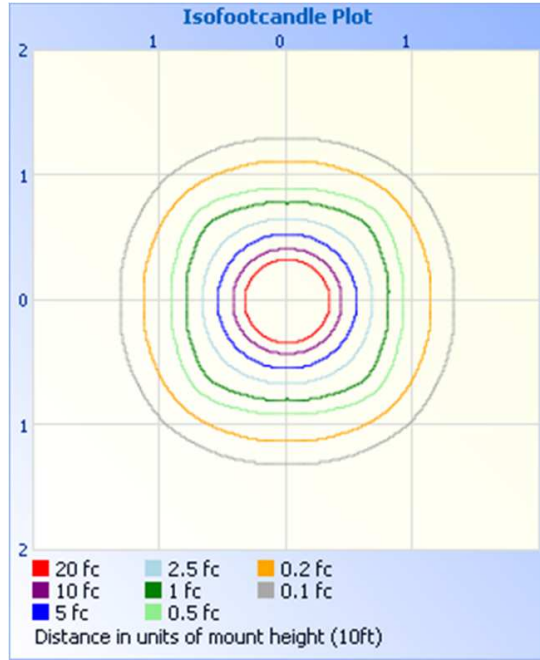
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2062	84.1
0-40	2311	94.3
0-60	2440	99.5
60-90	11.4	0.5
0-90	2451	100.0
90-180	0.0	0.0
0-180	2451	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	590.3	24.1
10-20	969.9	39.6
20-30	502.0	20.5
30-40	249.1	10.2
40-50	92.3	3.8
50-60	36.2	1.5
60-70	11.1	0.5
70-80	0.3	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