



REPORT

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

Project No. G103017649

Date: May 8, 2017

REPORT NO. 103017649CHI-015

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E4SF-LH93018AN
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-LH93018AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-015.

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

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SUMMARY

Model No.:	E4SF-LH93018AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	2494	2428
Total Power (W)	32.90	32.90
Luminaire Efficacy (LPW)	75.81	73.80

Criteria	Result
Power Factor	0.987
Current ATHD %	8.40
Correlated Color Temperature (CCT - K)	3100
Color Rendering Index (CRI - Ra)	92.2
Color Rendering Index (CRI - R9)	65.3
DUV	0.001
Chromaticity Coordinate (x)	0.432
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.247
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	05/08/17
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

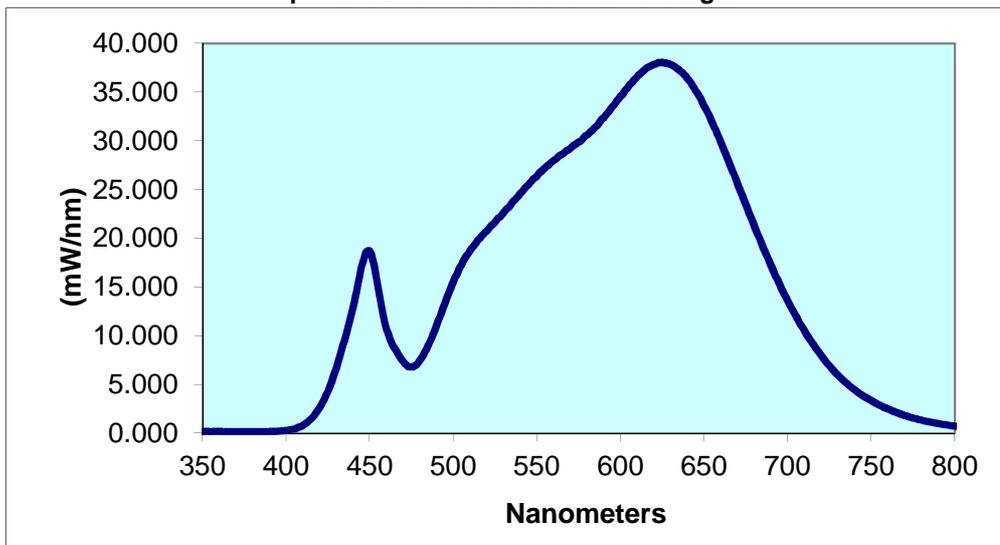
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
\\H04192017041604-01!	Up	120.0	277.8	32.90	0.987	8.40	2494	75.81
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')	
3100	92.2	65.3	0.001	0.432	0.405	0.247	0.521	

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.152	440	12.94	530	22.62	620	37.85	710	10.52
355	0.148	445	16.96	535	23.59	625	38.06	715	9.185
360	0.158	450	18.72	540	24.60	630	37.82	720	7.994
365	0.147	455	15.04	545	25.50	635	37.33	725	6.911
370	0.149	460	10.72	550	26.40	640	36.41	730	5.965
375	0.137	465	8.705	555	27.26	645	35.14	735	5.152
380	0.132	470	7.368	560	27.99	650	33.61	740	4.445
385	0.138	475	6.782	565	28.59	655	31.85	745	3.844
390	0.155	480	7.460	570	29.24	660	29.89	750	3.332
395	0.195	485	9.014	575	29.89	665	27.81	755	2.879
400	0.278	490	11.05	580	30.60	670	25.62	760	2.487
405	0.442	495	13.32	585	31.43	675	23.47	765	2.128
410	0.800	500	15.51	590	32.37	680	21.30	770	1.819
415	1.468	505	17.29	595	33.51	685	19.22	775	1.559
420	2.593	510	18.71	600	34.56	690	17.24	780	1.340
425	4.302	515	19.87	605	35.61	695	15.38		
430	6.662	520	20.74	610	36.57	700	13.61		
435	9.581	525	21.67	615	37.38	705	12.00		

Spectral Data Over Visible Wavelengths



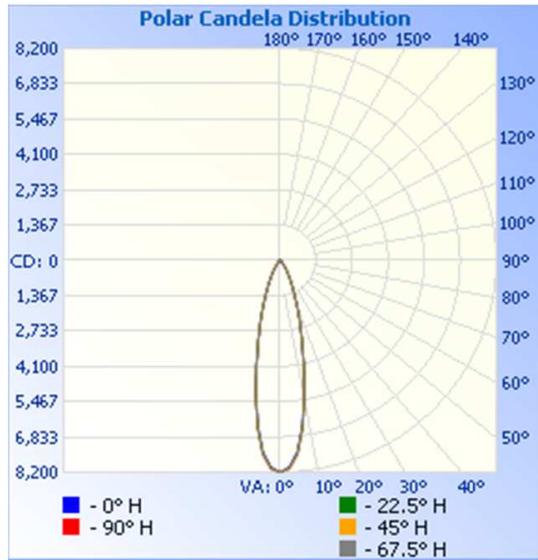
RESULTS OF TEST (cont'd)

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)
AH04192017041604-015	Up	120.0	277.8	32.90	0.987	2428	73.80

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	8192	8192	8192	8192	8192
5	7438	7483	7514	7523	7532
10	5277	5328	5300	5308	5297
15	3190	3207	3214	3220	3209
20	1898	1903	1908	1909	1900
25	1066	1078	1077	1080	1064
30	610	621	626	624	608
35	319	356	386	365	325
40	161	189	249	188	162
45	94	107	145	106	94
50	62	68	77	68	63
55	37	43	49	43	37
60	25	28	30	28	25
65	12	16	16	16	13
70	1	2	7	4	2
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

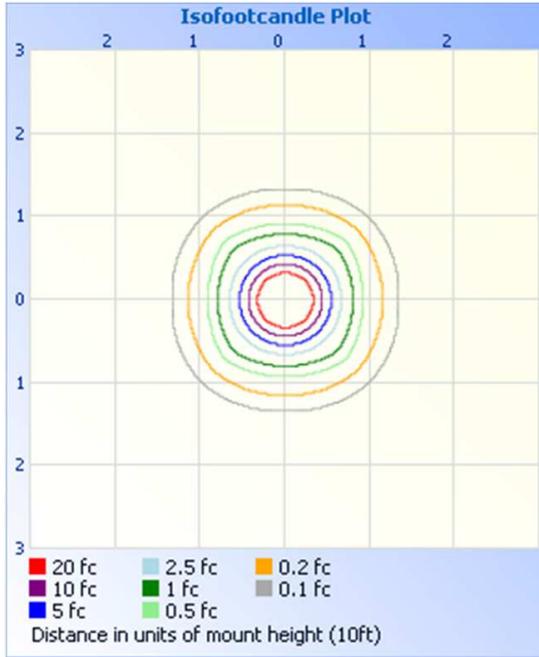


RESULTS OF TEST (cont'd)

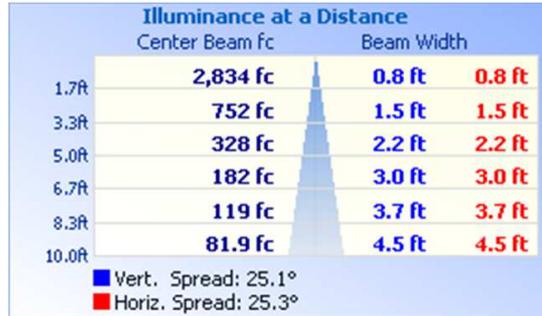
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2050	84.4
0-40	2280	93.9
0-60	2412	99.4
60-90	15.7	0.6
0-90	2428	100.0
90-180	0.0	0.0
0-180	2428	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	639.3	26.3
10-20	899.3	37.0
20-30	511.2	21.1
30-40	230.7	9.5
40-50	91.7	3.8
50-60	40.1	1.7
60-70	15.2	0.6
70-80	0.5	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