



REPORT

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

Project No. G103017649

Date: May 5, 2017

REPORT NO. 103017649CHI-017

TEST OF ONE LED RECESSED FIXTURE

MODEL NO. E4SF-LH93040AN
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-LH93040AN. The sample was received by Intertek on April 19, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH04192017041604-017.

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

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SUMMARY

Model No.:	E4SF-LH93040AN
Description:	LED RECESSED FIXTURE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	2584	2527
Total Power (W)	32.80	32.85
Luminaire Efficacy (LPW)	78.78	76.93

Criteria	Result
Power Factor	0.986
Current ATHD %	8.55
Correlated Color Temperature (CCT - K)	3090
Color Rendering Index (CRI - Ra)	92.3
Color Rendering Index (CRI - R9)	65.4
DUV	0.001
Chromaticity Coordinate (x)	0.432
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.247
Chromaticity Coordinate (v')	0.522

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	VBV	VBV	05/05/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	05/05/17
Pacific, AC power supply	118-ACX	CHI0358	VBV	VBV	05/05/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBV	VBV	05/03/17
3 Meter Sphere	SPR600	CHI0088	VBV	VBV	05/03/17
Elgar AC Power Supply	CW1251M	146112	VBV	VBV	05/03/17
Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV	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

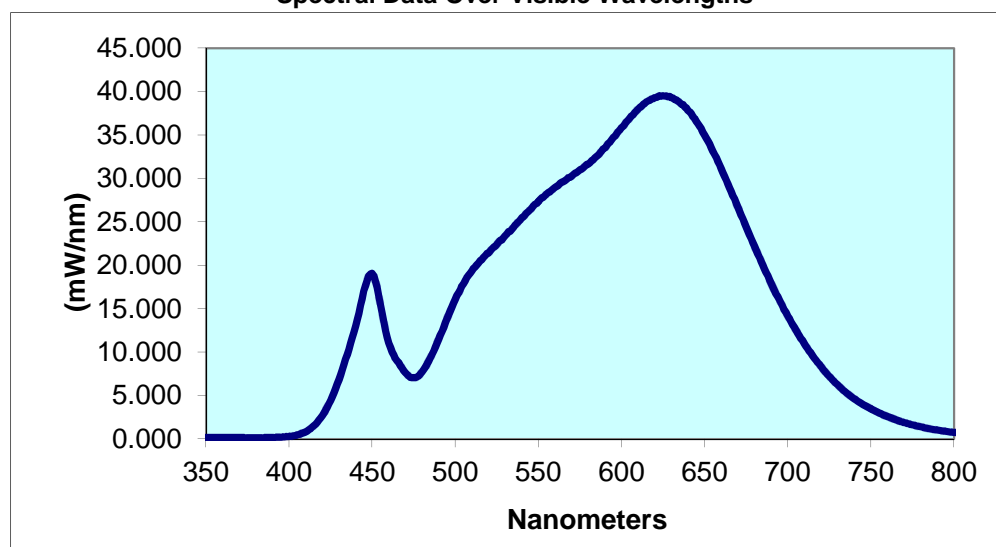
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
H04192017041604-01	Up	120.0	277.1	32.80	0.986	8.55	2584	78.78

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')
3090	92.3	65.4	0.001	0.432	0.406	0.247	0.522

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.160	440	13.03	530	23.41	620	39.31	710	10.95
355	0.154	445	17.03	535	24.39	625	39.53	715	9.561
360	0.145	450	19.06	540	25.47	630	39.29	720	8.324
365	0.150	455	15.52	545	26.40	635	38.76	725	7.209
370	0.138	460	11.05	550	27.35	640	37.84	730	6.221
375	0.130	465	8.982	555	28.23	645	36.55	735	5.365
380	0.133	470	7.650	560	28.99	650	34.97	740	4.628
385	0.137	475	7.033	565	29.63	655	33.14	745	4.003
390	0.155	480	7.724	570	30.27	660	31.10	750	3.471
395	0.202	485	9.341	575	30.99	665	28.95	755	2.993
400	0.290	490	11.46	580	31.67	670	26.69	760	2.587
405	0.470	495	13.79	585	32.55	675	24.46	765	2.214
410	0.833	500	16.06	590	33.52	680	22.19	770	1.894
415	1.537	505	17.88	595	34.73	685	20.02	775	1.620
420	2.682	510	19.35	600	35.85	690	17.96	780	1.392
425	4.427	515	20.53	605	36.95	695	16.02		
430	6.834	520	21.43	610	37.98	700	14.16		
435	9.750	525	22.41	615	38.80	705	12.50		

Spectral Data Over Visible Wavelengths



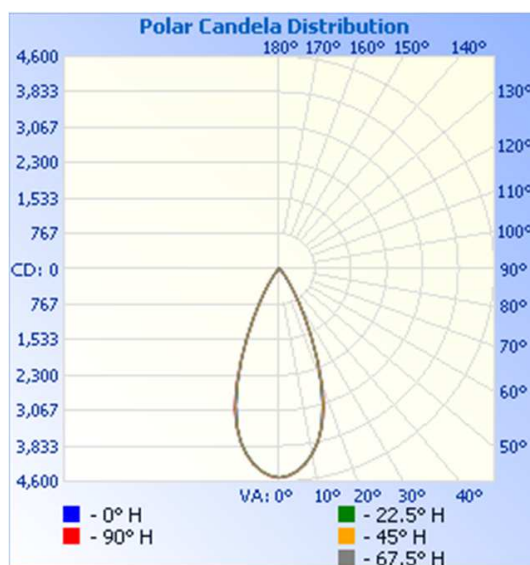
RESULTS OF TEST (cont'd)

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)
AH04192017041604-017	Up	120.0	277.5	32.85	0.987	2527	76.93

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	4517	4517	4517	4517	4517
5	4385	4385	4393	4402	4402
10	4053	4057	4071	4075	4076
15	3498	3502	3518	3535	3534
20	2595	2615	2648	2690	2698
25	1635	1637	1620	1613	1598
30	860	872	850	821	804
35	374	408	429	414	396
40	179	196	224	204	190
45	101	111	123	115	107
50	60	67	75	69	64
55	31	37	47	40	32
60	19	21	26	22	20
65	7	10	12	10	8
70	1	2	3	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

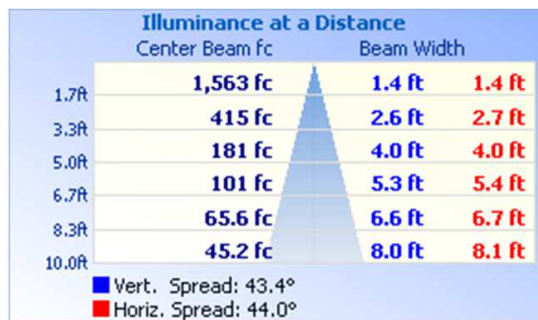


RESULTS OF TEST (cont'd)

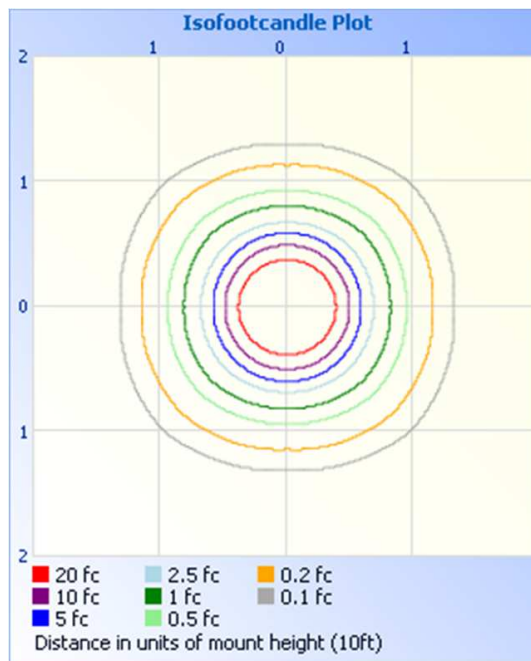
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2112	83.6
0-40	2387	94.5
0-60	2516	99.6
60-90	10.7	0.4
0-90	2527	100.0
90-180	0.0	0.0
0-180	2527	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	408.3	16.2
10-20	957.6	37.9
20-30	746.2	29.5
30-40	274.9	10.9
40-50	92.4	3.7
50-60	36.8	1.5
60-70	10.5	0.4
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