



REPORT

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

Project No. G102171228

Date: October 19, 2015

REPORT NO. 102171228CHI-003

TEST OF ONE LED RECESSED FIXTURES 4" APERTURE

MODEL NO. E4SF-LV83540AN
DRIVER MODEL NO. CITIZEN CLU036-1208C1-353M2G2
DRIVER MODEL NO. LTF DA30W750C
TRIM MODEL NO. E4SFB-OW

RENDERED TO

GENERATION BRANDS
7400 LINDER AVE
SKOKIE, IL 60077

TEST: Electrical and Photometric tests as required to the IESNA test standard.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500606081.

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-LV83540AN. The sample was received by Intertek on October 15, 2015, in undamaged condition and one sample was tested as received. The sample designation was AH10152015102903.

DATES OF TESTS: October 16, 2015 through October 19, 2015.

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SUMMARY

Model No.:	E4SF-LV83540AN
Description:	LED Recessed fixtures 4" aperture

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3110	3283
Total Power (W)	31.39	31.79
Luminaire Efficacy (LPW)	99.08	103.3

Criteria	Result
Power Factor	0.989
Current ATHD %	8.36
Correlated Color Temperature (CCT - K)	3471
Color Rendering Index (CRI - Ra)	82.6
Color Rendering Index (CRI - R9)	11.0
DUV	0.001
Chromaticity Coordinate (x)	0.406
Chromaticity Coordinate (y)	0.390
Chromaticity Coordinate (u')	0.237
Chromaticity Coordinate (v')	0.511

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU
3 Meter Sphere	SPR600	CHI0088	VBU	VBU
Elgar AC Power Supply	CW1251M	146112	VBU	VBU
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
Newport Humidity Recorder	iTHX-SD	146382	07/09/15	07/09/16
Yokogawa Power Meter	WT1600	146768	01/15/15	01/15/16
Omega Temperature Meter	MDSi8	146139	04/03/15	04/03/16
Yokogawa Power Meter	WT210	146919	07/14/15	07/14/16
Omega Thermometer	DPI8-C24	146920	10/09/15	10/09/16
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
Newport Hygrometer	iServer	146956	01/06/15	01/06/16
Elgar, AC Power Supply	CW1251P	146918	VBU	VBU



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 Three Meter 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

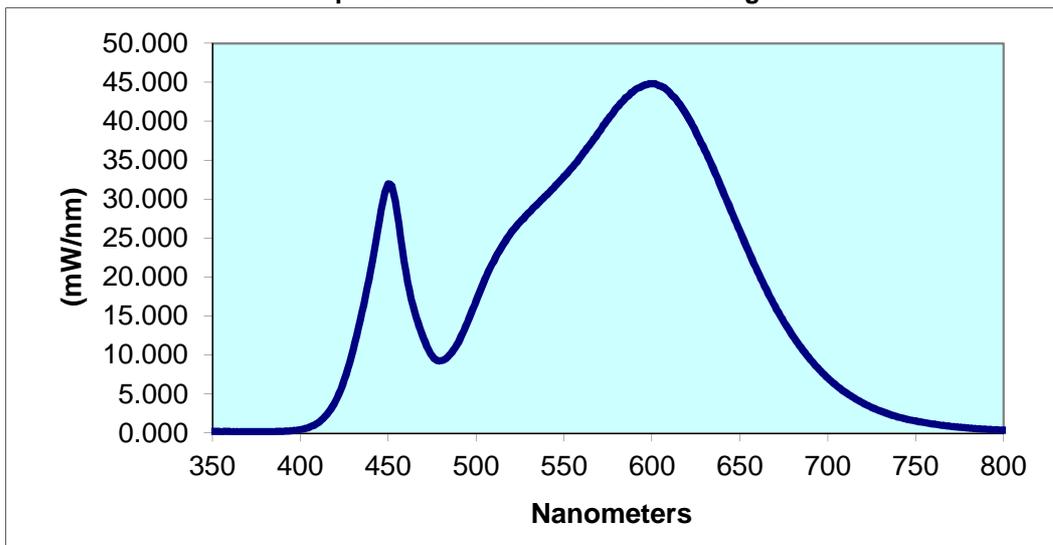
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH10152015102903	UP	120.0	264.3	31.39	0.989	8.36	3110	99.08

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3471	82.6	11.0	0.001	0.406	0.390	0.237	0.511

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.2	440	20.79	530	28.32	620	40.66	710	5.228
355	0.188	445	27.35	535	29.42	625	38.63	715	4.492
360	0.207	450	31.98	540	30.54	630	36.29	720	3.867
365	0.184	455	28.41	545	31.74	635	33.81	725	3.296
370	0.177	460	20.67	550	32.94	640	31.19	730	2.821
375	0.169	465	15.56	555	34.2	645	28.51	735	2.417
380	0.169	470	12.21	560	35.62	650	25.87	740	2.073
385	0.176	475	9.86	565	37.12	655	23.27	745	1.785
390	0.219	480	9.294	570	38.7	660	20.81	750	1.547
395	0.301	485	10.09	575	40.25	665	18.42	755	1.341
400	0.451	490	11.73	580	41.77	670	16.25	760	1.168
405	0.757	495	14.23	585	43.05	675	14.28	765	1.008
410	1.333	500	17.01	590	44	680	12.49	770	0.864
415	2.383	505	19.73	595	44.56	685	10.89	775	0.742
420	4.1	510	22.06	600	44.82	690	9.443	780	0.644
425	6.85	515	24.1	605	44.51	695	8.198		
430	10.68	520	25.76	610	43.69	700	7.069		
435	15.49	525	27.12	615	42.4	705	6.079		

Spectral Data Over Visible Wavelengths



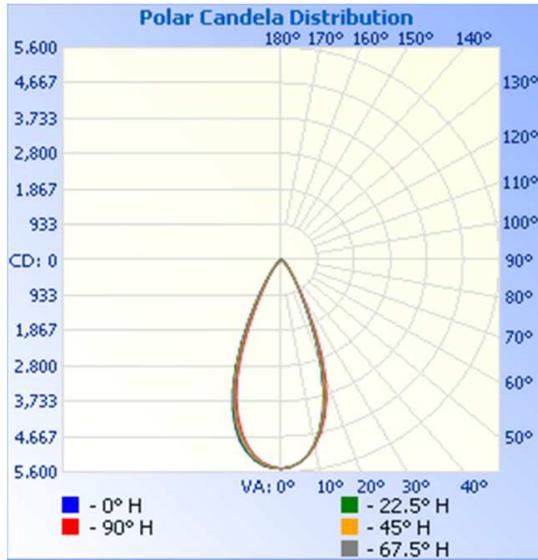
RESULTS OF TEST (cont'd)

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 (Lumens Per Watt)
AH10152015102903	Up	120.1	268.2	31.79	0.987	3283	103.3

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	5504	5504	5504	5504	5504
5	5372	5369	5364	5362	5366
10	4928	4925	4929	4948	4974
15	4131	4133	4172	4228	4294
20	2975	3013	3078	3196	3309
25	1739	1767	1818	1917	2031
30	915	921	939	976	1034
35	512	513	514	531	558
40	292	297	301	309	323
45	176	179	183	186	192
50	113	115	116	119	122
55	69	75	80	78	74
60	41	47	56	49	45
65	21	25	34	26	23
70	6	9	14	10	7
75	2	2	3	2	2
80	2	2	2	2	2
85	1	1	1	1	1
90	0	0	0	0	0

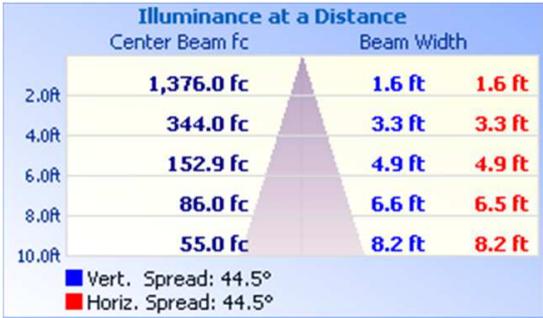


RESULTS OF TEST (cont'd)

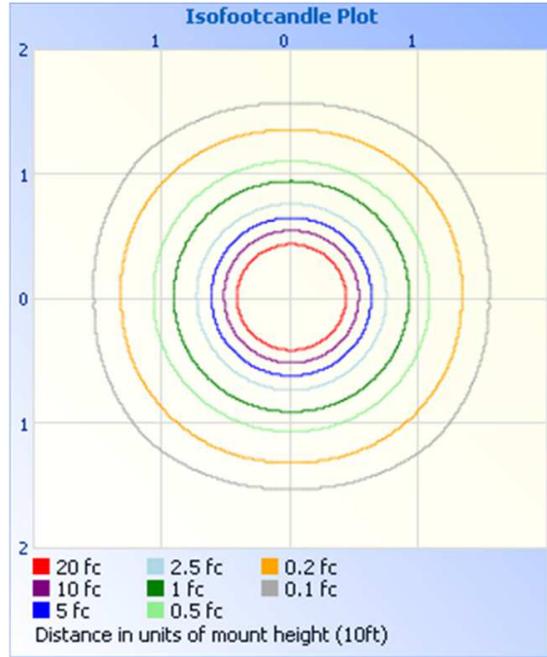
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	2625	80.0
0-40	3011	91.7
0-60	3248	98.9
60-90	35.0	1.1
0-90	3283	100.0
90-180	0.0	0.0
0-180	3283	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	501.0	15.3
10-20	1179	35.9
20-30	945.5	28.8
30-40	386.2	11.8
40-50	161.4	4.9
50-60	75.1	2.3
60-70	29.5	0.9
70-80	4.5	0.1
80-90	1.0	0.0

PICTURE (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:



Tim Quigley
Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Kenda Branch
Lighting Performance Team Lead
Lighting Division