

VISUAL COMFORT GROUP TEST REPORT

SCOPE OF WORK

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

MODEL NUMBER

E4SFW-830-W

REPORT NUMBER

103643585CHI-085

ISSUE DATE

April 2, 2019

REVISION DATE

None

DOCUMENT CONTROL NUMBER

TBD

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REPORT DATE: April 2, 2019

TEST REPORT

TEST OF ONE RECESSED DOWNLIGHT

MODEL NO. E4SFW-830-W
LED MODEL NO. CITIZEN CLU028-1203
DRIVER MODEL NO. DA30W700C2542-3001

RENDERED TO:

VISUAL COMFORT GROUP
7400 LINDER AVE
SKOKIE, IL 60077

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-00912313-2 .

STANDARDS USED

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting
ANSI NEMA ANSLG C78.377: 2015: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE

The client submitted one production sample of model number E4SFW-830-W. The sample was received by Intertek on March 21, 2019 in undamaged condition and one sample was tested as received. The sample designation was AH03212019112835-085.

DATE OF TESTS

March 28, 2019 through April 1, 2019.

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SUMMARY

MODEL NO:	E45FW-830-W
DESCRIPTION:	Recessed downlight

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	2343.2	2325.0
Input Power (W) @ 120 (VAC)	30.95	31.03
Lumen Efficacy (lm/W)	75.7	74.9
Input Power Factor () @ 120 (VAC)	0.998	0.997

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	4.87
Correlated Color Temperature (K)	3135
Color Rendering Index - Ra	82.1
Color Rendering - R9	1.6
DUV	0.0014
Chromaticity Coordinate (x)	0.430
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.245
Chromaticity Coordinate (v')	0.521

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EQUIPMENT LIST

EQUIPMENT USED	MODEL NO.	CONTROL NO.	LAST CAL DATE	CAL DUE DATE
Yokogawa Power Meter	WT210	146919	7/9/2018	7/9/2019
Omega Newport Thermometer	DPI8-C24	146920	10/4/2018	10/4/2019
LSI High Speed Mirror Goniometer	6440T	146928	VBV	VBV
Newport Thermohygrometer	iServer	146379	4/16/2018	4/16/2019
Pacific, AC power supply	118-ACX	CHI0358	VBV	VBV
Labsphere Spectroradiometer	CDS1100	CHI0091	VBV	VBV
3 Meter Sphere	SPR600	CHI0088	VBV	VBV
Elgar AC Power Supply	CW1251	146112	VBV	VBV
Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV
Newport Humidity Recorder	iTHX-SD	146961	7/23/2018	7/23/2019
Yokogawa Power Meter	WT1600	146769	4/6/2018	4/6/2019
Extech K Temperature Meter	SD200	CHI0207	4/12/2018	4/12/2019

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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 Spectroradiometer and integrating 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. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a 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 Type C Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for the SSL sample.

Ambient temperature was measured equal to the height of the sample mounted on the goniometer equipment. The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was allowed to stabilize for at least thirty minutes before measurements were made. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

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TEST REPORT

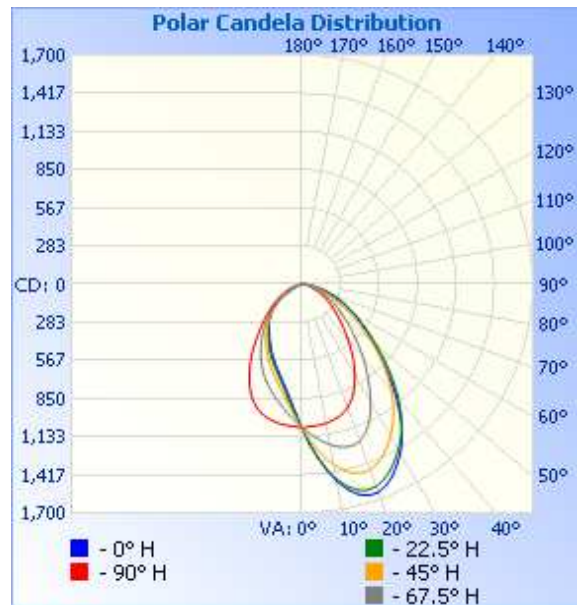
RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR	LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)
AH03212019112835-085	Base Up	120.1	259.1	31.03	0.997	2325.0	74.9

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	1071	1071	1071	1071	1071
5	1288	1289	1226	1143	1057
10	1489	1471	1364	1212	1046
15	1618	1582	1452	1252	1023
20	1645	1599	1466	1241	978
25	1574	1531	1408	1156	895
30	1448	1420	1302	1012	778
35	1279	1280	1174	848	650
40	1070	1103	1020	694	519
45	866	909	851	547	409
50	693	724	676	429	322
55	555	572	506	336	250
60	442	442	369	257	188
65	342	329	263	189	135
70	248	231	179	128	88
75	156	139	109	76	49
80	84	71	54	36	22
85	34	25	17	10	7
90	1	1	1	1	1



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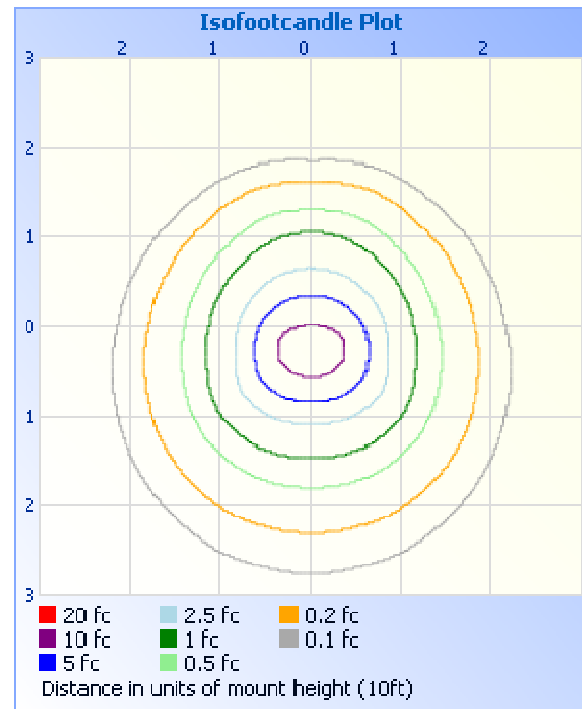
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RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

MOUNTING HEIGHT: 10ft	
ILLUMINANCE - CONE OF LIGHT	ISOILLUMINATION PLOT



ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	862.1	37.1
0-40	1346.7	57.9
0-60	2061.6	88.7
60-90	263.3	11.3
70-100	89.7	3.9
90-120	0.1	0.0
0-90	2324.9	100.0
90-180	0.1	0.0
0-180	2325.0	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	103.4	4.4
10-20	306.9	13.2
20-30	451.8	19.4
30-40	484.6	20.8
40-50	417.3	17.9
50-60	297.7	12.8
60-70	173.7	7.5
70-80	74.7	3.2
80-90	14.9	0.6
90-100	0.1	0.0

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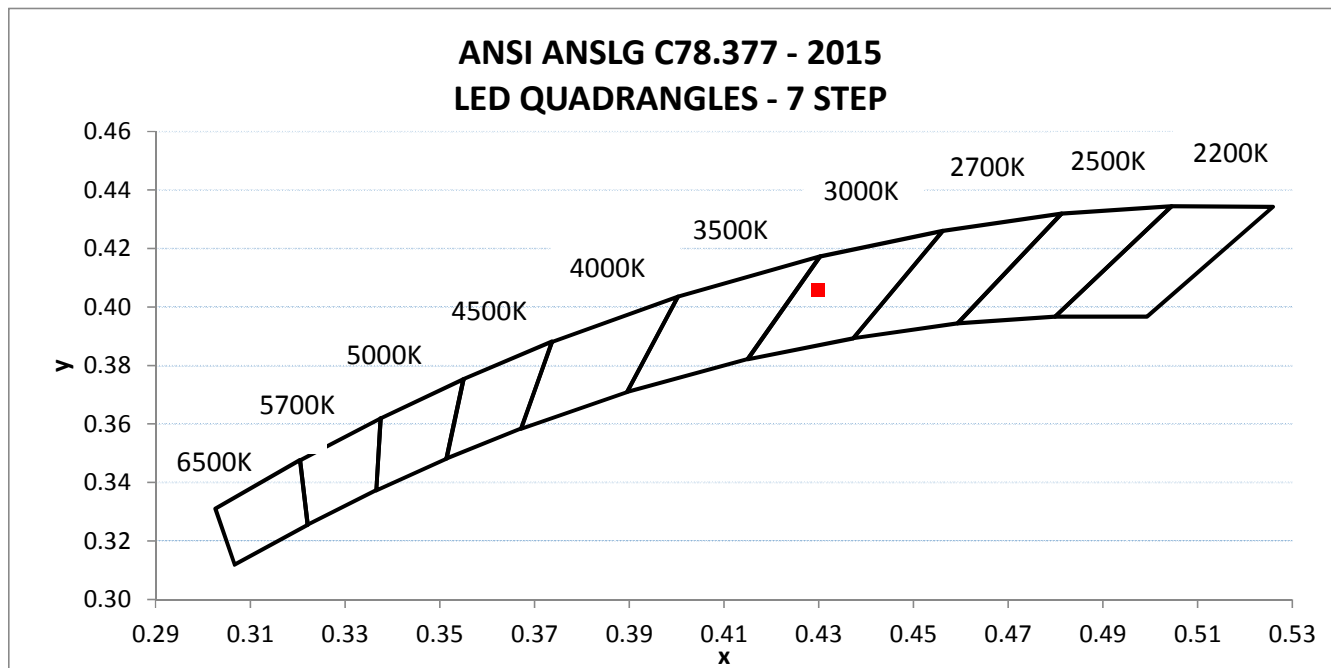
RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR	INPUT CURRENT ATHD (%)
AH03212019112835-085	Base Up	119.99	258.40	30.95	0.998	4.87

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
2343.2	75.7	3135	82.1	1.6	0.0014

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.430	0.406	0.245	0.521



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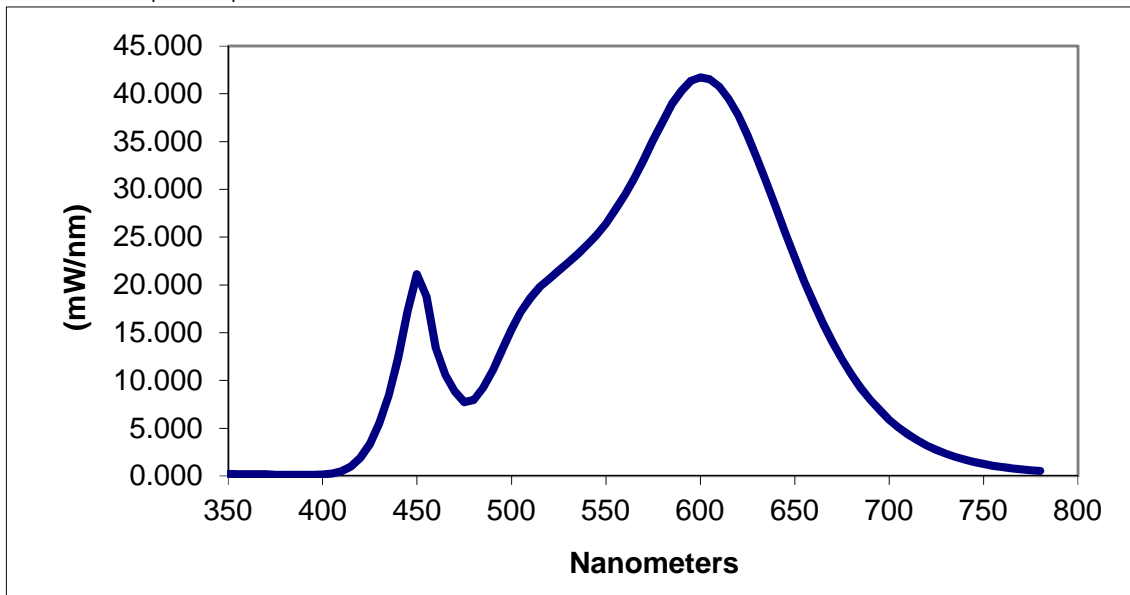
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RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)

SPECTRAL DISTRIBUTION OVER VISIBLE WAVELENGTHS*							
nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.225	460	13.392	570	33.105	680	10.623
355	0.197	465	10.594	575	35.171	685	9.194
360	0.208	470	8.877	580	37.073	690	7.957
365	0.210	475	7.734	585	38.925	695	6.919
370	0.190	480	7.968	590	40.310	700	5.889
375	0.141	485	9.236	595	41.352	705	5.080
380	0.140	490	11.059	600	41.716	710	4.356
385	0.141	495	13.188	605	41.526	715	3.730
390	0.142	500	15.381	610	40.750	720	3.185
395	0.143	505	17.166	615	39.492	725	2.728
400	0.168	510	18.649	620	37.762	730	2.336
405	0.265	515	19.802	625	35.658	735	1.993
410	0.491	520	20.638	630	33.225	740	1.711
415	0.989	525	21.497	635	30.727	745	1.470
420	1.894	530	22.318	640	28.104	750	1.259
425	3.328	535	23.205	645	25.453	755	1.082
430	5.488	540	24.183	650	22.860	760	0.935
435	8.443	545	25.190	655	20.402	765	0.802
440	12.319	550	26.418	660	18.105	770	0.695
445	17.282	555	27.852	665	15.961	775	0.590
450	21.141	560	29.431	670	13.980	780	0.523
455	18.793	565	31.146	675	12.229		

*Without correction of sample absorption.



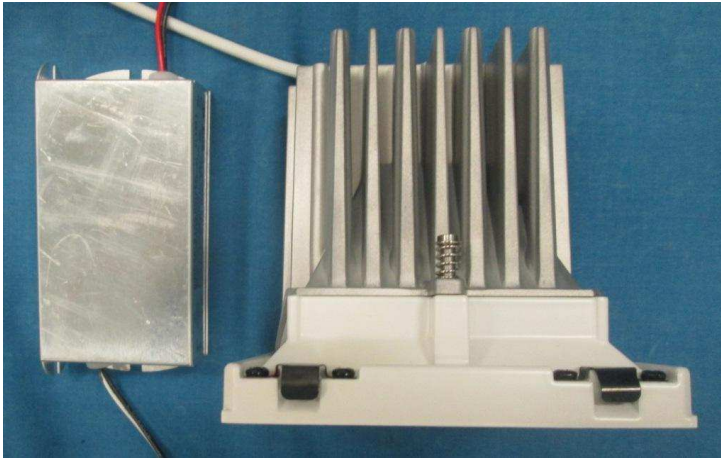
End Of Test Results

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PICTURES



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

Timothy Quigley
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Report Reviewed By:

Hector Huitron

Hector Huitron
Associate Engineer
Lighting Division

Attachments: IES File

REVISION HISTORY

JOB NUMBER	DATE OF REVISION	PROJECT HANDLER	REVIEWED BY	REVISION NOTE
None				