REPORT

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

Project No. G102171228 Date: April 11, 2017

REPORT NO. 102171228CHI-092

TEST OF ONE LED DOWNLIGHT

MODEL NO. E3SFB-LH8300AN-CLEAR
LED MODEL NO. CITIZEN CLU038-1205C4-303M2K1
DRIVER MODEL NO. LTF DA18W440C40BF

RENDERED TO

GENERATION BRANDS
7400 LINDER AVE.
SKOKIE, IL 60077 USA

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

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 prototype sample of model number E3SFB-LH8300AN-CLEAR. The sample was received by Intertek on April 4, 2017, in undamaged condition and one sample was tested as received. The sample designation was 04042017041733J.

DATES OF TESTS: April 10, 2017 through April 11, 2017.

SUMMARY

Model No.:	E3SFB-LH8300AN-CLEAR
Description:	LED Downlight

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	1034	987.0
Total Power (W)	16.64	16.66
Luminaire Efficacy (LPW)	62.14	59.24

Criteria	Result
Power Factor	0.977
Current ATHD %	11.64
Correlated Color Temperature (CCT - K)	2917
Color Rendering Index (CRI - Ra)	90.0
Color Rendering Index (CRI - R9)	53.1
DUV	0.005
Chromaticity Coordinate (x)	0.450
Chromaticity Coordinate (y)	0.421
Chromaticity Coordinate (u')	0.252
Chromaticity Coordinate (v')	0.530

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	04/11/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	04/11/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	04/11/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	04/11/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	04/11/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	04/10/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	04/10/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	04/10/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	04/10/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	04/10/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	04/10/17
Fluke K/L Temperature Meter	52	146004	01/10/17	01/10/18	04/10/17

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

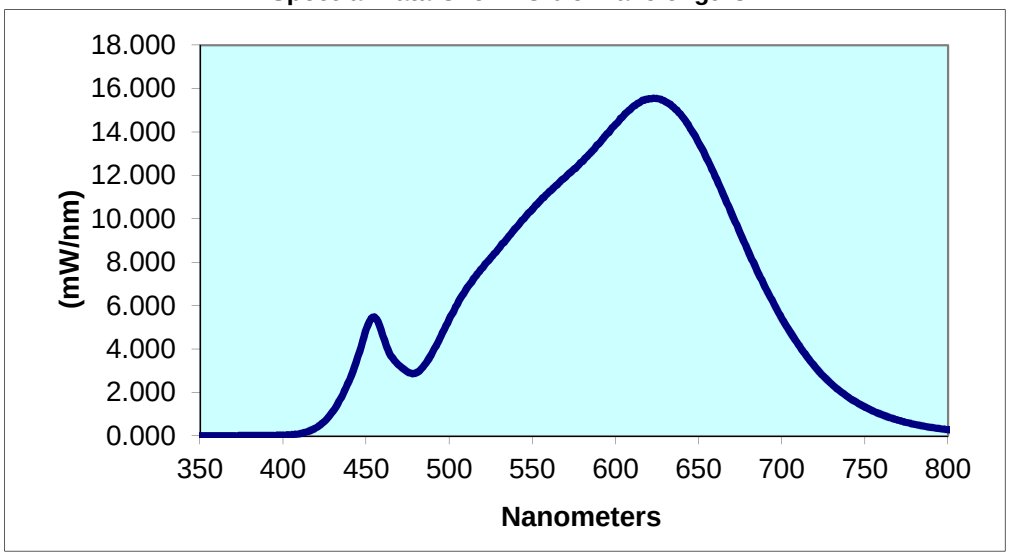
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
040420170417333J	Up	120.0	141.9	16.64	0.977	11.64	1034	62.14

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')
2917	90.0	53.1	0.005	0.450	0.421	0.252	0.530

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.006	440	2.603	530	8.658	620	15.53	710	4.203
355	0.006	445	3.647	535	9.121	625	15.54	715	3.672
360	0.007	450	4.903	540	9.592	630	15.40	720	3.190
365	0.008	455	5.483	545	10.01	635	15.14	725	2.765
370	0.008	460	4.634	550	10.44	640	14.73	730	2.396
375	0.010	465	3.671	555	10.87	645	14.16	735	2.072
380	0.011	470	3.247	560	11.25	650	13.50	740	1.790
385	0.014	475	2.956	565	11.58	655	12.77	745	1.544
390	0.017	480	2.904	570	11.93	660	11.95	750	1.336
395	0.023	485	3.259	575	12.29	665	11.11	755	1.148
400	0.035	490	3.861	580	12.64	670	10.22	760	0.991
405	0.058	495	4.583	585	13.06	675	9.349	765	0.847
410	0.108	500	5.372	590	13.46	680	8.484	770	0.727
415	0.208	505	6.082	595	13.93	685	7.657	775	0.621
420	0.386	510	6.735	600	14.36	690	6.863	780	0.531
425	0.682	515	7.287	605	14.77	695	6.141		
430	1.132	520	7.745	610	15.13	700	5.420		
435	1.774	525	8.208	615	15.38	705	4.792		

Spectral Data Over Visible Wavelengths



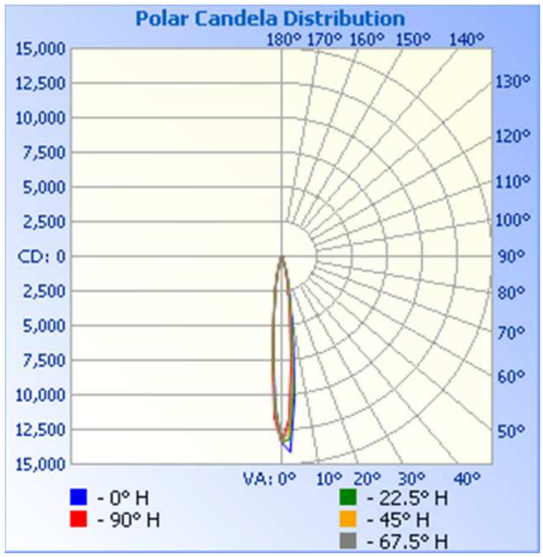
RESULTS OF TEST (cont'd)

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)
04042017041733J	Up	120.0	142.0	16.66	0.978	987.0	59.24

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	13421	13421	13421	13421	13421
5	10376	9632	9011	8367	7624
10	3786	3484	3235	2999	2863
15	1537	1420	1246	1196	1056
20	421	377	347	312	271
25	51	75	77	58	43
30	18	21	40	19	16
35	14	13	18	13	12
40	9	9	10	10	9
45	5	7	8	7	7
50	4	4	6	4	4
55	1	3	4	2	2
60	1	1	2	1	2
65	0	1	2	1	1
70	0	1	1	1	1
75	0	1	1	1	1
80	0	1	1	1	1
85	1	1	1	1	1
90	0	0	0	0	0

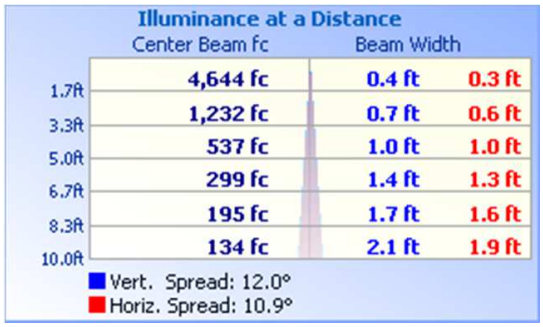


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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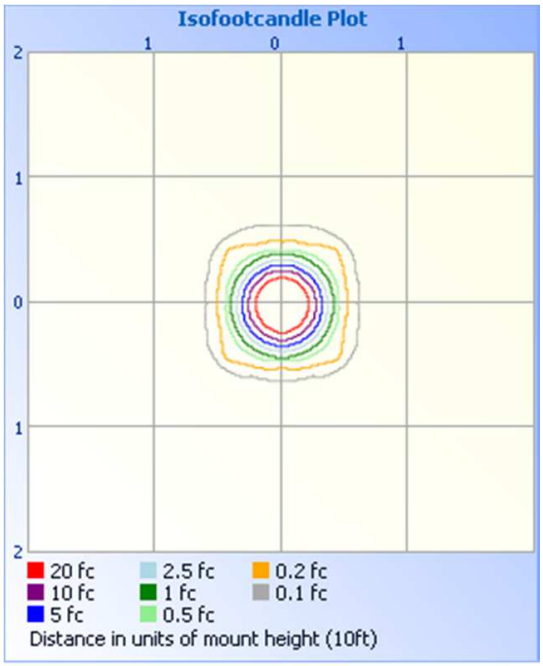


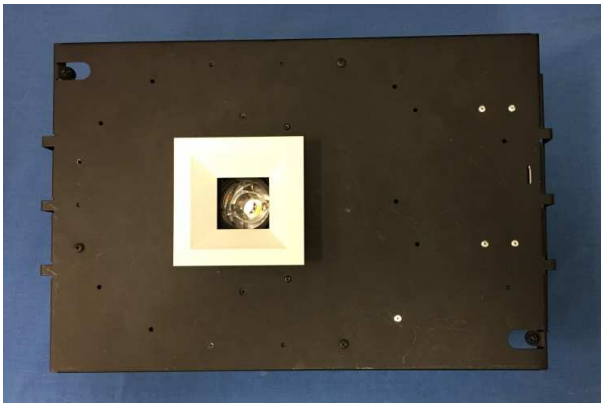
Zonal Lumen Summary and Percentages at 25°C

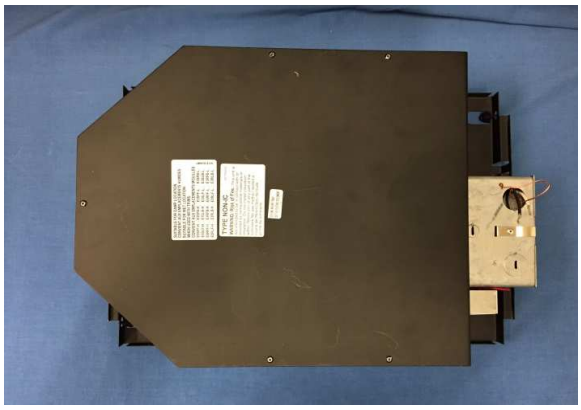
Zone	Lumens	% Luminaire
0-30	966.5	97.9
0-40	976.0	98.9
0-60	983.8	99.7
60-90	3.2	0.3
0-90	987.0	100.0
90-180	0.0	0.0
0-180	987.0	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	591.2	59.9
10-20	336.0	34.0
20-30	39.3	4.0
30-40	9.5	1.0
40-50	5.5	0.6
50-60	2.3	0.2
60-70	1.2	0.1
70-80	1.1	0.1
80-90	1.0	0.1

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:

Jehue Williams
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Lighting Division

Report Reviewed By:

Timothy Quigley
Engineer
Lighting Division

Attachment: None