



# REPORT

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

Project No. G102171228

Date: February 14, 2017

REPORT NO. 102171228CHI-078

TEST OF ONE LED PATHWAY LIGHT

MODEL NO. 700OATUR83012DH12S  
LED MODEL NO. CITIZEN CLU028-1202C4-303M2K1  
DRIVER MODEL NO. DL115W320C46IP65

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 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 700OATUR83012DH12S. The sample was received by Intertek on February 9, 2017, in undamaged condition and one sample was tested as received. The sample designation was AH02092017033612.

DATES OF TESTS: February 13, 2017 through February 14, 2017.

---

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

SUMMARY

Model No.: 700OATUR83012DH12S  
 Description: LED Pathway Light

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1009	1053
Total Power (W)	15.60	16.36
Luminaire Efficacy (LPW)	64.68	64.36

Criteria	Result
Power Factor	0.697
Current ATHD %	59.01
Correlated Color Temperature (CCT - K)	3032
Color Rendering Index (CRI - Ra)	82.7
Color Rendering Index (CRI - R9)	9.2
DUV	0.000
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.402
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.520
BUG Rating	B1-U0-G0
IES Classification	Type VS
Longitudinal Classification	Very Short

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	02/14/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	02/14/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	02/14/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	02/14/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	02/14/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	02/13/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	02/13/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	02/13/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	02/13/17
Newport Humidity Recorder	iTHX-SD	146382	06/27/16	06/27/17	02/13/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	02/13/17
Fluke Temperature Meter	52	146004	01/10/17	01/10/18	02/13/17



## 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.

### BUG Ratings (Backlight, Uplight, Glare) – for Outdoor Fixtures Only

Zonal Lumens were calculated and grouped using the formula in IESNA TM-15-11 for each zone as defined in the BUG addendum. The maximum lumen rating in each zone was compared against the BUG zonal requirements of Energy Star. Photometric Toolbox software was used to calculate results.

**RESULTS OF TEST**

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

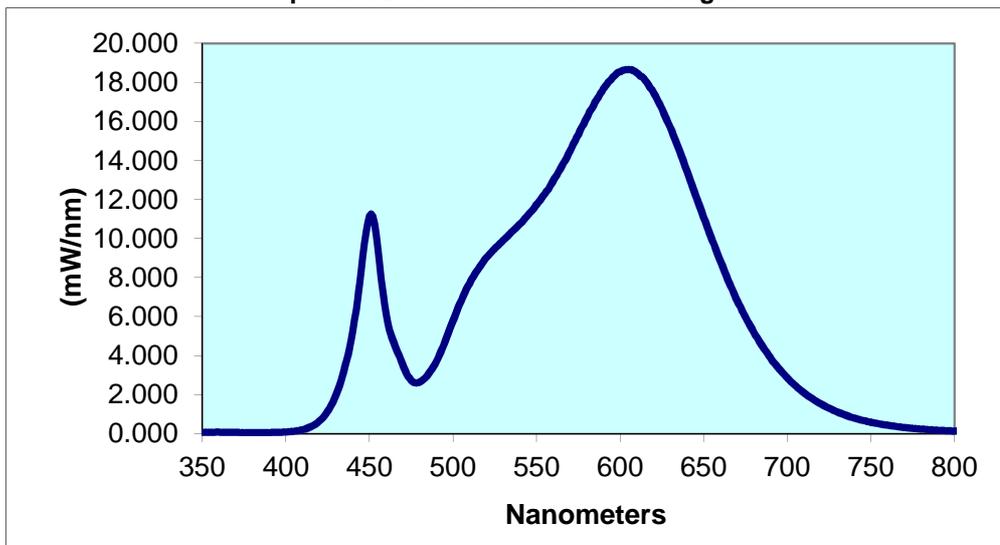
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH02092017033612	UP	12.0	1866	15.60	0.697	59.01	1009	64.68

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')
3032	82.7	9.2	0.000	0.434	0.402	0.250	0.520

**Spectral Distribution over Visible Wavelengths**

nm	mW/nm								
350	0.064	440	5.272	530	9.921	620	17.45	710	2.095
355	0.067	445	8.341	535	10.33	625	16.64	715	1.793
360	0.075	450	11.15	540	10.74	630	15.66	720	1.531
365	0.066	455	9.488	545	11.22	635	14.59	725	1.307
370	0.060	460	6.098	550	11.74	640	13.44	730	1.115
375	0.056	465	4.551	555	12.31	645	12.26	735	0.949
380	0.053	470	3.503	560	12.97	650	11.07	740	0.808
385	0.052	475	2.722	565	13.69	655	9.931	745	0.690
390	0.056	480	2.648	570	14.50	660	8.853	750	0.591
395	0.065	485	3.039	575	15.34	665	7.788	755	0.505
400	0.087	490	3.706	580	16.20	670	6.834	760	0.435
405	0.127	495	4.700	585	17.01	675	5.976	765	0.373
410	0.212	500	5.808	590	17.70	680	5.193	770	0.319
415	0.366	505	6.857	595	18.21	685	4.503	775	0.273
420	0.647	510	7.722	600	18.55	690	3.877	780	0.236
425	1.156	515	8.448	605	18.67	695	3.338		
430	1.998	520	9.029	610	18.49	700	2.858		
435	3.330	525	9.493	615	18.09	705	2.449		

**Spectral Data Over Visible Wavelengths**



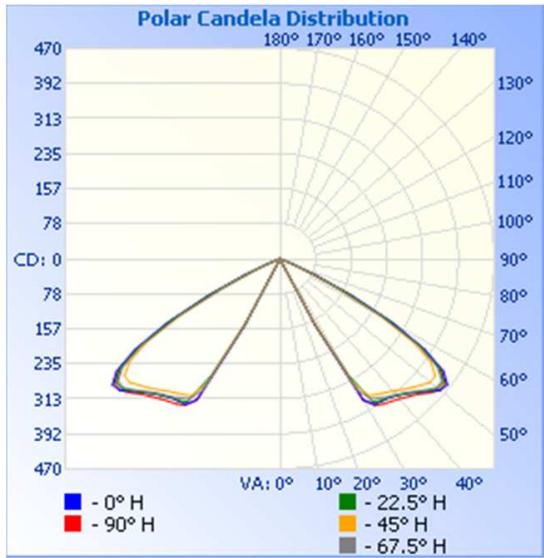
RESULTS OF TEST (cont'd)

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)
AH02092017033612	UP	12.1	1920	16.36	0.701	1053	64.36

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	0	0	0	0	0
5	0	0	0	0	0
10	0	0	0	0	0
15	0	0	0	0	0
20	0	0	0	0	0
25	4	4	4	4	5
30	364	300	323	340	365
35	388	386	370	379	396
40	399	399	386	397	408
45	422	421	407	419	427
50	458	451	430	448	456
55	437	427	404	421	429
60	286	274	253	256	272
65	87	81	53	57	79
70	7	7	1	4	5
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)

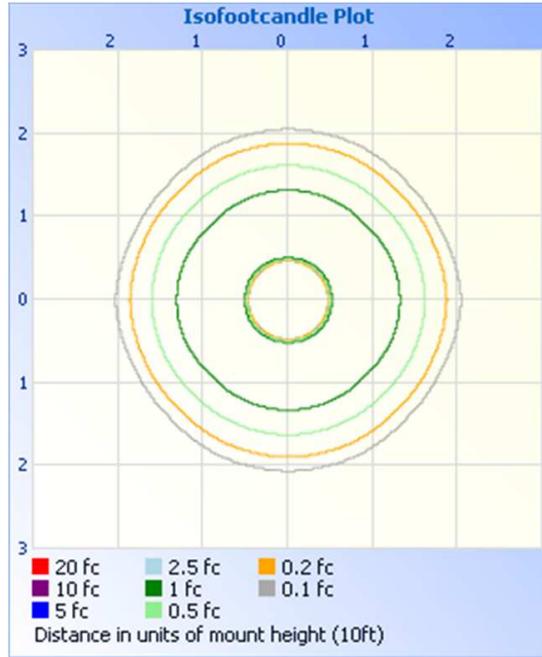
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	42.8	4.1
0-40	280.3	26.6
0-60	959.6	91.1
60-90	93.3	8.9
0-90	1053	100.0
90-180	0.0	0.0
0-180	1053	100.0

Luminaire Classification System (LCS)

LCS	Zone	Lumens	% Luminaire
FL	(0-30)	21.2	2.0
FM	(30-60)	458.4	43.5
FH	(60-80)	46.7	4.4
FVH	(80-90)	0.0	0.0
BL	(0-30)	21.2	2.0
BM	(30-60)	458.4	43.5
BH	(60-80)	46.7	4.4
BVH	(80-90)	0.0	0.0
UL	(90-100)	0.0	0.0
UH	(100-180)	0.0	0.0
Total		N.A.	0.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	0.0	0.0
10-20	0.0	0.0
20-30	42.8	4.1
30-40	237.6	22.6
40-50	325.4	30.9
50-60	353.9	33.6
60-70	92.7	8.8
70-80	0.6	0.1
80-90	0.0	0.0

BUG Rating: B1-U0-G0  
 IES Classification: Type VS  
 Longitudinal Classification: Very Short

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