REPORT

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

Project No. G101518786 March 19, 2015

REPORT NO. 101518786CHI-096

TEST OF ONE LED RECESSED RETRO-FIT FIXTURE

MODEL NO. ER6A-LO930WW
DRIVER MODEL NO. ERP EBR010U-0250-42
LED MODEL NO. CITIZEN CLU024-1202B8-303H5D2

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 500506211.

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 ER6A-LO930WW. The sample was received by Intertek on March 6, 2015, in undamaged condition and one sample was tested as received. The sample designation was 03062015070756.

DATES OF TESTS: March 11, 2015 through March 18, 2015.

SUMMARY

Model No.:	ER6A-LO930WW
Description:	LED Recessed Retro-fit Fixture

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	798.1	797.0
Total Power (W)	9.941	9.943
Luminaire Efficacy (LPW)	80.28	80.16

Criteria	Result
Power Factor	0.988
Current ATHD %	11.61
Correlated Color Temperature (CCT - K)	3033
Color Rendering Index (CRI - Ra)	92.6
Color Rendering Index (CRI - R9)	71.6
DUV	0.000
Chromaticity Coordinate (x)	0.434
Chromaticity Coordinate (y)	0.403
Chromaticity Coordinate (u')	0.249
Chromaticity Coordinate (v')	0.520

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	07/02/14	07/02/15
Yokogawa Power Meter	WT1600	146770	04/10/14	04/10/15
Omega Temperature Meter	MDSi8	146139	04/02/14	04/02/15
Yokogawa Power Meter	WT210	146919	07/16/14	07/16/15
Omega Thermometer	DPI8-C24	146920	10/09/14	10/09/15
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
Cole-Parmer Triple Timer	94440-00	CHI0041	04/01/14	04/01/15

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

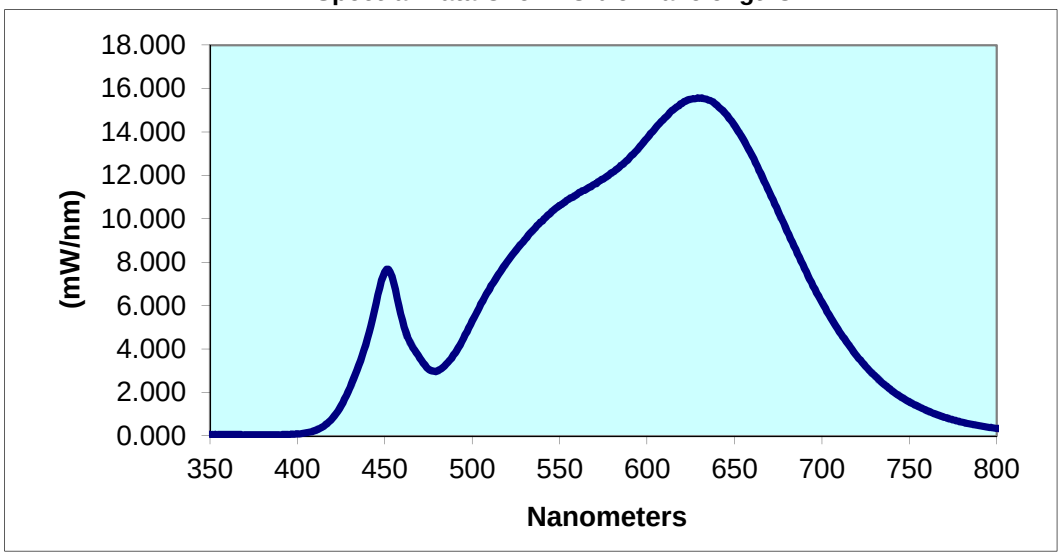
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
03062015070756	UP	120.0	83.79	9.941	0.988	11.61	798.1	80.28

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')
3033	92.6	71.6	0.000	0.434	0.403	0.249	0.520

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.07	440	4.47	530	9.046	620	15.32	710	4.801
355	0.063	445	6.132	535	9.499	625	15.51	715	4.218
360	0.063	450	7.57	540	9.903	630	15.56	720	3.674
365	0.056	455	7.072	545	10.29	635	15.47	725	3.207
370	0.051	460	5.318	550	10.62	640	15.23	730	2.783
375	0.045	465	4.22	555	10.89	645	14.83	735	2.411
380	0.047	470	3.58	560	11.14	650	14.29	740	2.087
385	0.049	475	3.067	565	11.36	655	13.66	745	1.805
390	0.053	480	3.001	570	11.6	660	12.91	750	1.568
395	0.068	485	3.298	575	11.84	665	12.07	755	1.354
400	0.094	490	3.806	580	12.13	670	11.21	760	1.17
405	0.143	495	4.502	585	12.46	675	10.33	765	1.01
410	0.249	500	5.299	590	12.83	680	9.442	770	0.863
415	0.448	505	6.074	595	13.25	685	8.584	775	0.742
420	0.807	510	6.787	600	13.72	690	7.718	780	0.637
425	1.391	515	7.446	605	14.21	695	6.909		
430	2.226	520	8.03	610	14.64	700	6.151		
435	3.249	525	8.553	615	15.03	705	5.447		

Spectral Data Over Visible Wavelengths



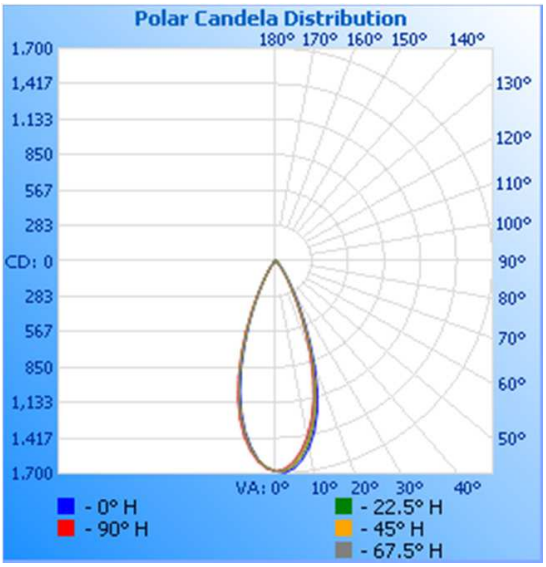
RESULTS OF TEST (cont'd)

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)
03062015070756	UP	120.0	83.77	9.943	0.989	797.0	80.16

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	1682	1682	1682	1682	1682
5	1666	1643	1634	1622	1610
10	1513	1477	1461	1441	1424
15	1251	1208	1194	1163	1143
20	889	844	834	814	786
25	531	493	484	458	449
30	281	247	239	231	221
35	135	121	118	112	110
40	69	63	61	58	57
45	39	36	35	34	33
50	23	22	22	21	20
55	16	15	14	14	13
60	11	11	10	10	10
65	8	8	8	7	7
70	6	6	5	5	4
75	2	2	2	2	1
80	1	0	1	0	0
85	0	0	0	0	0
90	0	0	0	0	0

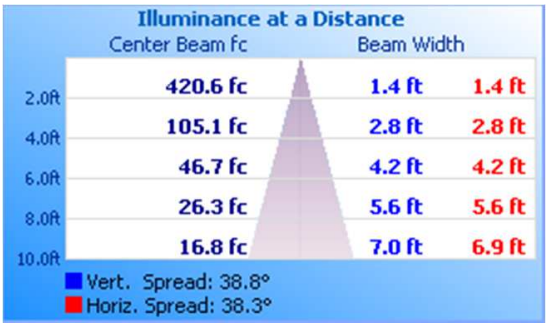


RESULTS OF TEST (cont'd)

Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



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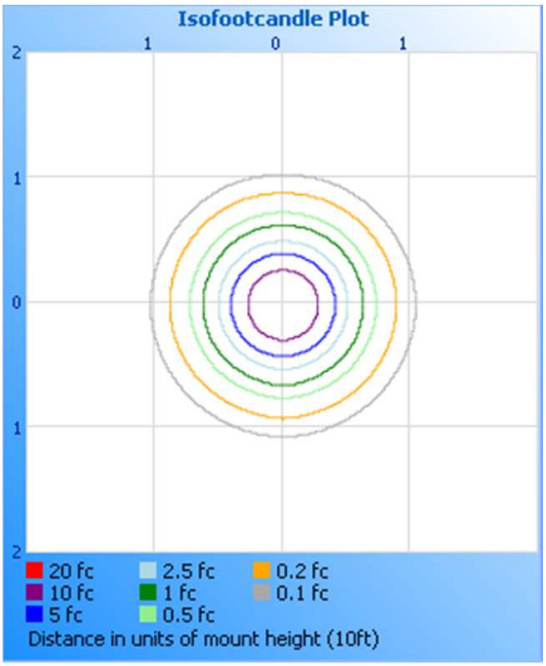


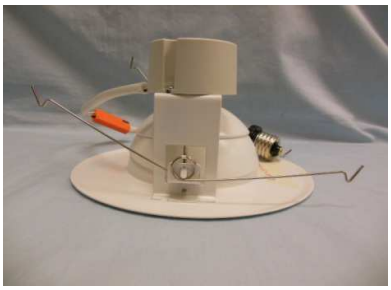
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	671.7	84.3
0-40	747.4	93.8
0-60	787.6	98.8
60-90	9.4	1.2
0-90	797.0	100.0
90-180	0.0	0.0
0-180	797.0	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	148.0	18.6
10-20	312.2	39.2
20-30	211.5	26.5
30-40	75.6	9.5
40-50	27.3	3.4
50-60	12.9	1.6
60-70	7.2	0.9
70-80	1.8	0.2
80-90	0.3	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:

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Report Reviewed By:

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Attachment: None