



REPORT

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

Project No. G102171228

Date: March 8, 2016

REPORT NO. 102171228CHI-013

TEST OF ONE LED RECESSED FIXTURE - MULTIPLES

MODEL NO. EMO830GIB
LED MODEL NO. CITIZEN CLU024-1203B8-303M1A2
DRIVER MODEL NO. LTF DA18W440C

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 EMO830GIB. The sample was received by Intertek on February 23, 2016, in undamaged condition and one sample was tested as received. The sample designation was AH02232016052244.

DATES OF TESTS: March 2, 2016 through March 4, 2016.



SUMMARY

Model No.:	EMO830GIB
Description:	LED Recessed Fixture - Multiples

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1130	1108
Total Power (W)	20.91	20.97
Luminaire Efficacy (LPW)	54.04	52.84

Criteria	Result
Power Factor	0.984
Current ATHD %	9.99
Correlated Color Temperature (CCT - K)	2958
Color Rendering Index (CRI - Ra)	82.5
Color Rendering Index (CRI - R9)	4.1
DUV	0.002
Chromaticity Coordinate (x)	0.442
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.251
Chromaticity Coordinate (v')	0.525

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/14/15	07/14/16	03/04/16
Omega Thermometer	DPI8-C24	146920	10/09/15	10/09/16	03/04/16
LSI High Speed Mirror Goniometer	6440T	146928	VBV	VBV	03/04/16
Newport Hygrometer	iServer	146956	01/04/16	01/04/17	03/04/16
Elgar, AC Power Supply	CW1251P	146918	VBV	VBV	03/04/16
Labsphere Spectroradiometer	CDS1100	CHI0091	VBV	VBV	03/02/16
3 Meter Sphere	SPR600	CHI0088	VBV	VBV	03/02/16
Elgar AC Power Supply	CW1251M	146112	VBV	VBV	03/02/16
Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV	03/02/16
Newport Humidity Recorder	iTHX-SD	146382	07/09/15	07/09/16	03/02/16
Yokogawa Power Meter	WT1600	146768	01/14/16	01/14/17	03/02/16
Omega Temperature Meter	MDSi8	146139	04/03/15	04/03/16	03/02/16



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

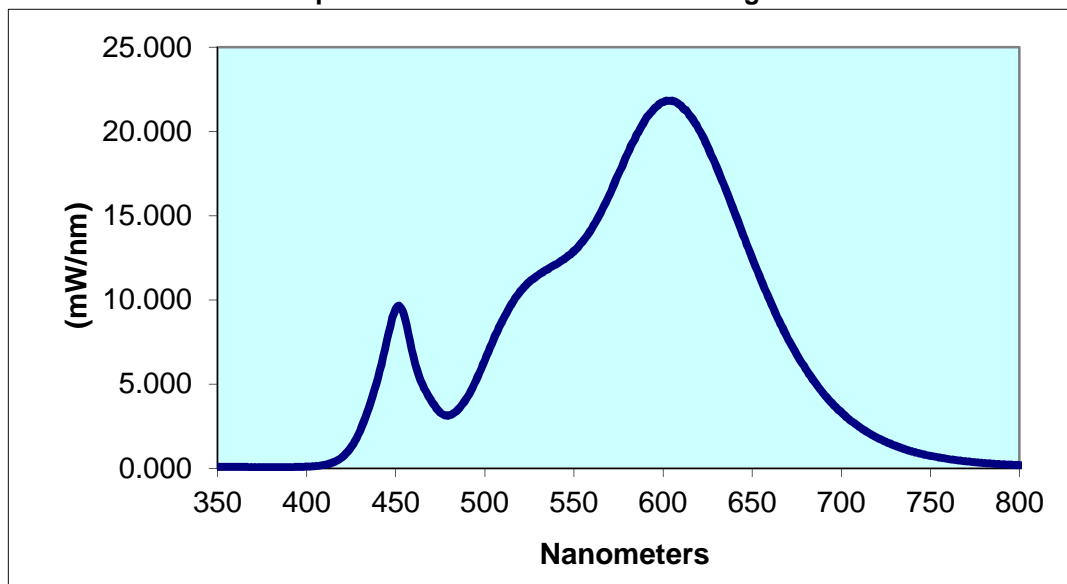
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH02232016052244	Up	120.0	177.1	20.91	0.984	9.99	1130	54.04

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')
2958	82.5	4.1	0.002	0.442	0.410	0.251	0.525

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.077	440	5.366	530	11.48	620	20.13	710	2.460
355	0.073	445	7.563	535	11.81	625	19.09	715	2.116
360	0.079	450	9.466	540	12.11	630	17.89	720	1.821
365	0.075	455	8.961	545	12.47	635	16.61	725	1.569
370	0.060	460	6.611	550	12.90	640	15.23	730	1.344
375	0.060	465	4.977	555	13.48	645	13.84	735	1.153
380	0.054	470	3.992	560	14.24	650	12.48	740	0.989
385	0.053	475	3.305	565	15.18	655	11.19	745	0.850
390	0.058	480	3.150	570	16.27	660	9.954	750	0.733
395	0.069	485	3.497	575	17.46	665	8.774	755	0.632
400	0.085	490	4.189	580	18.67	670	7.719	760	0.548
405	0.125	495	5.205	585	19.79	675	6.760	765	0.472
410	0.196	500	6.425	590	20.69	680	5.901	770	0.409
415	0.353	505	7.671	595	21.35	685	5.133	775	0.354
420	0.663	510	8.776	600	21.75	690	4.448	780	0.306
425	1.257	515	9.755	605	21.83	695	3.843		
430	2.224	520	10.52	610	21.55	700	3.317		
435	3.627	525	11.07	615	20.95	705	2.856		

Spectral Data Over Visible Wavelengths



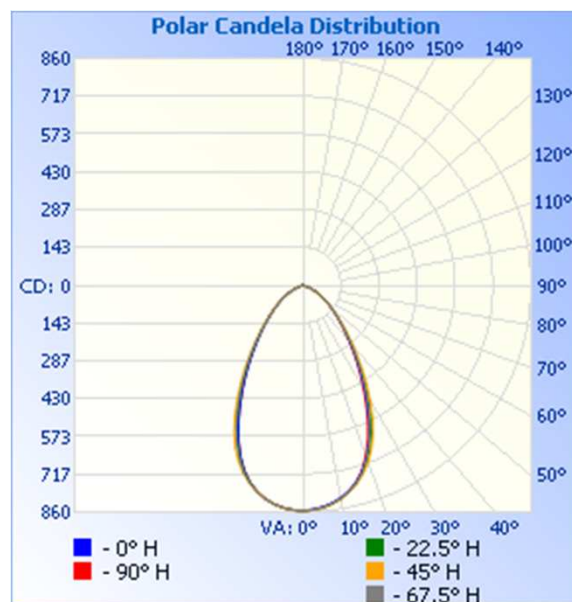
RESULTS OF TEST (cont'd)

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)
AH02232016052244	Up	120.0	177.6	20.97	0.984	1108	52.84

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	854	854	854	854	854
5	843	847	847	846	846
10	817	822	822	821	820
15	772	778	780	775	772
20	698	708	716	699	690
25	591	608	624	596	578
30	469	491	507	478	459
35	360	376	390	368	352
40	270	281	289	276	266
45	202	207	209	204	198
50	149	151	152	149	146
55	110	109	108	108	107
60	77	75	74	74	75
65	49	47	46	46	47
70	24	24	23	23	23
75	5	6	7	6	4
80	0	1	1	1	1
85	0	0	0	0	0
90	0	0	0	0	0



RESULTS OF TEST (cont'd)

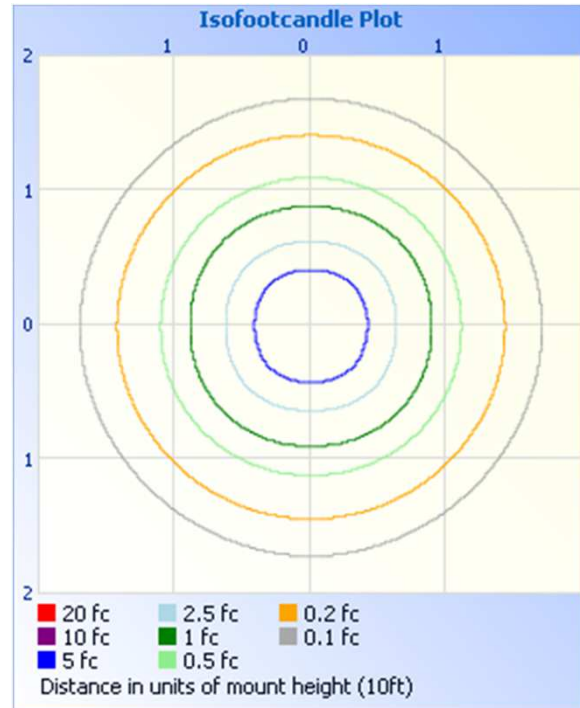
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



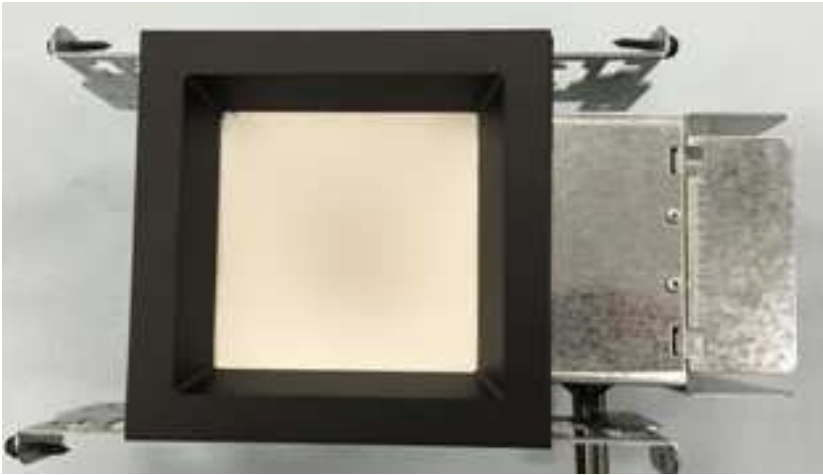
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	568.8	51.3
0-40	799.6	72.2
0-60	1054	95.1
60-90	54.2	4.9
0-90	1108	100.0
90-180	0.0	0.0
0-180	1108	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	79.9	7.2
10-20	216.5	19.5
20-30	272.4	24.6
30-40	230.8	20.8
40-50	157.9	14.3
50-60	96.1	8.7
60-70	45.8	4.1
70-80	8.1	0.7
80-90	0.4	0.0


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:



Timothy Quigley
Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Vladimir Kozak
Senior Associate Engineer
Lighting Division