



REPORT

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

Project No. G102056385

Date: March 24, 2015

REPORT NO. 102056385CHI-004

TEST OF ONE LED EM BATTERY BACKUP OUTPUT

MODEL NO. 281E3SLACH-CEM / 281E4SLACH-CEM
LED MODEL NO. CITIZEN CLL032-1208A5 3000K
DRIVER MODEL NO. FIRE HORSE - FHS2-UNV-36L

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 500587731.

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 281E3SLACH-CEM / 281E4SLACH-CEM. The sample was received by Intertek on March 18, 2015, in undamaged condition and one sample was tested as received. The sample designation was AH03182015090922-002.

DATES OF TESTS: March 20, 2015 through March 24, 2015.

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SUMMARY

Model No.:	281E3SLACH-CEM / 281E4SLACH-CEM
Description:	LED EM Battery Backup Output

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1160	1130
Total Power (W)	17.81	17.77
Luminaire Efficacy (LPW)	65.13	63.59

Criteria	Result
Power Factor	0.970
Current ATHD %	15.46
Correlated Color Temperature (CCT - K)	3014
Color Rendering Index (CRI - Ra)	83.6
Color Rendering Index (CRI - R9)	9.7
DUV	0.000
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.403
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.521

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/16/14	07/16/15	03/24/15
Omega Thermometer	DPI8-C24	146920	10/09/14	10/09/15	03/24/15
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	03/24/15
Newport Hygrometer	iServer	146956	01/06/15	01/06/16	03/24/15
Elgar, AC Power Supply	CW1251P	146918	VBU	VBU	03/24/15
Cole-Parmer Triple Timer	94440-00	CHI0041	04/01/14	04/01/15	03/24/15
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	03/20/15
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	03/20/15
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	03/20/15
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	03/20/15
Newport Humidity Recorder	iTHX-SD	146382	07/02/14	07/02/15	03/20/15
Yokogawa Power Meter	WT1600	146770	04/10/14	04/10/15	03/20/15
Omega Temperature Meter	MDSi8	146139	04/02/14	04/02/15	03/20/15



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

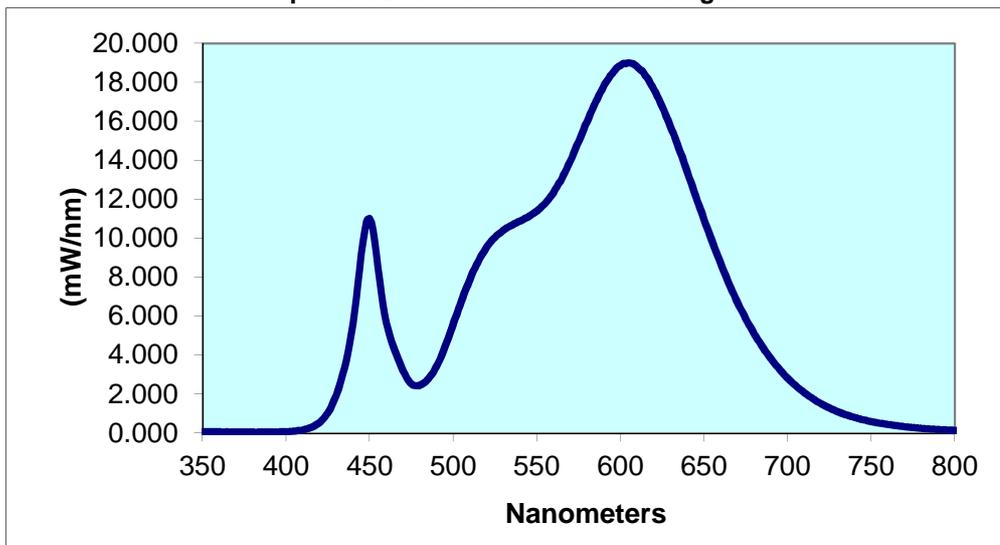
Intertek Sample No.	Base Orientatio n	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH03182015090922-002	UP	120.0	153.0	17.81	0.970	15.46	1160	65.13

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')
3014	83.6	9.7	0.000	0.436	0.403	0.250	0.521

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.072	440	5.644	530	10.42	620	17.64	710	2.074
355	0.066	445	9.154	535	10.67	625	16.76	715	1.774
360	0.067	450	11.02	540	10.87	630	15.72	720	1.513
365	0.063	455	8.514	545	11.11	635	14.59	725	1.294
370	0.053	460	5.673	550	11.40	640	13.42	730	1.103
375	0.047	465	4.259	555	11.80	645	12.19	735	0.942
380	0.047	470	3.192	560	12.36	650	10.96	740	0.805
385	0.046	475	2.518	565	13.08	655	9.813	745	0.691
390	0.049	480	2.462	570	13.97	660	8.712	750	0.597
395	0.057	485	2.776	575	14.95	665	7.666	755	0.515
400	0.073	490	3.421	580	15.97	670	6.725	760	0.447
405	0.105	495	4.419	585	16.98	675	5.863	765	0.385
410	0.167	500	5.597	590	17.83	680	5.104	770	0.327
415	0.295	505	6.803	595	18.45	685	4.426	775	0.285
420	0.545	510	7.884	600	18.86	690	3.822	780	0.244
425	1.046	515	8.819	605	19.01	695	3.293		
430	1.950	520	9.549	610	18.81	700	2.827		
435	3.372	525	10.05	615	18.34	705	2.424		

Spectral Data Over Visible Wavelengths



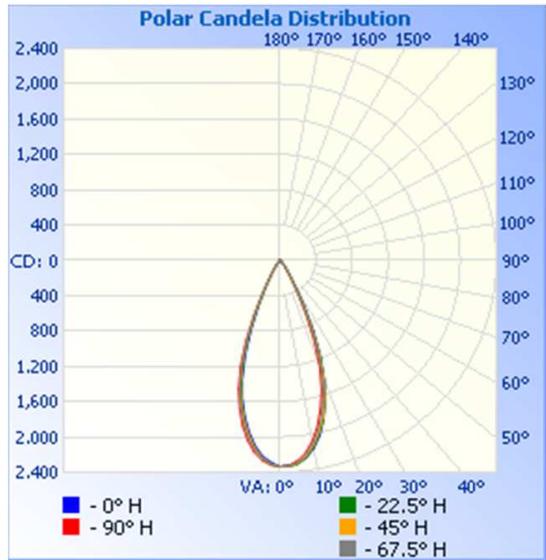
RESULTS OF TEST (cont'd)

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)
AH03182015090922-002	UP	120.0	152.0	17.77	0.975	1130	63.59

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	2335	2335	2335	2335	2335
5	2305	2312	2302	2290	2273
10	2157	2148	2127	2104	2071
15	1860	1856	1837	1790	1735
20	1427	1416	1417	1354	1285
25	866	835	808	761	694
30	351	339	308	299	263
35	136	136	126	125	114
40	62	66	67	62	56
45	23	27	34	28	24
50	11	12	15	12	11
55	4	5	7	6	4
60	1	1	3	2	1
65	1	1	1	1	1
70	1	1	1	1	1
75	0	0	0	0	0
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

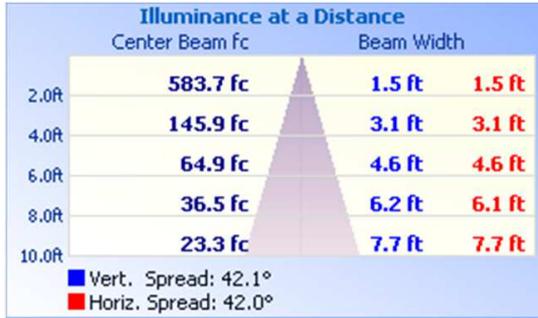


RESULTS OF TEST (cont'd)

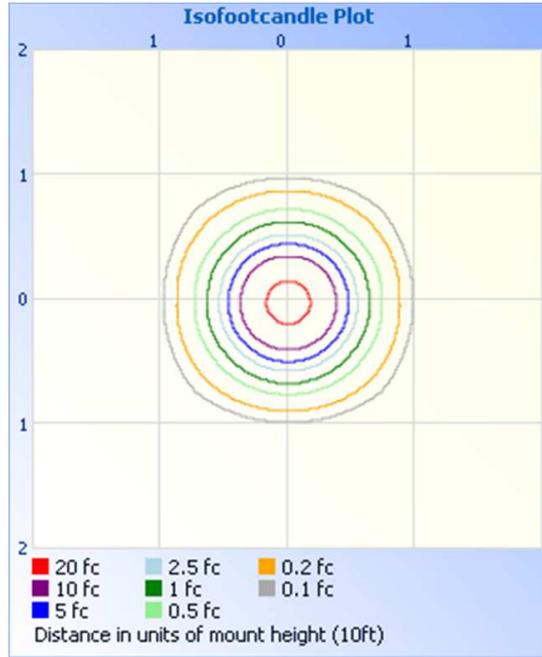
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



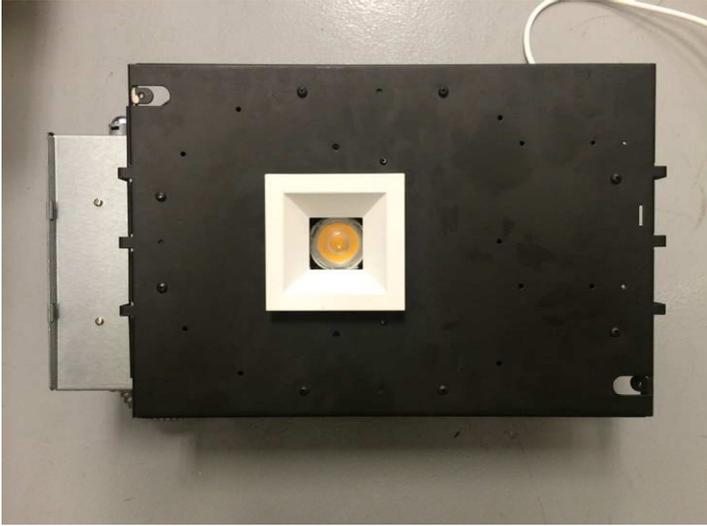
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	1016	89.9
0-40	1100	97.3
0-60	1129	99.9
60-90	1.2	0.1
0-90	1130	100.0
90-180	0.0	0.0
0-180	1130	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	210.1	18.6
10-20	476.5	42.2
20-30	329.1	29.1
30-40	84.0	7.4
40-50	23.8	2.1
50-60	5.6	0.5
60-70	1.1	0.1
70-80	0.1	0.0
80-90	0.0	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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Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley
Engineer
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