



REPORT

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

Project No. G103017649

Date: January 31, 2018

REPORT NO. 103017649CHI-066

TEST OF ONE LED RECESSED

MODEL NO. EN3S-LO930AAI W/ EN3SFW-WW TRIM
LED MODEL NO. LUMINUS CXM-9-30-90-36-AC30-F4-3
DRIVER MODEL NO. ERP ESS015W-0300-42

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 Qu-00779063-2.

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 EN3S-LO930AAI w/ EN3SFW-WW trim. The sample was received by Intertek on January 22, 2018, in undamaged condition and one sample was tested as received. The sample designation was AH01222018114900-066.

DATES OF TESTS: January 26, 2018 through January 31, 2018.

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SUMMARY

Model No.: EN3S-LO930AAI w/ EN3SFW-WW trim
Description: LED recessed

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	562.0	542.2
Total Power (W)	11.76	11.76
Luminaire Efficacy (LPW)	47.79	46.11

Criteria	Result
Power Factor	0.989
Current ATHD %	12.96
Correlated Color Temperature (CCT - K)	3098
Color Rendering Index (CRI - Ra)	90.4
Color Rendering Index (CRI - R9)	62.2
DUV	0.001
Chromaticity Coordinate (x)	0.433
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.246
Chromaticity Coordinate (v')	0.522

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/10/17	07/10/18	01/31/18
Omega Newport Thermometer	DPI8-C24	146920	10/04/17	10/04/18	01/31/18
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	01/31/18
Newport Thermohygrometer	iServer	146382	03/22/17	03/22/18	01/31/18
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	01/31/18
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	01/26/18
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	01/26/18
Elgar AC Power Supply	CW1251	146112	VBU	VBU	01/26/18
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	01/26/18
Newport Humidity Recorder	iTHX-SD	146961	07/14/17	07/14/18	01/26/18
Yokogawa Power Meter	WT1600	146768	10/03/17	10/03/18	01/26/18
Extech K Temperature Meter	SD200	CHI0207	04/05/17	04/05/18	01/26/18



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

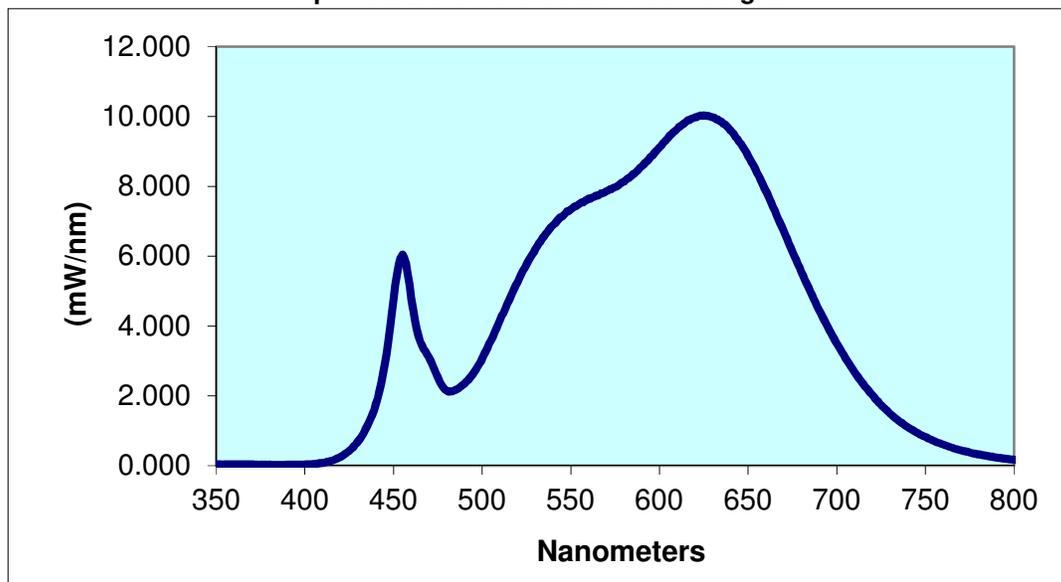
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
AH01222018114900-06€	UP	119.9	99.17	11.76	0.989	12.96	562.0	47.79

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')
3098	90.4	62.2	0.001	0.433	0.407	0.246	0.522

Spectral Distribution over Visible Wavelengths

nm	mW/nm								
350	0.041	440	1.763	530	6.201	620	9.976	710	2.688
355	0.045	445	2.897	535	6.576	625	10.03	715	2.339
360	0.045	450	4.777	540	6.894	630	9.973	720	2.026
365	0.040	455	6.045	545	7.132	635	9.848	725	1.739
370	0.039	460	4.820	550	7.338	640	9.601	730	1.495
375	0.033	465	3.566	555	7.503	645	9.276	735	1.286
380	0.030	470	3.103	560	7.647	650	8.869	740	1.108
385	0.029	475	2.527	565	7.735	655	8.392	745	0.956
390	0.031	480	2.151	570	7.857	660	7.865	750	0.824
395	0.034	485	2.179	575	7.982	665	7.315	755	0.708
400	0.039	490	2.348	580	8.138	670	6.718	760	0.609
405	0.051	495	2.636	585	8.341	675	6.140	765	0.520
410	0.083	500	3.067	590	8.570	680	5.560	770	0.442
415	0.144	505	3.584	595	8.848	685	4.997	775	0.379
420	0.253	510	4.168	600	9.120	690	4.465	780	0.325
425	0.427	515	4.730	605	9.397	695	3.968		
430	0.695	520	5.260	610	9.646	700	3.500		
435	1.116	525	5.760	615	9.847	705	3.079		

Spectral Data Over Visible Wavelengths



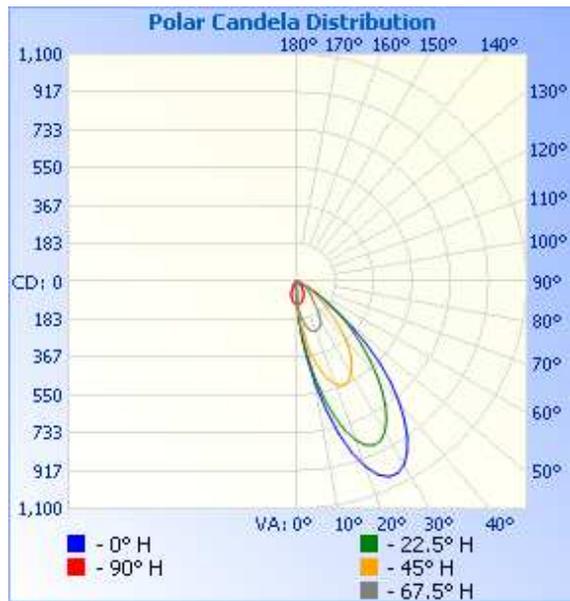
RESULTS OF TEST (cont'd)

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)
AH01222018114900-066	UP	120.0	99.13	11.76	0.989	542.2	46.11

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	117	117	117	117	117
5	285	279	225	162	109
10	509	469	346	212	102
15	760	668	454	244	92
20	954	817	528	255	81
25	1043	874	549	246	71
30	1024	840	516	223	56
35	920	737	449	170	40
40	757	594	356	116	33
45	562	439	247	91	25
50	346	303	153	64	23
55	162	170	101	52	20
60	66	79	59	37	17
65	12	28	34	26	15
70	4	6	14	16	12
75	3	3	4	6	7
80	2	2	2	2	2
85	1	1	1	1	1
90	0	0	0	0	0

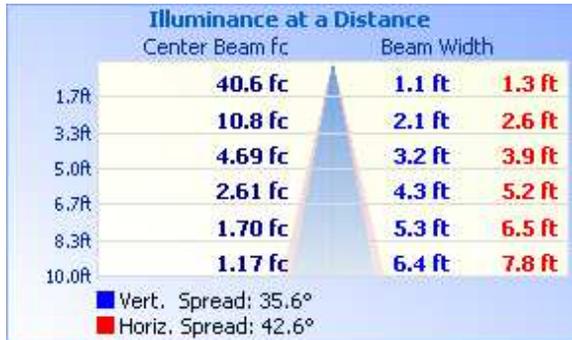


RESULTS OF TEST (cont'd)

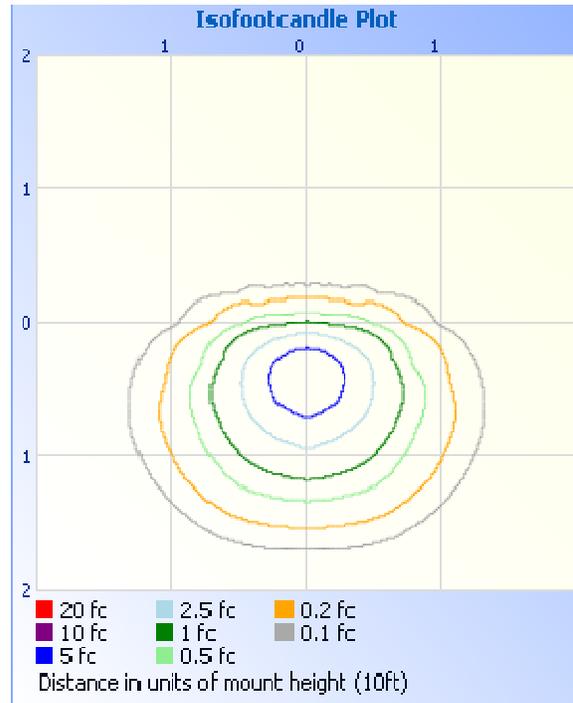
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



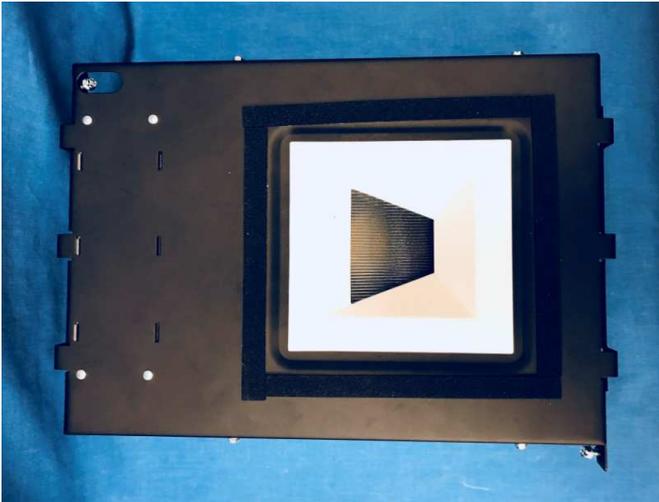
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	214.4	39.5
0-40	360.3	66.4
0-60	519.3	95.8
60-90	22.9	4.2
0-90	542.2	100.0
90-180	0.0	0.0
0-180	542.2	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	15.1	2.8
10-20	68.5	12.6
20-30	130.9	24.1
30-40	145.9	26.9
40-50	107.1	19.7
50-60	52.0	9.6
60-70	17.5	3.2
70-80	4.7	0.9
80-90	0.7	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:

Hector Huitron
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:

Timothy Quigley
Engineer
Lighting Division