

# VISUAL COMFORT & CO. TEST REPORT

## SCOPE OF WORK

Electrical and Photometric tests as required to the IESNA LM-79 test standard.

## MODEL NUMBER

ENCL3RFD-930W - 15W - 40deg

## REPORT NUMBER

104206403CHI-097

## ISSUE DATE

May 18, 2020

## REVISION DATE

July 21, 2020

## DOCUMENT CONTROL NUMBER

TBD

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**REPORT NO.: 104206403CHI-097**

**TEST REPORT**

**REPORT DATE: July 21, 2020**

TEST OF ONE ENCL3 RD FL FIX 930 W - 90CRI 3000K 40 DEGREE 400 MA

MODEL NO. ENCL3RFD-930W - 15W - 40DEG  
LED MODEL NO. LUMINUS CXM-9-30-90-36-AC40-F5-3  
DRIVER MODEL NO. ERP ESS020W-0400-42

RENDERED TO:

VISUAL COMFORT & CO.  
7400 LINDER AVE.  
SKOKIE IL 60077

**STATEMENT OF LIMITATIONS**

NVLAP Lab Code 600186-0. 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 Qu-01040682-1.

**STANDARDS USED**

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting  
ANSI NEMA ANSLG C78.377: 2015: Specifications of the Chromaticity of Solid State Lighting Products

**DESCRIPTION OF SAMPLE**

The client submitted one production sample of model number ENCL3RFD-930W - 15W - 40deg. The sample was received by Intertek on May 8, 2020 in undamaged condition and one sample was tested as received. The sample designation was AH05082020115126.

**DATE OF TESTS**

May 11, 2020 through May 13, 2020.

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**SUMMARY**

<b>MODEL NO:</b>	ENCL3RFD-930W - 15W - 40deg
<b>DESCRIPTION:</b>	ENCL3 RD FL FIX 930 W - 90CRI 3000K 40 Degree 400 mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1303.7	1316.5
Input Power (W) @ 120 (VAC)	15.37	15.43
Lumen Efficacy (lm/W)	84.8	85.3
Input Power Factor ( ) @ 120 (VAC)	0.989	0.989

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	11.71
Correlated Color Temperature (K)	3018
Color Rendering Index - Ra	94.5
Color Rendering - R9	69.5
DUV	-0.0001
Chromaticity Coordinate (x)	0.436
Chromaticity Coordinate (y)	0.403
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.521

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**EQUIPMENT LIST**

EQUIPMENT USED	MODEL NO.	CONTROL NO.	LAST CAL DATE	CAL DUE DATE
Yokogawa Power Meter	WT210	146919	7/1/2019	7/1/2020
Omega Thermometer	DPI8-C24	146920	10/3/2019	10/3/2020
LSI High Speed Mirror Goniometer	6440T	146928	VBV	VBV
Newport Thermohygrometer	iServer	146957	12/2/2019	12/2/2020
Pacific, AC Power Supply	118-ACX	CHI0153	VBV	VBV
Labsphere Spectroradiometer	CDS-600	146923	VBV	VBV
2M Rotating Sphere	7660-ROT	146923	VBV	VBV
Omega thermometer	USB TC08	EQA00-26615	4/7/2020	4/7/2021
Ametek DC Power Supply	XFR150-8	146846	VBV	VBV
Newport Humidity Recorder	iTHX-SD	146961	7/26/2019	7/26/2020
Yokogawa Power Meter	WT210	146880	10/2/2019	10/2/2020
Chroma Power Supply	61604	CHI0371	VBV	VBV
Yokogawa Power Meter	WT1600	146770	10/1/2019	10/1/2020
Pacific AC Power Supply	ACX-118	CHI0154	VBV	VBV

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**TEST REPORT**

**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 Spectroradiometer and integrating 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. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a 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 Type C Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for the SSL sample.

Ambient temperature was measured equal to the height of the sample mounted on the goniometer equipment. The SSL sample was operated on the client provided driver at rated input volts in its designated orientation. The SSL sample was allowed to stabilize for at least thirty minutes before measurements were made. Stabilization procedures to LM-79 were followed. Electrical measurements including voltage, current, and power were measured using a power analyzer.

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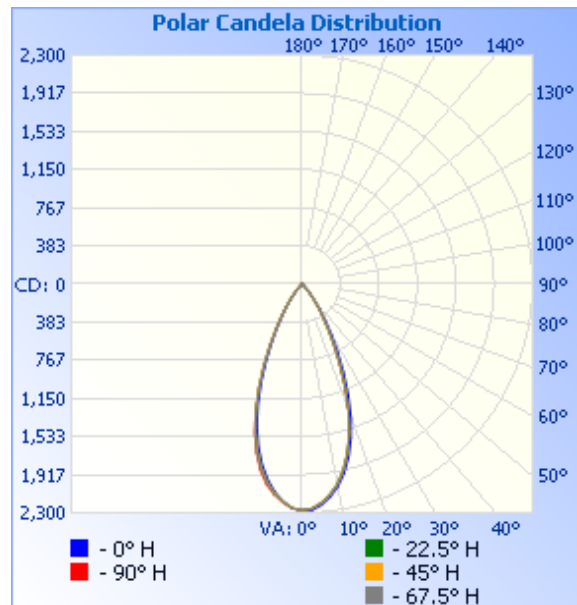
RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR	LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)
AH05082020115126	Base Up	120.0	129.9	15.43	0.989	1316.5	85.3

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	2274	2274	2274	2274	2274
5	2228	2205	2208	2208	2204
10	2063	2033	2038	2044	2044
15	1796	1746	1752	1755	1756
20	1422	1352	1349	1348	1354
25	976	902	902	893	893
30	590	526	519	515	516
35	309	272	276	276	272
40	126	111	110	110	109
45	46	38	39	40	40
50	14	12	12	12	12
55	6	6	6	6	6
60	4	4	4	4	4
65	3	3	3	3	3
70	2	2	2	2	2
75	1	1	1	1	1
80	1	1	1	1	1
85	0	0	0	0	0
90	0	0	0	0	0



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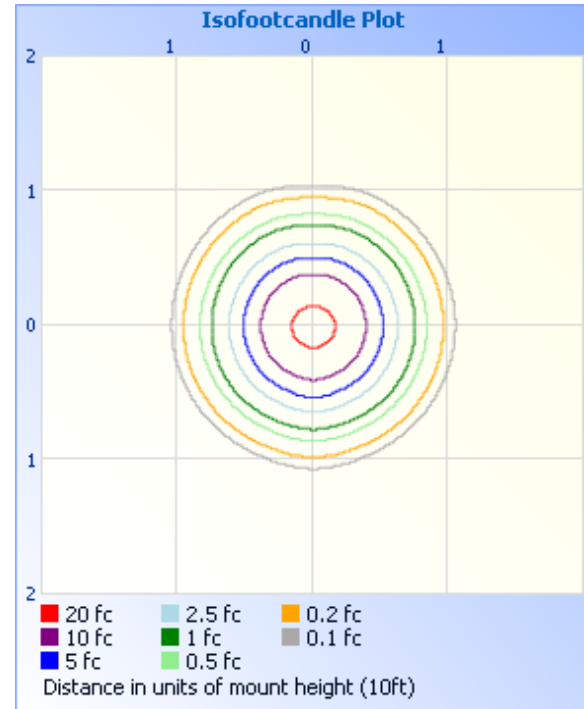
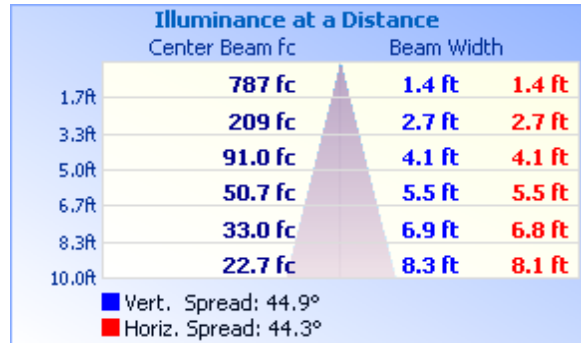
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RESULTS OF TESTS

PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

MOUNTING HEIGHT: 10ft	
ILLUMINANCE - CONE OF LIGHT	ISOILLUMINATION PLOT



ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	1092.7	83.0
0-40	1268.7	96.4
0-60	1311.6	99.6
60-90	4.9	0.4
70-100	2.0	0.2
90-120	0.0	0.0
0-90	1316.5	100.0
90-180	0.0	0.0
0-180	1316.5	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	204.5	15.5
10-20	477.6	36.3
20-30	410.6	31.2
30-40	176.0	13.4
40-50	36.8	2.8
50-60	6.1	0.5
60-70	2.8	0.2
70-80	1.5	0.1
80-90	0.5	0.0

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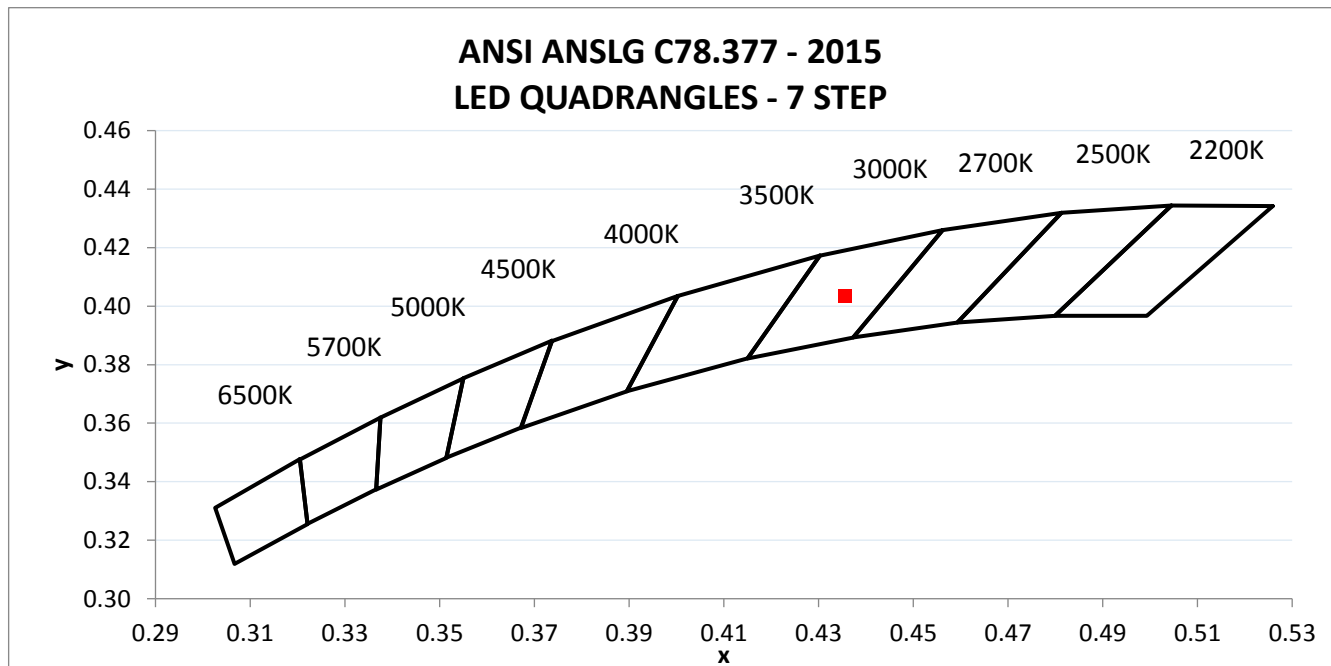
# RESULTS OF TESTS

## PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)

INTERTEK CONTROL NO.	BASE POSITION	INPUT VOLTAGE (VAC)	INPUT CURRENT (mA)	INPUT POWER (W)	INPUT POWER FACTOR ( )	INPUT CURRENT ATHD (%)
AH05082020115126	Base Up	119.96	129.57	15.37	0.989	11.71

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
1303.7	84.8	3018	94.5	69.5	-0.0001

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.436	0.403	0.250	0.521





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**TEST REPORT**

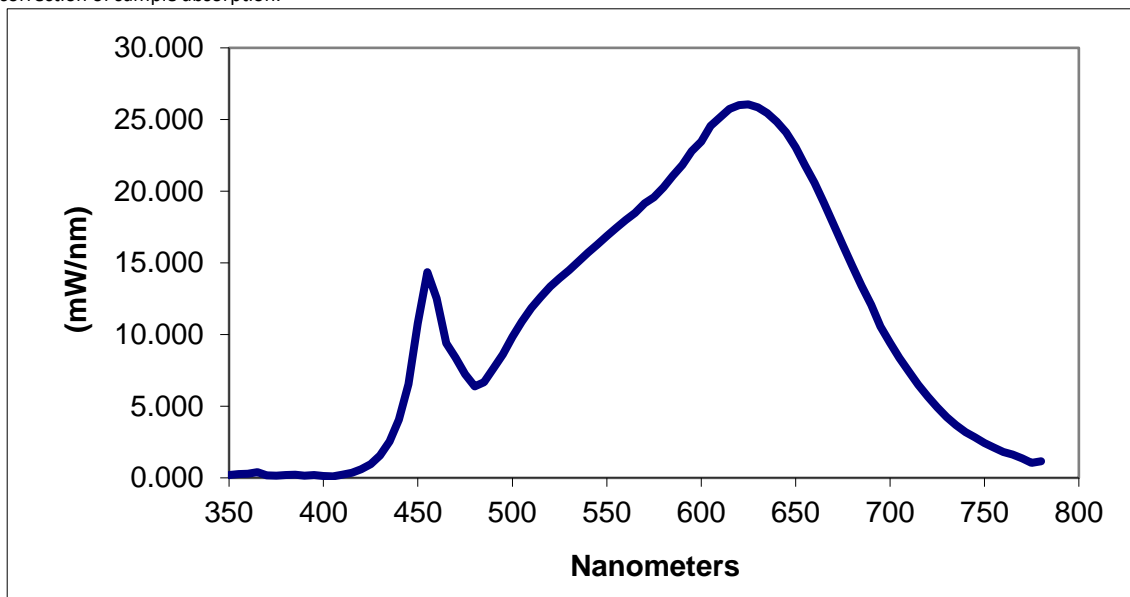
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**RESULTS OF TESTS**

**PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)**

SPECTRAL DISTRIBUTION OVER VISIBLE WAVELENGTHS*							
nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.206	460	12.525	570	19.141	680	14.778
355	0.256	465	9.388	575	19.582	685	13.400
360	0.283	470	8.391	580	20.260	690	12.076
365	0.401	475	7.225	585	21.071	695	10.562
370	0.168	480	6.391	590	21.820	700	9.416
375	0.143	485	6.679	595	22.791	705	8.373
380	0.196	490	7.652	600	23.464	710	7.405
385	0.224	495	8.625	605	24.565	715	6.488
390	0.144	500	9.840	610	25.153	720	5.658
395	0.187	505	10.889	615	25.741	725	4.932
400	0.120	510	11.842	620	26.013	730	4.235
405	0.106	515	12.608	625	26.058	735	3.682
410	0.220	520	13.352	630	25.855	740	3.200
415	0.358	525	13.922	635	25.454	745	2.842
420	0.605	530	14.484	640	24.839	750	2.440
425	0.965	535	15.097	645	24.114	755	2.109
430	1.557	540	15.717	650	23.068	760	1.798
435	2.537	545	16.263	655	21.817	765	1.616
440	4.058	550	16.872	660	20.591	770	1.355
445	6.539	555	17.444	665	19.187	775	1.052
450	10.789	560	18.001	670	17.704	780	1.152
455	14.352	565	18.481	675	16.250		

\*Without correction of sample absorption.



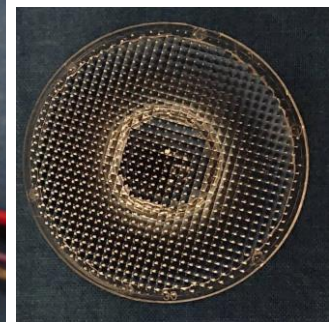
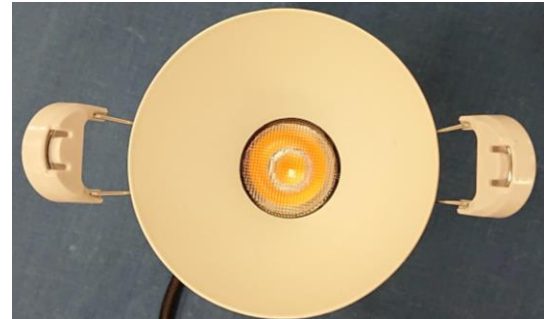
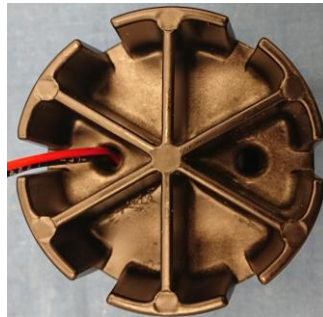
**End Of Test Results**

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**PICTURES**



**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:

Report Reviewed By:

Signature on file

Signature on file

Ian Smith  
Engineer  
Lighting Division

Jeff Davis  
N.A. Technical Lead  
Lighting Division

Attachments: IES File

**REVISION HISTORY**

JOB NUMBER	DATE OF REVISION	PROJECT HANDLER	REVIEWED BY	REVISION NOTE
None	25-Jun-20	IS IS	TQ	Model Number, Description, and LED Model Updated
None	21-Jul-20	IS IS	JD JD	"B" Removed from Model Number & Description