

# 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 - 12W - 20deg

## REPORT NUMBER

104206403CHI-092

## ISSUE DATE

May 18, 2020

## REVISION DATE

July 21, 2020

## DOCUMENT CONTROL NUMBER

TBD

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**REPORT NO.: 104206403CHI-092**

**TEST REPORT**

**REPORT DATE: July 21, 2020**

TEST OF ONE ENCL3 RD FL FIX 930 W - 90CRI 3000K 20 DEGREE 300MA

MODEL NO. ENCL3RFD-930W - 12W - 20DEG  
LED MODEL NO. LUMINUS CXM-9-30-90-36-AC40-F5-3  
DRIVER MODEL NO. ERP ESS015W-0300-42

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 - 12W - 20deg. 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 12, 2020.

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**SUMMARY**

<b>MODEL NO:</b>	ENCL3RFD-930W - 12W - 20deg
<b>DESCRIPTION:</b>	ENCL3 RD FL FIX 930 W - 90CRI 3000K 20 Degree 300mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	963.7	948.5
Input Power (W) @ 120 (VAC)	11.69	11.69
Lumen Efficacy (lm/W)	82.4	81.1
Input Power Factor ( ) @ 120 (VAC)	0.984	0.986

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	14.92
Correlated Color Temperature (K)	3035
Color Rendering Index - Ra	94.9
Color Rendering - R9	72.3
DUV	0.0002
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.404
Chromaticity Coordinate (u')	0.249
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	EQAH00-26615	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 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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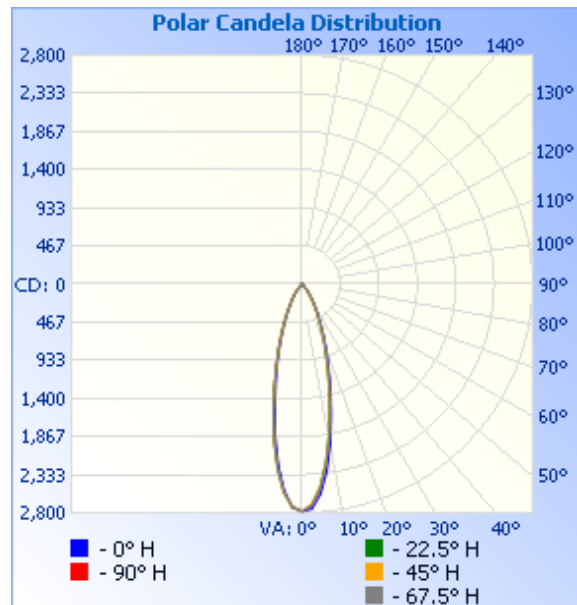
RESULTS OF TESTS

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	120.1	98.7	11.69	0.986	948.5	81.1

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	2779	2779	2779	2779	2779
5	2577	2488	2502	2516	2535
10	1980	1868	1892	1911	1932
15	1333	1238	1260	1289	1302
20	857	796	805	826	838
25	534	487	494	510	518
30	316	282	287	299	305
35	180	162	166	168	172
40	72	60	62	65	68
45	31	27	28	29	30
50	9	8	8	8	8
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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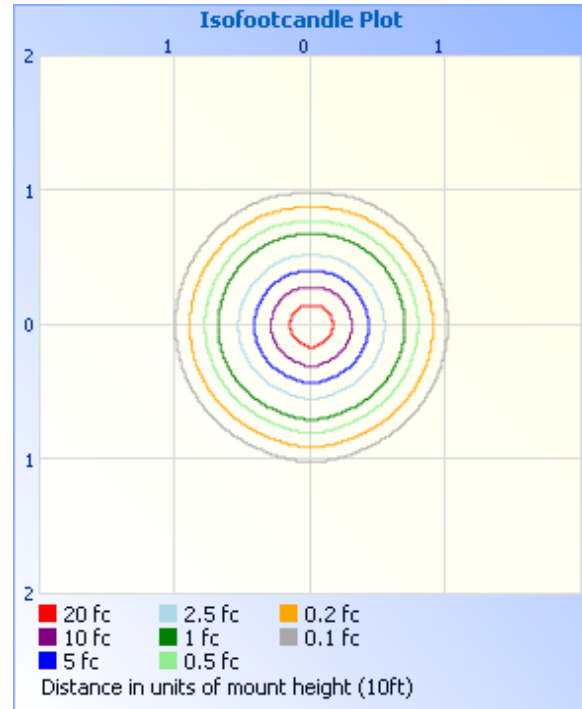
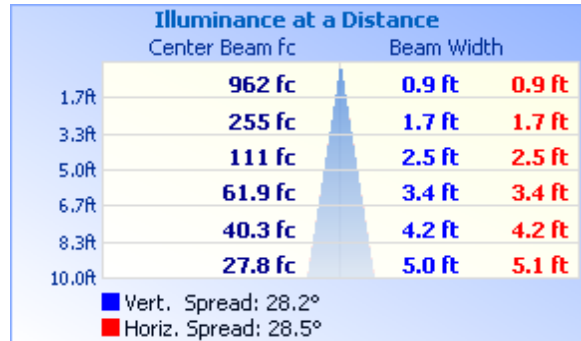
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RESULTS OF TESTS

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	810.6	85.5
0-40	915.3	96.5
0-60	943.9	99.5
60-90	4.7	0.5
70-100	1.9	0.2
90-120	0.0	0.0
0-90	948.5	100.0
90-180	0.0	0.0
0-180	948.5	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	220.7	23.3
10-20	355.7	37.5
20-30	234.2	24.7
30-40	104.7	11.0
40-50	23.2	2.4
50-60	5.3	0.6
60-70	2.7	0.3
70-80	1.4	0.1
80-90	0.5	0.1

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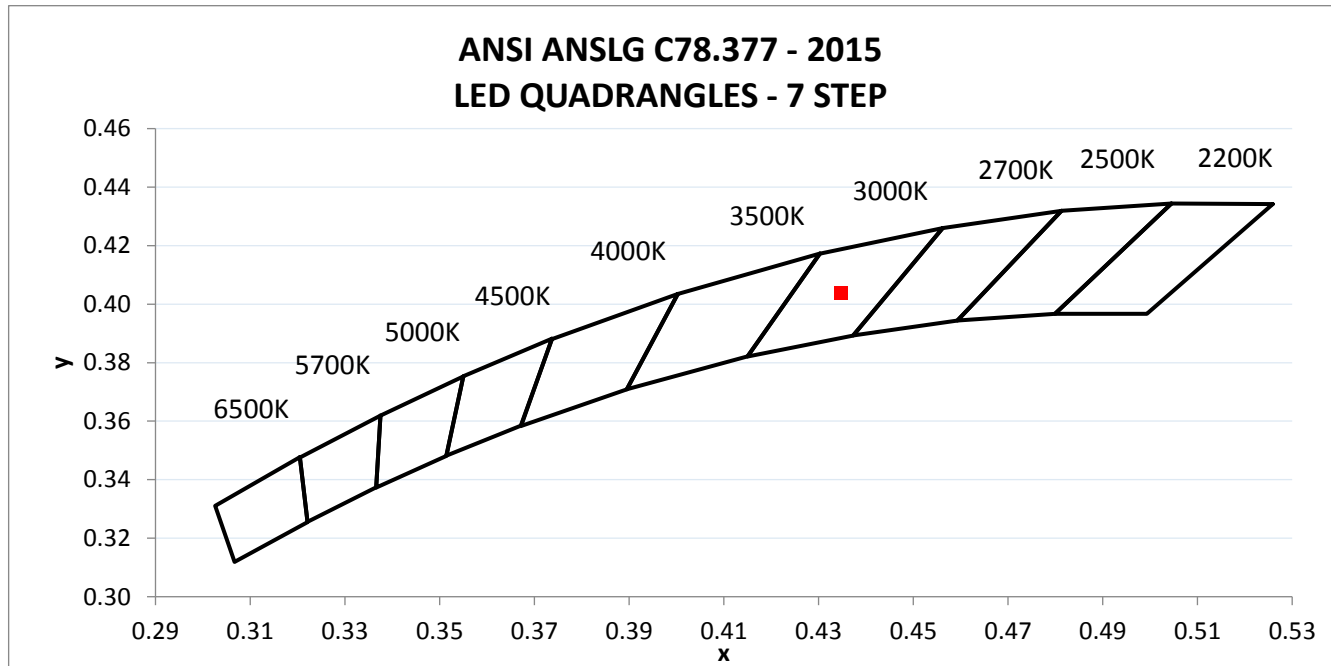
RESULTS OF TESTS

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	119.99	98.98	11.69	0.984	14.92

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
963.7	82.4	3035	94.9	72.3	0.0002

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.435	0.404	0.249	0.521





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TEST REPORT

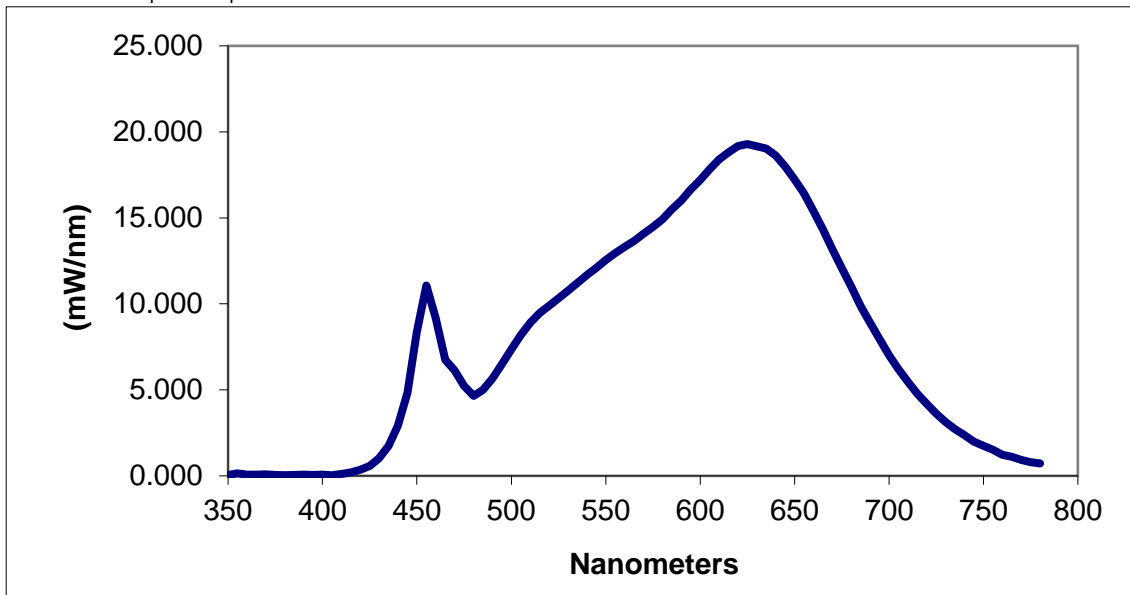
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## RESULTS OF TESTS

### 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	0.058	460	9.182	570	14.076	680	10.995
355	0.147	465	6.758	575	14.480	685	9.881
360	0.073	470	6.138	580	14.921	690	8.882
365	0.081	475	5.232	585	15.488	695	7.963
370	0.090	480	4.649	590	16.010	700	7.016
375	0.061	485	4.996	595	16.647	705	6.203
380	0.039	490	5.670	600	17.204	710	5.460
385	0.063	495	6.488	605	17.829	715	4.772
390	0.081	500	7.369	610	18.397	720	4.186
395	0.051	505	8.190	615	18.812	725	3.625
400	0.070	510	8.908	620	19.174	730	3.118
405	0.044	515	9.458	625	19.291	735	2.708
410	0.112	520	9.897	630	19.157	740	2.354
415	0.204	525	10.322	635	19.029	745	1.979
420	0.355	530	10.767	640	18.614	750	1.749
425	0.582	535	11.208	645	17.986	755	1.519
430	1.029	540	11.684	650	17.233	760	1.230
435	1.752	545	12.092	655	16.426	765	1.112
440	2.922	550	12.555	660	15.377	770	0.930
445	4.831	555	12.942	665	14.339	775	0.791
450	8.359	560	13.313	670	13.171	780	0.719
455	11.068	565	13.646	675	12.088		

\*Without correction of sample absorption.



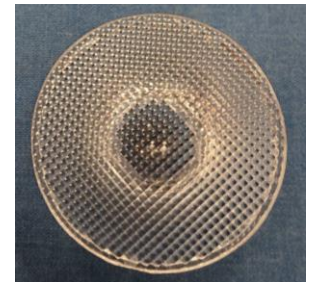
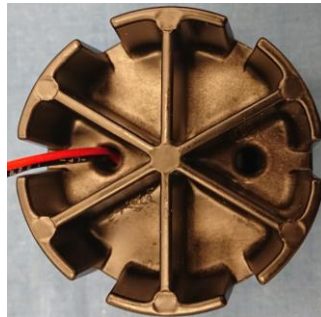
End Of Test Results

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## TEST REPORT

## 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