

# VISUAL COMFORT & CO.

## TEST REPORT

### SCOPE OF WORK

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

### MODEL NUMBER

ENCL3RFD-927W - 15W - 40deg

### REPORT NUMBER

104206403CHI-100

### ISSUE DATE

May 18, 2020

### REVISION DATE

July 21, 2020

### DOCUMENT CONTROL NUMBER

TBD

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**REPORT NO.: 104206403CHI-100**

**TEST REPORT**

**REPORT DATE: July 21, 2020**

TEST OF ONE ENCL3 RD FL FIX 927 W - 90CRI 2700K 40 DEGREE 400 MA

MODEL NO. ENCL3RFD-927W - 15W - 40DEG  
LED MODEL NO. LUMINUS CXM-9-27-90-36-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-927W - 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 12, 2020 through May 14, 2020.

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**TEST REPORT**

**REPORT DATE: July 21, 2020**

**SUMMARY**

<b>MODEL NO:</b>	ENCL3RFD-927W - 15W - 40deg
<b>DESCRIPTION:</b>	ENCL3 RD FL FIX 927 W - 90CRI 2700K 40 Degree 400 mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1295.4	1296.8
Input Power (W) @ 120 (VAC)	15.25	15.33
Lumen Efficacy (lm/W)	85.0	84.6
Input Power Factor ( ) @ 120 (VAC)	0.989	0.989

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	11.74
Correlated Color Temperature (K)	2769
Color Rendering Index - Ra	93.5
Color Rendering - R9	64.7
DUV	0.0002
Chromaticity Coordinate (x)	0.455
Chromaticity Coordinate (y)	0.410
Chromaticity Coordinate (u')	0.259
Chromaticity Coordinate (v')	0.526

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**EQUIPMENT LIST**

<b>EQUIPMENT USED</b>	<b>MODEL NO.</b>	<b>CONTROL NO.</b>	<b>LAST CAL DATE</b>	<b>CAL DUE DATE</b>
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	VBU	VBU
Newport Thermohygrometer	iServer	146957	12/2/2019	12/2/2020
Pacific, AC Power Supply	118-ACX	CHI0153	VBU	VBU
Labsphere Spectroradiometer	CDS-600	146923	VBU	VBU
2M Rotating Sphere	7660-ROT	146923	VBU	VBU
Omega thermometer	USB TC08	EQA00-26615	4/7/2020	4/7/2021
Ametek DC Power Supply	XFR150-8	146846	VBU	VBU
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	VBU	VBU
Yokogawa Power Meter	WT1600	146770	10/1/2019	10/1/2020
Pacific AC Power Supply	ACX-118	CHI0154	VBU	VBU

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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.

**TEST REPORT**

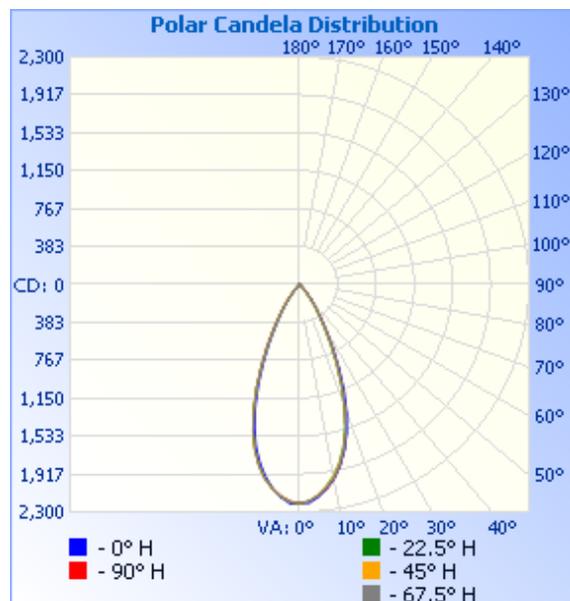
**RESULTS OF TESTS**

**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	129.1	15.33	0.989	1296.8	84.6

**INTENSITY SUMMARY - CANDELAS**

Angle	0	22.5	45	67.5	90
0	2213	2213	2213	2213	2213
5	2155	2134	2135	2140	2146
10	1992	1962	1970	1988	1992
15	1734	1697	1709	1721	1722
20	1376	1314	1325	1332	1334
25	937	866	882	895	908
30	535	490	504	520	528
35	280	256	266	277	287
40	117	102	105	112	116
45	42	36	36	38	39
50	12	11	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



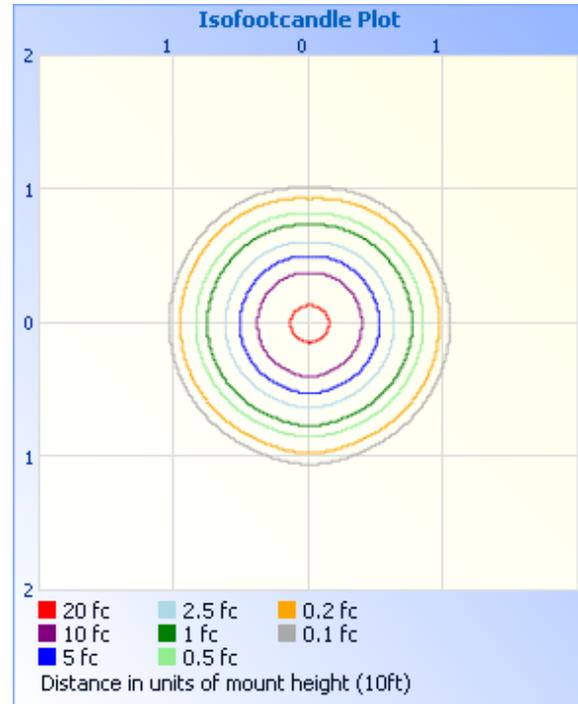
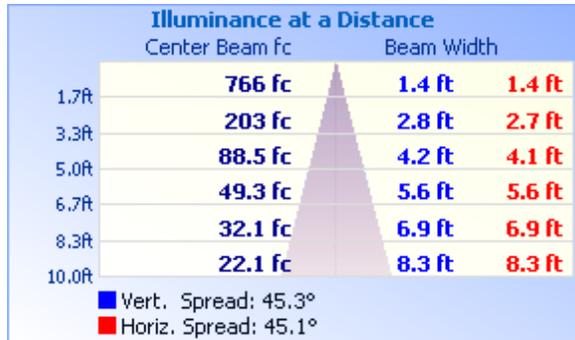
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**RESULTS OF TESTS**

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

**MOUNTING HEIGHT: 10ft**

<b>ILLUMINANCE - CONE OF LIGHT</b>	<b>ISOILLUMINATION PLOT</b>
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**ZONAL LUMEN SUMMARY AND PERCENTAGES**

ZONE	LUMENS	% LUMINAIRE
0-30	1076.9	83.0
0-40	1251.0	96.5
0-60	1292.1	99.6
60-90	4.7	0.4
70-100	1.9	0.1
90-120	0.0	0.0
0-90	1296.8	100.0
90-180	0.0	0.0
0-180	1296.8	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	199.3	15.4
10-20	470.6	36.3
20-30	407.0	31.4
30-40	174.1	13.4
40-50	35.2	2.7
50-60	5.9	0.5
60-70	2.8	0.2
70-80	1.4	0.1
80-90	0.5	0.0

TEST REPORT

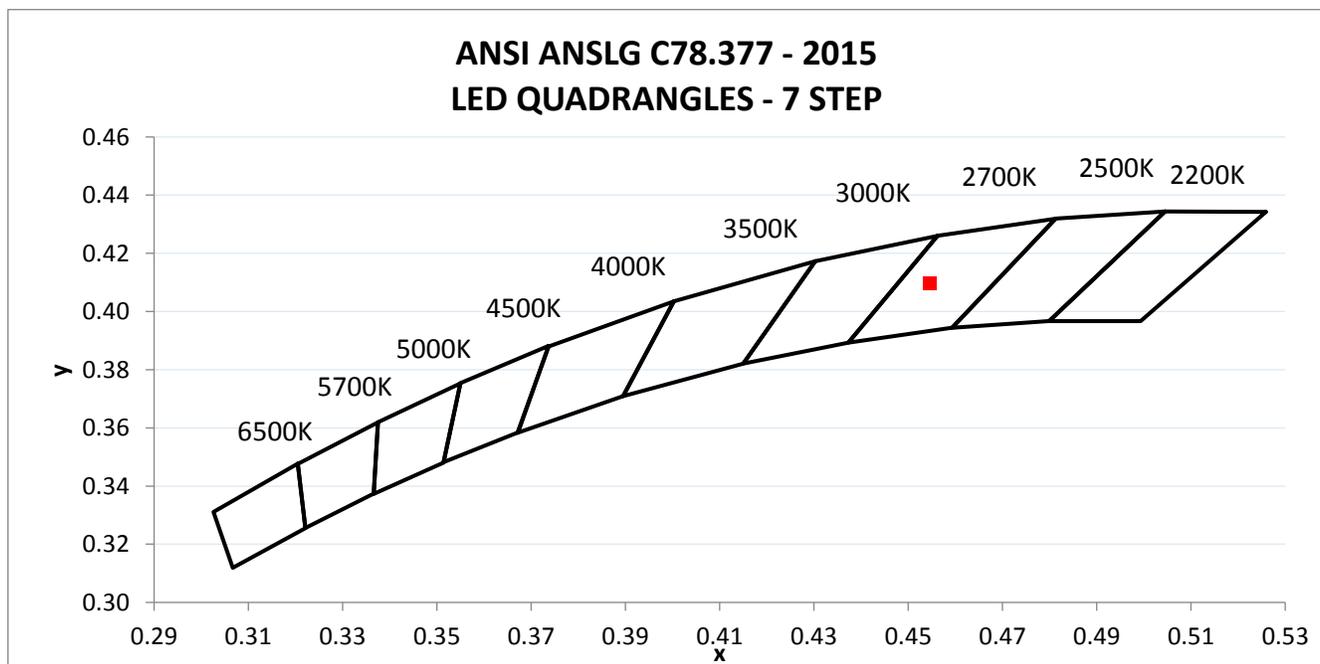
RESULTS OF TESTS

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	119.98	128.53	15.25	0.989	11.74

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
1295.4	85.0	2769	93.5	64.7	0.0002

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.455	0.410	0.259	0.526



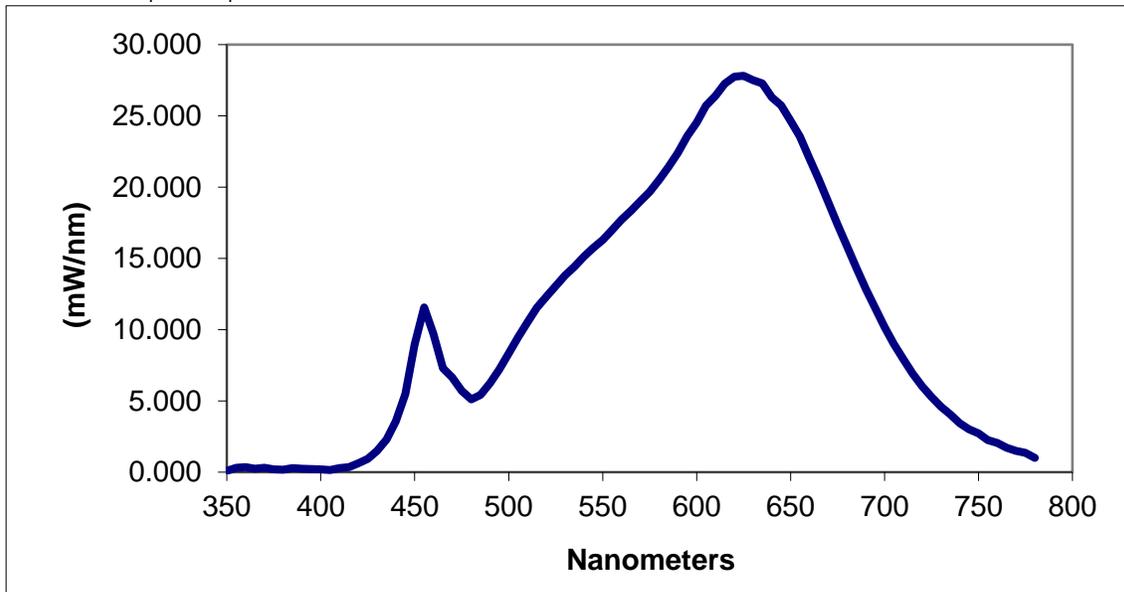
**TEST REPORT**

**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	0.093	460	9.702	570	19.009	680	15.855
355	0.305	465	7.306	575	19.673	685	14.360
360	0.345	470	6.641	580	20.515	690	12.850
365	0.243	475	5.713	585	21.411	695	11.542
370	0.311	480	5.098	590	22.408	700	10.182
375	0.190	485	5.427	595	23.574	705	8.997
380	0.171	490	6.255	600	24.538	710	7.923
385	0.291	495	7.214	605	25.716	715	6.916
390	0.252	500	8.342	610	26.408	720	6.032
395	0.212	505	9.472	615	27.256	725	5.282
400	0.208	510	10.544	620	27.755	730	4.594
405	0.148	515	11.550	625	27.813	735	4.060
410	0.282	520	12.321	630	27.505	740	3.438
415	0.348	525	13.064	635	27.282	745	3.018
420	0.618	530	13.809	640	26.302	750	2.731
425	0.924	535	14.415	645	25.733	755	2.250
430	1.503	540	15.141	650	24.643	760	2.046
435	2.307	545	15.728	655	23.543	765	1.724
440	3.562	550	16.305	660	22.002	770	1.499
445	5.499	555	16.990	665	20.551	775	1.348
450	8.953	560	17.732	670	18.959	780	1.000
455	11.564	565	18.318	675	17.379		

\*Without correction of sample absorption.



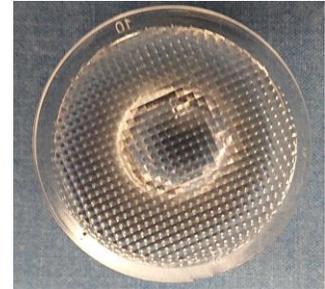
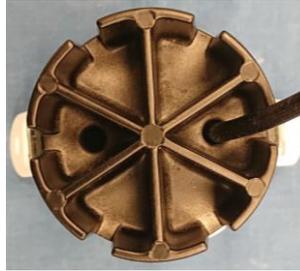
**End Of Test Results**

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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	<i>IS</i> IS	<i>TQ</i> TQ	Model Number, Description, and LED Model Updated
None	21-Jul-20	<i>IS</i> IS	<i>JD</i> JD	"B" Removed from Model Number & Description