

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 - 12W - 40deg

REPORT NUMBER

104206403CHI-099

ISSUE DATE

May 18, 2020

REVISION DATE

July 21, 2020

DOCUMENT CONTROL NUMBER

TBD

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REPORT NO.: 104206403CHI-099

TEST REPORT

REPORT DATE: July 21, 2020

TEST OF ONE ENCL3 RD FL FIX 927 W - 90CRI 2700K 40 DEGREE 300 MA

MODEL NO. ENCL3RFD-927W - 12W - 40DEG
LED MODEL NO. LUMINUS CXM-9-27-90-36-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-927W - 12W - 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 13, 2020.

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REPORT DATE: July 21, 2020

SUMMARY

MODEL NO:	ENCL3RFD-927W - 12W - 40deg
DESCRIPTION:	ENCL3 RD FL FIX 927 W - 90CRI 2700K 40 Degree 300 mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1025.2	1030.5
Input Power (W) @ 120 (VAC)	11.64	11.65
Lumen Efficacy (lm/W)	88.1	88.5
Input Power Factor () @ 120 (VAC)	0.984	0.986

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	14.88
Correlated Color Temperature (K)	2758
Color Rendering Index - Ra	93.7
Color Rendering - R9	66.1
DUV	0.0005
Chromaticity Coordinate (x)	0.456
Chromaticity Coordinate (y)	0.411
Chromaticity Coordinate (u')	0.260
Chromaticity Coordinate (v')	0.527

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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	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 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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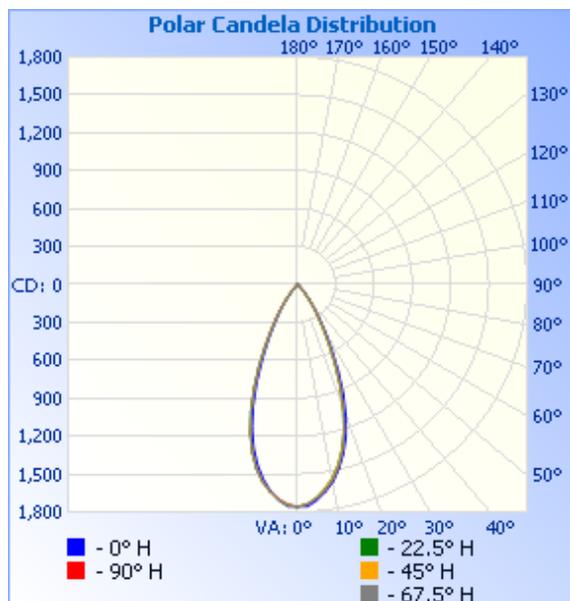
RESULTS OF TESTS

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	98.4	11.65	0.986	1030.5	88.5

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	1757	1757	1757	1757	1757
5	1715	1692	1693	1698	1704
10	1587	1556	1561	1576	1582
15	1386	1345	1353	1366	1366
20	1105	1042	1049	1056	1057
25	759	686	698	711	719
30	441	391	400	415	419
35	228	203	211	221	229
40	96	82	84	90	93
45	34	29	29	31	31
50	10	9	9	10	10
55	5	5	5	5	5
60	3	3	3	3	3
65	2	2	2	2	2
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



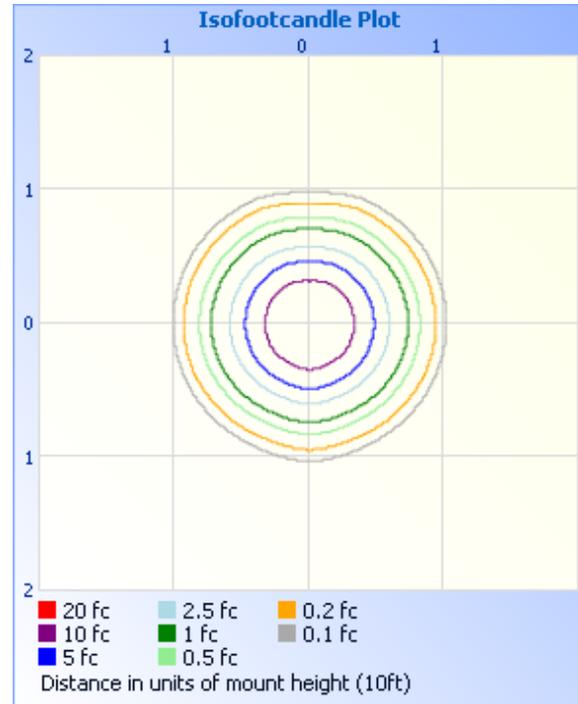
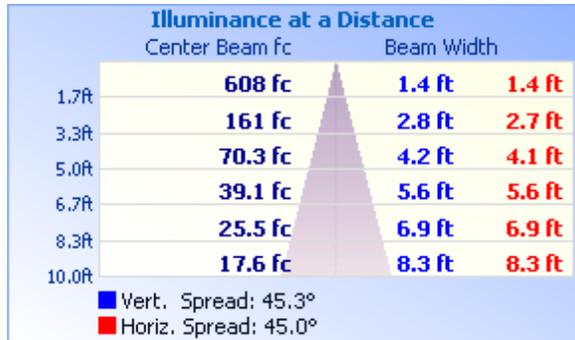
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RESULTS OF TESTS

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

MOUNTING HEIGHT: 10ft

ILLUMINANCE - CONE OF LIGHT	ISOILLUMINATION PLOT
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ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	855.0	83.0
0-40	993.6	96.4
0-60	1026.5	99.6
60-90	4.0	0.4
70-100	1.7	0.2
90-120	0.0	0.0
0-90	1030.5	100.0
90-180	0.0	0.0
0-180	1030.5	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	158.2	15.4
10-20	373.5	36.2
20-30	323.3	31.4
30-40	138.6	13.5
40-50	28.1	2.7
50-60	4.8	0.5
60-70	2.3	0.2
70-80	1.2	0.1
80-90	0.4	0.0

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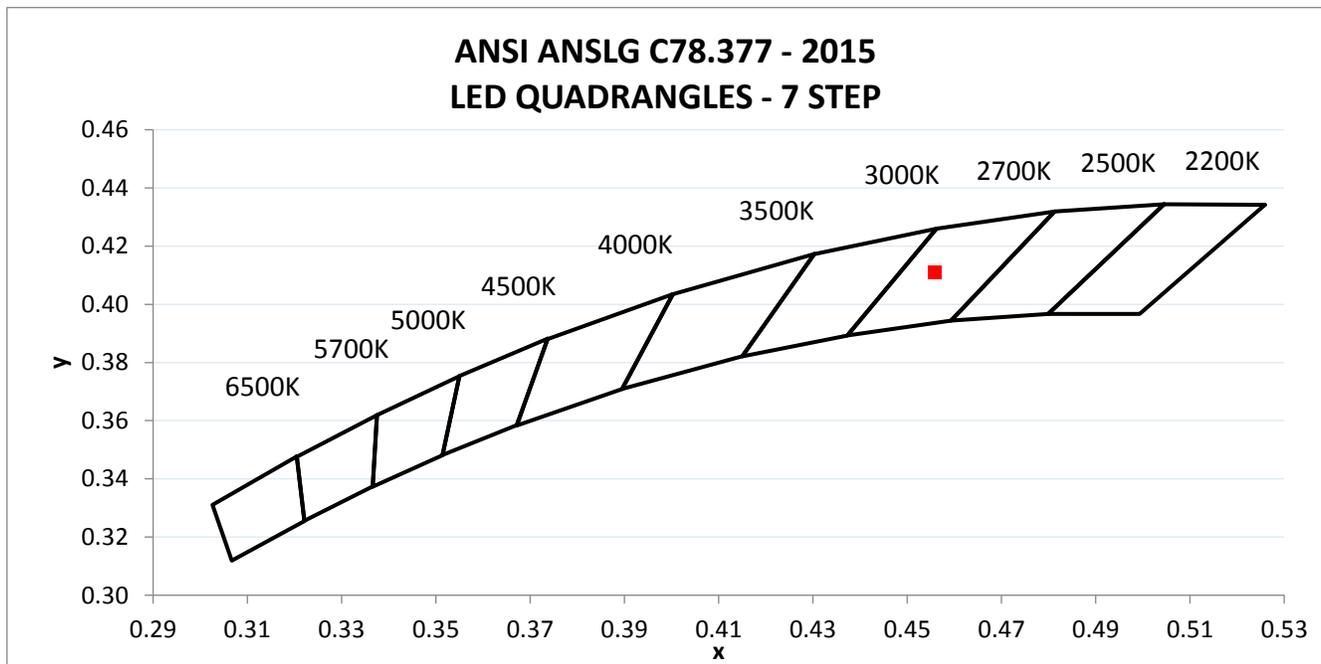
RESULTS OF TESTS

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	119.99	98.57	11.64	0.984	14.88

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
1025.2	88.1	2758	93.7	66.1	0.0005

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.456	0.411	0.260	0.527



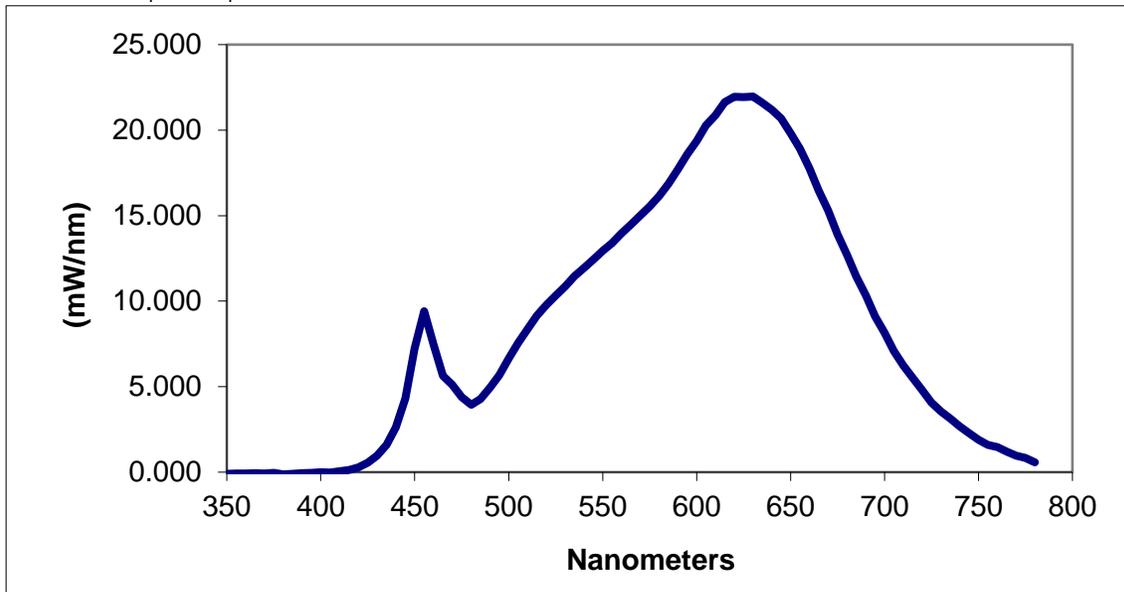
TEST REPORT

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	-0.097	460	7.490	570	15.015	680	12.702
355	-0.077	465	5.627	575	15.535	685	11.447
360	-0.076	470	5.109	580	16.140	690	10.333
365	-0.059	475	4.379	585	16.859	695	9.105
370	-0.079	480	3.932	590	17.706	700	8.144
375	-0.046	485	4.280	595	18.589	705	7.080
380	-0.127	490	4.947	600	19.356	710	6.234
385	-0.095	495	5.679	605	20.275	715	5.518
390	-0.063	500	6.649	610	20.875	720	4.790
395	-0.038	505	7.543	615	21.625	725	4.068
400	0.002	510	8.374	620	21.947	730	3.552
405	-0.012	515	9.157	625	21.940	735	3.146
410	0.048	520	9.777	630	21.962	740	2.675
415	0.135	525	10.314	635	21.605	745	2.282
420	0.284	530	10.867	640	21.183	750	1.904
425	0.548	535	11.460	645	20.678	755	1.598
430	0.970	540	11.944	650	19.808	760	1.472
435	1.598	545	12.426	655	18.913	765	1.209
440	2.625	550	12.951	660	17.767	770	0.964
445	4.317	555	13.398	665	16.461	775	0.840
450	7.231	560	13.978	670	15.286	780	0.583
455	9.416	565	14.473	675	13.916		

*Without correction of sample absorption.



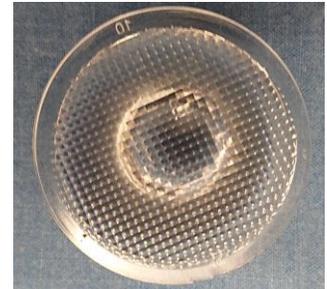
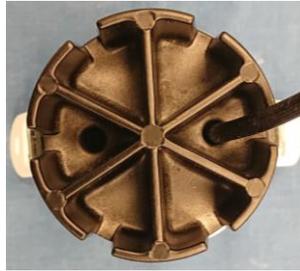
End Of Test Results

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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	"B" Removed from Model Number & Description