

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 - 40deg

REPORT NUMBER

104206403CHI-094

ISSUE DATE

May 18, 2020

REVISION DATE

July 21, 2020

DOCUMENT CONTROL NUMBER

TBD

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REPORT NO.: 104206403CHI-094

TEST REPORT

REPORT DATE: July 21, 2020

TEST OF ONE ENCL3 RD FL FIX 930 W - 90CRI 3000K 40 DEGREE 300 MA

MODEL NO. ENCL3RFD-930W - 12W - 40DEG
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 - 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 12, 2020.

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SUMMARY

MODEL NO:	ENCL3RFD-930W - 12W - 40deg
DESCRIPTION:	ENCL3 RD FL FIX 930 W - 90CRI 3000K 40 Degree 300 mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1036.1	1043.7
Input Power (W) @ 120 (VAC)	11.70	11.69
Lumen Efficacy (lm/W)	88.6	89.3
Input Power Factor () @ 120 (VAC)	0.984	0.986

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	14.92
Correlated Color Temperature (K)	3001
Color Rendering Index - Ra	95.0
Color Rendering - R9	71.7
DUV	0.0000
Chromaticity Coordinate (x)	0.437
Chromaticity Coordinate (y)	0.404
Chromaticity Coordinate (u')	0.251
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 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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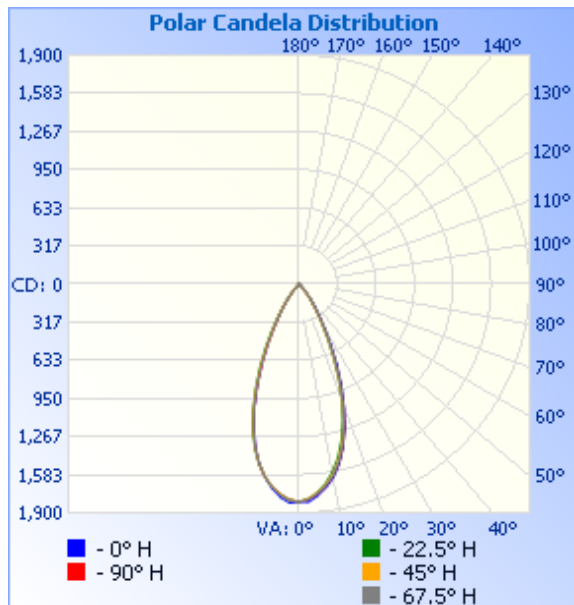
RESULTS OF TESTS

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	98.8	11.69	0.986	1043.7	89.3

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	1806	1806	1806	1806	1806
5	1765	1733	1738	1746	1753
10	1627	1582	1603	1615	1624
15	1395	1346	1370	1388	1400
20	1078	1031	1046	1060	1074
25	734	678	681	696	711
30	423	381	383	390	401
35	229	199	196	200	207
40	96	82	80	82	83
45	36	30	29	29	30
50	11	9	9	9	9
55	5	4	4	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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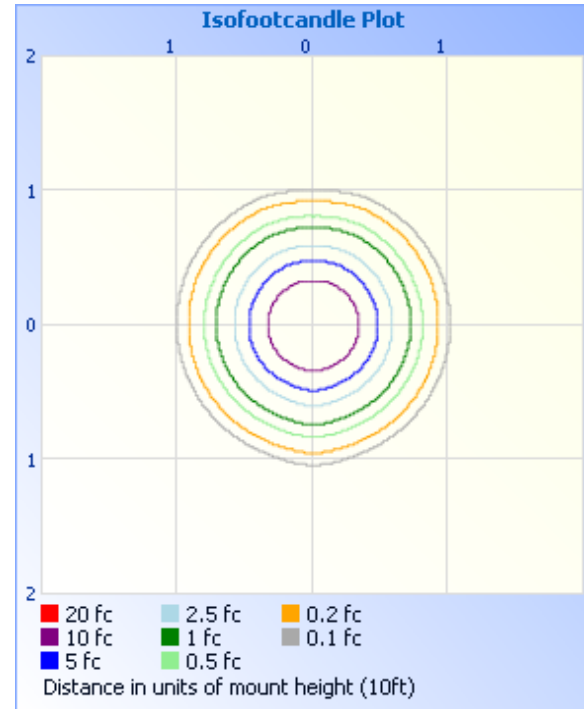
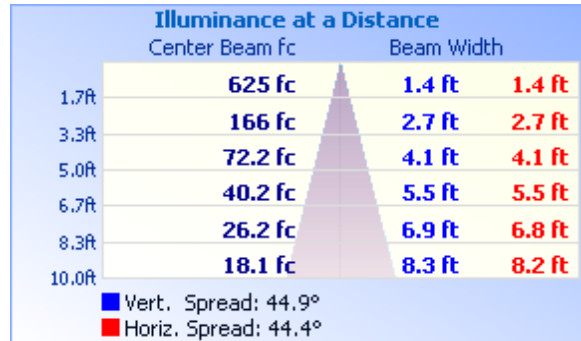
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RESULTS OF TESTS

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	869.3	83.3
0-40	1006.8	96.5
0-60	1039.9	99.6
60-90	3.8	0.4
70-100	1.6	0.2
90-120	0.0	0.0
0-90	1043.7	100.0
90-180	0.0	0.0
0-180	1043.7	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	162.6	15.6
10-20	380.5	36.5
20-30	326.2	31.3
30-40	137.5	13.2
40-50	28.5	2.7
50-60	4.7	0.4
60-70	2.2	0.2
70-80	1.2	0.1
80-90	0.4	0.0

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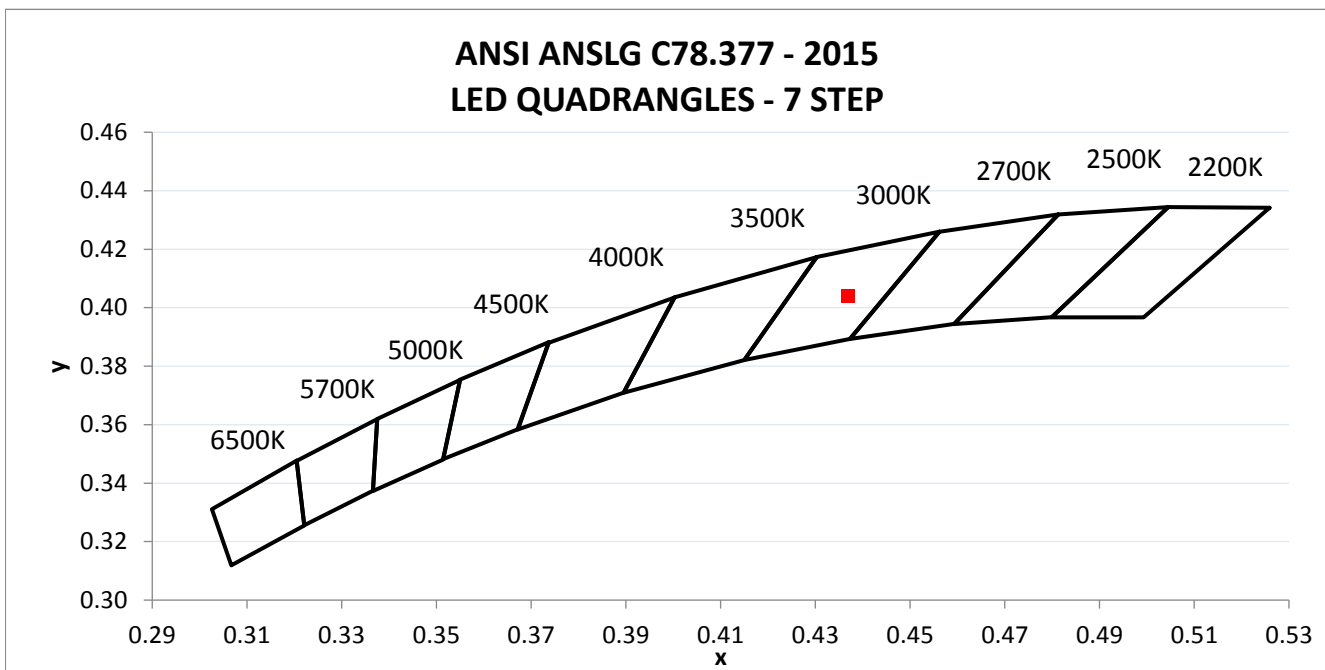
RESULTS OF TESTS

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	120.01	99.02	11.70	0.984	14.92

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
1036.1	88.6	3001	95.0	71.7	0.0000

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.437	0.404	0.251	0.521



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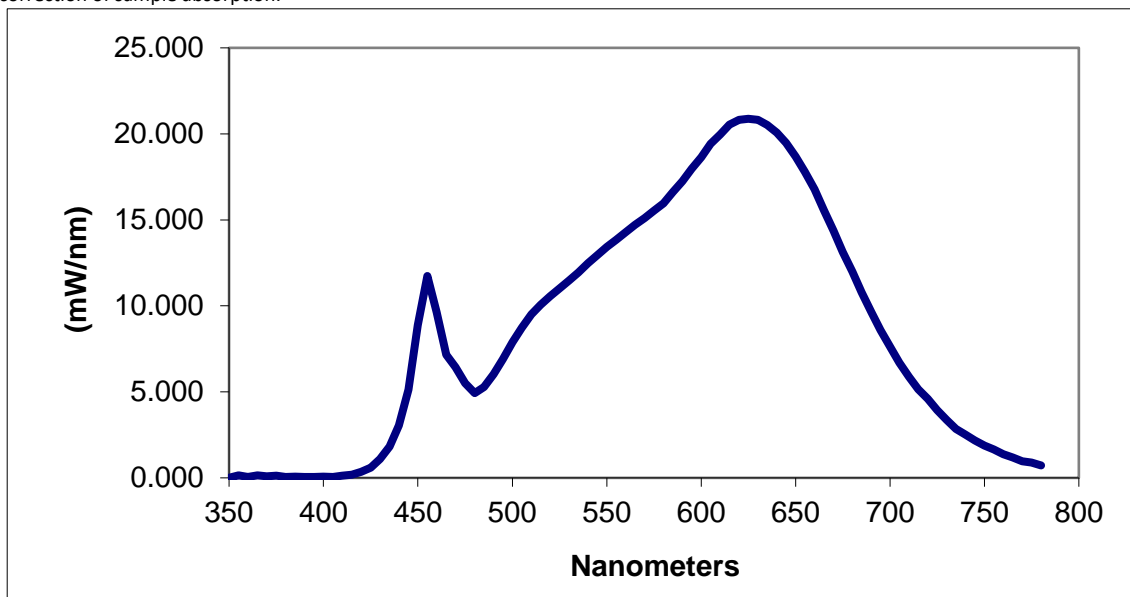
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RESULTS OF TESTS

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	0.008	460	9.640	570	15.095	680	12.003
355	0.147	465	7.158	575	15.539	685	10.786
360	0.060	470	6.434	580	15.962	690	9.660
365	0.139	475	5.504	585	16.618	695	8.601
370	0.092	480	4.924	590	17.249	700	7.629
375	0.128	485	5.277	595	17.967	705	6.697
380	0.056	490	6.024	600	18.640	710	5.872
385	0.067	495	6.892	605	19.418	715	5.153
390	0.048	500	7.887	610	19.966	720	4.592
395	0.050	505	8.719	615	20.532	725	3.933
400	0.078	510	9.500	620	20.815	730	3.357
405	0.045	515	10.064	625	20.877	735	2.845
410	0.126	520	10.563	630	20.815	740	2.511
415	0.179	525	11.004	635	20.520	745	2.168
420	0.354	530	11.483	640	20.065	750	1.886
425	0.588	535	11.945	645	19.477	755	1.653
430	1.093	540	12.489	650	18.667	760	1.368
435	1.828	545	12.940	655	17.777	765	1.183
440	3.047	550	13.421	660	16.776	770	0.973
445	5.130	555	13.841	665	15.570	775	0.899
450	8.873	560	14.281	670	14.372	780	0.717
455	11.732	565	14.707	675	13.133		

*Without correction of sample absorption.



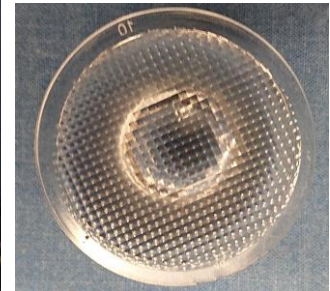
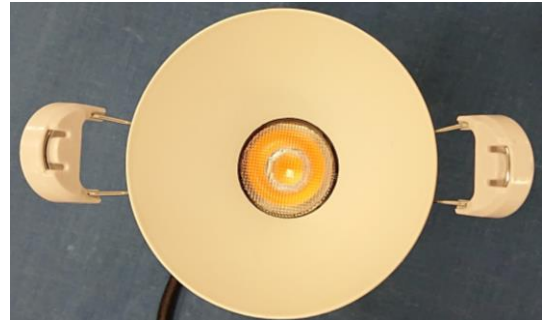
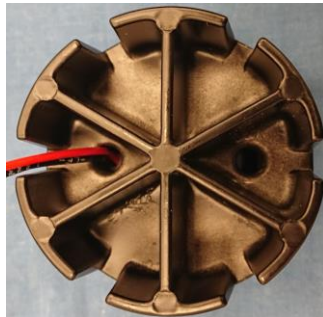
End Of Test Results

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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