

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 - 30deg

REPORT NUMBER

104206403CHI-093

ISSUE DATE

May 18, 2020

REVISION DATE

July 21, 2020

DOCUMENT CONTROL NUMBER

TBD

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TEST REPORT

REPORT DATE: July 21, 2020

TEST OF ONE ENCL3 RD FL FIX 930 W - 90CRI 3000K 30 DEGREE 300 MA

MODEL NO. ENCL3RFD-930W - 12W - 30DEG
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 - 30deg. 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 - 30deg
DESCRIPTION:	ENCL3 RD FL FIX 930 W - 90CRI 3000K 30 Degree 300 mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1096.8	1088.6
Input Power (W) @ 120 (VAC)	11.70	11.69
Lumen Efficacy (lm/W)	93.8	93.1
Input Power Factor () @ 120 (VAC)	0.984	0.986

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	14.92
Correlated Color Temperature (K)	3029
Color Rendering Index - Ra	94.9
Color Rendering - R9	72.1
DUV	-0.0001
Chromaticity Coordinate (x)	0.435
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 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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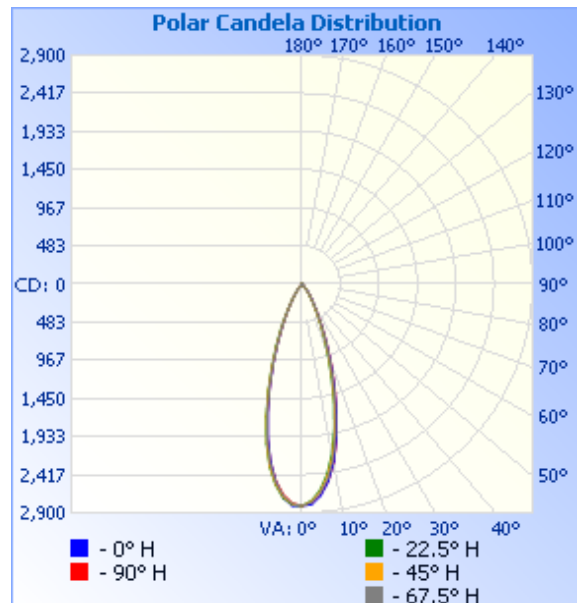
RESULTS OF TESTS

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	1088.6	93.1

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	2809	2809	2809	2809	2809
5	2694	2616	2633	2651	2678
10	2285	2177	2208	2248	2291
15	1656	1547	1578	1624	1675
20	1042	944	981	1018	1063
25	580	524	536	564	591
30	305	271	272	289	301
35	157	136	136	140	149
40	62	51	52	56	61
45	26	20	20	22	22
50	7	6	6	6	7
55	4	4	4	4	4
60	3	3	3	3	3
65	2	2	2	2	2
70	2	1	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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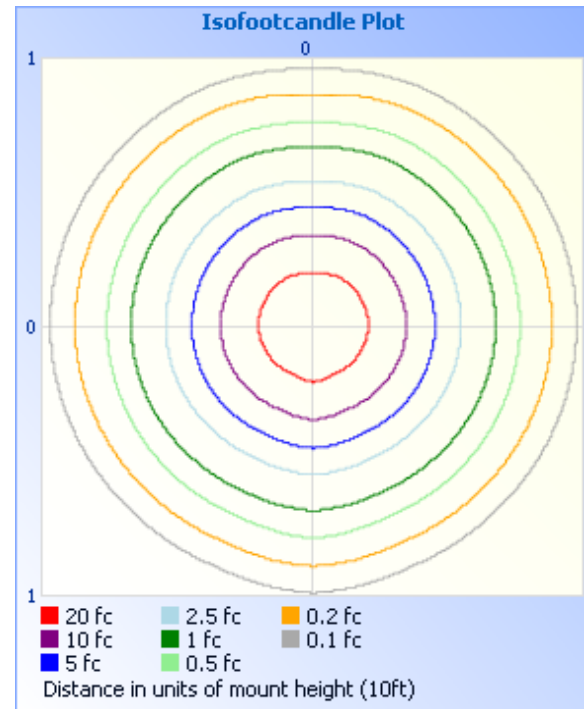
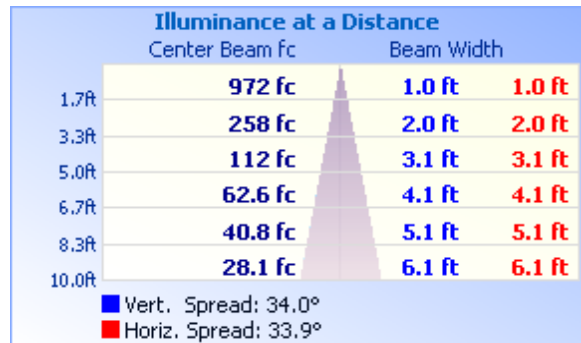
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RESULTS OF TESTS

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	965.6	88.7
0-40	1061.7	97.5
0-60	1084.8	99.7
60-90	3.7	0.3
70-100	1.6	0.1
90-120	0.0	0.0
0-90	1088.6	100.0
90-180	0.0	0.0
0-180	1088.6	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	241.8	22.2
10-20	450.3	41.4
20-30	273.4	25.1
30-40	96.1	8.8
40-50	19.2	1.8
50-60	3.9	0.4
60-70	2.2	0.2
70-80	1.1	0.1
80-90	0.4	0.0

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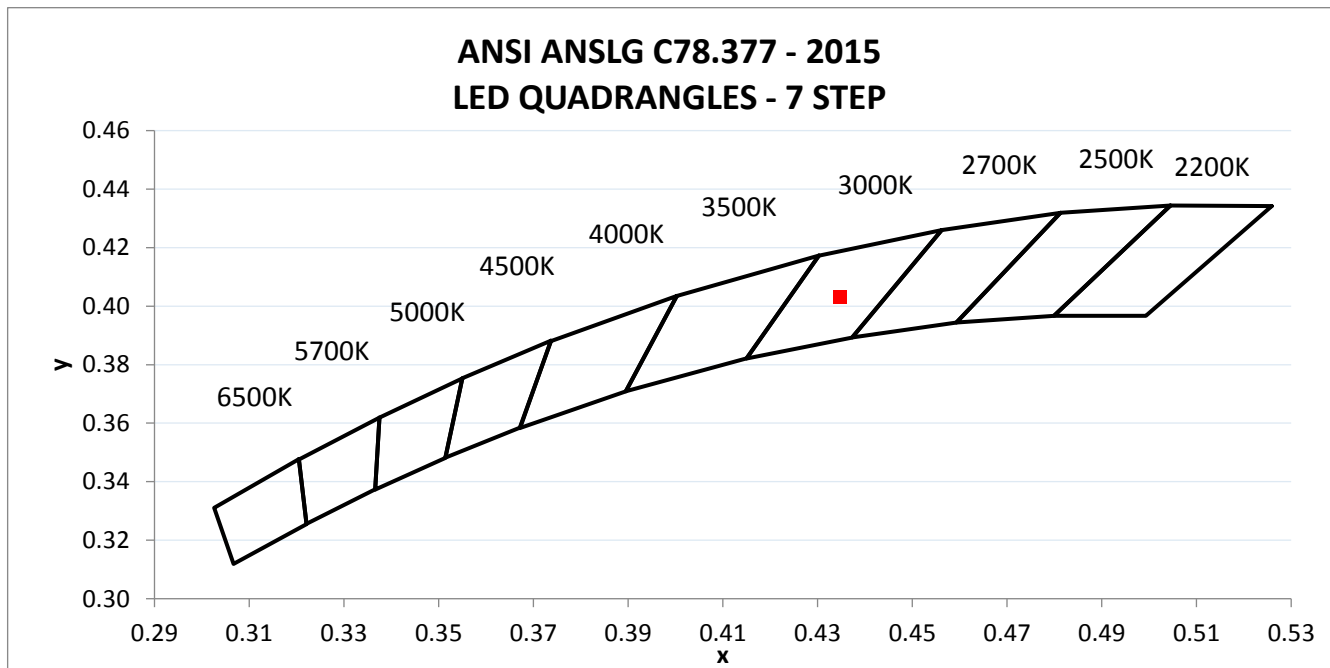
RESULTS OF TESTS

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
1096.8	93.8	3029	94.9	72.1	-0.0001

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.435	0.403	0.250	0.521



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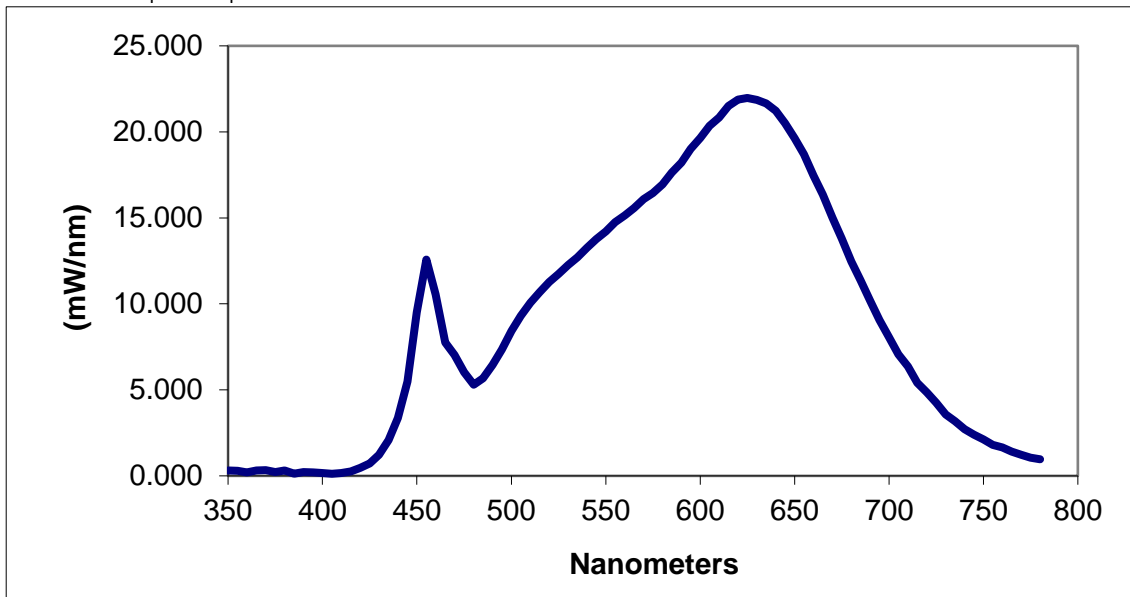
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RESULTS OF TESTS

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	0.315	460	10.544	570	16.093	680	12.463
355	0.292	465	7.751	575	16.445	685	11.365
360	0.200	470	7.039	580	16.946	690	10.175
365	0.305	475	6.024	585	17.643	695	9.056
370	0.327	480	5.300	590	18.215	700	8.050
375	0.220	485	5.671	595	19.019	705	7.064
380	0.308	490	6.462	600	19.650	710	6.354
385	0.133	495	7.339	605	20.352	715	5.417
390	0.228	500	8.424	610	20.826	720	4.853
395	0.202	505	9.301	615	21.508	725	4.252
400	0.170	510	10.059	620	21.873	730	3.567
405	0.122	515	10.684	625	21.971	735	3.182
410	0.156	520	11.264	630	21.858	740	2.723
415	0.253	525	11.731	635	21.649	745	2.395
420	0.456	530	12.251	640	21.220	750	2.119
425	0.715	535	12.697	645	20.493	755	1.799
430	1.223	540	13.262	650	19.621	760	1.646
435	2.073	545	13.757	655	18.688	765	1.420
440	3.356	550	14.216	660	17.445	770	1.235
445	5.495	555	14.746	665	16.341	775	1.050
450	9.502	560	15.139	670	15.017	780	0.960
455	12.571	565	15.562	675	13.799		

*Without correction of sample absorption.



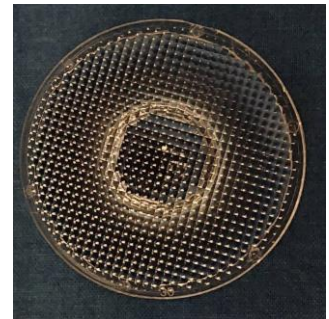
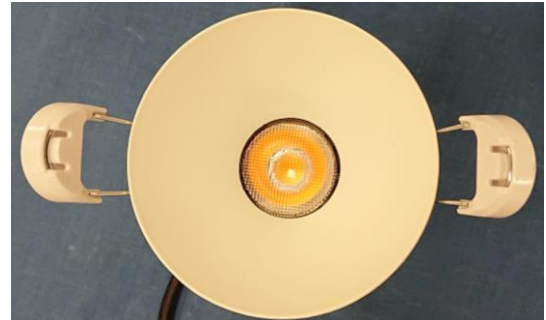
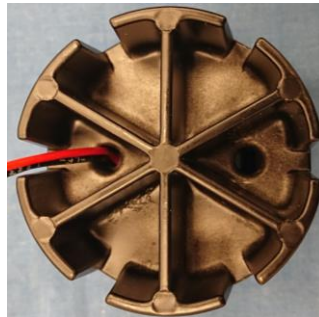
End Of Test Results

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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