

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 - 60deg

REPORT NUMBER

104206403CHI-095

ISSUE DATE

May 18, 2020

REVISION DATE

July 21, 2020

DOCUMENT CONTROL NUMBER

TBD

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REPORT NO.: 104206403CHI-095

TEST REPORT

REPORT DATE: July 21, 2020

TEST OF ONE ENCL3 RD FL FIX 930 W - 90CRI 3000K 60 DEGREE 300 MA

MODEL NO. ENCL3RFD-930W - 12W - 60DEG
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 - 60deg. 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.

REPORT NO.: 104206403CHI-095

TEST REPORT

REPORT DATE: July 21, 2020

SUMMARY

MODEL NO:	ENCL3RFD-930W - 12W - 60deg
DESCRIPTION:	ENCL3 RD FL FIX 930 W - 90CRI 3000K 60 Degree 300 mA

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1101.4	1120.2
Input Power (W) @ 120 (VAC)	11.70	11.69
Lumen Efficacy (lm/W)	94.2	95.8
Input Power Factor () @ 120 (VAC)	0.984	0.986

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	14.92
Correlated Color Temperature (K)	3008
Color Rendering Index - Ra	94.6
Color Rendering - R9	70.4
DUV	0.0003
Chromaticity Coordinate (x)	0.437
Chromaticity Coordinate (y)	0.405
Chromaticity Coordinate (u')	0.250
Chromaticity Coordinate (v')	0.522

REPORT NO.: 104206403CHI-095

TEST REPORT

REPORT DATE: July 21, 2020

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

REPORT NO.: 104206403CHI-095

REPORT DATE: July 21, 2020

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.

REPORT NO.: 104206403CHI-095

TEST REPORT

REPORT DATE: July 21, 2020

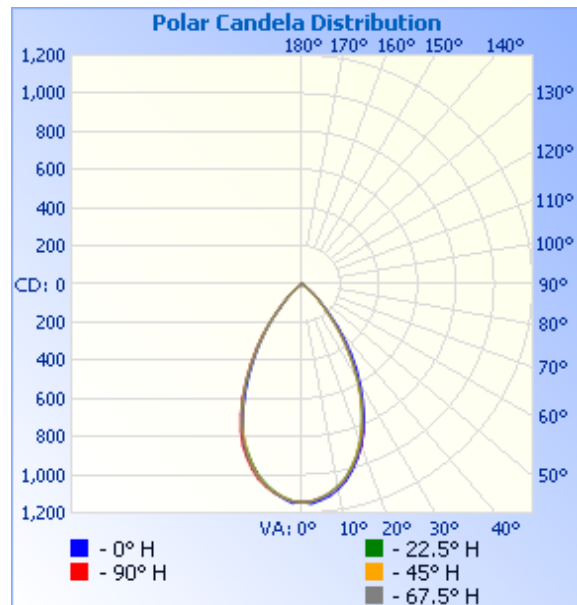
RESULTS OF TESTS

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	1120.2	95.8

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	1144	1144	1144	1144	1144
5	1137	1126	1125	1123	1124
10	1093	1074	1078	1079	1080
15	1011	992	996	1002	1006
20	900	877	879	892	902
25	763	735	738	749	755
30	605	576	574	581	585
35	445	406	406	411	418
40	287	253	251	258	263
45	149	132	130	135	136
50	81	72	71	72	71
55	11	12	15	19	20
60	8	8	8	8	8
65	6	6	6	6	6
70	5	4	4	5	5
75	3	3	3	3	3
80	2	2	2	2	2
85	1	1	1	1	1
90	0	0	0	0	0



REPORT NO.: 104206403CHI-095

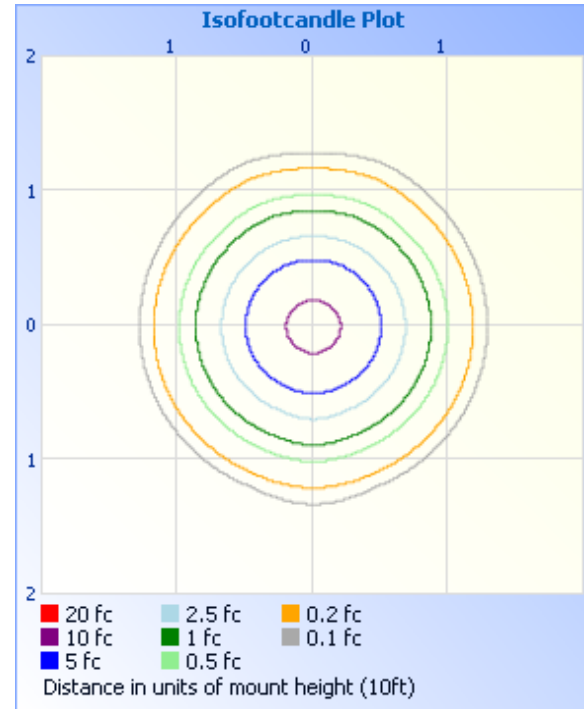
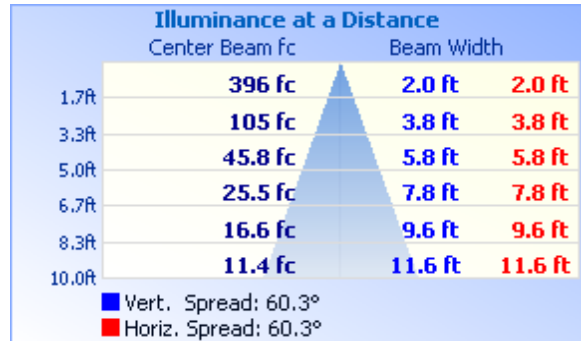
REPORT DATE: July 21, 2020

TEST REPORT

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	721.0	64.4
0-40	975.9	87.1
0-60	1109.3	99.0
60-90	10.9	1.0
70-100	4.7	0.4
90-120	0.0	0.0
0-90	1120.2	100.0
90-180	0.0	0.0
0-180	1120.2	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	105.8	9.4
10-20	277.8	24.8
20-30	337.5	30.1
30-40	254.9	22.8
40-50	110.2	9.8
50-60	23.2	2.1
60-70	6.2	0.6
70-80	3.5	0.3
80-90	1.2	0.1

REPORT NO.: 104206403CHI-095

REPORT DATE: July 21, 2020

TEST REPORT

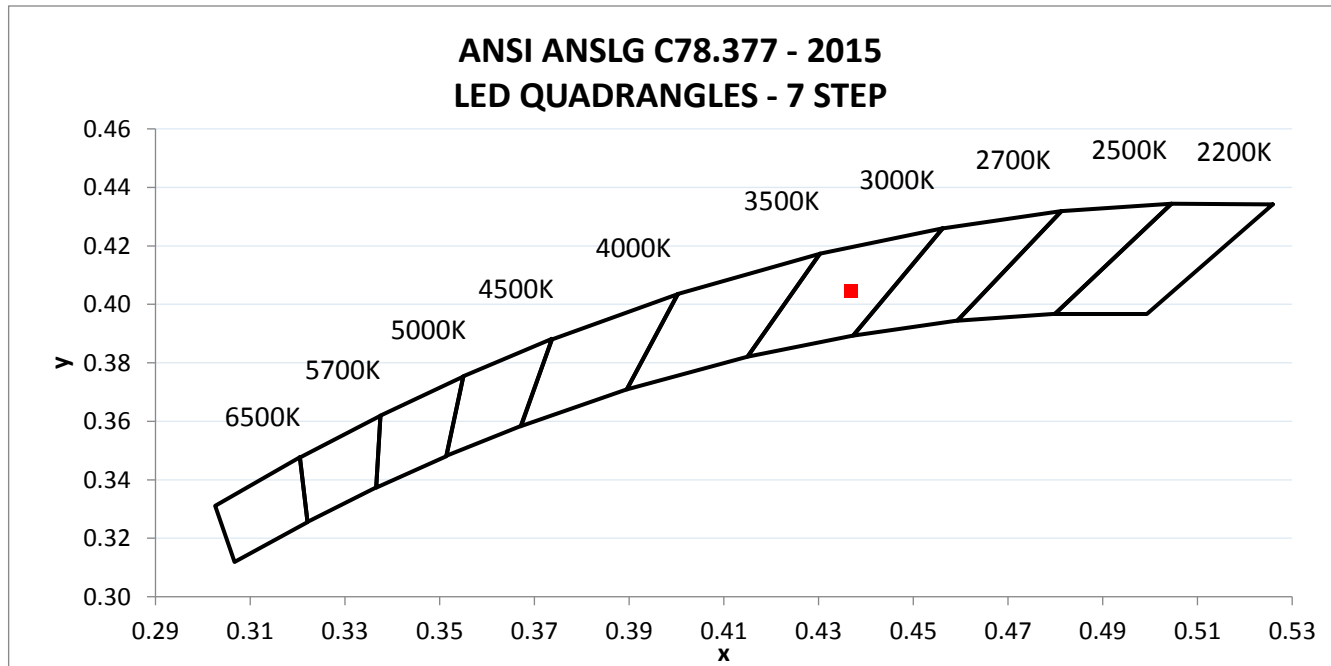
RESULTS OF TESTS

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	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
1101.4	94.2	3008	94.6	70.4	0.0003

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.437	0.405	0.250	0.522



REPORT NO.: 104206403CHI-095

TEST REPORT

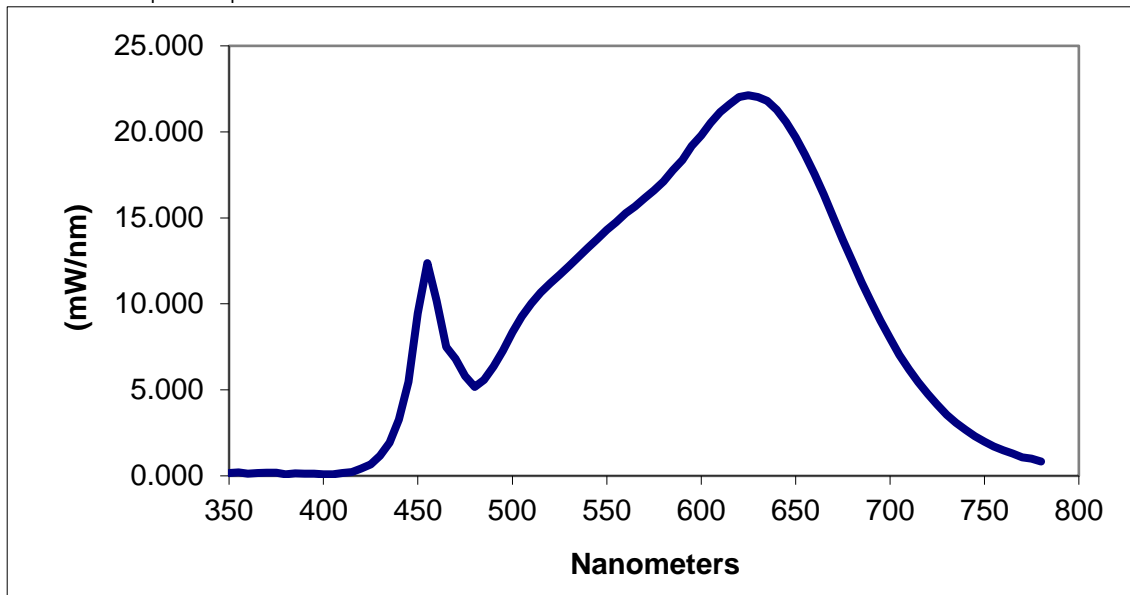
REPORT DATE: July 21, 2020

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	0.167	460	10.181	570	16.138	680	12.473
355	0.198	465	7.504	575	16.588	685	11.257
360	0.131	470	6.810	580	17.108	690	10.093
365	0.160	475	5.799	585	17.770	695	9.016
370	0.187	480	5.170	590	18.356	700	7.990
375	0.176	485	5.580	595	19.174	705	7.026
380	0.095	490	6.362	600	19.783	710	6.201
385	0.150	495	7.268	605	20.517	715	5.455
390	0.126	500	8.343	610	21.150	720	4.768
395	0.126	505	9.261	615	21.599	725	4.144
400	0.090	510	10.034	620	22.029	730	3.544
405	0.098	515	10.661	625	22.129	735	3.087
410	0.157	520	11.200	630	22.028	740	2.680
415	0.228	525	11.687	635	21.802	745	2.301
420	0.418	530	12.202	640	21.287	750	1.990
425	0.675	535	12.731	645	20.573	755	1.716
430	1.171	540	13.263	650	19.674	760	1.485
435	1.941	545	13.763	655	18.679	765	1.309
440	3.269	550	14.304	660	17.547	770	1.083
445	5.467	555	14.741	665	16.352	775	0.997
450	9.451	560	15.269	670	15.002	780	0.827
455	12.373	565	15.667	675	13.734		

*Without correction of sample absorption.



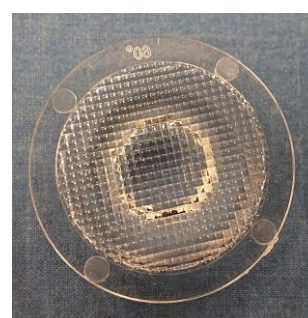
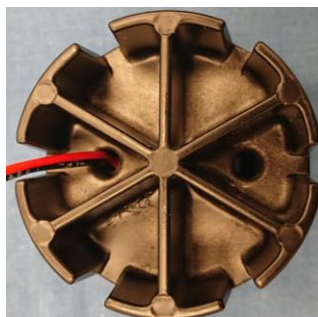
End Of Test Results

REPORT NO.: 104206403CHI-095

REPORT DATE: July 21, 2020

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