

VISUAL COMFORT GROUP TEST REPORT

SCOPE OF WORK

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

MODEL NUMBER

700**HNE**-LED930

REPORT NUMBER

104206403CHI-055

ISSUE DATE

March 5, 2020

REVISION DATE

None

DOCUMENT CONTROL NUMBER

TBD

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REPORT NO.:104206403CHI-055

REPORT DATE: March 5, 2020

TEST REPORT

TEST OF ONE MINI HANEA PENDANT

MODEL NO. 700**HNE**-LED930
LED MODEL NO. LEEDERSON LED BI-PIN

RENDERED TO:

VISUAL COMFORT GROUP
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-01040682-0.

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 700**HNE**-LED930. The sample was received by Intertek on March 4, 2020 in undamaged condition and one sample was tested as received. The sample designation was AH03042020081521-002.

DATE OF TESTS

March 4, 2020 through March 5, 2020.

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SUMMARY

MODEL NO:	700**HNE**-LED930
DESCRIPTION:	Mini Hanea Pendant

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	290.4	281.9
Input Power (W) @ 12 (VAC)	5.03	5.01
Lumen Efficacy (lm/W)	57.7	56.3
Input Power Factor () @ 12 (VAC)	0.920	0.921

CRITERIA	RESULTS
Input Current ATHD (%) @ 12 (VAC)	37.01
Correlated Color Temperature (K)	2942
Color Rendering Index - Ra	93.7
Color Rendering - R9	66.7
DUV	0.0025
Chromaticity Coordinate (x)	0.438
Chromaticity Coordinate (y)	0.399
Chromaticity Coordinate (u')	0.253
Chromaticity Coordinate (v')	0.519

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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 2M Sphere & Spectroradiometer	CDS1100	146137	VBU	VBU
Elgar AC Power Supply	CW1251M	146113	VBU	VBU
Sorenson DC Power Supply	XFR150-8	146847	VBU	VBU
Yokogawa Power Analyzer	WT1600	146767	4/3/2019	4/3/2020
Omega Temperature	MDSi8	146873	7/2/2019	7/2/2020
Newport Thermohygrometer	iTHX-M	146961	7/26/2019	7/26/2020

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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.

TEST REPORT

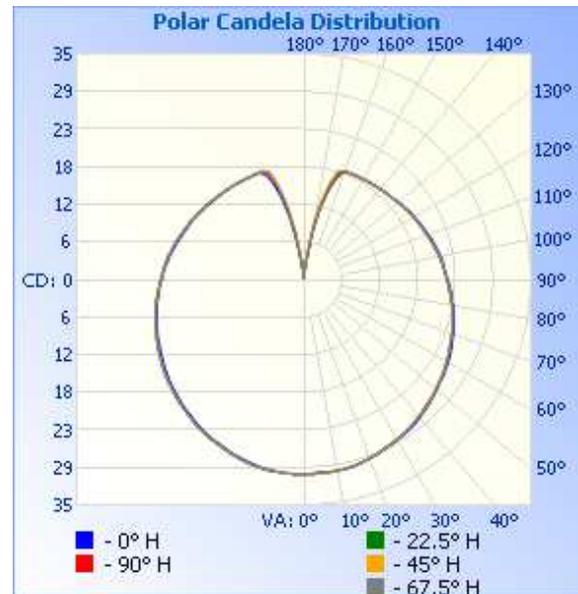
RESULTS OF TESTS

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)
AH03042020081521-002	Horizontal	12.0	453.5	5.01	0.921	281.9	56.3

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	30	30	30	30	30
5	30	30	30	30	30
10	30	30	30	30	30
15	30	30	30	30	30
20	30	30	30	30	30
25	29	29	29	29	29
30	29	29	29	29	29
35	28	28	28	28	28
40	28	28	28	28	28
45	27	27	27	27	27
50	27	27	26	26	26
55	26	26	26	26	26
60	26	26	25	25	25
65	25	25	25	25	25
70	24	24	24	24	24
75	24	24	24	24	24
80	23	23	23	23	23
85	23	23	23	23	23
90	22	22	22	22	22
95	22	22	22	22	22
100	21	21	21	21	21
105	21	21	21	21	21
110	20	20	20	20	20
115	20	20	20	20	20
120	20	20	20	20	20
125	19	19	19	19	19
130	19	19	19	19	19
135	19	18	18	18	18
140	18	18	18	18	18
145	18	18	18	18	18
150	18	18	18	18	18
155	18	18	18	18	18
160	18	18	18	18	18
165	15	15	16	15	14
170	8	8	9	8	7
175	1	1	2	2	1



TEST REPORT

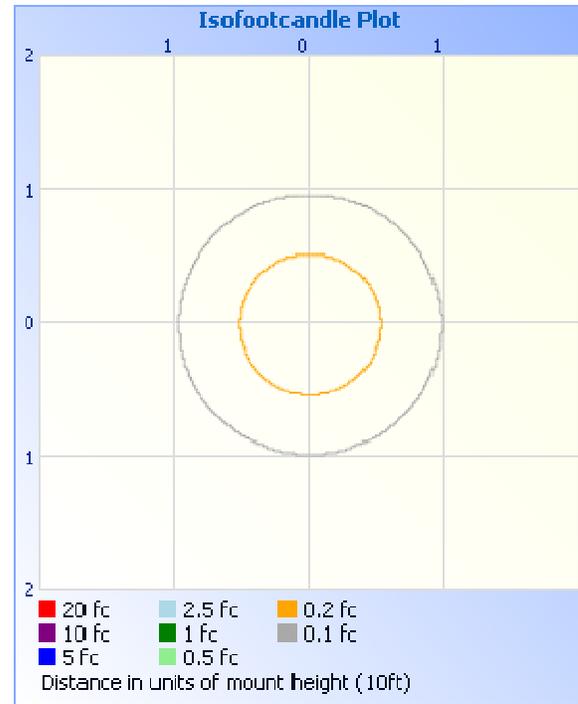
RESULTS OF TESTS

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

MOUNTING HEIGHT: 10ft

ILLUMINANCE - CONE OF LIGHT	ISOILLUMINATION PLOT
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Illuminance at a Distance		
	Center Beam fc	Beam Width
1.7ft	10.4 fc	
3.3ft	2.77 fc	
5.0ft	1.21 fc	
6.7ft	0.67 fc	
8.3ft	0.44 fc	
10.0ft	0.30 fc	



ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	24.8	8.8
0-40	42.4	15.1
0-60	86.7	30.8
60-90	74.4	26.4
70-100	73.3	26.0
90-120	65.1	23.1
0-90	161.1	57.1
90-180	120.8	42.9
0-180	281.9	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	2.9	1.0
10-20	8.5	3.0
20-30	13.4	4.8
30-40	17.7	6.3
40-50	21.0	7.4
50-60	23.3	8.3
60-70	24.6	8.7
70-80	25.1	8.9
80-90	24.7	8.7
90-100	23.6	8.4
100-110	21.9	7.8
110-120	19.7	7.0
120-130	17.2	6.1
130-140	14.3	5.1
140-150	11.4	4.0
150-160	8.3	2.9
160-170	4.1	1.5
170-180	0.3	0.1

TEST REPORT

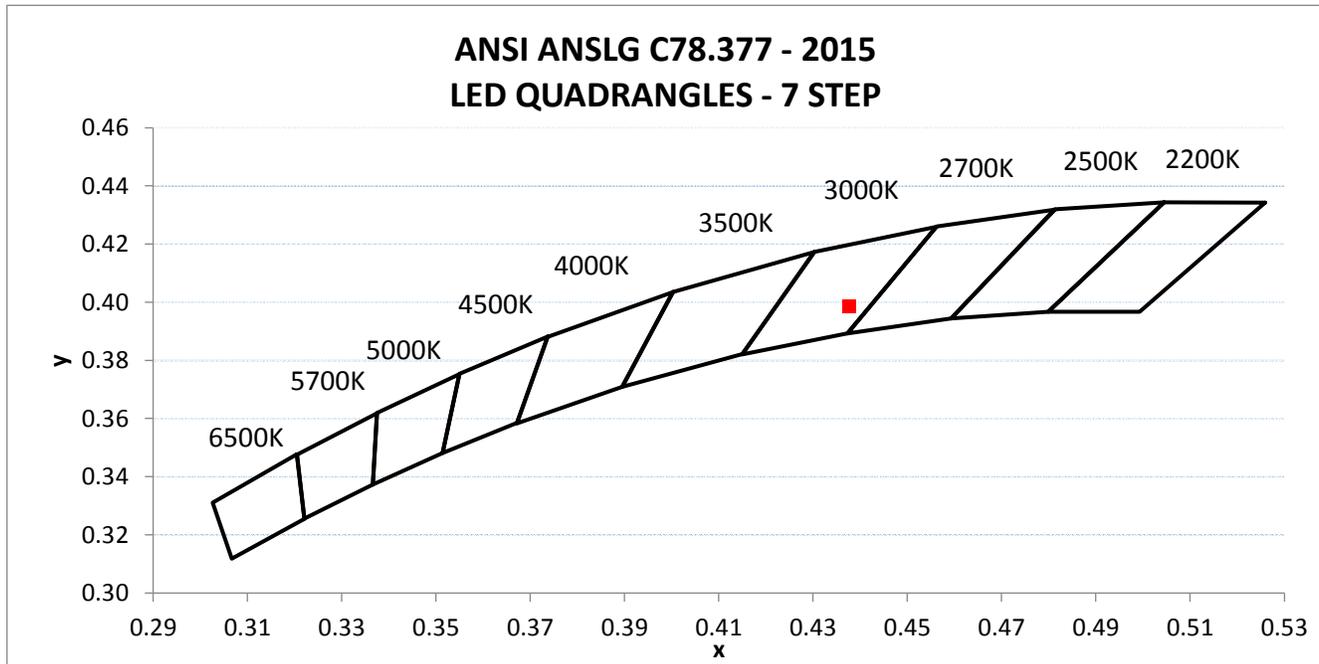
RESULTS OF TESTS

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 (%)
AH03042020081521-002	Horizontal	12.01	454.77	5.03	0.920	37.01

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
290.4	57.7	2942	93.7	66.7	0.0025

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.438	0.399	0.253	0.519



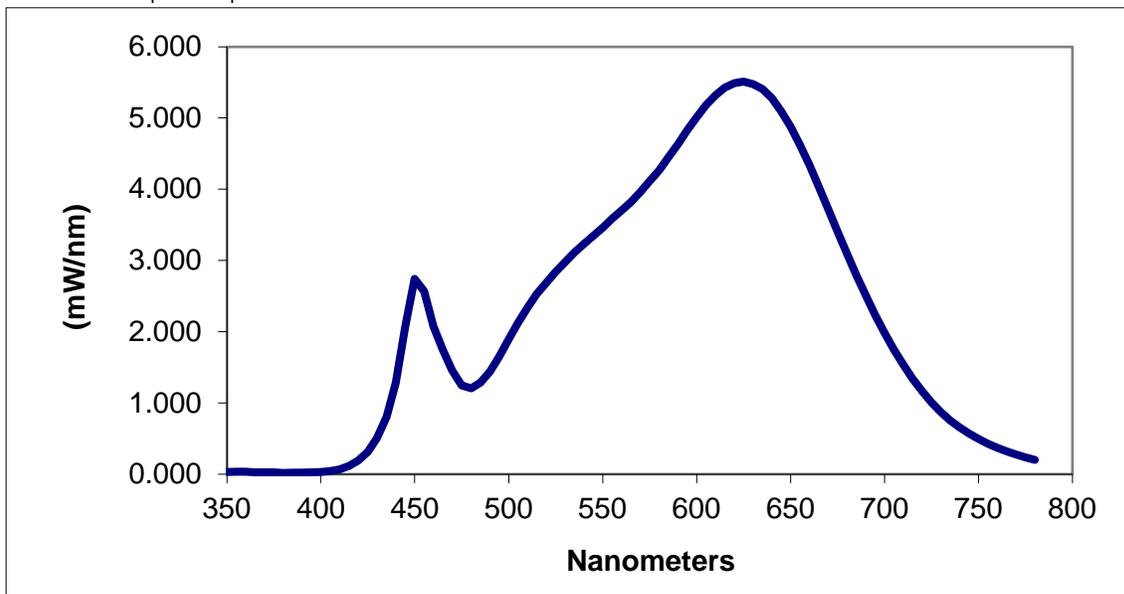
TEST REPORT

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	0.030	460	2.074	570	3.958	680	3.096
355	0.034	465	1.740	575	4.111	685	2.794
360	0.037	470	1.456	580	4.264	690	2.508
365	0.028	475	1.246	585	4.446	695	2.235
370	0.026	480	1.203	590	4.631	700	1.981
375	0.025	485	1.286	595	4.827	705	1.748
380	0.020	490	1.441	600	5.011	710	1.534
385	0.021	495	1.651	605	5.177	715	1.340
390	0.022	500	1.899	610	5.318	720	1.164
395	0.025	505	2.124	615	5.423	725	1.007
400	0.029	510	2.339	620	5.486	730	0.871
405	0.042	515	2.531	625	5.509	735	0.754
410	0.068	520	2.687	630	5.474	740	0.655
415	0.115	525	2.840	635	5.408	745	0.569
420	0.190	530	2.980	640	5.276	750	0.495
425	0.312	535	3.109	645	5.096	755	0.429
430	0.510	540	3.233	650	4.877	760	0.371
435	0.804	545	3.343	655	4.622	765	0.320
440	1.285	550	3.460	660	4.340	770	0.274
445	2.080	555	3.583	665	4.038	775	0.235
450	2.743	560	3.701	670	3.718	780	0.202
455	2.568	565	3.819	675	3.406		

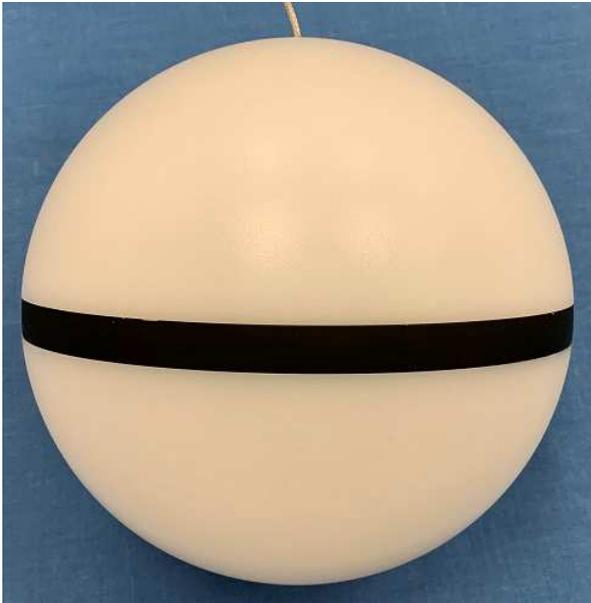
*Without correction of sample absorption.



End Of Test Results

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:

Timothy Quigley
Project Engineer
Lighting Division

Report Reviewed By:

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				