

VISUAL COMFORT & CO. TEST REPORT

SCOPE OF WORK

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

MODEL NUMBER

700OSIKN92730x120

REPORT NUMBER

104206403CHI-032

ISSUE DATE

February 28, 2020

REVISION DATE

None

DOCUMENT CONTROL NUMBER

TBD

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TEST REPORT

TEST OF ONE IKON STEP

MODEL NO. 700OSIKN92730X120
LED MODEL NO. SEOUL STW9C2SB
DRIVER MODEL NO. EPT D13-300RC2-NI

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 700OSIKN92730x120. The sample was received by Intertek on February 18, 2020 in undamaged condition and one sample was tested as received. The sample designation was AH02182020100147.

DATE OF TESTS

February 19, 2020 through February 19, 2020.

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SUMMARY

MODEL NO:	700OSIKN92730x120
DESCRIPTION:	Ikon Step

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	202.4	204.3
Input Power (W) @ 120 (VAC)	12.24	12.27
Lumen Efficacy (lm/W)	16.5	16.7
Input Power Factor () @ 120 (VAC)	0.962	0.962

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	23.27
Correlated Color Temperature (K)	2795
Color Rendering Index - Ra	93.9
Color Rendering - R9	69.6
DUV	0.0010
Chromaticity Coordinate (x)	0.451
Chromaticity Coordinate (y)	0.406
Chromaticity Coordinate (u')	0.259
Chromaticity Coordinate (v')	0.524

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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 2M Sphere & Spectroradiometer	CDS1100	146137	VBV	VBV
Elgar AC Power Supply	CW1251M	146113	VBV	VBV
Sorenson DC Power Supply	XFR150-8	146847	VBV	VBV
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.

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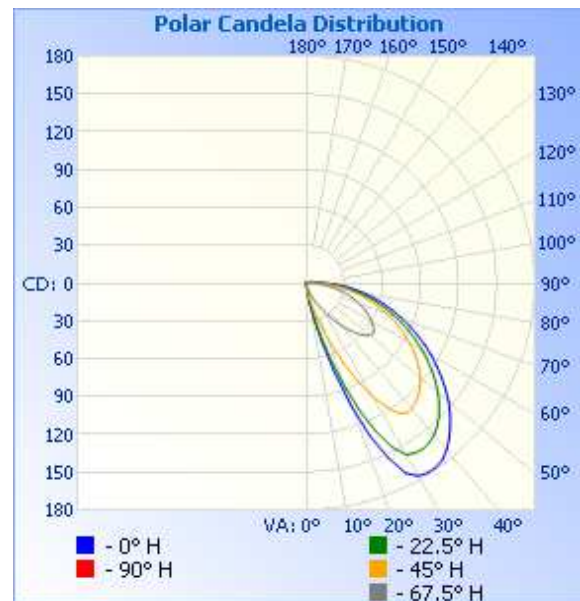
RESULTS OF TESTS

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)
AH02182020100147	Horizontal	120.0	106.3	12.27	0.962	204.3	16.7

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	0	0	0	0	0
5	2	3	1	0	0
10	16	15	7	1	0
15	48	41	20	4	0
20	103	84	40	8	0
25	153	130	70	14	0
30	177	157	103	22	0
35	178	161	125	32	0
40	172	157	130	44	0
45	160	148	125	56	0
50	147	136	117	64	0
55	130	121	107	65	0
60	114	105	94	59	0
65	96	89	80	52	0
70	80	73	66	43	0
75	63	57	51	33	0
80	47	42	37	23	0
85	31	26	23	14	0
90	16	12	10	5	0
95	9	7	6	2	0
100	7	6	4	1	0
105	5	4	2	1	0
110	3	3	2	1	0
115	2	2	1	0	0
120	2	1	1	0	0
125	1	1	1	0	0
130	1	1	1	0	0
135	1	1	0	0	0
140	1	1	0	0	0
145	1	0	0	0	0



Lum. Classification System (LCS)

LCS	Zone	Lumens	%Lumens
FL	(0-30)	20.7	10.2
FM	(30-60)	110.9	54.4
FH	(60-80)	56.0	27.5
FVH	(80-90)	10.7	5.3
BL	(0-30)	< 0.05	0.0
BM	(30-60)	0.1	0.0
BH	(60-80)	< 0.05	0.0
BVH	(80-90)	< 0.05	0.0
UL	(90-100)	2.9	1.4
UH	(100-180)	2.8	1.4
Total		204.1	100.0

BUG Rating: B0-U1-G1

IES Classification: Type III
Longitudinal Classification: Very Short

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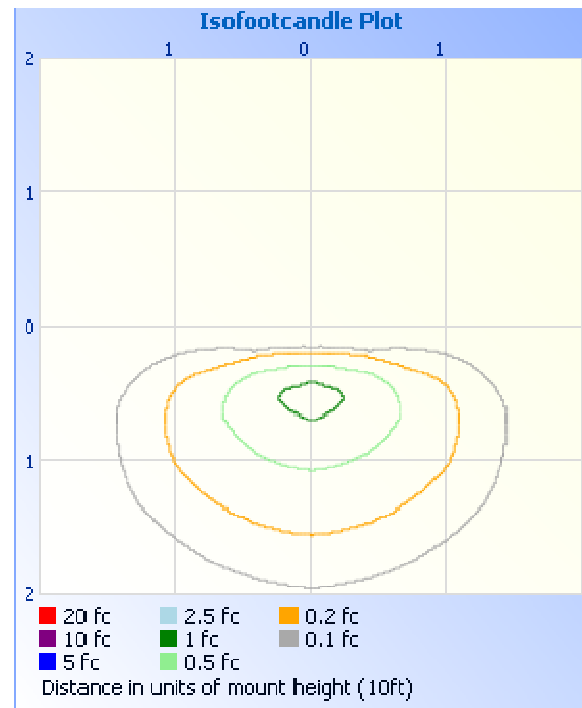
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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - DISTRIBUTION METHOD (25°C +/- 1°C)

MOUNTING HEIGHT: 10ft	
ILLUMINANCE - CONE OF LIGHT	ISOILLUMINATION PLOT



ZONAL LUMEN SUMMARY AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	20.8	10.2
0-40	52.5	25.7
0-60	131.8	64.5
60-90	66.8	32.7
70-100	36.4	17.8
90-120	4.8	2.4
0-90	198.6	97.2
90-180	5.6	2.8
0-180	204.3	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	0.2	0.1
10-20	3.7	1.8
20-30	16.9	8.3
30-40	31.7	15.5
40-50	39.4	19.3
50-60	39.9	19.5
60-70	33.3	16.3
70-80	22.8	11.2
80-90	10.7	5.3
90-100	2.9	1.4
100-110	1.3	0.6
110-120	0.6	0.3
120-130	0.4	0.2
130-140	0.2	0.1
140-150	0.1	0.1
150-160	0.1	0.0

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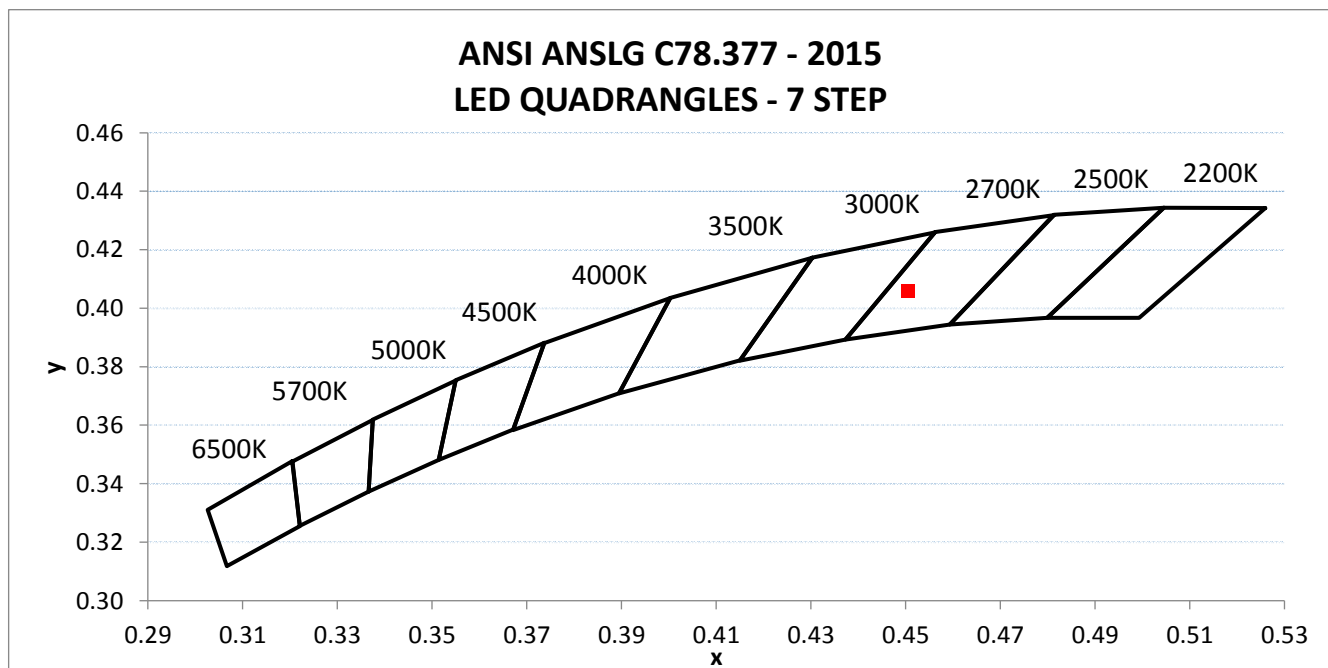
RESULTS OF TESTS

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 (%)
AH02182020100147	Horizontal	120.01	105.97	12.24	0.962	23.27

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
202.4	16.5	2795	93.9	69.6	0.0010

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.451	0.406	0.259	0.524



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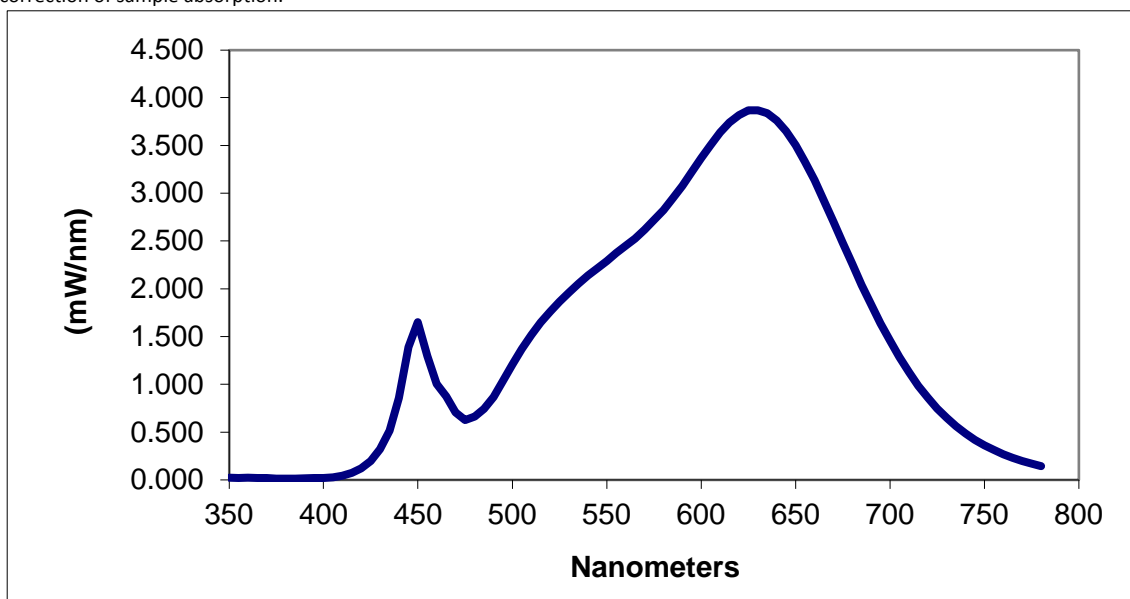
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RESULTS OF TESTS

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	0.021	460	1.004	570	2.617	680	2.258
355	0.021	465	0.873	575	2.718	685	2.040
360	0.023	470	0.706	580	2.822	690	1.834
365	0.018	475	0.627	585	2.946	695	1.637
370	0.020	480	0.661	590	3.076	700	1.455
375	0.015	485	0.744	595	3.221	705	1.286
380	0.013	490	0.866	600	3.367	710	1.126
385	0.014	495	1.034	605	3.501	715	0.986
390	0.015	500	1.207	610	3.636	720	0.860
395	0.018	505	1.369	615	3.740	725	0.748
400	0.019	510	1.517	620	3.818	730	0.648
405	0.027	515	1.648	625	3.868	735	0.562
410	0.044	520	1.761	630	3.869	740	0.484
415	0.074	525	1.865	635	3.837	745	0.419
420	0.121	530	1.963	640	3.761	750	0.362
425	0.195	535	2.053	645	3.648	755	0.313
430	0.321	540	2.138	650	3.503	760	0.269
435	0.517	545	2.212	655	3.328	765	0.231
440	0.857	550	2.290	660	3.138	770	0.198
445	1.390	555	2.372	665	2.925	775	0.169
450	1.650	560	2.452	670	2.703	780	0.145
455	1.296	565	2.525	675	2.481		

*Without correction of sample absorption.



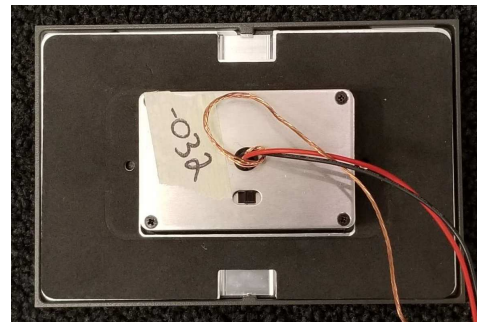
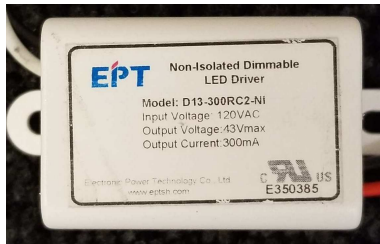
End Of Test Results

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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:

Ian Smith

Ian Smith
Engineer
Lighting Division

Report Reviewed By:

Jeff Davis

Jeff Davis
NA Technical Lead
Lighting Division

Attachments: IES File

REVISION HISTORY

JOB NUMBER	DATE OF REVISION	PROJECT HANDLER	REVIEWED BY	REVISION NOTE
None				