

VISUAL COMFORT GROUP TEST REPORT

SCOPE OF WORK

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

MODEL NUMBER

700LSLNG48**-LED930

REPORT NUMBER

104206403CHI-004

ISSUE DATE

January 24, 2020

REVISION DATE

None

DOCUMENT CONTROL NUMBER

TBD

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REPORT DATE: January 24, 2020

TEST REPORT

TEST OF ONE LINGER 48 LINEAR SUSPENSION

MODEL NO. 700LSLNG48**-LED930
LED MODEL NO. CITIZEN CLU028-1203C4-303H5M3-F1
DRIVER MODEL NO. LTF DA45W1200C2036-3001

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-01040682-1.

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 700LSLNG48**-LED930. The sample was received by Intertek on January 10, 2020 in undamaged condition and one sample was tested as received. The sample designation was AH01102020125804-004.

DATE OF TESTS

January 23, 2020 through January 24, 2020.

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SUMMARY

MODEL NO:	700LSLNG48**-LED930
DESCRIPTION:	Linger 48 Linear Suspension

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	3774.5	3540.9
Input Power (W) @ 120 (VAC)	45.97	45.88
Lumen Efficacy (lm/W)	82.1	77.2
Input Power Factor () @ 120 (VAC)	0.995	0.987

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	9.56
Correlated Color Temperature (K)	2938
Color Rendering Index - Ra	93.3
Color Rendering - R9	61.5
DUV	0.0005
Chromaticity Coordinate (x)	0.442
Chromaticity Coordinate (y)	0.407
Chromaticity Coordinate (u')	0.253
Chromaticity Coordinate (v')	0.523

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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
Elgar, AC Power Supply	CW1251	146111	VBV	VBV
Labsphere Spectroradiometer	CDS1100	CHI0091	VBV	VBV
3 Meter Sphere	SPR600	CHI0088	VBV	VBV
Elgar AC Power Supply	CW1251	146112	VBV	VBV
Sorenson DC Power Supply	XFR150-8	146846	VBV	VBV
Newport Humidity Recorder	iTHX-SD	146382	4/17/2019	4/17/2020
Yokogawa Power Meter	WT1600	146769	4/3/2019	4/3/2020
Extech K Temperature Meter	SD200	CHI0207	4/3/2019	4/3/2020

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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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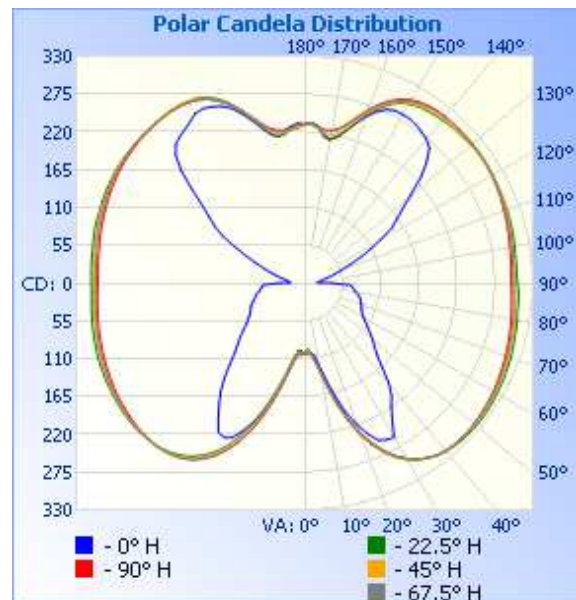
RESULTS OF TESTS

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)
AH01102020125804-004	Base Up	120.0	387.4	45.88	0.987	3540.9	77.2

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	104	104	104	104	104
5	102	103	103	104	104
10	123	132	132	131	130
15	170	183	183	181	179
20	218	234	233	232	229
25	252	271	272	270	268
30	259	294	296	296	295
35	219	311	312	311	310
40	189	319	318	318	318
45	149	322	320	320	320
50	129	323	320	320	319
55	111	323	320	319	318
60	98	321	319	317	315
65	91	320	317	314	312
70	87	317	313	312	309
75	83	314	311	309	306
80	75	312	309	306	304
85	70	310	307	304	301
90	40	308	304	302	299
95	21	307	304	303	300
100	26	308	306	305	302
105	40	310	308	306	304
110	57	312	310	309	307
115	90	313	312	311	310
120	128	314	313	313	313
125	163	315	314	315	315
130	200	314	314	316	316
135	250	312	312	315	316
140	274	310	312	315	316
145	281	307	310	313	314
150	283	301	303	305	308
155	279	286	288	291	293
160	257	260	263	266	268
165	230	229	234	239	240
170	212	212	218	224	226
175	229	226	225	228	228
180	231	231	231	231	231



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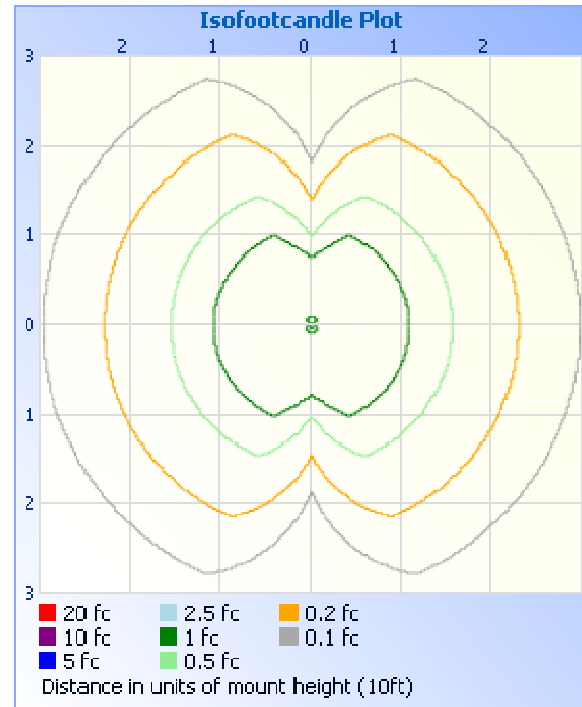
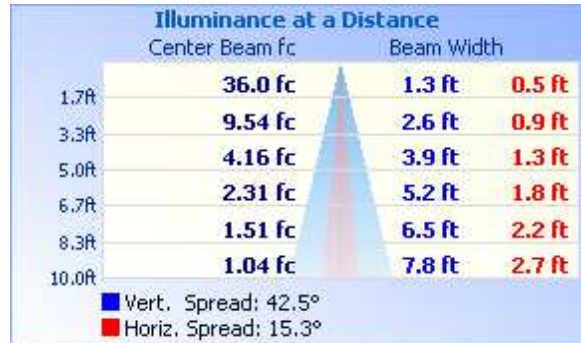
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RESULTS OF TESTS

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	184.6	5.2
0-40	371.5	10.5
0-60	866.4	24.5
60-90	884.2	25.0
70-100	892.8	25.2
90-120	868.5	24.5
0-90	1750.6	49.4
90-180	1790.4	50.6
0-180	3540.9	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	10.6	0.3
10-20	51.7	1.5
20-30	122.3	3.5
30-40	186.9	5.3
40-50	231.4	6.5
50-60	263.4	7.4
60-70	285.6	8.1
70-80	298.0	8.4
80-90	300.6	8.5
90-100	294.3	8.3
100-110	291.1	8.2
110-120	283.2	8.0
120-130	266.6	7.5
130-140	238.0	6.7
140-150	193.9	5.5
150-160	133.9	3.8
160-170	68.2	1.9
170-180	21.3	0.6

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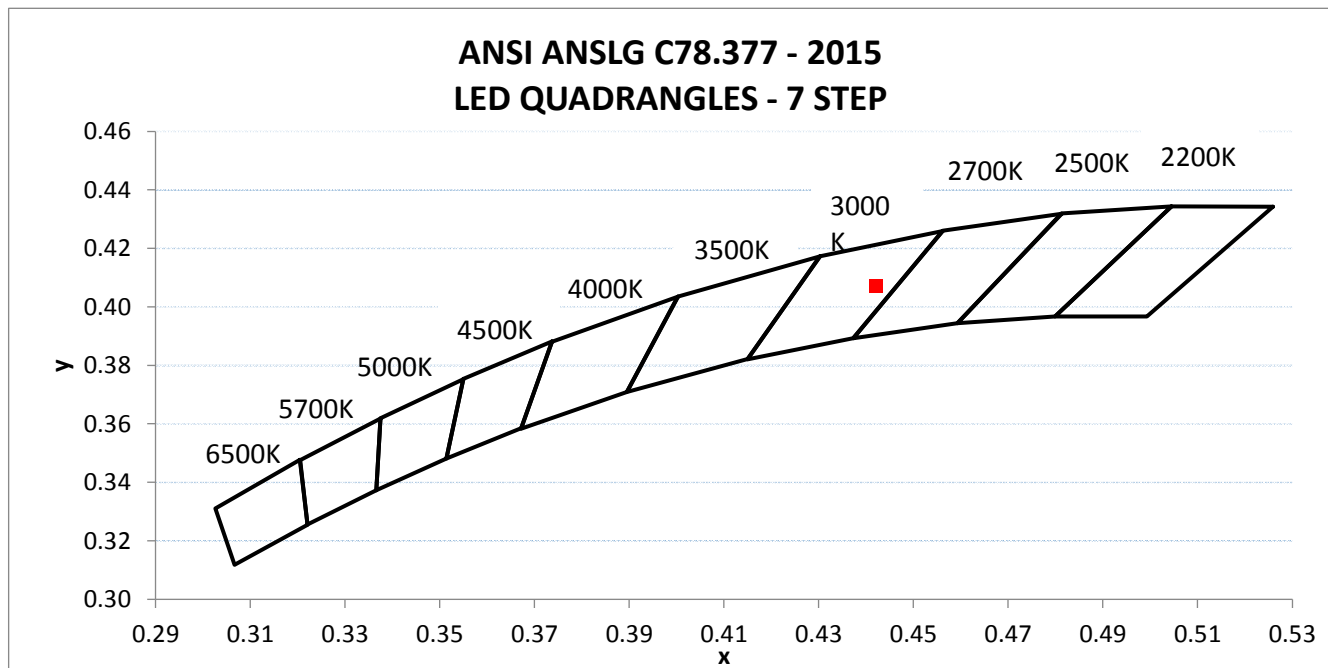
RESULTS OF TESTS

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 (%)
AH01102020125804-004	Base Up	120.00	385.00	45.97	0.995	9.56

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
3774.5	82.1	2938	93.3	61.5	0.0005

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.442	0.407	0.253	0.523



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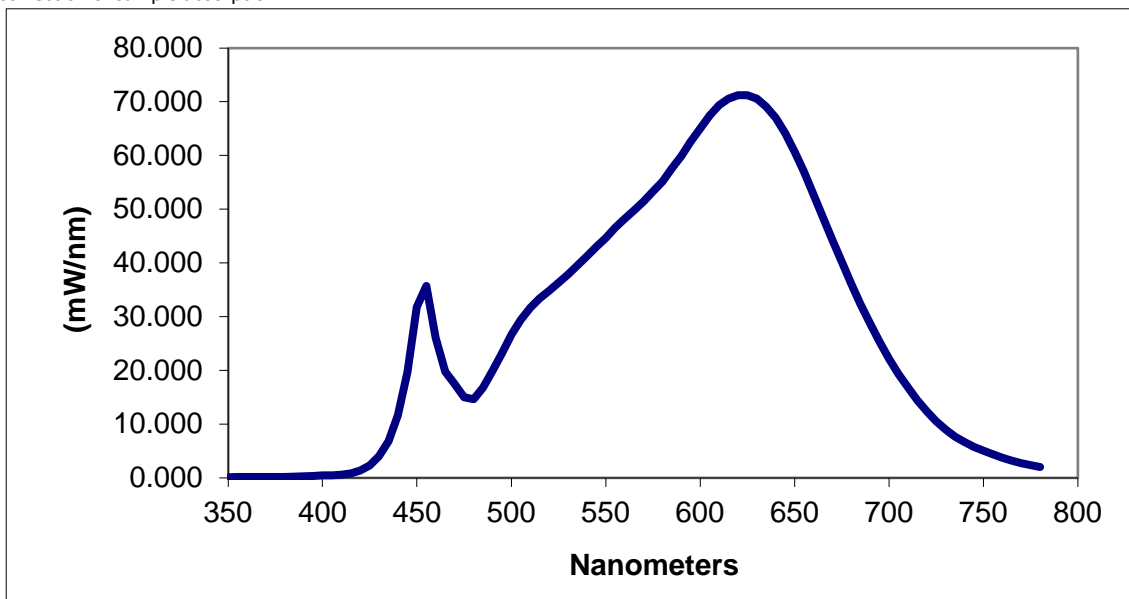
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PHOTOMETRIC AND ELECTRICAL MEASUREMENTS - INTEGRATING SPHERE METHOD (25°C +/- 1°C)

SPECTRAL DISTRIBUTION OVER VISIBLE WAVELENGTHS*							
nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.139	460	26.096	570	51.443	680	36.085
355	0.169	465	19.758	575	53.268	685	32.262
360	0.173	470	17.491	580	55.121	690	28.703
365	0.145	475	14.971	585	57.537	695	25.331
370	0.172	480	14.645	590	59.856	700	22.152
375	0.186	485	16.801	595	62.580	705	19.368
380	0.184	490	19.947	600	65.002	710	16.864
385	0.247	495	23.134	605	67.371	715	14.483
390	0.306	500	26.671	610	69.377	720	12.372
395	0.369	505	29.373	615	70.543	725	10.535
400	0.452	510	31.683	620	71.208	730	8.960
405	0.492	515	33.397	625	71.219	735	7.680
410	0.592	520	34.791	630	70.553	740	6.671
415	0.851	525	36.315	635	69.071	745	5.772
420	1.346	530	37.873	640	66.940	750	5.045
425	2.314	535	39.545	645	64.170	755	4.394
430	4.063	540	41.270	650	60.674	760	3.768
435	6.860	545	42.961	655	56.936	765	3.217
440	11.659	550	44.638	660	52.691	770	2.747
445	19.708	555	46.570	665	48.525	775	2.352
450	31.797	560	48.209	670	44.202	780	2.030
455	35.737	565	49.777	675	40.234		

*Without correction of sample absorption.



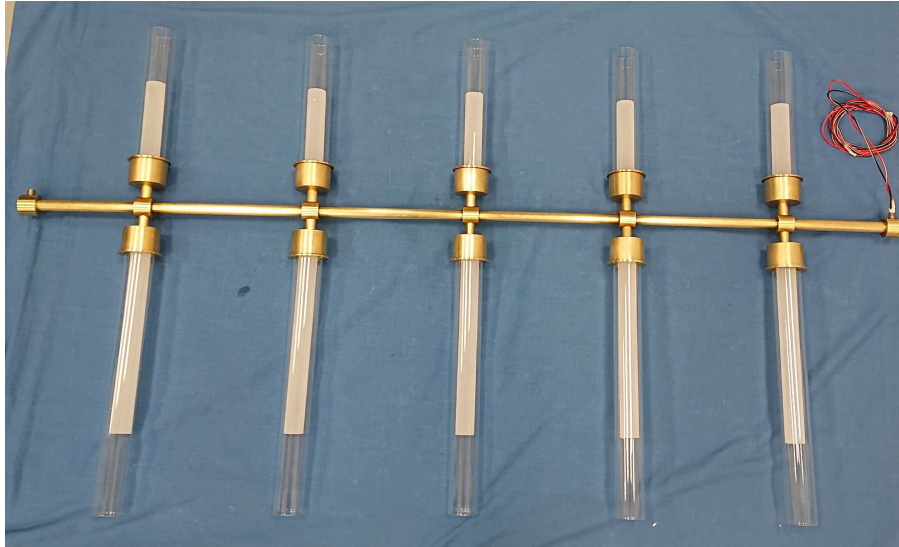
End Of Test Results

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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				