

VISUAL COMFORT GROUP TEST REPORT

SCOPE OF WORK

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

MODEL NUMBER

700MRAGxx-LED927

REPORT NUMBER

103017649CHI-085

ISSUE DATE

July 27, 2018

REVISION DATE

None

DOCUMENT CONTROL NUMBER

TBD

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REPORT DATE: July 27, 2018

TEST REPORT

TEST OF ONE CHANDELIER

MODEL NO. 700MRAGXX-LED927
LED MODEL NO. SEOUL STW9B12B-NZ
DRIVER MODEL NO. LTF / TA150WD24LED-0000

RENDERED TO:

VISUAL COMFORT GROUP
7400 LINDER AVE
SKOKIE, IL 60077

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-00779063-2.

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 700MRAGxx-LED927. The sample was received by Intertek on July 16, 2018 in undamaged condition and one sample was tested as received. The sample designation was AH07162018035546-085.

DATE OF TESTS

July 23, 2018 through July 24, 2018.

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SUMMARY

MODEL NO:	700MRAGxx-LED927
DESCRIPTION:	Chandelier

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	1816.1	1684.3
Input Power (W) @ 120 (VAC)	75.06	76.73
Lumen Efficacy (lm/W)	24.2	22.0
Input Power Factor () @ 120 (VAC)	0.897	0.942

CRITERIA	RESULTS
Input Current ATHD (%) @ 120 (VAC)	37.21
Correlated Color Temperature (K)	2656
Color Rendering Index - Ra	92.2
Color Rendering - R9	62.5
DUV	0.0012
Chromaticity Coordinate (x)	0.461
Chromaticity Coordinate (y)	0.408
Chromaticity Coordinate (u')	0.265
Chromaticity Coordinate (v')	0.526

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EQUIPMENT LIST

EQUIPMENT USED	MODEL NO.	CONTROL NO.	LAST CAL DATE	CAL DUE DATE
Yokogawa Power Meter	WT210	146919	7/9/2018	7/9/2019
Omega Newport Thermometer	DPI8-C24	146920	10/4/2017	10/4/2018
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU
Newport Thermohygrometer	iServer	146957	11/17/2017	11/17/2018
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU
3 Meter Sphere	SPR600	CHI0088	VBU	VBU
Elgar AC Power Supply	CW1251	146112	VBU	VBU
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU
Newport Humidity Recorder	iTHX-SD	146379	4/16/2018	4/16/2019
Yokogawa Power Meter	WT1600	146769	4/6/2018	4/6/2019

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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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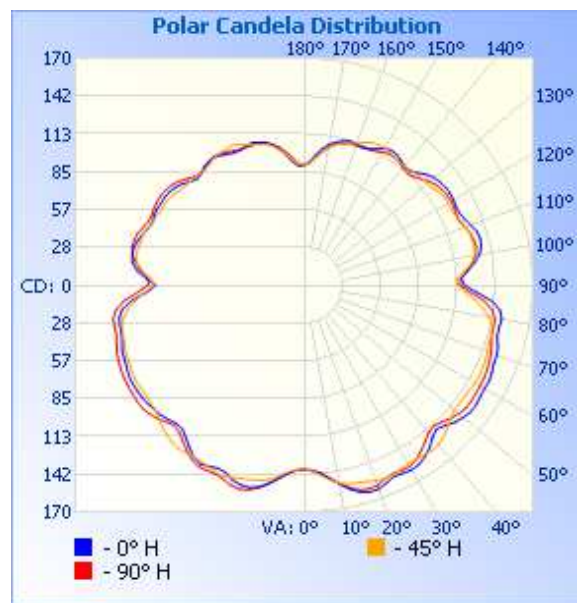
RESULTS OF TESTS

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)
AH07162018035546-085	Base Up	119.98	679.0	76.73	0.942	1684.3	22.0

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	692	692	692	692	692
5	672	668	672	676	677
10	617	612	616	619	620
15	546	539	544	546	549
20	456	452	454	455	458
25	360	355	357	358	361
30	243	235	238	243	250
35	117	110	112	113	117
40	33	30	29	30	31
45	16	15	16	16	16
50	12	12	12	12	12
55	9	9	9	9	9
60	7	6	6	7	7
65	5	4	5	5	5
70	3	3	3	3	3
75	1	1	1	1	1
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0



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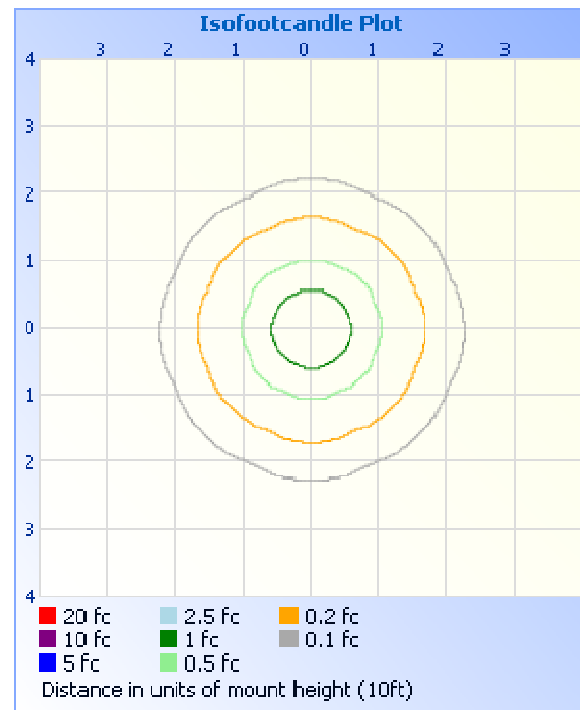
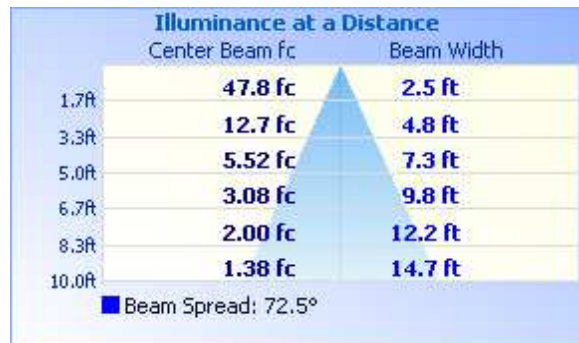
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RESULTS OF TESTS

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	130.2	7.7
0-40	225.8	13.4
0-60	471.0	28.0
60-90	444.1	26.4
70-100	443.4	26.3
90-120	403.9	24.0
0-90	915.2	54.3
90-180	769.1	45.7
0-180	1684.3	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	13.8	0.8
10-20	43.8	2.6
20-30	72.5	4.3
30-40	95.6	5.7
40-50	113.8	6.8
50-60	131.4	7.8
60-70	143.7	8.5
70-80	150.8	9.0
80-90	149.6	8.9
90-100	143.0	8.5
100-110	136.7	8.1
110-120	124.3	7.4
120-130	108.8	6.5
130-140	89.7	5.3
140-150	73.0	4.3
150-160	53.2	3.2
160-170	31.1	1.8
170-180	9.4	0.6

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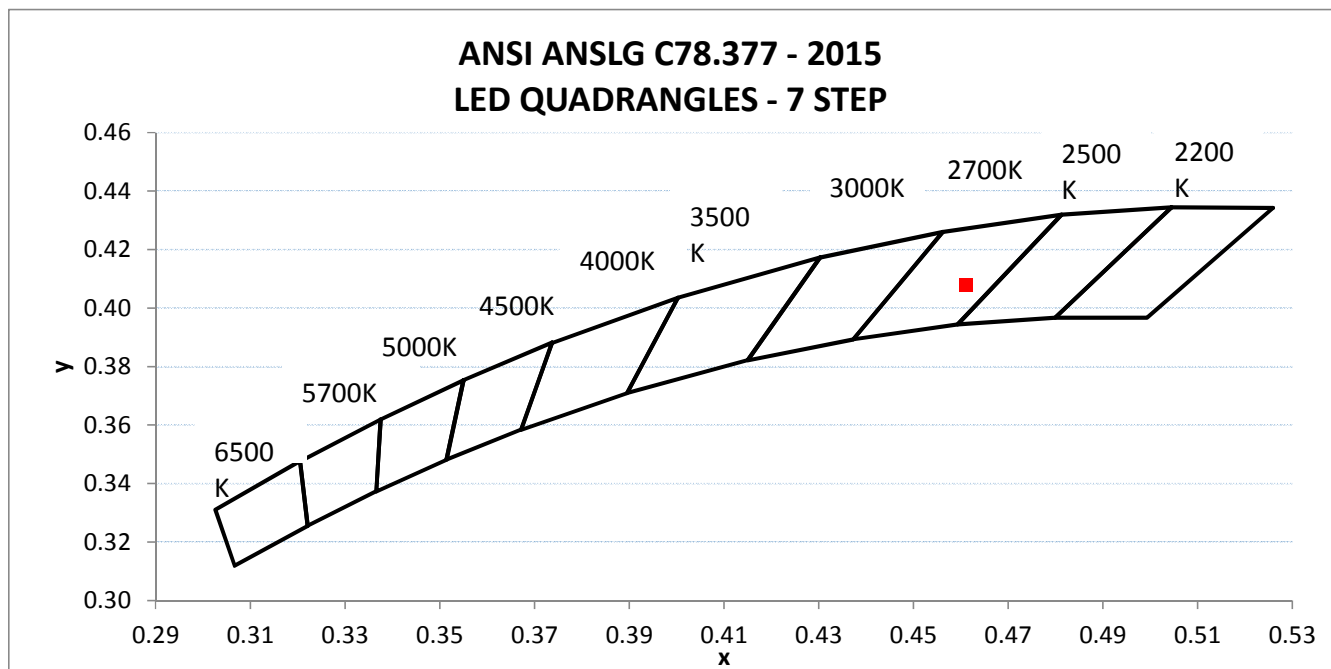
RESULTS OF TESTS

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 (%)
AH07162018035546-085	Base Up	120.00	697.20	75.06	0.897	37.21

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
1816.1	24.2	2656	92.2	62.5	0.0012

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.461	0.408	0.265	0.526



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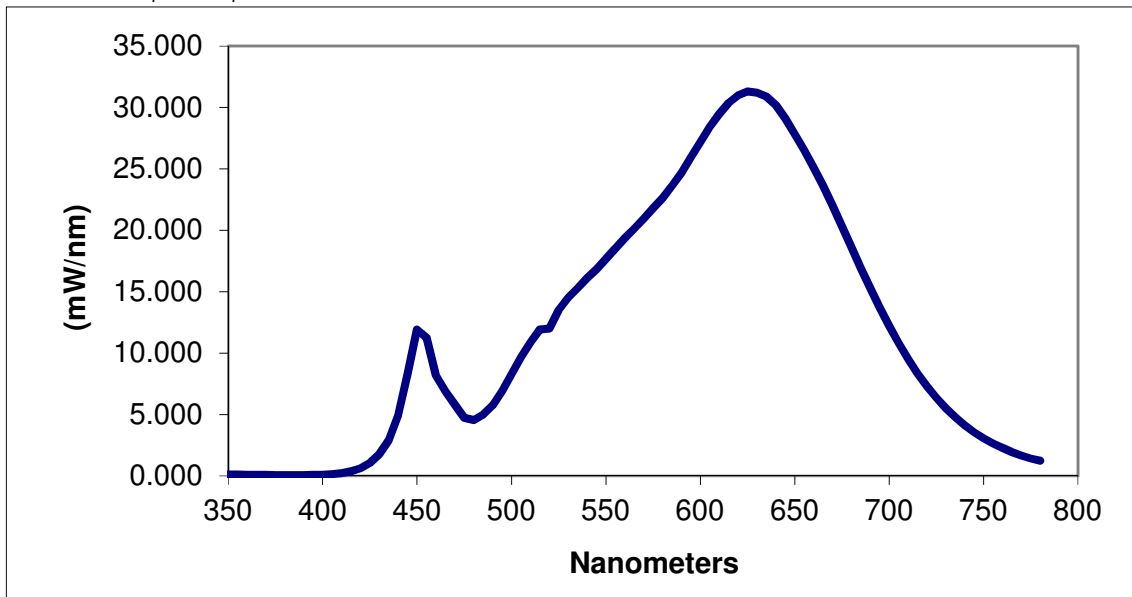
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RESULTS OF TESTS

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	0.121	460	8.199	570	20.944	680	18.631
355	0.117	465	6.892	575	21.801	685	16.931
360	0.103	470	5.819	580	22.642	690	15.291
365	0.104	475	4.726	585	23.618	695	13.733
370	0.090	480	4.560	590	24.672	700	12.211
375	0.083	485	4.989	595	25.938	705	10.831
380	0.081	490	5.753	600	27.184	710	9.526
385	0.077	495	6.908	605	28.410	715	8.349
390	0.080	500	8.317	610	29.476	720	7.303
395	0.091	505	9.647	615	30.375	725	6.372
400	0.103	510	10.888	620	31.004	730	5.528
405	0.147	515	11.921	625	31.309	735	4.780
410	0.225	520	12.004	630	31.199	740	4.132
415	0.380	525	13.523	635	30.875	745	3.563
420	0.629	530	14.543	640	30.175	750	3.072
425	1.057	535	15.279	645	29.129	755	2.641
430	1.756	540	16.127	650	27.813	760	2.280
435	2.911	545	16.813	655	26.541	765	1.953
440	4.915	550	17.682	660	25.099	770	1.676
445	8.329	555	18.524	665	23.653	775	1.438
450	11.934	560	19.366	670	22.000	780	1.243
455	11.264	565	20.125	675	20.351		

*Without correction of sample absorption.



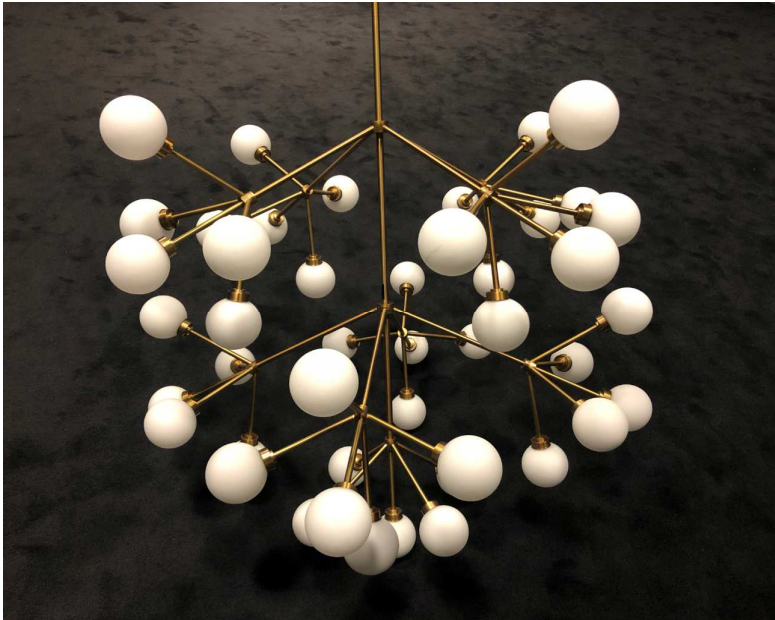
End Of Test Results

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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:

A handwritten signature in black ink, appearing to read 'Hector Huitron', written over a white background.

Hector Huitron
Associate Engineer
Lighting Division

Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Tim Quigley', written in a cursive style over a white background.

Timothy Quigley
Engineer
Lighting Division

Attachments: IES File

REVISION HISTORY

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