

VISUAL COMFORT GROUP TEST REPORT

SCOPE OF WORK

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

MODEL NUMBER

700KHELLO3

REPORT NUMBER

103982892CHI-001

ISSUE DATE

June 28, 2019

REVISION DATE

None

DOCUMENT CONTROL NUMBER

TBD

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REPORT NO.: 103982892CHI-001

REPORT DATE: June 28, 2019

TEST REPORT

TEST OF ONE LED HEAD

MODEL NO. 700KHELLO3
LED MODEL NO. TOSHIBA LDRA0730MU5USD

RENDERED TO:

VISUAL COMFORT GROUP
7400 LINDER AVE.
SKOKIE, IL 60077

AUTHORIZATION

The testing performed was authorized by signed quote number Qu-00981438-0.

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 700KHELLO3. The sample was received by Intertek on June 14, 2019 in undamaged condition and one sample was tested as received. The sample designation was AH06142019092403-001.

DATE OF TESTS

June 26, 2019 through June 27, 2019.

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SUMMARY

MODEL NO:	700KHELLO3
DESCRIPTION:	LED head

CRITERIA	RESULTS	
	INTEGRATING SPHERE	GONIOPHOTOMETER
Lumen Output (lumens)	289.6	293.8
Input Power (W) @ 12 (VAC)	6.73	6.69
Lumen Efficacy (lm/W)	43.0	43.9
Input Power Factor @ 12 (VAC)	0.720	0.774

CRITERIA	RESULTS
Input Current ATHD (%) @ 12 (VAC)	78.63
Correlated Color Temperature (K)	3285
Color Rendering Index - Ra	82.3
Color Rendering - R9	16.2
DUV	0.0010
Chromaticity Coordinate (x)	0.419
Chromaticity Coordinate (y)	0.400
Chromaticity Coordinate (u')	0.241
Chromaticity Coordinate (v')	0.517

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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	10/4/2018	10/4/2019
LSI High Speed Mirror Goniometer	6440T	146928	VBV	VBV
Newport Thermohygrometer	iServer	146957	12/11/2018	12/11/2019
Pacific, AC power supply	118-ACX	CHI0358	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	7/10/2018	7/10/2019
Newport Thermohygrometer	iTHX-M	146961	7/23/2018	7/23/2019

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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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TEST REPORT

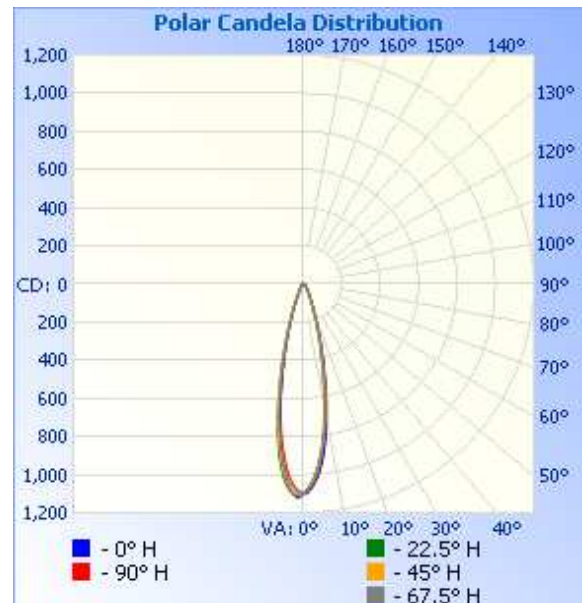
RESULTS OF TESTS

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)
AH06142019092403-001	Base Up	12.0	719.7	6.69	0.774	293.8	43.9

INTENSITY SUMMARY - CANDELAS

Angle	0	22.5	45	67.5	90
0	1097	1097	1097	1097	1097
5	975	930	941	954	979
10	668	619	646	665	694
15	366	326	346	362	379
20	176	154	164	177	180
25	84	75	79	85	86
30	54	48	47	48	48
35	33	30	30	31	30
40	22	21	21	21	22
45	17	16	16	16	17
50	14	14	14	14	15
55	13	14	13	13	14
60	11	12	12	11	13
65	11	9	9	10	9
70	7	7	7	7	7
75	5	4	4	4	4
80	2	2	2	2	2
85	1	1	1	1	1
90	0	0	0	0	0



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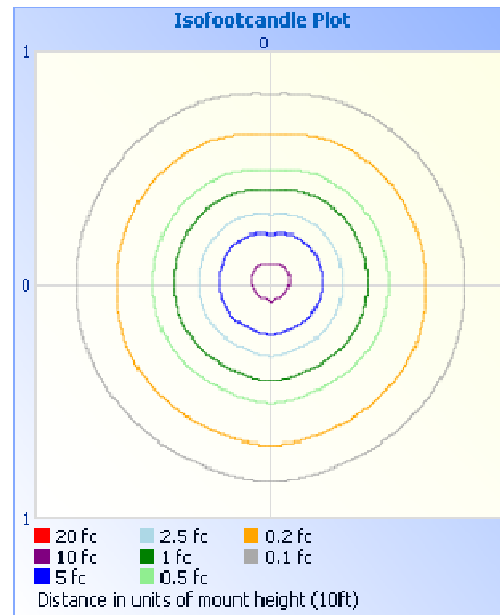
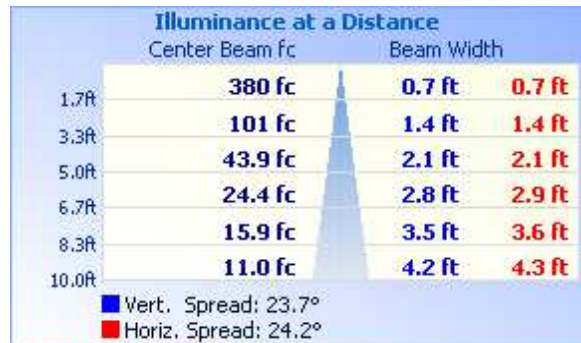
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RESULTS OF TESTS

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	233.8	79.6
0-40	253.8	86.4
0-60	279.0	95.0
60-90	14.8	5.0
70-100	5.6	1.9
90-120	0.0	0.0
0-90	293.8	100.0
90-180	0.0	0.0
0-180	293.8	100.0

ZONE	LUMENS	% LUMINAIRE
0-10	84.7	28.8
10-20	106.2	36.1
20-30	42.9	14.6
30-40	20.0	6.8
40-50	13.4	4.6
50-60	11.8	4.0
60-70	9.2	3.1
70-80	4.5	1.5
80-90	1.1	0.4

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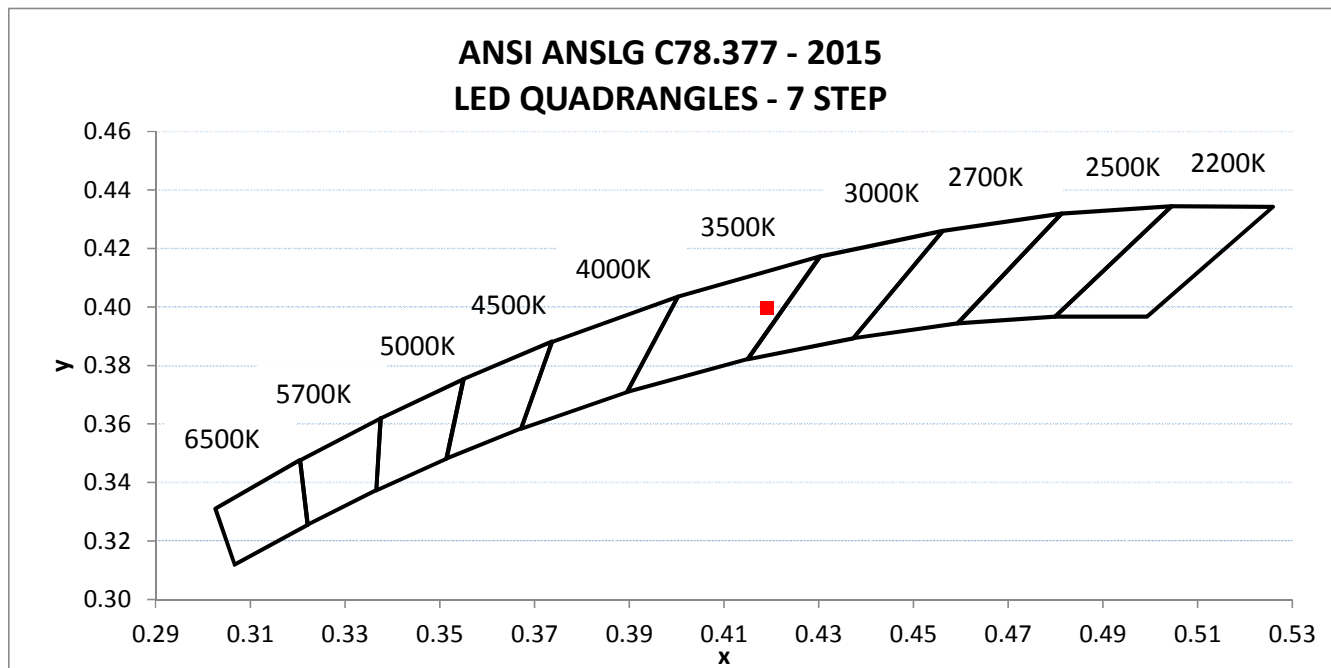
RESULTS OF TESTS

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 (%)
AH06142019092403-001	Base Up	11.99	780.10	6.73	0.720	78.63

LIGHT OUTPUT (lm)	LUMEN EFFICACY (lm/W)	CORRELATED COLOR TEMPERATURE - CCT (K)	CRI - Ra	CRI - R9	DUV
289.6	43.0	3285	82.3	16.2	0.0010

CIE 1931 CHROMATICITY COORDINATE (x)	CIE 1931 CHROMATICITY COORDINATE (y)	CIE 1976 CHROMATICITY COORDINATE (u')	CIE 1976 CHROMATICITY COORDINATE (v')
0.419	0.400	0.241	0.517



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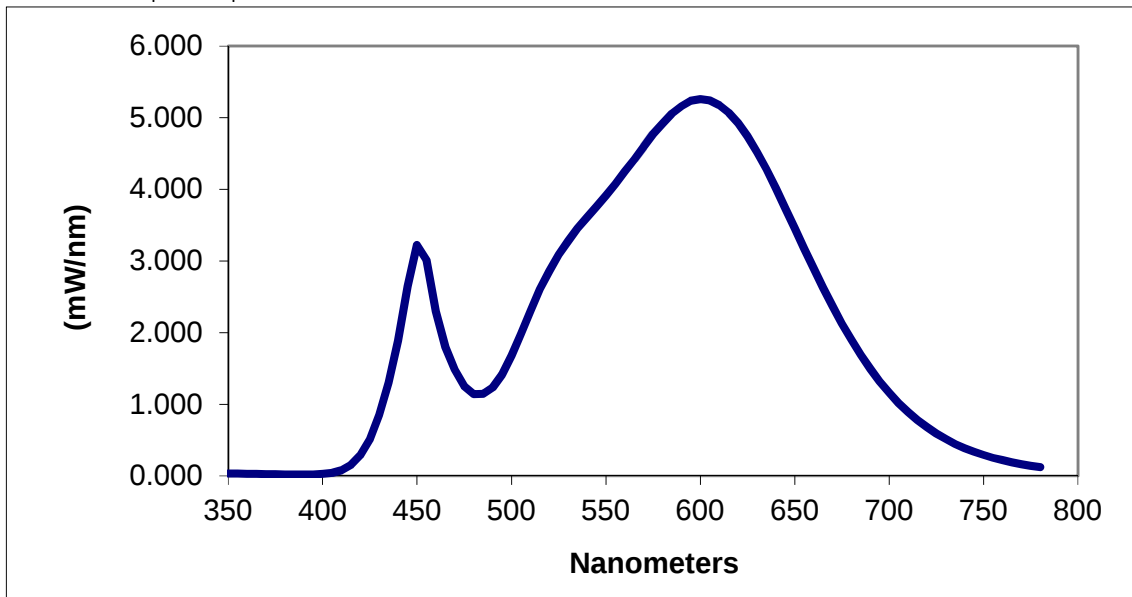
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RESULTS OF TESTS

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	0.034	460	2.301	570	4.595	680	1.901
355	0.034	465	1.800	575	4.771	685	1.692
360	0.032	470	1.486	580	4.919	690	1.496
365	0.030	475	1.255	585	5.058	695	1.321
370	0.028	480	1.140	590	5.161	700	1.162
375	0.026	485	1.145	595	5.237	705	1.018
380	0.023	490	1.237	600	5.260	710	0.890
385	0.021	495	1.416	605	5.240	715	0.781
390	0.021	500	1.682	610	5.173	720	0.681
395	0.022	505	1.984	615	5.073	725	0.593
400	0.029	510	2.304	620	4.925	730	0.516
405	0.044	515	2.606	625	4.743	735	0.447
410	0.080	520	2.862	630	4.516	740	0.388
415	0.155	525	3.087	635	4.281	745	0.337
420	0.289	530	3.282	640	4.011	750	0.292
425	0.514	535	3.456	645	3.737	755	0.254
430	0.854	540	3.612	650	3.453	760	0.221
435	1.304	545	3.757	655	3.173	765	0.191
440	1.888	550	3.914	660	2.897	770	0.164
445	2.645	555	4.072	665	2.630	775	0.144
450	3.225	560	4.252	670	2.371	780	0.124
455	3.012	565	4.414	675	2.130		

*Without correction of sample absorption.



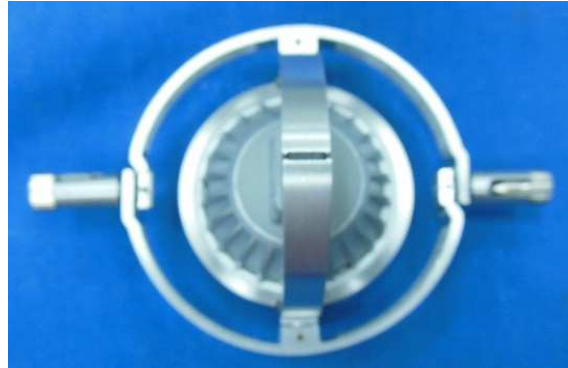
End Of Test Results

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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:

Timothy Quigley
Project Engineer
Lighting Division

Report Reviewed By:

Hector Huitron
Associate Engineer
Lighting Division

Attachments: IES File

REVISION HISTORY

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