



REPORT

545 E. Algonquin Rd., Arlington Heights, IL 60005

Project No. G103017649

Date: August 23, 2017

REPORT NO. 103017649CHI-046

TEST OF ONE LED CHANDELIER

MODEL NO. CH996ABLED930
LED MODEL NO. CITIZEN CLU028-1201C4-303H5K2
DRIVER MODEL NO. MORETECH DA22W600C2036BF1-00HE

RENDERED TO

GENERATION BRANDS
7400 LINDER AVE
SKOKIE, IL 60077 USA

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

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

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

IESNA LM-79 - 2008: Electrical and Photometric Measurements of Solid State Lighting

ANSI NEMA ANSLG C78.377: 2012: Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one production sample of model number CH996ABLED930. The sample was received by Intertek on August 17, 2017, in undamaged condition and one sample was tested as received. The sample designation was 0817201702341-046.

DATES OF TESTS: August 22, 2017 through August 23, 2017.



SUMMARY

Model No.:	CH996ABLED930
Description:	LED Chandelier

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	1897	1820
Total Power (W)	23.50	23.50
Luminaire Efficacy (LPW)	80.72	77.45

Criteria	Result
Power Factor	0.981
Current ATHD %	9.59
Correlated Color Temperature (CCT - K)	3067
Color Rendering Index (CRI - Ra)	92.3
Color Rendering Index (CRI - R9)	68.8
DUV	0.002
Chromaticity Coordinate (x)	0.435
Chromaticity Coordinate (y)	0.409
Chromaticity Coordinate (u')	0.247
Chromaticity Coordinate (v')	0.523

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date	Date Used
Yokogawa Power Meter	WT210	146919	07/10/17	07/10/18	08/22/17
Omega Newport Thermometer	DPI8-C24	146920	10/07/16	10/07/17	08/22/17
LSI High Speed Mirror Goniometer	6440T	146928	VBU	VBU	08/22/17
Newport Thermohygrometer	iServer	146956	01/06/17	01/06/18	08/22/17
Pacific, AC power supply	118-ACX	CHI0358	VBU	VBU	08/22/17
Labsphere Spectroradiometer	CDS1100	CHI0091	VBU	VBU	08/23/17
3 Meter Sphere	SPR600	CHI0088	VBU	VBU	08/23/17
Elgar AC Power Supply	CW1251M	146112	VBU	VBU	08/23/17
Sorenson DC Power Supply	XFR150-8	146846	VBU	VBU	08/23/17
Newport Humidity Recorder	iTHX-SD	146961	07/14/17	07/14/18	08/23/17
Yokogawa Power Meter	WT1600	146768	01/10/17	01/10/18	08/23/17
Extech temperature data logger	SD200	CHI0207	04/06/17	04/06/18	08/23/17



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 Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot 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. Electrical measurements including voltage, current, and power were measured using the Yokogawa 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 LSI Type C High Speed Model 6440 Mirror Goniometer was used to measure the intensity (candelas) at each angle of distribution for each sample.

Ambient temperature was measured equal to the height of the sample mounted on the Goniometer equipment. Each sample was operated at input rated voltage in its designated orientation. Each sample was allowed to stabilize for at least thirty minutes before measurements were made. Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

RESULTS OF TEST

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) - Integrating Sphere Method

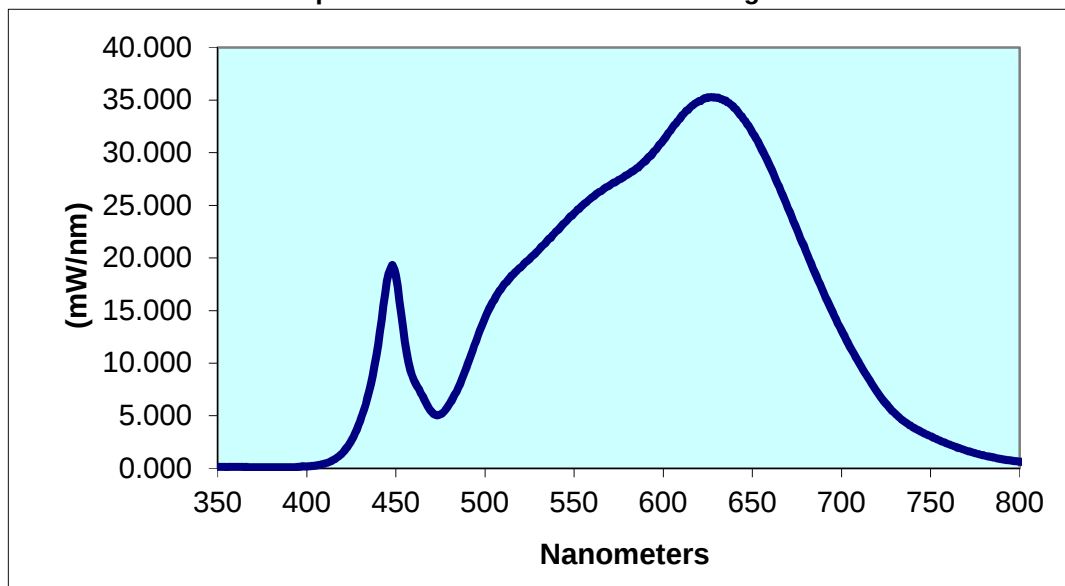
Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
0817201702341-046	Up	120.0	199.6	23.50	0.981	9.59	1897	80.72

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
3067	92.3	68.8	0.002	0.435	0.409	0.247	0.523

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.143	440	11.78	530	20.72	620	34.92	710	10.00
355	0.130	445	17.80	535	21.64	625	35.26	715	8.593
360	0.144	450	18.32	540	22.53	630	35.21	720	7.284
365	0.129	455	12.08	545	23.37	635	34.96	725	6.142
370	0.119	460	8.432	550	24.23	640	34.24	730	5.225
375	0.111	465	6.854	555	25.03	645	33.21	735	4.505
380	0.105	470	5.387	560	25.76	650	31.92	740	3.920
385	0.108	475	5.141	565	26.33	655	30.41	745	3.456
390	0.117	480	6.105	570	26.90	660	28.68	750	3.050
395	0.136	485	7.669	575	27.42	665	26.79	755	2.662
400	0.182	490	9.773	580	27.90	670	24.75	760	2.301
405	0.270	495	12.09	585	28.51	675	22.73	765	1.984
410	0.457	500	14.31	590	29.20	680	20.66	770	1.699
415	0.809	505	15.96	595	30.16	685	18.64	775	1.447
420	1.468	510	17.30	600	31.18	690	16.70	780	1.230
425	2.640	515	18.32	605	32.32	695	14.87		
430	4.534	520	19.08	610	33.40	700	13.10		
435	7.329	525	19.89	615	34.28	705	11.49		

Spectral Data Over Visible Wavelengths



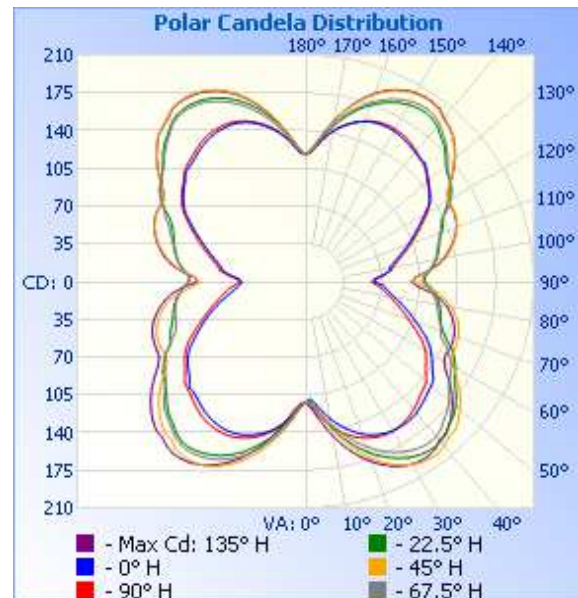
RESULTS OF TEST (cont'd)

Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {VAC}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (LPW)
0817201702341-046	Up	120.0	199.4	23.50	0.982	1820	77.45

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
0	112	112	112	112	112
5	115	119	120	120	123
10	129	137	139	134	136
15	141	154	158	149	147
20	150	168	174	163	154
25	156	180	187	174	159
30	160	188	196	182	160
35	160	193	200	187	159
40	159	194	199	187	155
45	154	187	195	180	149
50	151	180	186	173	145
55	142	168	173	162	135
60	134	159	157	155	127
65	122	149	151	144	114
70	108	134	150	133	101
75	95	129	145	127	89
80	83	125	136	123	78
85	74	120	123	117	70
90	63	110	99	108	61
95	73	115	115	114	72
100	79	122	132	122	82
105	89	127	141	126	91
110	101	133	148	132	103
115	113	139	152	138	116
120	127	153	151	155	130
125	140	163	163	163	139
130	147	169	179	170	146
135	155	180	191	182	154
140	157	188	197	191	158
145	160	192	203	196	162
150	162	190	201	193	164
155	162	184	195	187	163
160	158	174	185	177	158
165	152	162	170	164	151
170	142	147	151	148	141
175	128	130	131	131	128
180	118	118	118	118	118



RESULTS OF TEST (cont'd)

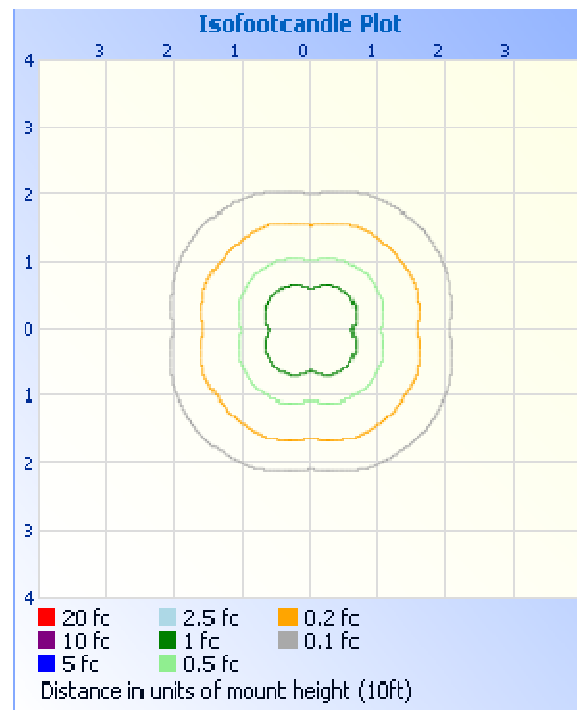
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



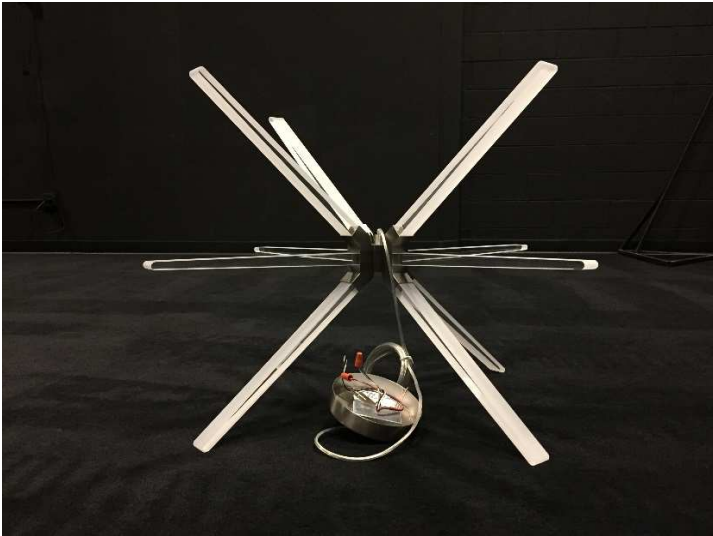
Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	137.2	7.5
0-40	252.2	13.9
0-60	528.3	29.0
60-90	378.8	20.8
0-90	907.1	49.8
90-180	912.9	50.2
0-180	1820	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	12.2	0.7
10-20	43.8	2.4
20-30	81.1	4.5
30-40	115.0	6.3
40-50	135.6	7.5
50-60	140.6	7.7
60-70	135.8	7.5
70-80	128.3	7.0
80-90	114.7	6.3
90-100	112.2	6.2
100-110	127.6	7.0
110-120	135.6	7.5
120-130	140.4	7.7
130-140	136.2	7.5
140-150	117.5	6.5
150-160	84.3	4.6
160-170	46.2	2.5
170-180	13.0	0.7

PICTURES (not to scale)



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:



Hector Huitron
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Timothy Quigley
Engineer
Lighting Division