



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102328456

Date: April 2, 2016

REPORT NO. 102328456LAX-042

TEST OF ONE LED CHORUS

MODEL NO. DW CHORUS 48 CW & WW

RENDERED TO

ELATION LIGHTING
6122 S. EASTERN AVE
COMMERCE CA 90040

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

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number Qu-00648726.

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

DESCRIPTION OF SAMPLE: The client submitted one prototype sample of model number DW CHORUS 48 CW & WW. The sample was received by Intertek on March 21, 2016, in undamaged condition and one sample was tested as received. The sample designation was LAN-1603210811-002.

DATES OF TESTS: March 31, 2016 through April 1, 2016.

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SUMMARY

Model No.:	DW CHORUS 48 CW & WW
Description:	LED CHORUS

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	14858	14945
Total Power (W)	304.8	304.9
Luminaire Efficacy (LPW)	48.75	49.02

Criteria	Result
Power Factor	0.982
Current ATHD %	16.85
Correlated Color Temperature (CCT - K)	4023
Color Rendering Index (CRI - Ra)	77.9
Color Rendering Index (CRI - R9)	14.8
DUV	0.008
Chromaticity Coordinate (x)	0.374
Chromaticity Coordinate (y)	0.358
Chromaticity Coordinate (u')	0.229
Chromaticity Coordinate (v')	0.492

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	03/07/16	04/07/16
LabSphere Spectrometer	CDS-3020	000834	03/07/16	04/07/16
California Instruments Power Supply	CSW5550	001339	VBU	VBU
Yokogawa Power Meter	WT333	001320	06/03/15	06/03/16
Extech Instruments Stop Watch	365510	001379	11/19/15	11/16/16
Temp. & RH Meter	971	001380	12/17/15	12/17/16
DC Power Supply	LPS-100-0833	000836	05/07/15	05/07/16
LSI High Speed Mirror Goniometer	6440T	000943	03/08/16	04/08/16
California Instruments Power Supply	CSW5550	001339	VBU	VBU
Yokogawa Power Analyzer	WT210	000945	12/04/15	12/04/16
Temp. & RH Meter	971	001380	12/17/15	12/17/16
Extech Instruments Stop Watch	9/23/2900	001379	11/19/15	11/19/16
Tape Measure	C1-25	000915	12/04/15	12/04/16

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 CDS 3020 Spectrometer and Three Meter 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 spectrometer 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

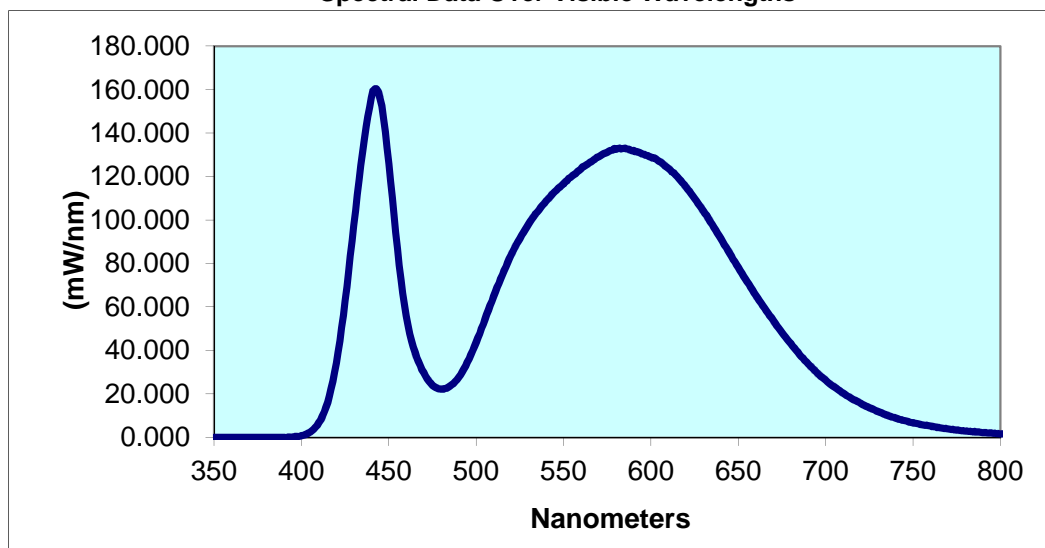
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN-1603210811-002	UP	120.0	2580	304.8	0.9819	16.85	14858	48.75

Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
4023	77.9	14.8	0.008	0.374	0.358	0.229	0.492

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.039	440	156.300	530	98.33	620	115.200	710	20.420
355	0.039	445	156.100	535	103.90	625	110.000	715	17.860
360	0.039	450	125.900	540	108.80	630	104.100	720	15.710
365	0.039	455	86.660	545	113.10	635	98.020	725	13.730
370	0.039	460	55.950	550	116.80	640	91.510	730	11.910
375	0.039	465	39.210	555	120.50	645	84.720	735	10.340
380	0.039	470	29.820	560	123.50	650	78.130	740	9.007
385	0.039	475	23.980	565	126.60	655	71.680	745	7.755
390	0.039	480	22.280	570	129.20	660	65.490	750	6.824
395	0.243	485	23.710	575	131.20	665	59.440	755	5.940
400	0.840	490	27.740	580	132.70	670	53.820	760	5.289
405	2.559	495	34.650	585	133.20	675	48.230	765	4.517
410	6.852	500	43.850	590	132.10	680	43.070	770	3.937
415	16.190	505	54.350	595	130.50	685	38.190	775	3.393
420	34.270	510	64.880	600	129.00	690	33.830	780	2.993
425	62.850	515	74.900	605	126.90	695	29.800		
430	97.400	520	84.050	610	123.90	700	26.300		
435	131.500	525	91.500	615	120.00	705	23.210		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

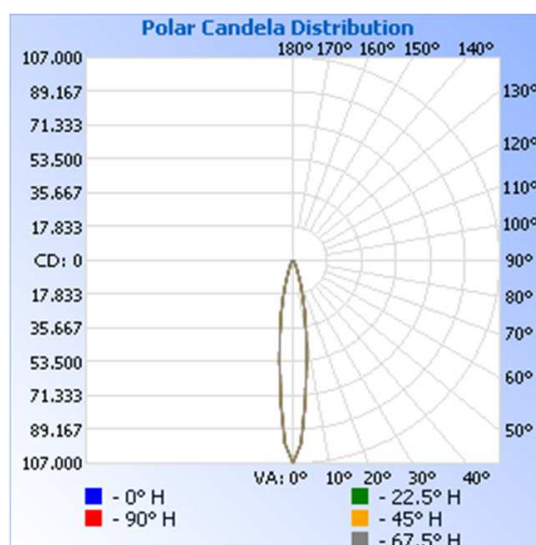
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
LAN-1603210811-002	UP	120.0	2594	304.9	0.981	14945	49.02

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 106,686.6

Angle	0	22.5	45	67.5	90
0	106687	106687	106687	106687	106687
5	73911	73911	73911	73911	73911
10	39106	39106	39106	39106	39106
15	19479	19479	19479	19479	19479
20	8743	8743	8743	8743	8743
25	4334	4334	4334	4334	4334
30	2420	2420	2420	2420	2420
35	1214	1214	1214	1214	1214
40	580	580	580	580	580
45	410	410	410	410	410
50	242	242	242	242	242
55	131	131	131	131	131
60	116	116	116	116	116
65	95	95	95	95	95
70	58	58	58	58	58
75	65	65	65	65	65
80	38	38	38	38	38
85	35	35	35	35	35
90	30	30	30	30	30

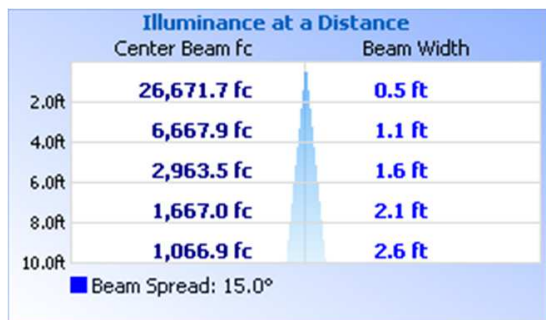


RESULTS OF TEST (cont'd)

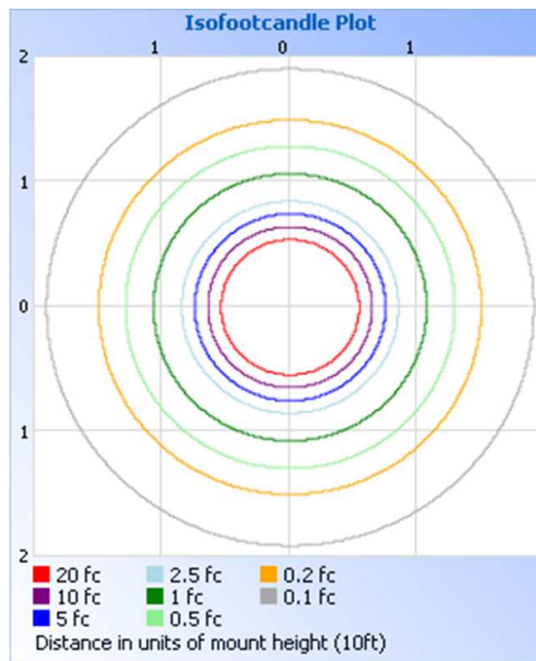
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	13515	90.4
0-40	14330	95.9
0-60	14769	98.8
60-90	171.6	1.1
0-90	14941	100.0
90-180	4.2	0.0
0-180	14945	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	5866	39.2
10-20	5519	36.9
20-30	2131	14.3
30-40	814.8	5.5
40-50	299.2	2.0
50-60	139.8	0.9
60-70	85.2	0.6
70-80	52.5	0.4
80-90	33.9	0.2
90-100	4.2	0.0

PICTURE (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:



Ameet Alawi
Technician
Lighting Division

Attachment: None

Report Reviewed By:



Kenda Branch
Lighting Performance Team Lead
Lighting Division