



# REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102328456

Date: April 1, 2016

REPORT NO. 102328456LAX-039

TEST OF ONE LED CHORUS

MODEL NO. DW CHORUS 72 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 72 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-1603210811-001.

DATES OF TESTS: March 28, 2016

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## SUMMARY

Model No.:	DW CHORUS 72 CW & WW
Description:	LED CHORUS

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	18543	17919
Total Power (W)	369.0	362.9
Luminaire Efficacy (LPW)	50.25	49.38

Criteria	Result
Power Factor	0.975
Current ATHD %	16.20
Correlated Color Temperature (CCT - K)	4020
Color Rendering Index (CRI - Ra)	76.8
Color Rendering Index (CRI - R9)	12.7
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

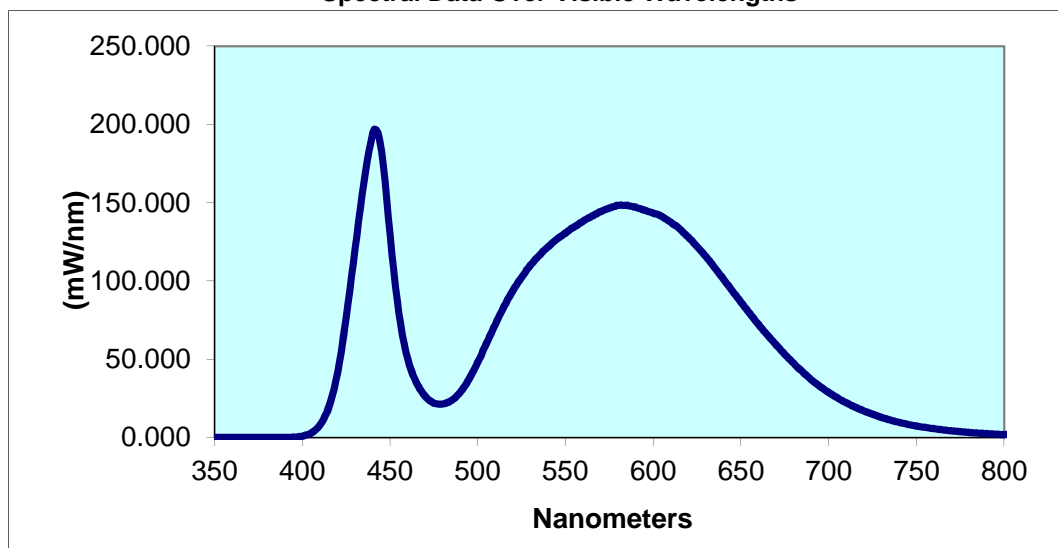
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN-1603210811-001	UP	120.0	3155	369.0	0.9745	16.20	18543	50.25

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')
4020	76.8	12.7	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	0.006	440	194.000	530	110.100	620	127.900	710	22.210
355	0.006	445	183.000	535	116.300	625	121.900	715	19.460
360	0.006	450	129.200	540	121.900	630	115.500	720	17.050
365	0.006	455	79.500	545	126.700	635	108.500	725	14.840
370	0.006	460	50.290	550	130.700	640	101.200	730	12.860
375	0.006	465	34.930	555	134.600	645	93.650	735	11.200
380	0.006	470	26.180	560	138.200	650	86.270	740	9.739
385	0.006	475	21.900	565	141.600	655	79.090	745	8.399
390	0.006	480	21.450	570	144.300	660	72.250	750	7.336
395	0.239	485	23.810	575	146.600	665	65.560	755	6.455
400	0.903	490	29.120	580	148.200	670	59.200	760	5.668
405	2.950	495	37.550	585	148.500	675	53.020	765	4.866
410	8.094	500	48.300	590	147.200	680	47.420	770	4.238
415	19.480	505	60.330	595	145.100	685	42.050	775	3.671
420	41.540	510	72.350	600	143.400	690	37.040	780	3.225
425	77.420	515	83.770	605	141.100	695	32.580		
430	120.300	520	94.050	610	137.600	700	28.760		
435	163.100	525	102.600	615	133.300	705	25.300		

**Spectral Data Over Visible Wavelengths**



# RESULTS OF TEST (cont'd)

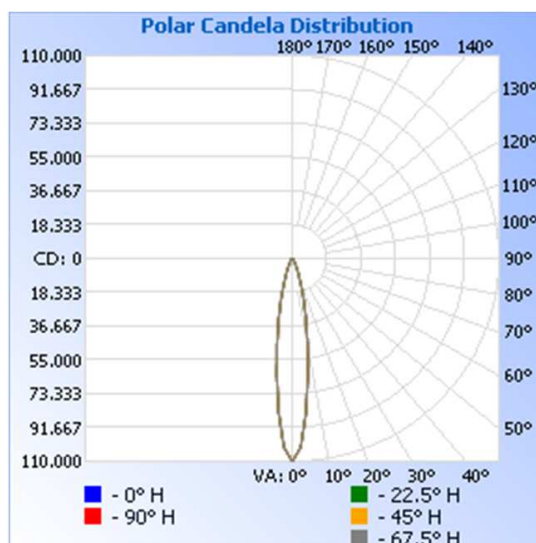
## Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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-1603210811-001	UP	120.0	3235	362.9	0.97	17919	49.38

## Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 109,941.4

Angle	0	22.5	45	67.5	90
0	109941	109941	109941	109941	109941
5	83671	83671	83671	83671	83671
10	46558	46558	46558	46558	46558
15	23494	23494	23494	23494	23494
20	11035	11035	11035	11035	11035
25	5543	5543	5543	5543	5543
30	2995	2995	2995	2995	2995
35	1534	1534	1534	1534	1534
40	790	790	790	790	790
45	520	520	520	520	520
50	345	345	345	345	345
55	249	249	249	249	249
60	162	162	162	162	162
65	129	129	129	129	129
70	112	112	112	112	112
75	60	60	60	60	60
80	47	47	47	47	47
85	20	20	20	20	20
90	0	0	0	0	0

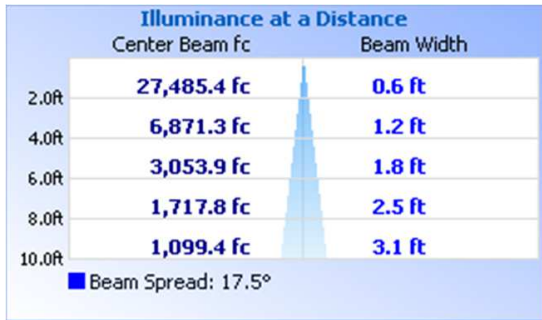


## RESULTS OF TEST (cont'd)

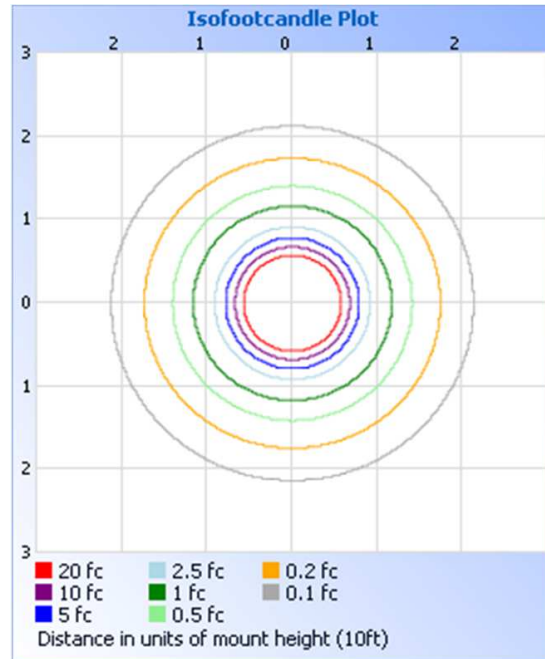
### Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	16063	89.6
0-40	17078	95.3
0-60	17710	98.8
60-90	209.3	1.2
0-90	17919	100.0
90-180	0.0	0.0
0-180	17919	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	6697	37.4
10-20	6667	37.2
20-30	2700	15.1
30-40	1015	5.7
40-50	405.2	2.3
50-60	226.5	1.3
60-70	132.1	0.7
70-80	63.3	0.4
80-90	14.0	0.1

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:

A handwritten signature in black ink, appearing to read 'Ameet Alawi'.

Ameet Alawi  
Technician  
Lighting Division

Attachment: None

Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Kenda Branch'.

Kenda Branch  
Lighting Performance Team Lead  
Lighting Division