



REPORT

25800 COMMERCE DRIVE, LAKE FOREST, CA 92630

Project No. G102328456

Date: April 1, 2016

REPORT NO. 102328456LAX-047

TEST OF ONE LED CHORUS

MODEL NO. DW CHORUS 24 CW

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 24 CW. 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-1603210811-005.

DATES OF TESTS: March 29, 2016 through March 30, 2016.

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SUMMARY

Model No.:	DW CHORUS 24 CW
Description:	LED CHORUS

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	6387	6440
Total Power (W)	124.8	123.5
Luminaire Efficacy (LPW)	51.18	52.15

Criteria	Result
Power Factor	0.987
Current ATHD %	12.24
Correlated Color Temperature (CCT - K)	5922
Color Rendering Index (CRI - Ra)	67.9
Color Rendering Index (CRI - R9)	-17.4
DUV	0.004
Chromaticity Coordinate (x)	0.324
Chromaticity Coordinate (y)	0.328
Chromaticity Coordinate (u')	0.206
Chromaticity Coordinate (v')	0.469

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

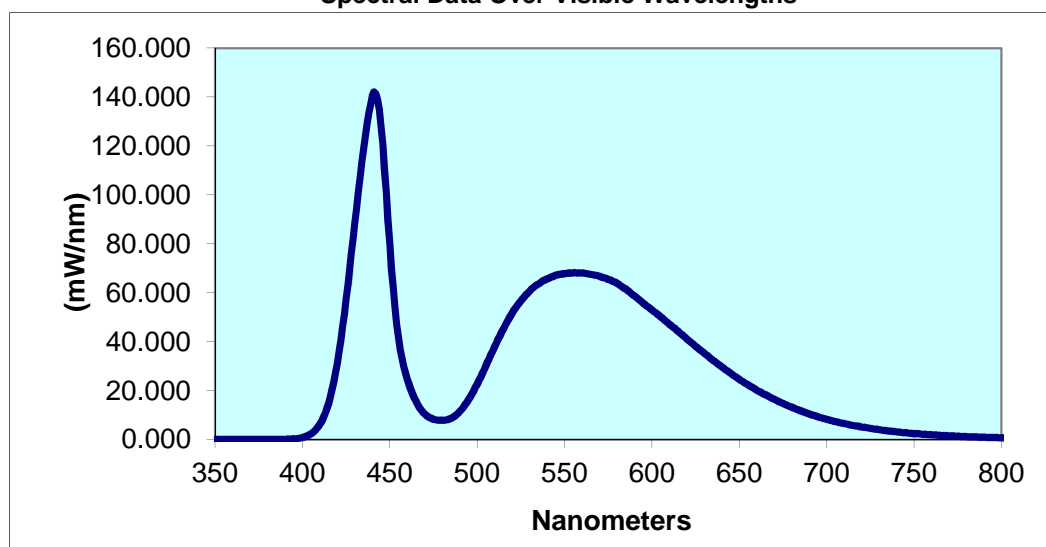
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN-1603210811-005	UP	120.0	1051	124.8	0.9866	12.24	6387	51.18

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')
5922	67.9	-17.4	0.004	0.324	0.328	0.206	0.469

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.004	440	140.500	530	60.770	620	41.080	710	6.539
355	0.004	445	128.300	535	63.600	625	38.140	715	5.795
360	0.004	450	79.710	540	65.730	630	35.240	720	5.167
365	0.004	455	41.600	545	67.150	635	32.390	725	4.582
370	0.004	460	24.710	550	67.790	640	29.680	730	4.004
375	0.004	465	15.540	555	68.160	645	27.060	735	3.531
380	0.004	470	10.420	560	68.020	650	24.610	740	3.090
385	0.040	475	8.310	565	67.570	655	22.330	745	2.728
390	0.059	480	7.816	570	66.760	660	20.220	750	2.413
395	0.230	485	8.697	575	65.480	665	18.300	755	2.145
400	0.804	490	11.470	580	63.870	670	16.430	760	1.909
405	2.381	495	16.220	585	61.600	675	14.750	765	1.672
410	6.310	500	22.670	590	58.760	680	13.200	770	1.474
415	14.940	505	30.240	595	55.780	685	11.750	775	1.301
420	31.260	510	37.950	600	52.990	690	10.450	780	1.151
425	57.510	515	45.290	605	50.130	695	9.283		
430	88.310	520	51.710	610	47.140	700	8.251		
435	119.000	525	56.660	615	44.220	705	7.353		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

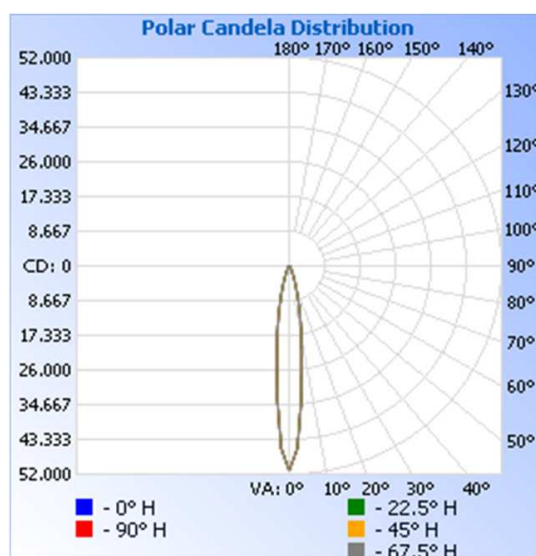
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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-1603210811-005	UP	120.0	1052	123.5	0.983	6440	52.15

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 51,049.1

Angle	0	22.5	45	67.5	90
0	51049	51049	51049	51049	51049
5	33516	33516	33516	33516	33516
10	16819	16819	16819	16819	16819
15	8055	8055	8055	8055	8055
20	3513	3513	3513	3513	3513
25	1776	1776	1776	1776	1776
30	1000	1000	1000	1000	1000
35	523	523	523	523	523
40	276	276	276	276	276
45	172	172	172	172	172
50	118	118	118	118	118
55	89	89	89	89	89
60	66	66	66	66	66
65	51	51	51	51	51
70	36	36	36	36	36
75	15	15	15	15	15
80	10	10	10	10	10
85	4	4	4	4	4
90	3	3	3	3	3

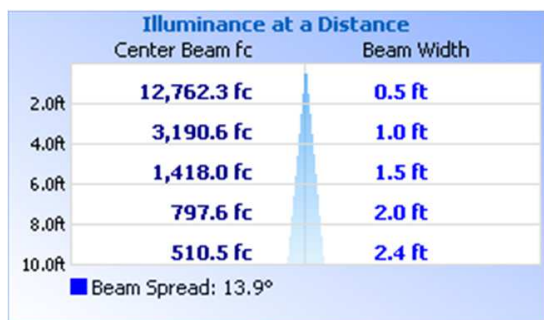


RESULTS OF TEST (cont'd)

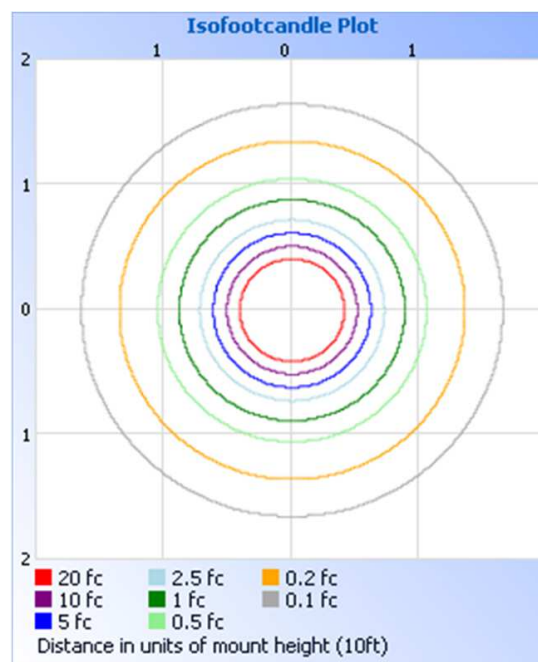
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	5802	90.1
0-40	6148	95.5
0-60	6366	98.8
60-90	73.7	1.1
0-90	6440	100.0
90-180	0.5	0.0
0-180	6440	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	2634	40.9
10-20	2299	35.7
20-30	868.9	13.5
30-40	345.8	5.4
40-50	137.8	2.1
50-60	80.1	1.2
60-70	47.8	0.7
70-80	20.4	0.3
80-90	5.5	0.1
90-100	0.5	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