REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102328456 Date: April 1, 2016

REPORT NO. 102328456LAX-046

TEST OF ONE LED CHORUS

MODEL NO. DW CHORUS 24 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 24 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-1603210811-005.

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

SUMMARY

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

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	4739	4746
Total Power (W)	125.3	124.2
Luminaire Efficacy (LPW)	37.82	38.21

Criteria	Result
Power Factor	0.987
Current ATHD %	12.77
Correlated Color Temperature (CCT - K)	2703
Color Rendering Index (CRI - Ra)	81.0
Color Rendering Index (CRI - R9)	10.5
DUV	0.000
Chromaticity Coordinate (x)	0.460
Chromaticity Coordinate (y)	0.411
Chromaticity Coordinate (u')	0.262
Chromaticity Coordinate (v')	0.528

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

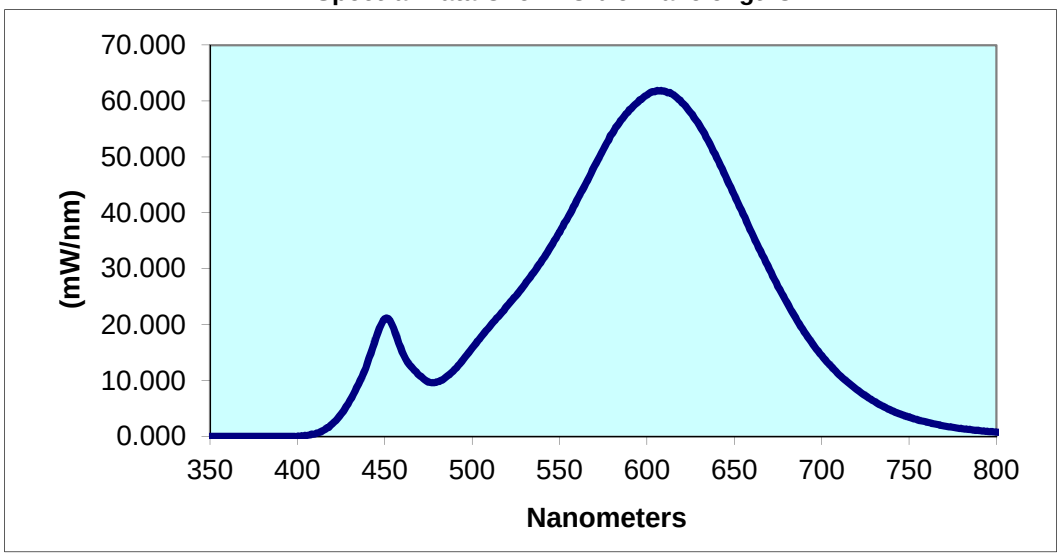
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN-1603210811-005	UP	120.0	1055	125.3	0.9865	12.77	4739	37.82

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')
2703	81.0	10.5	0.000	0.460	0.411	0.262	0.528

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.007	440	13.080	530	27.190	620	59.740	710	11.080
355	0.007	445	17.660	535	29.250	625	57.960	715	9.655
360	0.007	450	21.060	540	31.580	630	55.640	720	8.433
365	0.007	455	19.400	545	33.980	635	52.930	725	7.325
370	0.007	460	15.120	550	36.570	640	49.890	730	6.290
375	0.007	465	12.510	555	39.340	645	46.510	735	5.417
380	0.007	470	10.900	560	42.240	650	43.190	740	4.663
385	0.007	475	9.746	565	45.300	655	39.790	745	3.999
390	0.007	480	9.768	570	48.360	660	36.470	750	3.466
395	0.007	485	10.640	575	51.310	665	33.130	755	2.981
400	0.037	490	12.010	580	54.170	670	29.960	760	2.601
405	0.185	495	13.820	585	56.570	675	26.860	765	2.226
410	0.485	500	15.840	590	58.470	680	23.990	770	1.913
415	1.141	505	17.790	595	59.860	685	21.300	775	1.657
420	2.310	510	19.670	600	61.090	690	18.750	780	1.436
425	4.033	515	21.500	605	61.760	695	16.450		
430	6.390	520	23.360	610	61.760	700	14.470		
435	9.408	525	25.130	615	61.140	705	12.690		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

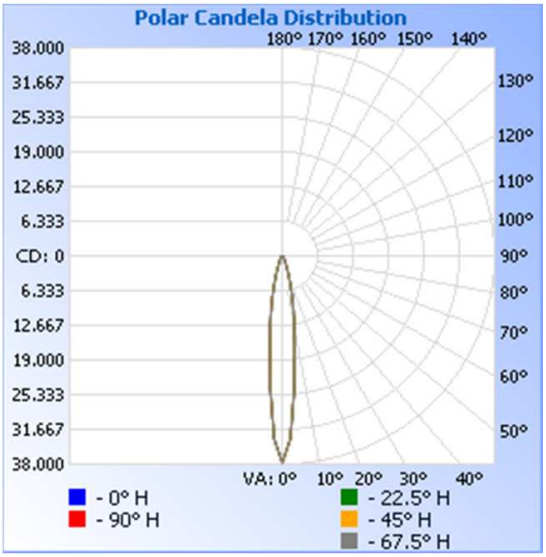
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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	124.2	0.983	4746	38.21

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 37,706.4

Angle	0	22.5	45	67.5	90
0	37706	37706	37706	37706	37706
5	24406	24406	24406	24406	24406
10	12350	12350	12350	12350	12350
15	6007	6007	6007	6007	6007
20	2629	2629	2629	2629	2629
25	1350	1350	1350	1350	1350
30	765	765	765	765	765
35	394	394	394	394	394
40	202	202	202	202	202
45	122	122	122	122	122
50	85	85	85	85	85
55	59	59	59	59	59
60	45	45	45	45	45
65	26	26	26	26	26
70	20	20	20	20	20
75	10	10	10	10	10
80	2	2	2	2	2
85	0	0	0	0	0
90	0	0	0	0	0

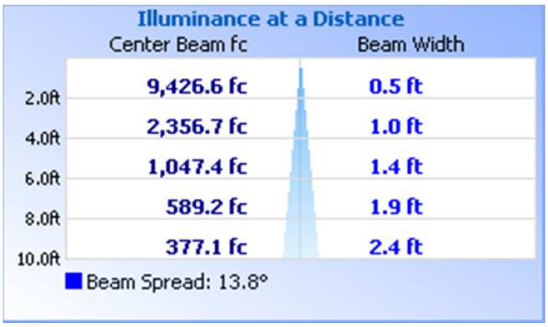


RESULTS OF TEST (cont'd)

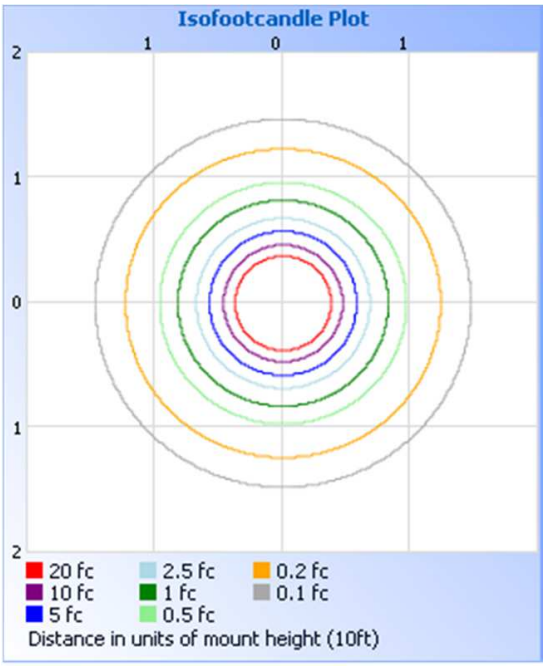
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	4289	90.4
0-40	4550	95.9
0-60	4705	99.1
60-90	40.7	0.9
0-90	4746	100.0
90-180	0.0	0.0
0-180	4746	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	1924	40.5
10-20	1708	36.0
20-30	656.3	13.8
30-40	261.3	5.5
40-50	99.8	2.1
50-60	55.5	1.2
60-70	30.4	0.6
70-80	9.8	0.2
80-90	0.4	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

Report Reviewed By:

Kenda Branch
Lighting Performance Team Lead
Lighting Division

Attachment: None