



REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G102328456

Date: April 2, 2016

REPORT NO. 102328456LAX-044

TEST OF ONE LED CHORUS

MODEL NO. DW CHORUS 48 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 48 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-1603210811-002.

DATES OF TESTS: March 30, 2016 through March 31, 2016.

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SUMMARY

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

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	12262	12626
Total Power (W)	245.2	243.5
Luminaire Efficacy (LPW)	50.01	51.85

Criteria	Result
Power Factor	0.978
Current ATHD %	18.83
Correlated Color Temperature (CCT - K)	5968
Color Rendering Index (CRI - Ra)	70.2
Color Rendering Index (CRI - R9)	-13.1
DUV	0.003
Chromaticity Coordinate (x)	0.323
Chromaticity Coordinate (y)	0.327
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

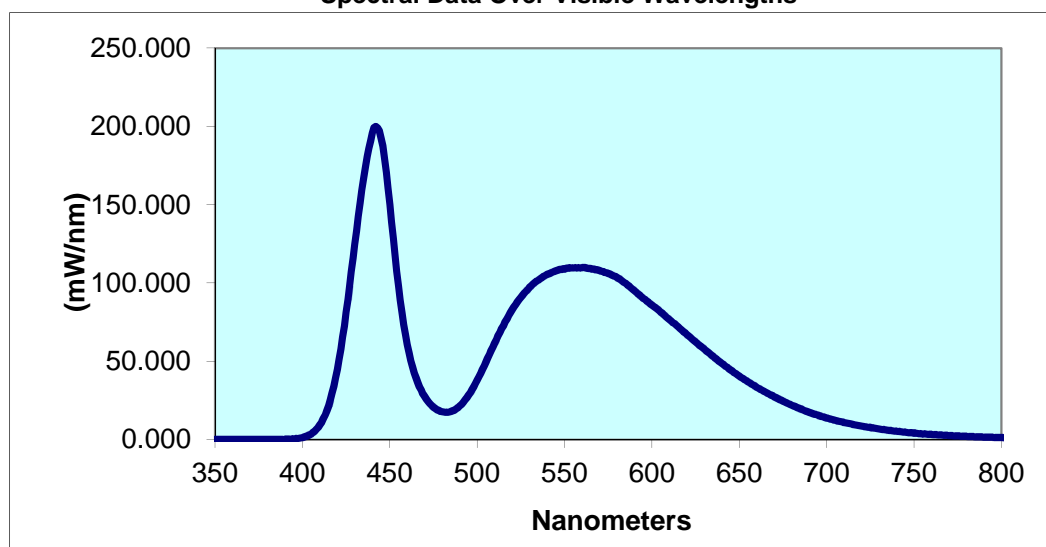
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN-1603210811-002	UP	120.0	2090	245.2	0.9776	18.83	12262	50.01

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')
5968	70.2	-13.1	0.003	0.323	0.327	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	0.013	440	195.900	530	97.35	620	67.030	710	10.920
355	0.013	445	192.900	535	101.90	625	62.320	715	9.694
360	0.013	450	150.100	540	105.40	630	57.640	720	8.635
365	0.013	455	98.030	545	107.90	635	53.120	725	7.737
370	0.013	460	60.800	550	109.00	640	48.720	730	6.733
375	0.013	465	39.330	555	109.70	645	44.410	735	5.935
380	0.013	470	27.390	560	109.80	650	40.440	740	5.229
385	0.034	475	20.620	565	109.20	655	36.760	745	4.624
390	0.131	480	17.730	570	108.00	660	33.390	750	4.079
395	0.361	485	18.020	575	106.10	665	30.240	755	3.580
400	1.180	490	21.420	580	103.40	670	27.280	760	3.277
405	3.544	495	28.220	585	99.82	675	24.480	765	2.840
410	9.386	500	37.950	590	95.16	680	21.980	770	2.471
415	21.690	505	49.520	595	90.28	685	19.610	775	2.212
420	44.780	510	61.490	600	85.89	690	17.410	780	1.987
425	81.350	515	72.900	605	81.41	695	15.510		
430	124.800	520	82.950	610	76.75	700	13.790		
435	167.000	525	90.790	615	71.97	705	12.290		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

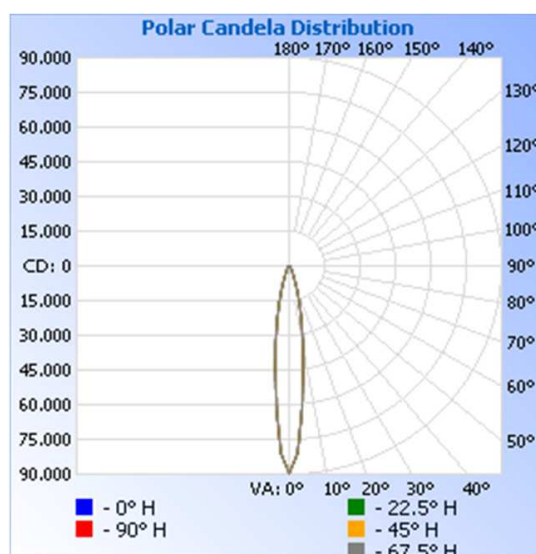
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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	2072	243.5	0.977	12626	51.85

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 89,553.6

Angle	0	22.5	45	67.5	90
0	89554	89554	89554	89554	89554
5	62133	62133	62133	62133	62133
10	32970	32970	32970	32970	32970
15	16473	16473	16473	16473	16473
20	7362	7362	7362	7362	7362
25	3657	3657	3657	3657	3657
30	2045	2045	2045	2045	2045
35	1041	1041	1041	1041	1041
40	549	549	549	549	549
45	317	317	317	317	317
50	253	253	253	253	253
55	159	159	159	159	159
60	120	120	120	120	120
65	88	88	88	88	88
70	68	68	68	68	68
75	51	51	51	51	51
80	30	30	30	30	30
85	11	11	11	11	11
90	9	9	9	9	9

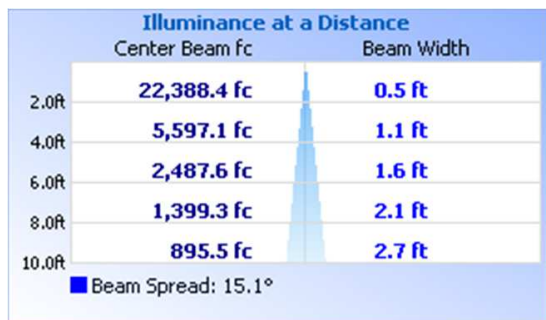


RESULTS OF TEST (cont'd)

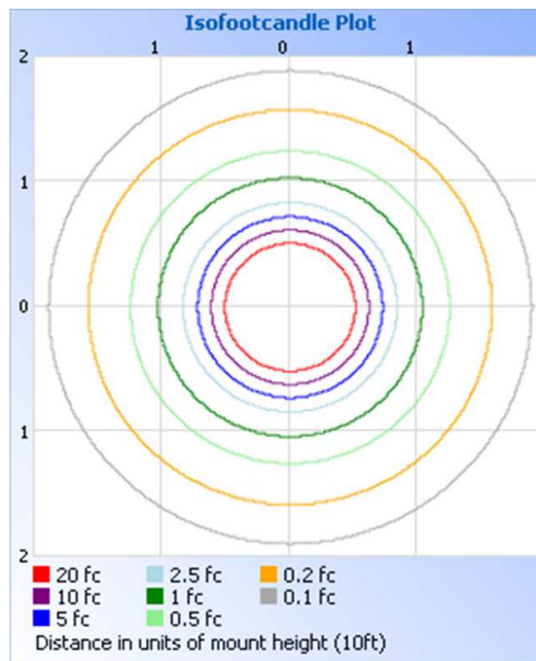
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	11381	90.1
0-40	12072	95.6
0-60	12477	98.8
60-90	147.5	1.2
0-90	12624	100.0
90-180	1.2	0.0
0-180	12626	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	4933	39.1
10-20	4660	36.9
20-30	1788	14.2
30-40	691.5	5.5
40-50	261.3	2.1
50-60	143.1	1.1
60-70	82.0	0.6
70-80	42.5	0.3
80-90	23.0	0.2
90-100	1.2	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