



REPORT

25800 COMMERCE DRIVE, LAKE FOREST, CA 92630

Project No. G102328456

Date: April 1, 2016

REPORT NO. 102328456LAX-048

TEST OF ONE LED CHORUS

MODEL NO. DW CHORUS 12 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 12 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 LAN1603210811-003.

DATES OF TESTS: March 29, 2016

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SUMMARY

Model No.:	DW CHORUS 12 CW & WW
Description:	LED CHORUS

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3259	3358
Total Power (W)	75.48	74.79
Luminaire Efficacy (LPW)	43.18	44.90

Criteria	Result
Power Factor	0.947
Current ATHD %	29.27
Correlated Color Temperature (CCT - K)	4117
Color Rendering Index (CRI - Ra)	80.0
Color Rendering Index (CRI - R9)	17.1
DUV	0.007
Chromaticity Coordinate (x)	0.372
Chromaticity Coordinate (y)	0.358
Chromaticity Coordinate (u')	0.227
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

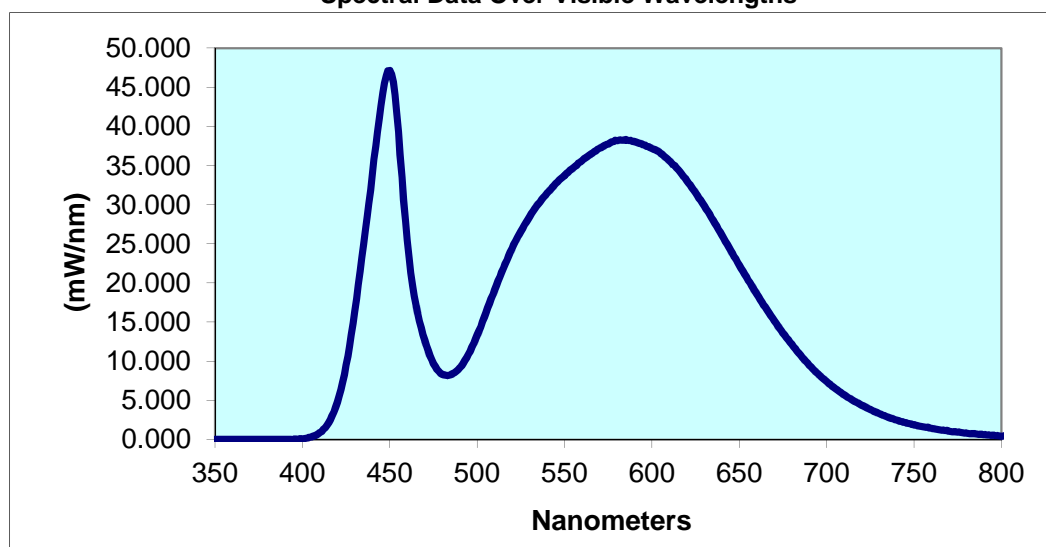
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1603210811-003	UP	120.0	664.2	75.48	0.9471	29.27	3259	43.18

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')
4117	80.0	17.1	0.007	0.372	0.358	0.227	0.492

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	0.005	440	33.880	530	28.520	620	33.030	710	5.708
355	0.005	445	42.640	535	30.080	625	31.530	715	5.006
360	0.005	450	47.160	540	31.490	630	29.800	720	4.378
365	0.005	455	39.300	545	32.720	635	28.000	725	3.844
370	0.005	460	25.480	550	33.750	640	26.110	730	3.307
375	0.005	465	17.100	555	34.730	645	24.150	735	2.867
380	0.005	470	12.680	560	35.620	650	22.250	740	2.497
385	0.005	475	9.691	565	36.480	655	20.370	745	2.161
390	0.005	480	8.354	570	37.230	660	18.600	750	1.876
395	0.035	485	8.323	575	37.770	665	16.840	755	1.644
400	0.101	490	9.170	580	38.210	670	15.180	760	1.434
405	0.314	495	10.880	585	38.310	675	13.590	765	1.238
410	0.887	500	13.360	590	38.100	680	12.150	770	1.073
415	2.163	505	16.200	595	37.670	685	10.780	775	0.930
420	4.773	510	19.110	600	37.190	690	9.495	780	0.807
425	9.517	515	21.910	605	36.560	695	8.381		
430	16.350	520	24.480	610	35.630	700	7.390		
435	24.990	525	26.580	615	34.490	705	6.486		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

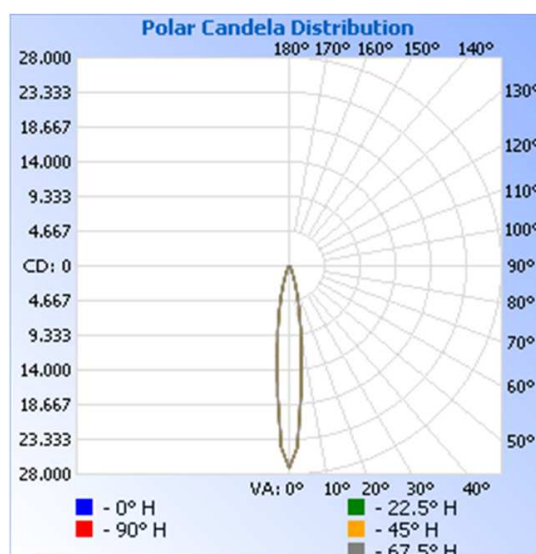
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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)
LAN1603210811-003	UP	120.0	651.1	74.79	0.952	3358	44.90

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value: 27,153.8

Angle	0	22.5	45	67.5	90
0	27154	27154	27154	27154	27154
5	17512	17512	17512	17512	17512
10	8688	8688	8688	8688	8688
15	4166	4166	4166	4166	4166
20	1817	1817	1817	1817	1817
25	932	932	932	932	932
30	535	535	535	535	535
35	275	275	275	275	275
40	148	148	148	148	148
45	90	90	90	90	90
50	63	63	63	63	63
55	47	47	47	47	47
60	33	33	33	33	33
65	25	25	25	25	25
70	16	16	16	16	16
75	6	6	6	6	6
80	3	3	3	3	3
85	5	5	5	5	5
90	1	1	1	1	1

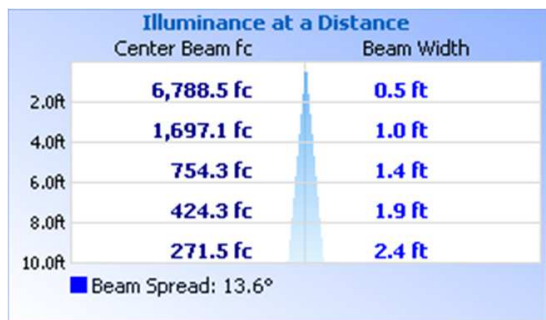


RESULTS OF TEST (cont'd)

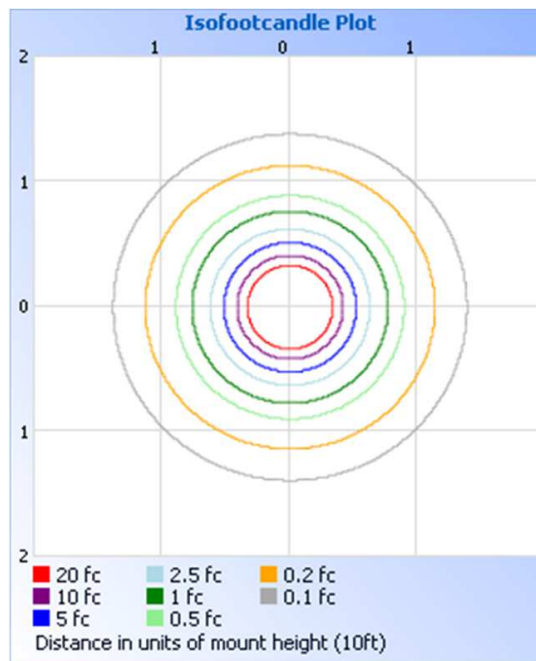
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	3019	89.9
0-40	3203	95.4
0-60	3318	98.8
60-90	39.4	1.2
0-90	3358	100.0
90-180	0.1	0.0
0-180	3358	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	1376	41.0
10-20	1189	35.4
20-30	454.6	13.5
30-40	184.1	5.5
40-50	72.7	2.2
50-60	42.5	1.3
60-70	24.7	0.7
70-80	9.5	0.3
80-90	5.2	0.2
90-100	0.1	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