



# REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G101607677

Date: June 9, 2014

REPORT NO. 101607677LAX-011

TEST OF ONE 3000K WARM WHITE 17 BEAM ANGLE

MODEL NO. DW FRESNEL

RENDERED TO

ELATION PROFESSIONAL  
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 500519256.

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 FRESNEL. The sample was received by Intertek on May 29, 2014, in undamaged condition and one sample was tested as received. The sample designation was LAN1405291025-001.

DATES OF TESTS: June 9, 2014

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## SUMMARY

Model No.:	DW FRESNEL
Description:	3000K WARM WHITE 17 BEAM ANGLE

Criteria	Result	
	Sphere	Goniometer
Total Lumen Output (Lumens)	3730	3553
Total Power (W)	142.8	142.7
Luminaire Efficacy (LPW)	26.12	24.9

Criteria	Result
Power Factor	0.978
Current ATHD %	10.16
Correlated Color Temperature (CCT - K)	3253
Color Rendering Index (CRI - Ra)	93.9
Color Rendering Index (CRI - R9)	78.3
DUV	0.002
Chromaticity Coordinate (x)	0.418
Chromaticity Coordinate (y)	0.392
Chromaticity Coordinate (u')	0.243
Chromaticity Coordinate (v')	0.514

## EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Date Calibrated	Calibration Due Date
Variac	Powerstat	000396	VBU	VBU
LapSphere 3M Integrating Sphere	CA-11821-LRT	000830	05/12/14	06/12/14
LabSphere Spectrometer	CDS-3020	000834	05/12/14	06/12/14
California Instruments Power Supply	CSW5550	001338	VBU	VBU
Power Meter, Digital	WT210	000912	03/14/14	03/14/15
Extech Instruments Stop Watch	365510	001380	11/05/13	11/05/14
Omega Environmental Monitor	iBTHX-W	000886	09/10/13	09/10/14
LSI High Speed Mirror Goniometer	6440T	000943	05/12/14	06/12/14
Elgar Power Supply	CW1251	000944	N/A	N/A
Yokogawa Power Analyzer	WT210	000945	11/14/13	11/14/14
Omega Environmental Monitor	iBTHX-W	000882	09/09/13	09/09/14
Extech Instruments Stop Watch	365510	001380	11/05/13	11/05/14
Tape measure	33-428	000678	12/09/13	12/09/14

## 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**

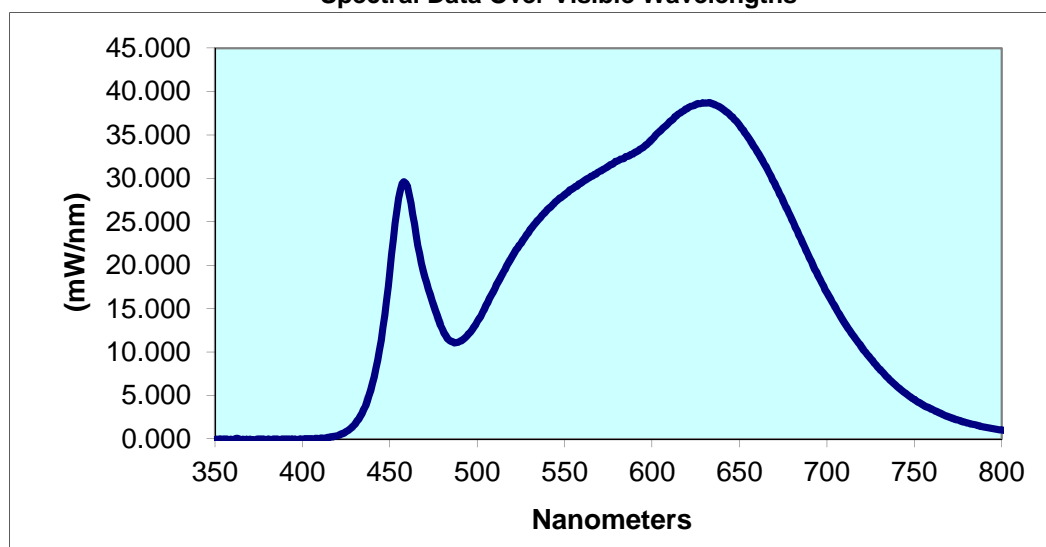
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1405291025-001	UP	120.0	1217	142.8	0.978	10.16	3730	26.12

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')
3253	93.9	78.3	0.002	0.418	0.392	0.243	0.514

## **Spectral Distribution over Visible Wavelengths**

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	-0.055	440	6.361	530	24.040	620	38.030	710	13.390
355	-0.047	445	11.370	535	25.250	625	38.530	715	11.880
360	-0.065	450	19.350	540	26.380	630	38.680	720	10.530
365	-0.198	455	27.700	545	27.360	635	38.570	725	9.262
370	-0.023	460	29.050	550	28.140	640	38.060	730	8.056
375	-0.025	465	23.440	555	28.910	645	37.190	735	7.005
380	-0.041	470	18.640	560	29.580	650	36.080	740	6.055
385	-0.039	475	15.340	565	30.230	655	34.680	745	5.227
390	-0.034	480	12.630	570	30.820	660	33.120	750	4.533
395	-0.022	485	11.240	575	31.410	665	31.370	755	3.912
400	-0.015	490	11.240	580	31.990	670	29.440	760	3.428
405	0.007	495	12.090	585	32.520	675	27.350	765	2.971
410	0.069	500	13.520	590	33.010	680	25.250	770	2.500
415	0.171	505	15.370	595	33.580	685	23.030	775	2.167
420	0.390	510	17.310	600	34.520	690	20.840	780	1.864
425	0.836	515	19.240	605	35.520	695	18.750		
430	1.710	520	21.020	610	36.520	700	16.830		
435	3.377	525	22.540	615	37.400	705	15.070		

**Spectral Data Over Visible Wavelengths**



# RESULTS OF TEST (cont'd)

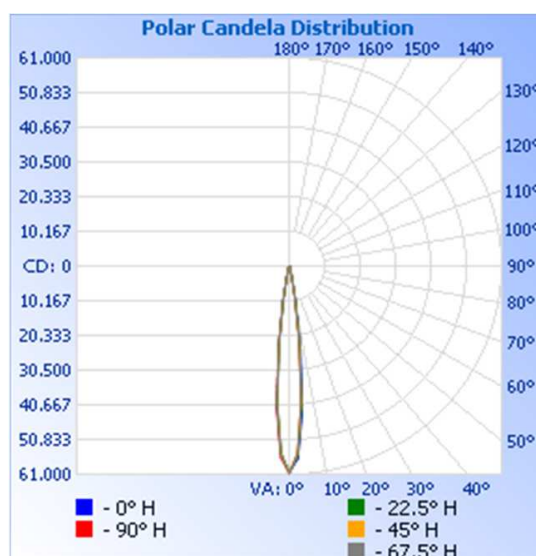
## Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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)
LAN1405291025-001	UP	120.0	1216	142.7	0.978	3553	24.9

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

Maximum Candela Value: 60654

Angle	0	22.5	45	67.5	90
0	60444	60453	60521	60617	60654
5	42630	41386	39773	39515	39563
10	10571	9662	8956	9018	9097
15	1504	1404	1315	1355	1409
20	470	466	459	448	478
25	139	132	134	125	136
30	91	78	68	77	83
35	66	68	65	67	62
40	47	64	46	41	46
45	48	43	36	36	41
50	35	41	35	41	43
55	28	22	30	30	34
60	3	4	20	15	26
65	0	0	21	10	1
70	0	7	3	0	6
75	0	0	0	0	7
80	0	2	0	0	0
85	0	2	0	12	1
90	4	0	0	0	0

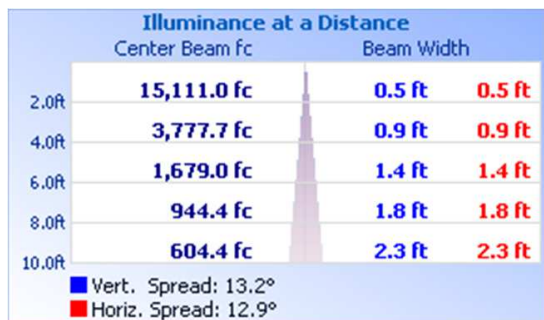


# RESULTS OF TEST (cont'd)

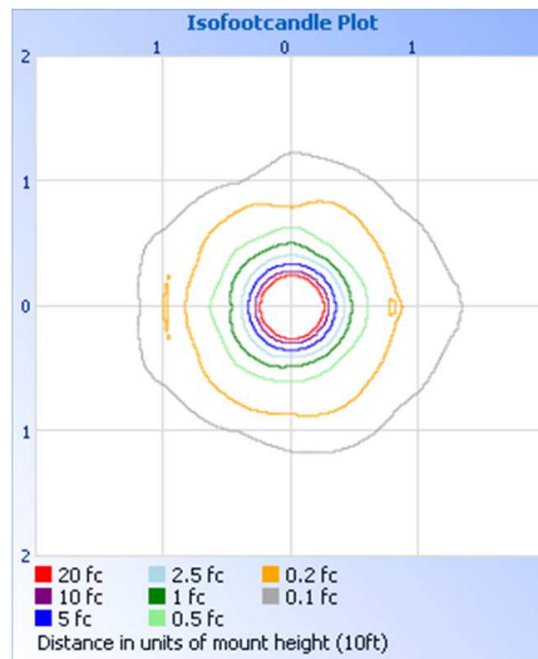
## Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	3446	97.0
0-40	3486	98.1
0-60	3541	99.6
60-90	12.1	0.3
0-90	3553	100.0
90-180	0.3	0.0
0-180	3553	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	2730	76.8
10-20	625.2	17.6
20-30	90.0	2.5
30-40	39.9	1.1
40-50	31.8	0.9
50-60	23.2	0.7
60-70	7.3	0.2
70-80	2.8	0.1
80-90	2.0	0.1
90-100	0.3	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:



Erik Linares  
Technician  
Lighting Division

Attachment: None

Report Reviewed By:



Kenda Branch  
Engineer  
Lighting Division