REPORT

25800 COMMERCENTRE DRIVE, LAKE FOREST, CA 92630

Project No. G101607677 Date: June 6, 2014

REPORT NO. 101607677LAX-012

TEST OF ONE FULL ON 27 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 4, 2014 through June 6, 2014.

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SUMMARY

Model No.:	DW FRESNEL
Description:	Full On 27 Beam Angle

	Result	
Criteria	Sphere	Goniometer
Total Lumen Output (Lumens)	10719	10292
Total Power (W)	270.0	269.4
Luminaire Efficacy (LPW)	39.7	38.2

Criteria	Result
Power Factor	0.996
Current ATHD %	5.63
Correlated Color Temperature (CCT - K)	4762
Color Rendering Index (CRI - Ra)	92.4
Color Rendering Index (CRI - R9)	91.6
DUV	0.004
Chromaticity Coordinate (x)	0.351
Chromaticity Coordinate (y)	0.348
Chromaticity Coordinate (u')	0.217
Chromaticity Coordinate (v')	0.484

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

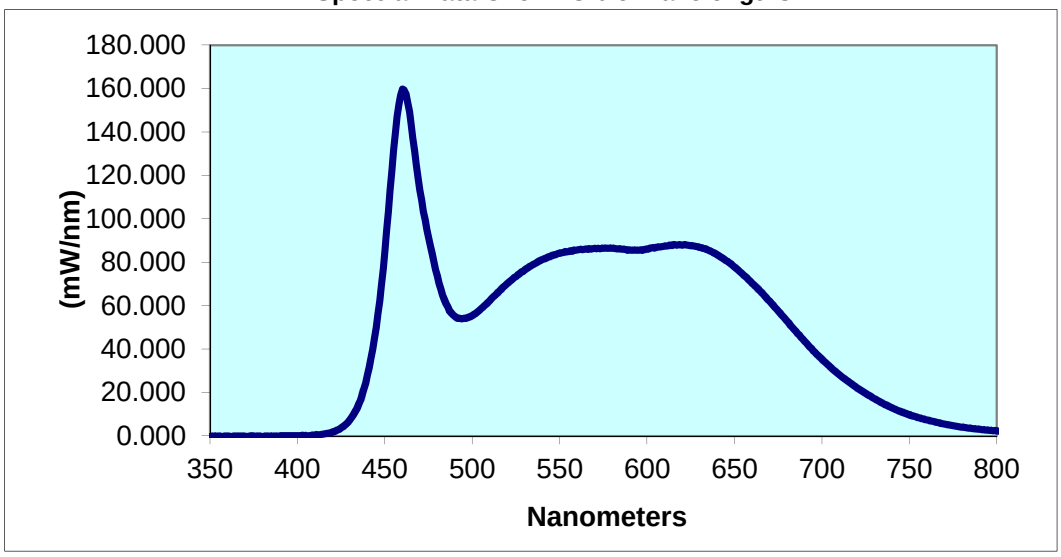
Intertek Sample No.	Base Orientation	Input Voltage {Vac}	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)	Luminous Flux (Lumens)	Lumen Efficacy (LPW)
LAN1405291025-001	LINEAR	120.0	2264	270.0	0.996	5.63	10719	39.7

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')
4762	92.4	91.6	0.004	0.351	0.348	0.217	0.484

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
350	-0.207	440	27.900	530	76.610	620	87.930	710	28.190
355	-0.080	445	49.980	535	78.990	625	87.670	715	25.010
360	-0.110	450	85.220	540	81.230	630	86.880	720	22.210
365	-0.181	455	131.600	545	82.870	635	85.600	725	19.580
370	-0.087	460	159.700	550	84.140	640	83.530	730	17.110
375	0.043	465	143.500	555	84.950	645	80.800	735	14.920
380	-0.205	470	113.300	560	85.610	650	77.710	740	12.940
385	-0.042	475	91.020	565	86.070	655	74.200	745	11.230
390	-0.038	480	73.530	570	86.370	660	70.410	750	9.728
395	-0.017	485	60.880	575	86.350	665	66.390	755	8.450
400	0.036	490	55.090	580	86.420	670	62.030	760	7.451
405	0.135	495	54.070	585	86.180	675	57.460	765	6.363
410	0.388	500	55.480	590	85.730	680	52.970	770	5.442
415	0.873	505	58.530	595	85.490	685	48.230	775	4.727
420	1.806	510	62.390	600	86.040	690	43.640	780	4.059
425	3.700	515	66.420	605	86.850	695	39.270		
430	7.511	520	70.270	610	87.410	700	35.320		
435	14.610	525	73.480	615	87.970	705	31.610		

Spectral Data Over Visible Wavelengths



RESULTS OF TEST (cont'd)

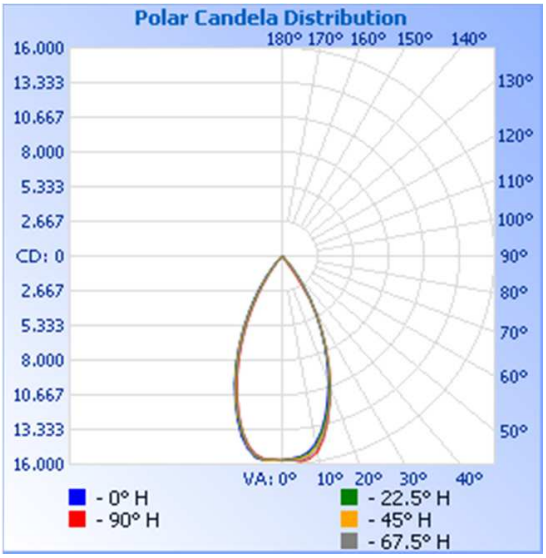
Photometric and Electrical Measurements at Ambient Temperature (25°C +/- 1°C) – Distribution Method

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	2265	269.4	0.991	10292	38.2

Intensity (Candlepower) Summary at 25°C - Candelas

Maximum Candela Value 15676

Angle	0	22.5	45	67.5	90
0	15683	15683	15664	15671	15676
5	15458	15526	15602	15762	15826
10	14553	14741	14893	15071	15290
15	12623	12792	12993	13081	13200
20	10200	10381	10569	10583	10495
25	7618	7695	7839	7784	7734
30	5072	5090	5085	5044	5026
35	2889	2764	2568	2579	1650
40	1165	1092	913	37	13
45	345	317	271	6	3
50	7	25	62	8	2
55	0	0	23	0	1
60	0	1	13	0	0
65	10	0	0	4	3
70	0	17	6	0	1
75	0	0	8	0	9
80	0	1	7	0	0
85	0	3	0	0	0
90	0	0	0	4	1

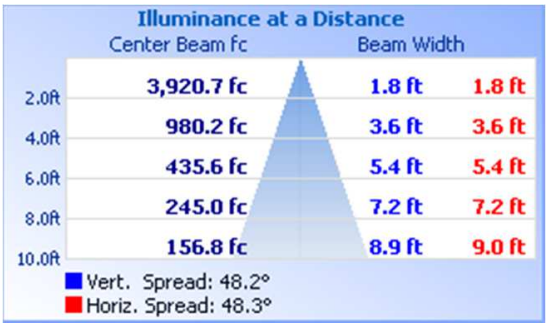


RESULTS OF TEST (cont'd)

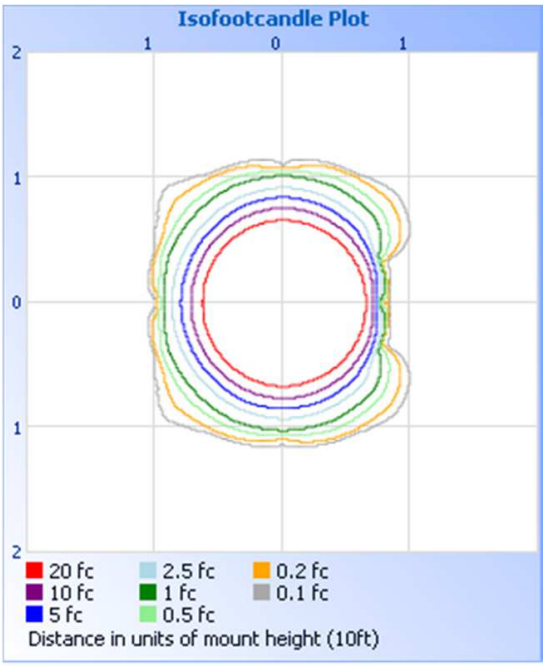
Illumination Plots

Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
0-30	8469	82.3
0-40	10064	97.8
0-60	10282	99.9
60-90	9.8	0.1
0-90	10292	100.0
90-180	0.3	0.0
0-180	10292	100.0

Zonal Lumens and Percentages at 25°C

Zone	Lumens	% Luminaire
0-10	1469	14.3
10-20	3550	34.5
20-30	3450	33.5
30-40	1595	15.5
40-50	210.5	2.0
50-60	8.2	0.1
60-70	3.2	0.0
70-80	4.1	0.0
80-90	2.5	0.0
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:

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Report Reviewed By:

Kenda Branch
Engineer
Lighting Division

Attachment: None