



FOR THE SCOPE OF
ACCREDITATION UNDER NVLAP LAB
CODE 100402-0.

REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100560144

Original Issue Date: December 20, 2011

Revision Date: February 9, 2012

REPORT NO. 100560144CRT-001

TEST OF ONE LED HIGHBAY

FIXTURE MODEL NO. LED-DF-100-WW

RENDERED TO

THE LIGHT SOURCE, INC.
3935 WESTINGTONHOUSE BLVD.
CHARLOTTE, NC 28273

Revision Note February 9, 2012: This report was revised to correct the company name.

TEST: Electrical and Photometric tests as required to the IESNA test standard.

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for SSL by US DOE's CALiPER program.

STATEMENT OF LIMITATION: This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500342506.

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 Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

ANSI NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted one sample of model number LED-DF-100-WW. The sample was received by Intertek on November 11, 2011, in undamaged condition, and one sample was tested as received. The sample designation was T238215-1.

DATES OF TESTS: December 5, 2011 through December 7, 2011.

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SUMMARY

Model No.: LED-DF-100-WW
Description: LED Highbay

Criteria	Result
Total Lumen Output	4760 Lumens
Total Power	111.0 W
Luminaire Efficacy	42.88
Power Factor	0.952
Current ATHD	10.86%
Correlated Color Temperature (CCT)	2910 K
Color Rendering Index (CRI) - Ra	67.3
Color Rendering Index (CRI) - R9	-29.3
Duv	0.002
Chromaticity Coordinate (x)	0.447
Chromaticity Coordinate (y)	0.412
Chromaticity Coordinate (u')	0.253
Chromaticity Coordinate (v')	0.526

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Leeds & Northup Standard Resistor	Manganin	Y089	02/17/11	02/17/12
Data Precision Digital Voltmeter	3600	V124	02/17/11	02/17/12
Fluke Multimeter	45	M133	02/17/11	02/17/12
Fluke Temperature Meter	53 II	T1318	02/25/11	02/25/12
Kikusui DC Power Supply	35-10L	E160	---	---
Sorenson DC Power Supply	DLM150-20E	--	---	---
NIST Spectral Flux Standard Source	RF1024	---	09/18/10	100 hours of use
Elgar AC Power Supply	CW1251	--	--	--
Yokogawa Power Meter	WT210	E464	04/19/11	04/19/12
LSI High Speed Mirror Goniometer	6440	--	w/use	w/use
Cole Parmer Hygro Thermometer	445703	T1359	10/26/11	10/26/12
Yokogawa Power Analyzer	WT1600	E462	06/22/11	06/22/12
ITS 3 Meter Sphere	W/ CDS 1100	N307	w/use	w/use
EXTECH	445703	T1366	10/26/11	10/26/12



TEST METHODS

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79.

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 Xitron or Yokogawa Power Analyzer.

Some graphics were created with Photometrics Plus software.

Photometric and Electrical Measurements – Integrating Sphere Method

A Labsphere Model CDS 1100 CCD Array Spectroradiometer and Two Meter or Ten Foot 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 Xitron or Yokogawa Power Analyzer.

The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

Estimated Total Operating Time

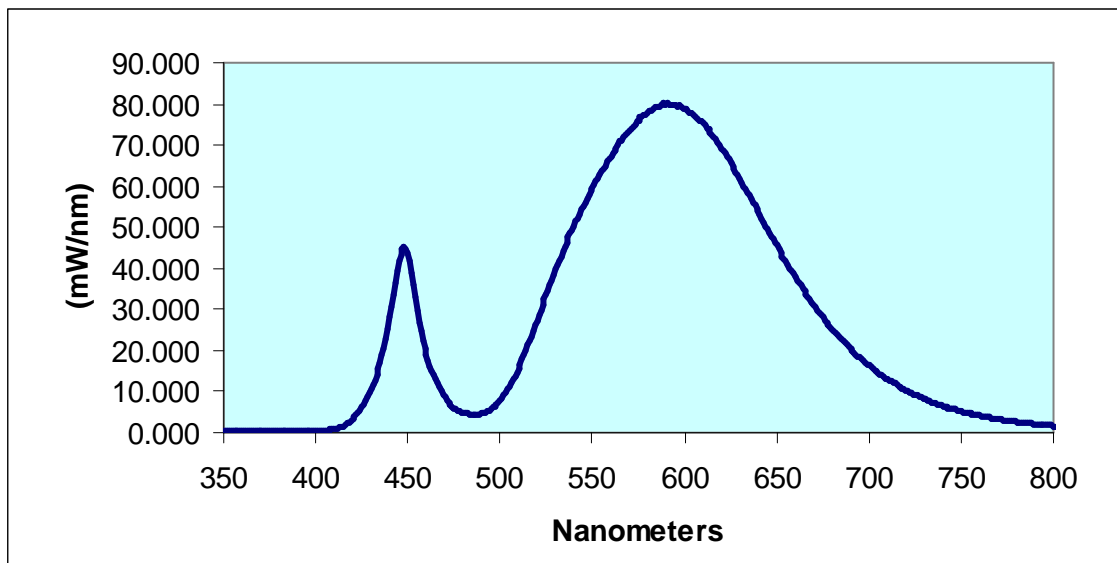
<u>Model No.</u>	<u>Total Hours</u>
LED-DF-100-WW	4

RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
LED-DF-100-WW							
350	0.729	460	18.771	570	73.459	680	25.109
355	0.395	465	13.039	575	76.091	685	22.639
360	0.533	470	8.799	580	77.982	690	20.319
365	0.363	475	6.076	585	79.133	695	18.267
370	0.453	480	4.900	590	79.873	700	16.362
375	0.462	485	4.527	595	79.829	705	14.635
380	0.350	490	4.674	600	78.950	710	13.064
385	0.410	495	5.763	605	77.372	715	11.654
390	0.340	500	7.953	610	75.255	720	10.354
395	0.367	505	11.251	615	72.502	725	9.265
400	0.431	510	15.782	620	69.276	730	8.239
405	0.562	515	21.199	625	65.656	735	7.356
410	0.900	520	27.227	630	61.688	740	6.526
415	1.682	525	33.649	635	57.734	745	5.823
420	3.304	530	39.760	640	53.770	750	5.184
425	6.149	535	45.263	645	49.629	755	4.643
430	10.629	540	50.347	650	45.544	760	4.188
435	17.111	545	55.039	655	41.716	765	0.000
440	28.014	550	59.390	660	38.017	770	3.321
445	41.740	555	63.550	665	34.440	775	2.961
450	43.760	560	67.236	670	31.141	780	2.634
455	29.861	565	70.838	675	28.100		

THE LIGHT SOURCE, INC.
Sample No. T238215-1
Model No. LED-DF-100-WW
Spectral Data Over Visible Wavelengths



RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31'	CIE 31'	CIE 76'	CIE 76'
					Chromaticity Coordinate (x)	Chromaticity Coordinate (y)	Chromaticity Coordinate (u')	Chromaticity Coordinate (v')
LED-DF-100-WW								
T238215-1	2910	67.3	-29.3	0.002	0.447	0.412	0.253	0.526

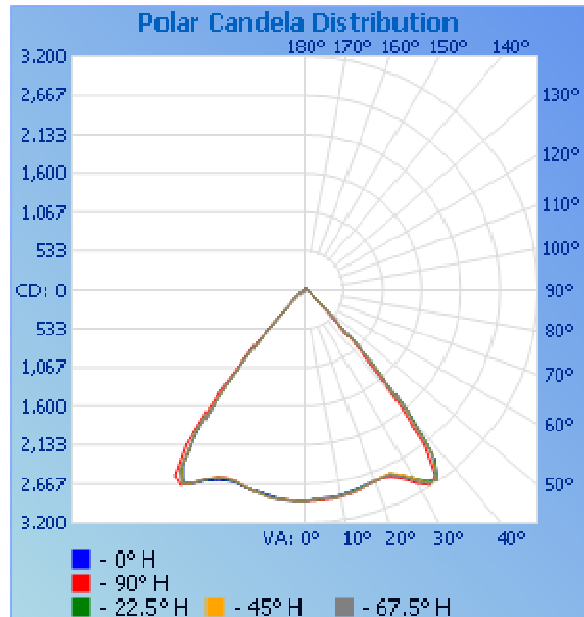
Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current
						ATHD (%)
LED-DF-100-WW						
T238215-1	UP	208.0	546.8	111.4	0.948	10.86

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute	Lumen
						Luminous Flux (Lumens)	Efficacy (Lumens Per Watt)
LED-DF-100-WW							
T238215-1	UP	208.0	560.0	111.0	0.952	4760	42.88

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
LED-DF-100-WW					
0	2905	2905	2905	2905	2905
5	2875	2880	2879	2872	2896
10	2868	2873	2879	2882	2886
15	2822	2825	2844	2839	2847
20	2790	2794	2790	2805	2800
25	2794	2786	2783	2802	2836
30	2993	2983	2990	3030	3067
35	3172	3180	3166	3171	3113
40	2240	2233	2153	2088	1864
45	640	651	620	574	441
50	120	131	132	117	91
55	48	51	50	49	46
60	31	32	31	32	30
65	21	22	21	21	20
70	12	12	13	13	11
75	7	6	6	6	5
80	0	0	0	0	0
85	2	1	0	0	0
90	0	0	0	0	0
95	0	0	0	0	0
100	0	0	0	0	0
105	0	0	0	0	0
110	0	0	0	0	0
115	0	0	0	0	0
120	0	0	0	0	0
125	0	0	0	0	0
130	0	0	0	0	1



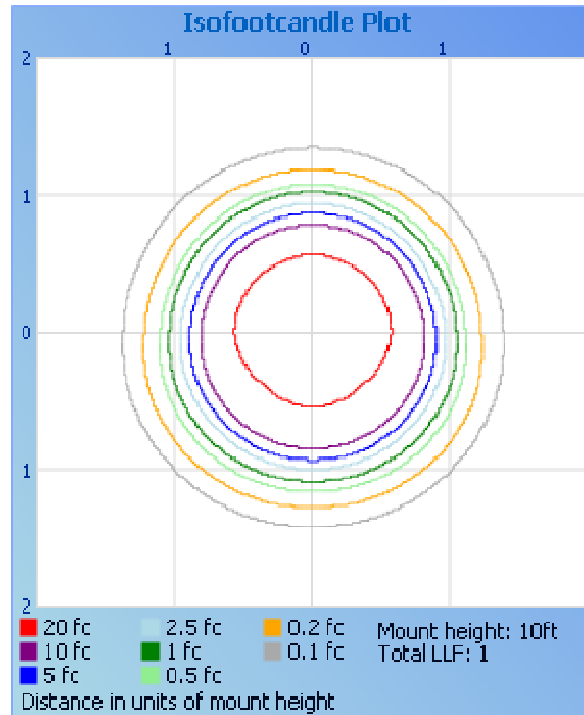
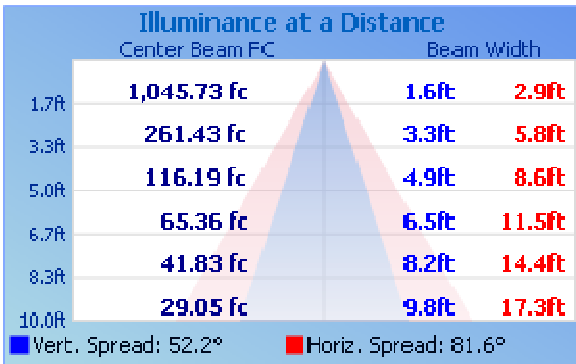
RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: LED-DF-100-WW
Mounting Height: 10 ft.

Illuminance - Cone of Light

Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
LED-DF-100-WW		
0-30	2408	50.6
0-40	4176	87.7
0-60	4735	99.5
60-90	25.5	0.5
0-90	4760	100.0
90-180	0.1	0.0
0-180	4760	100.0

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:

A handwritten signature in black ink, appearing to read "Joseph Schledorn".

Joseph Schledorn
Engineer
Lighting Division

Attachment: None

Report Reviewed By:

A handwritten signature in black ink, appearing to read "Jacki Swiernik".

Jacki Swiernik
Engineering Team Leader
Lighting Division