TRANSFOTEC INTERNATIONAL
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LM - 79 Reporting

Laboratory Information

Name of test lab	Intertek
Date of test report	July 31st, 2013
Test report number	101235726CRT-006
Laboratory contact name	Vladimir Kozak

Product Information

Manufacturer	TFT Transfotec™
Brand name	Virgolite
Model number	H1957.000
Number of units (modular products)	1

Electrical Measurements (input to LMPS - 350 power supply with full load configuration)

	Integrating Sphere Output	Goniophotometer Output	
Input wattage	42.50	39.40	W
Input current	361.3	335.3	mA
Input voltage	120.0	120.0	Vac
Power factor	0.979	0.979	
Off-state power	N/A	N/A	W

Photometric Characteristics

Total initial lumen output	27.7	26.6	lm
Initial luminaire efficacy	89.35		lm/W
Correlated color temperature (CCT)	3643		K
Color rendering index (CRI)	86.9		
R9 value	34.7		
Duv	0.003		

Luminous Intensity Distribution

Zonal lumens in the 0° -60° zone	81.6	%
Zonal lumens in the 60° -90° zone	18.4	%
Zonal lumens in the 0° -90° zone	100	%

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

REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100557536 Date: July 31, 2012

REPORT NO. 101235726CRT-006

TEST OF ONE VIRGO™ XS 3500K LED MODULE

LED MODULE MODEL NO. H1957.000
DRIVER MODEL NO. LMPS-350 1006.69

RENDERED TO

TFT TRANSFOTEC™
6068 BOUL METROPOLITAIN EST
MONTREAL, QUEBEC
CANADA, H1S 1A9

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 NVLAP, NIST, or any agency of the federal government.

AUTHORIZATION: The testing performed was authorized by signed quote number 500436155.

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 126 production samples of model number H1957.000. The samples were received by Intertek on June 24, 2013, in undamaged condition, and one sample was tested as received. The sample designation was CRT1306241043-002C.

DATES OF TESTS: July 26, 2013 through July 30, 2013.

SUMMARY

Model No.:	H1957.000
Description:	Virgo™ XS 3500K
Test Note:	Testing performed on one LED module with 125 additional modules connected to the power supply for proper loading per client request.

Criteria	Result
Module Lumen Output	27.7 Lumens
Output Power per Module (W)*	0.31
Module Efficacy (Lm/W)	89.35
Full Kit Input Power Factor	0.979
Full Kit Input Current ATHD	9.23%
Correlated Color Temperature (CCT)	3643 K
Color Rendering Index (CRI) – Ra	86.9
Color Rendering Index (CRI) - R9	34.7
Duv	0.003
Chromaticity Coordinate (x)	0.395
Chromaticity Coordinate (y)	0.379
Chromaticity Coordinate (u')	0.234
Chromaticity Coordinate (v')	0.505

*TEST NOTE: Output Power per Module was calculated by dividing total Output Power by number of modules in full kit.

EQUIPMENT LIST

Equipment Used	Model Number	Control Number	Last Calibration Date	Calibration Due Date
Leeds & Northup Standard Resistor	Manganin	Y089	02/07/13	02/07/14
Data Precision Digital Voltmeter	3600	V124	02/07/13	02/07/14
Fluke Multimeter	45	M133	02/07/13	02/07/14
Kikusui DC Power Supply	35-10L	E160	N/A	N/A
Sorenson DC Power Supply	DLM150-20E	N/A	N/A	N/A
NIST Spectral Flux Standard Source	RF1024	N/A	9/18/2010	100 hrs of use
ITS 2 Meter Integ. Sphere	---	N308	VBU	VBU
Labsphere Diode Array	CDS 600	W/N308	07/01/13	08/01/13
Xitron Power Analyzer	2503AH	E235	05/10/13	06/10/14
Fluke Temp Meter	52	T801	09/07/12	09/07/13
Extech Hygro-Thermometer	445703	T1366	11/8/12	11/08/13
Elgar AC power supply	CW1251	---	---	---
LSI High Speed Mirror Goniometer	6440	---	07/24/13	08/24/13
Elgar Power Supply	CW1251	---	VBU	VBU
Yokogawa Power Analyzer	WT210	E464	04/17/13	04/17/14
Extech Hygro Thermometer	445703	T1359	11/08/12	11/08/13
Fisher Scientific	---	N1132	04/22/13	04/22/14
M-D Building Products	Smart Tool	L112	02/13/13	02/13/14
Yokogawa Power Analyzer	WT1600	E462	07/17/13	07/17/14

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.

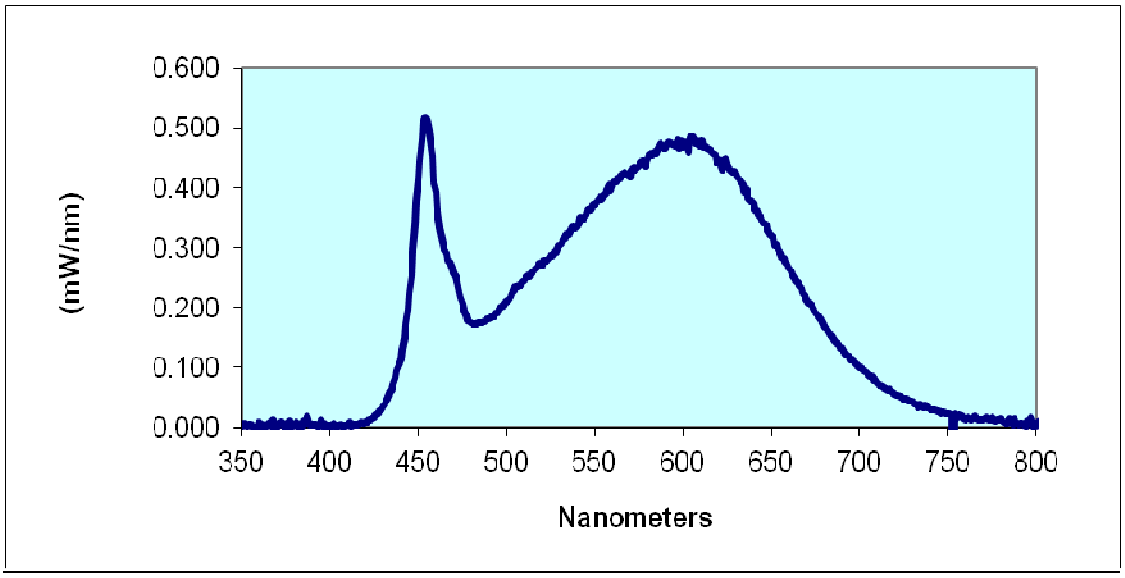
The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
			H1957.000				
350	0.006	460	0.393	570	0.417	680	0.166
355	0.004	465	0.297	575	0.437	685	0.149
360	0.009	470	0.258	580	0.448	690	0.132
365	0.006	475	0.205	585	0.457	695	0.113
370	0.001	480	0.175	590	0.466	700	0.100
375	0.000	485	0.175	595	0.470	705	0.088
380	0.004	490	0.181	600	0.466	710	0.075
385	0.011	495	0.191	605	0.485	715	0.064
390	0.004	500	0.212	610	0.478	720	0.057
395	0.012	505	0.234	615	0.463	725	0.047
400	0.003	510	0.246	620	0.446	730	0.043
405	0.001	515	0.260	625	0.440	735	0.036
410	0.004	520	0.270	630	0.425	740	0.029
415	0.004	525	0.286	635	0.391	745	0.027
420	0.009	530	0.303	640	0.374	750	0.022
425	0.017	535	0.323	645	0.341	755	0.016
430	0.033	540	0.334	650	0.319	760	0.013
435	0.065	545	0.355	655	0.291	765	0.000
440	0.115	550	0.372	660	0.265	770	0.012
445	0.224	555	0.387	665	0.240	775	0.017
450	0.412	560	0.406	670	0.215	780	0.015
455	0.515	565	0.422	675	0.191		

TFT TRANSFOTEC
Sample No. CRT1306241043-002C
Model No. H1957.000
Spectral Data Over Visible Wavelengths



RESULTS OF TESTS (cont'd)

Electrical Measurements at 25°C – Integrating Sphere Method - Full Kit

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Current ATHD (%)
			H1957.000			
CRT1306241043-002C	UP	120.0	361.3	42.50	0.979	9.23

Intertek Sample No.	Driver Output Voltage (Vrms)	Driver Output Current (Amps)	Driver Output Power (Watts)
CRT1306241043-002C	10.57	4.12	38.59

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

Intertek Sample No.	Output Power (Watts)*	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
CRT1306241043-002C	0.31	27.7	89.35

*TEST NOTE: Output Power per Module was calculated by dividing total Output Power by number of modules in full kit.

Intertek Sample No.	Correlated Color Temperature (K)	CRI -Ra	CRI -R9	DUV	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
CRT1306241043-002C	3643	86.9	34.7	0.003	0.395	0.379	0.234	0.505

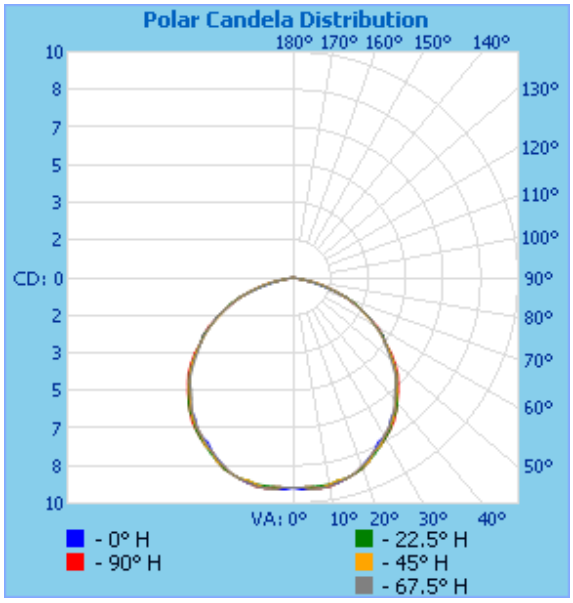
RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor
		H1957.000			
CRT1306241043-002C	UP	120.0	335.3	39.40	0.979

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
		H1957.000			
0	9	9	9	9	9
5	9	9	9	9	9
10	9	9	9	9	9
15	9	9	9	9	9
20	9	9	9	9	9
25	8	9	8	8	8
30	8	8	8	8	8
35	8	8	8	8	8
40	7	7	7	7	7
45	6	6	6	6	7
50	6	6	6	6	6
55	5	5	5	5	5
60	4	4	4	4	4
65	3	3	3	3	3
70	2	2	2	2	2
75	1	1	2	2	2
80	0	0	0	0	0
85	0	0	0	0	0
90	0	0	0	0	0

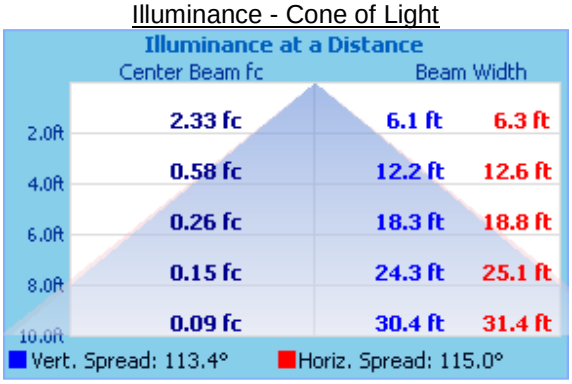


RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: H1957.000
Mounting Height: 10 ft.

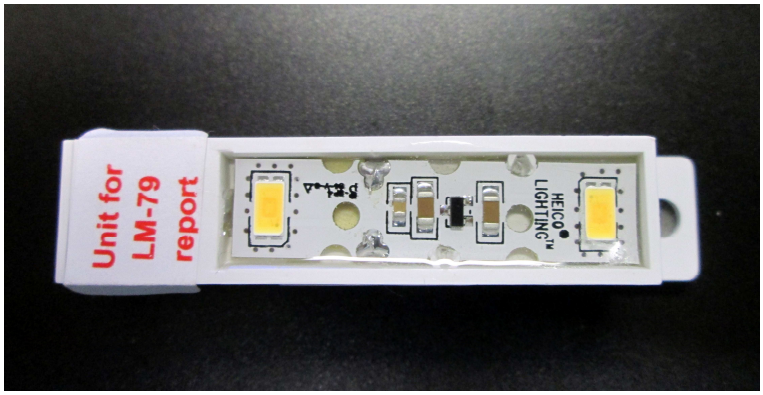
Illuminance - Cone of Light



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
	H1957.000	
0-30	7.4	27.9
0-40	12.2	46.0
0-60	21.7	81.6
60-90	4.9	18.4
0-90	26.6	100.0
90-180	0.0	0.0
0-180	26.6	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:

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Report Reviewed By:

Jacki Swiernik
Staff Engineer
Lighting Division

Attachment: None