

LM-79 Reporting

Laboratory Information

Name of test lab	Intertek
Date of test report	July 31 st , 2013
Test report number	101235726CRT-005
Laboratory contact name	Vladimir Kozak

Product Information

Manufacturer	HEICO lighting™
Brand name	Virgolite
Model number	H1967.000
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	42.43	39.70	W
Input current	361.1	337.9	mA
Input voltage	120.0	120.0	Vac
Power factor	0.927	0.979	
Off-state power	N/A	N/A	W

Photometric Characteristics

Total initial lumen output	225.6	224.1	lm
Initial luminaire efficacy	98.52		lm/W
Correlated color temperature (CCT)	3603		K
Color rendering index (CRI)	85.8		
R9 value	28.9		
Duv	0.003		

Luminous Intensity Distribution

Zonal lumens in the 0° -60° zone	80.9	%
Zonal lumens in the 60° -90° zone	19.1	%
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-005

TEST OF ONE VIRGO+™ LS6 3500K LED MODULE

LED MODULE MODEL NO. H1967.000
DRIVER MODEL NO. LMPS-350 1006.69

RENDERED TO

HEICO LIGHTING™
400 du PARC
ST-EUSTACHE, QUEBEC
CANADA, J7R 0A1

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 17 production samples of model number H1967.000. The samples were received by Intertek on June 24, 2013, in undamaged condition, and one sample was tested as received. The sample designation was CRT1306241043-002B.

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

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. Measurement uncertainty budgets have been determined for applicable test methods and are available upon request.



SUMMARY

Model No.:	H1967.000
Description:	Virgo+™ LS6 3500K
Test Note:	Testing performed on one LED module with 16 additional modules connected to the power supply for proper loading per client request.

Criteria	Result
Module Lumen Output	225.6 Lumens
Output Power per Module (W)*	2.29
Module Efficacy (Lm/W)	98.52
Full Kit Input Power Factor	0.927
Full Kit Input Current ATHD	9.20 %
Correlated Color Temperature (CCT)	3603 K
Color Rendering Index (CRI) – Ra	85.8
Color Rendering Index (CRI) - R9	28.9
Duv	0.003
Chromaticity Coordinate (x)	0.397
Chromaticity Coordinate (y)	0.381
Chromaticity Coordinate (u')	0.234
Chromaticity Coordinate (v')	0.506

*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	VBV	VBV
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	---	VBV	VBV
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.

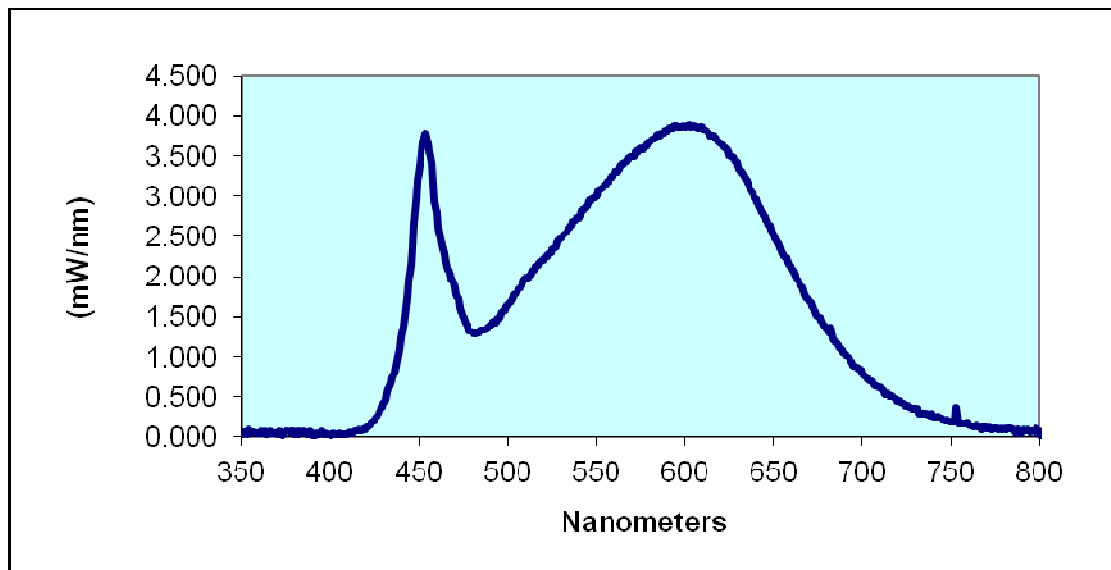


RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
H1967.000							
350	0.035	460	2.789	570	3.489	680	1.333
355	0.052	465	2.170	575	3.596	685	1.184
360	0.047	470	1.856	580	3.677	690	1.024
365	0.048	475	1.489	585	3.757	695	0.889
370	0.028	480	1.296	590	3.818	700	0.796
375	0.082	485	1.326	595	3.879	705	0.693
380	0.033	490	1.380	600	3.872	710	0.612
385	0.070	495	1.483	605	3.876	715	0.504
390	0.015	500	1.663	610	3.841	720	0.445
395	0.069	505	1.793	615	3.761	725	0.386
400	0.020	510	1.978	620	3.666	730	0.349
405	0.038	515	2.077	625	3.513	735	0.292
410	0.039	520	2.206	630	3.362	740	0.240
415	0.077	525	2.342	635	3.172	745	0.236
420	0.123	530	2.483	640	2.966	750	0.192
425	0.225	535	2.610	645	2.750	755	0.174
430	0.424	540	2.736	650	2.512	760	0.151
435	0.736	545	2.906	655	2.287	765	0.000
440	1.235	550	3.017	660	2.103	770	0.114
445	2.139	555	3.153	665	1.879	775	0.105
450	3.388	560	3.308	670	1.700	780	0.102
455	3.662	565	3.397	675	1.506		

HEICO LIGHTING
Sample No. CRT1306241043-002B
Model No. H1967.000
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 (%)
H1967.000						
CRT1306241043-002B	UP	120.0	361.1	42.43	0.927	9.20

Intertek Sample No.	Driver Output Voltage (Vrms)	Driver Output Current (Amps)	Driver Output Power (Watts)
CRT1306241043-002B	10.05	4.11	39.00

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)
CRT1306241043-002B	2.29	225.6	98.52

*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')
CRT1306241043-002B	3603	85.8	28.9	0.003	0.397	0.381	0.234	0.506



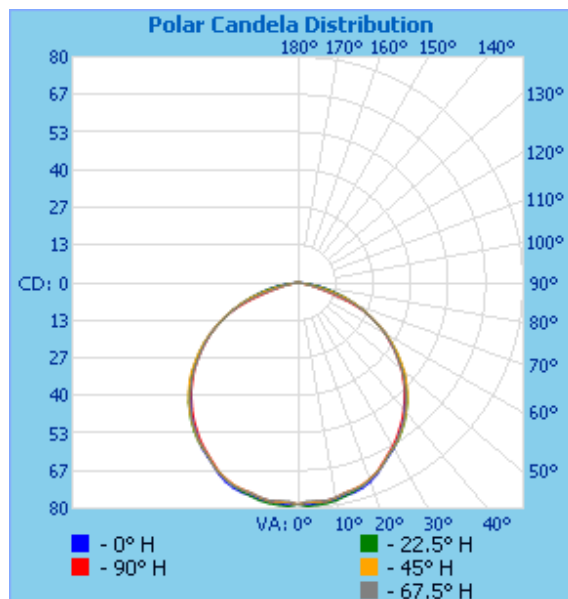
RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor
H1967.000					
CRT1306241043-002B	UP	120.0	337.9	39.70	0.979

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
H1967.000					
0	78	78	78	78	78
5	79	79	78	78	78
10	78	78	77	77	77
15	77	77	76	76	76
20	75	74	74	74	74
25	71	71	71	71	71
30	68	68	68	67	67
35	64	64	64	64	63
40	59	60	60	59	58
45	54	55	55	54	53
50	49	49	49	48	48
55	42	43	43	42	42
60	36	36	36	36	35
65	28	28	29	28	28
70	21	21	21	20	18
75	14	14	12	9	8
80	8	7	4	4	4
85	2	2	1	1	0
90	0	0	0	0	0

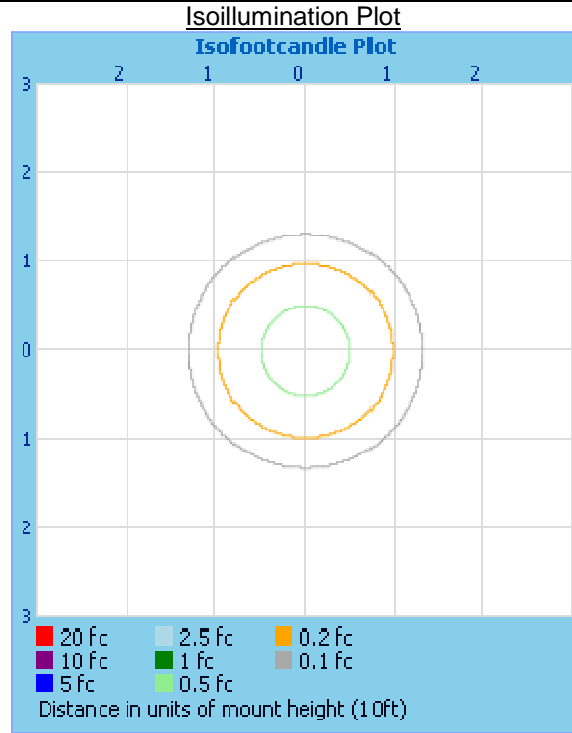
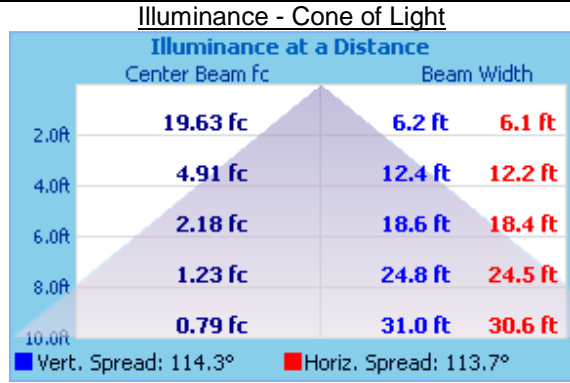




RESULTS OF TESTS (cont'd)

Illumination Plots

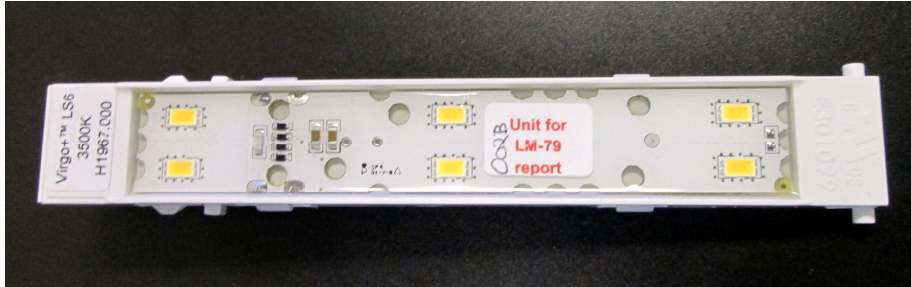
Model No.: H1967.000
 Mounting Height: 10 ft.



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
H1967.000		
0-30	61.8	27.6
0-40	101.7	45.4
0-60	181.4	80.9
60-90	42.7	19.1
0-90	224.1	100.0
90-180	0.0	0.0
0-180	224.1	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.

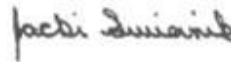
In Charge Of Tests:



Vladimir Kozak
Associate Engineer
Lighting Division

Attachment: None

Report Reviewed By:



Jacki Swiernik
Staff Engineer
Lighting Division