

LM-79 Reporting

Laboratory Information

Name of test lab	Intertek
Date of test report	July 31 st , 2013
Test report number	101235726CRT-002
Laboratory contact name	Vladimir Kozak

Product Information

Manufacturer	HEICO lighting™
Brand name	Virgolite
Model number	H1927.000
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	42.46	39.64	W
Input current	361.4	337.6	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	77.1	65.0	lm
Initial luminaire efficacy	91.79		lm/W
Correlated color temperature (CCT)	3579		K
Color rendering index (CRI)	85.4		
R9 value	27.5		
Duv	0.002		

Luminous Intensity Distribution

Zonal lumens in the 0° -60° zone	85.1	%
Zonal lumens in the 60° -90° zone	14.9	%
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-002

TEST OF ONE VIRGO+™ LS2 3500K LED MODULE

LED MODULE MODEL NO. H1927.000
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 46 production samples of model number H1927.000. The samples were received by Intertek on June 24, 2013, in undamaged condition, and one sample was tested as received. The sample designation was CRT1306241043-001B.

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

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SUMMARY

Model No.:	H1927.000
Description:	Virgo+™ LS2 3500K
Test Note:	Testing performed on one LED module with 45 additional modules connected to the power supply for proper loading per client request.

Criteria	Result
Module Lumen Output	77.1 Lumens
Output Power per Module (W)*	0.84
Module Efficacy (Lm/W)	91.79
Full Kit Input Power Factor	0.979
Full Kit Input Current ATHD	9.39 %
Correlated Color Temperature (CCT)	3579 K
Color Rendering Index (CRI) – Ra	85.4
Color Rendering Index (CRI) - R9	27.5
Duv	0.002
Chromaticity Coordinate (x)	0.399
Chromaticity Coordinate (y)	0.383
Chromaticity Coordinate (u')	0.235
Chromaticity Coordinate (v')	0.507

*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.

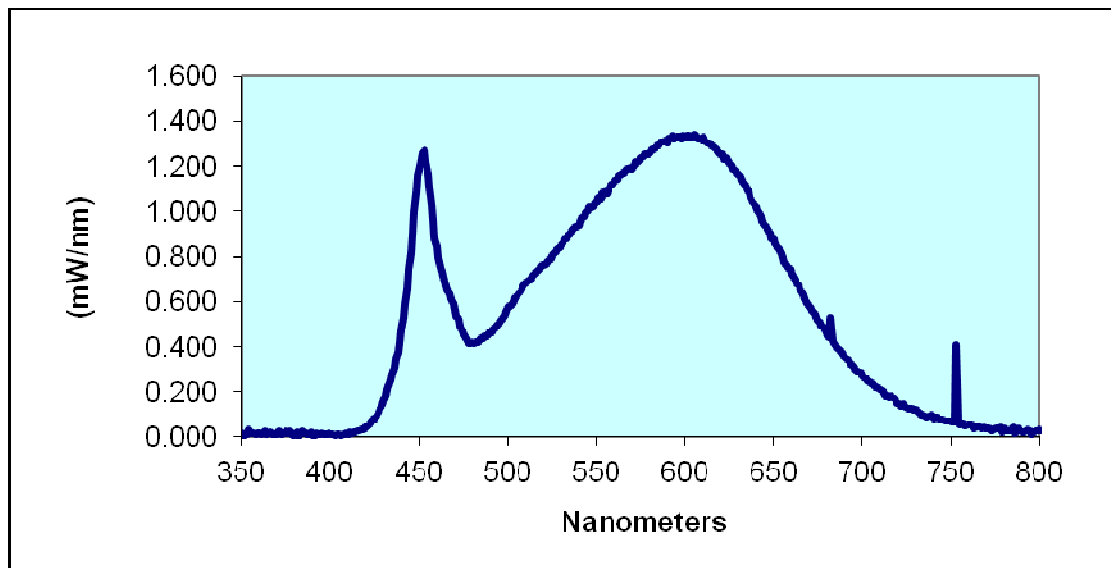


RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
H1927.000							
350	0.014	460	0.843	570	1.186	680	0.445
355	0.017	465	0.669	575	1.237	685	0.398
360	0.017	470	0.560	580	1.261	690	0.352
365	0.015	475	0.450	585	1.291	695	0.312
370	0.020	480	0.418	590	1.304	700	0.272
375	0.025	485	0.435	595	1.329	705	0.239
380	0.012	490	0.463	600	1.325	710	0.212
385	0.019	495	0.506	605	1.339	715	0.177
390	0.005	500	0.578	610	1.328	720	0.149
395	0.018	505	0.625	615	1.294	725	0.132
400	0.008	510	0.682	620	1.252	730	0.123
405	0.009	515	0.721	625	1.214	735	0.094
410	0.009	520	0.761	630	1.164	740	0.083
415	0.029	525	0.807	635	1.086	745	0.076
420	0.048	530	0.852	640	1.019	750	0.071
425	0.084	535	0.892	645	0.940	755	0.055
430	0.161	540	0.939	650	0.875	760	0.056
435	0.279	545	1.005	655	0.792	765	0.000
440	0.472	550	1.045	660	0.721	770	0.035
445	0.819	555	1.092	665	0.644	775	0.040
450	1.201	560	1.138	670	0.582	780	0.040
455	1.163	565	1.171	675	0.521		

HEICO LIGHTING
Sample No. CRT1306241043-001B
Model No. H1927.000
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 (%)
H1927.000						
CRT1306241043-001B	UP	120.0	361.4	42.46	0.979	9.39

Intertek Sample No.	Driver Output Voltage (Vrms)	Driver Output Current (Amps)	Driver Output Power (Watts)
CRT1306241043-001B	10.40	4.13	38.84

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)
CRT1306241043-001B	0.84	77.1	91.79

*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')
CRT1306241043-001B	3579	85.4	27.5	0.002	0.399	0.383	0.235	0.507

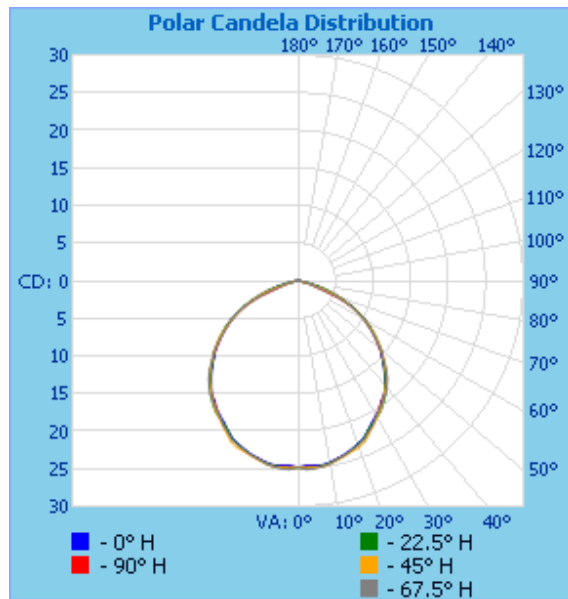
RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor
H1927.000					
CRT1306241043-001B	UP	120.0	337.6	39.64	0.979

Intensity (Candlepower) Summary at 25°C - Candelas

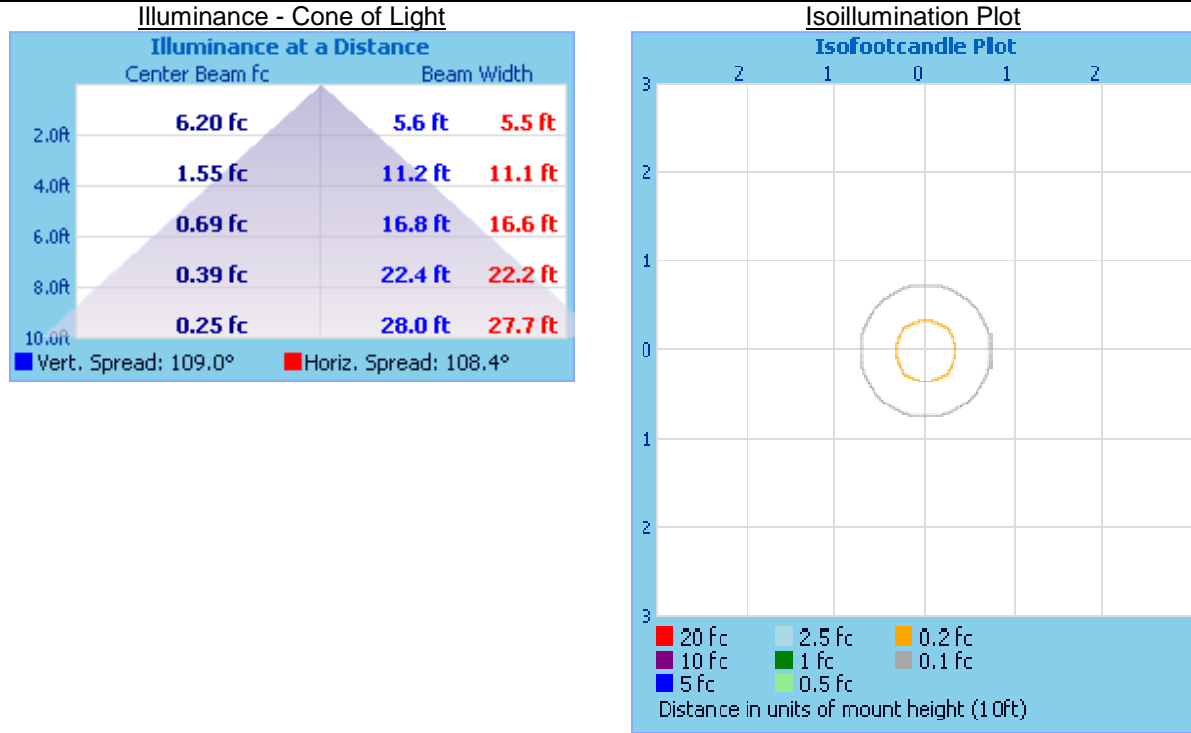
Angle	0	22.5	45	67.5	90
H1927.000					
0	25	25	25	25	25
5	25	25	25	25	25
10	24	25	25	25	25
15	24	24	24	24	24
20	23	23	24	23	23
25	22	22	22	22	22
30	21	21	21	21	21
35	20	20	20	20	19
40	18	18	18	18	18
45	16	16	16	17	16
50	14	15	15	14	14
55	12	12	12	12	12
60	10	10	10	10	10
65	8	8	8	7	7
70	5	5	5	4	3
75	3	3	2	2	1
80	1	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.: H1927.000
Mounting Height: 10 ft.



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
H1927.000		
0-30	19.4	29.8
0-40	31.7	48.7
0-60	55.3	85.1
60-90	9.7	14.9
0-90	65.0	100.0
90-180	0.0	0.0
0-180	65.0	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.

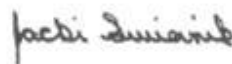
In Charge Of Tests:



Vladimir Kozak
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Lighting Division

Attachment: None

Report Reviewed By:



Jacki Swiernik
Staff Engineer
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