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-010

TEST OF ONE POLYOPTIK™ 40° x 20° 3500K LED MODULE

LED MODULE MODEL NO. H1977.040
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 27 production samples of model number H1977.040. The samples were received by Intertek on June 24, 2013, in undamaged condition, and one sample was tested as received. The sample designation was CRT1306241043-002AD.

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

SUMMARY

Model No.:	H1977.040
Description:	POLYOPTIK™ 40° x 20° 3500K
Test Note:	Testing performed on one LED module with 26 additional modules connected to the power supply for proper loading per client request.

Criteria	Result
Module Lumen Output	124.3 Lumens
Output Power per Module (W)*	1.41
Module Efficacy (Lm/W)	88.16
Full Kit Input Power Factor	0.979
Full Kit Input Current ATHD	9.29%
Correlated Color Temperature (CCT)	3472K
Color Rendering Index (CRI) – Ra	82.6
Color Rendering Index (CRI) - R9	14.2
Duv	0.001
Chromaticity Coordinate (x)	0.406
Chromaticity Coordinate (y)	0.389
Chromaticity Coordinate (u')	0.237
Chromaticity Coordinate (v')	0.511

*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.

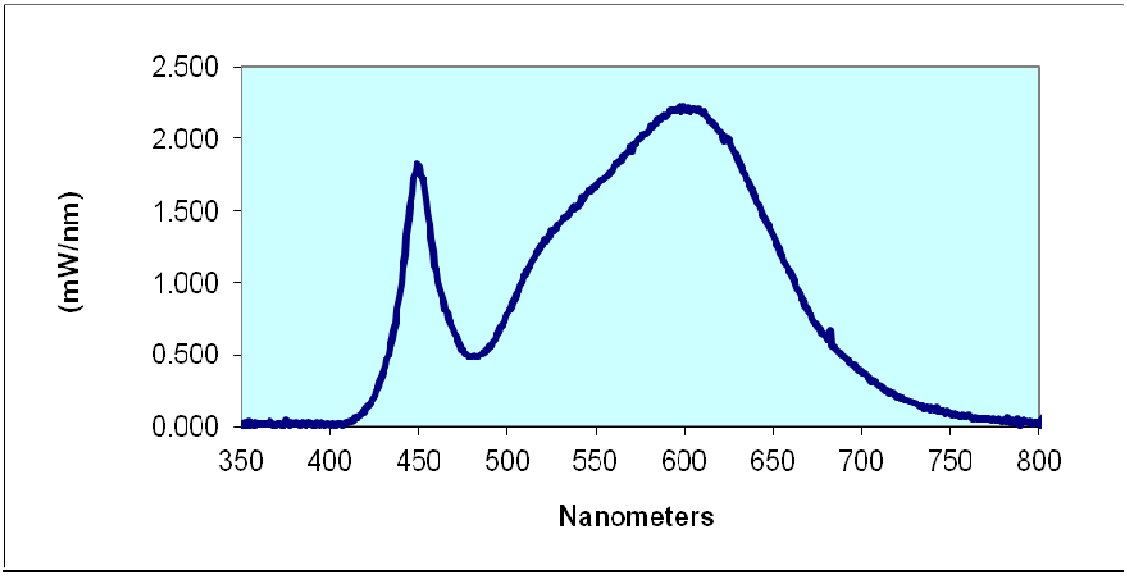
The calibration of the sphere photometer-spectroradiometer system is traceable to the National Institute of Standards and Technology.

RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
			H1977.040				
350	0.015	460	1.073	570	1.913	680	0.609
355	0.023	465	0.817	575	1.998	685	0.547
360	0.021	470	0.649	580	2.059	690	0.483
365	0.015	475	0.528	585	2.133	695	0.425
370	0.015	480	0.489	590	2.164	700	0.370
375	0.040	485	0.505	595	2.194	705	0.315
380	0.020	490	0.561	600	2.205	710	0.283
385	0.021	495	0.655	605	2.209	715	0.235
390	0.020	500	0.793	610	2.181	720	0.205
395	0.024	505	0.919	615	2.120	725	0.186
400	0.013	510	1.058	620	2.047	730	0.161
405	0.015	515	1.172	625	1.986	735	0.125
410	0.026	520	1.269	630	1.849	740	0.121
415	0.059	525	1.355	635	1.715	745	0.105
420	0.123	530	1.418	640	1.585	750	0.090
425	0.220	535	1.489	645	1.441	755	0.066
430	0.374	540	1.534	650	1.323	760	0.080
435	0.616	545	1.629	655	1.181	765	0.000
440	0.996	550	1.670	660	1.063	770	0.055
445	1.530	555	1.728	665	0.922	775	0.043
450	1.807	560	1.815	670	0.796	780	0.046
455	1.497	565	1.876	675	0.694		

HEICO LIGHTING
Sample No. CRT1306241043-002AD
Model No. H1977.040
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 (%)
			H1977.040			
CRT1306241043-002AD	UP	120.0	359.4	42.20	0.979	9.29

Intertek Sample No.	Driver Output Voltage (Vrms)	Driver Output Current (Amps)	Driver Output Power (Watts)
CRT1306241043-002AD	9.85	4.11	37.94

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)
CRT1306241043-002AD	1.41	124.3	88.16

*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')
CRT1306241043-002AD	3472	82.6	14.2	0.001	0.406	0.389	0.237	0.511

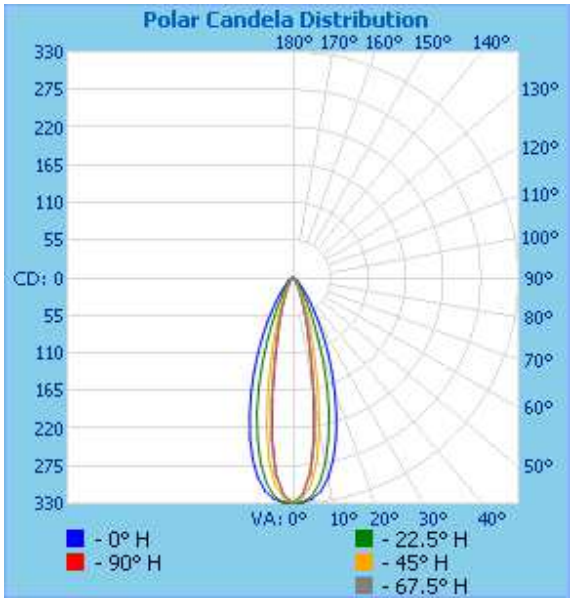
RESULTS OF TESTS (cont'd)

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor
		H1977.040			
CRT1306241043-002AD	UP	120.1	331.8	38.98	0.979

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
		H1977.040			
0	329	329	329	329	329
5	325	320	303	289	287
10	297	274	222	181	172
15	243	204	123	90	84
20	179	129	65	48	45
25	121	71	35	24	23
30	75	38	19	13	12
35	44	22	11	8	7
40	26	14	8	6	6
45	16	10	6	5	5
50	11	7	5	5	5
55	8	6	5	4	4
60	6	4	4	4	4
65	5	4	3	3	3
70	4	3	2	2	2
75	3	2	2	2	2
80	2	2	2	1	1
85	1	1	1	1	1
90	1	1	1	0	0
95	2	1	0	0	0
100	1	0	0	0	0

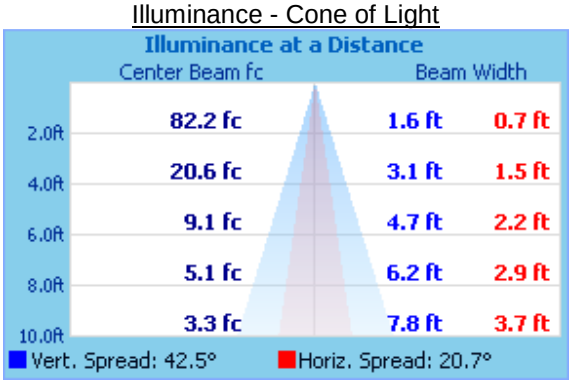


RESULTS OF TESTS (cont'd)

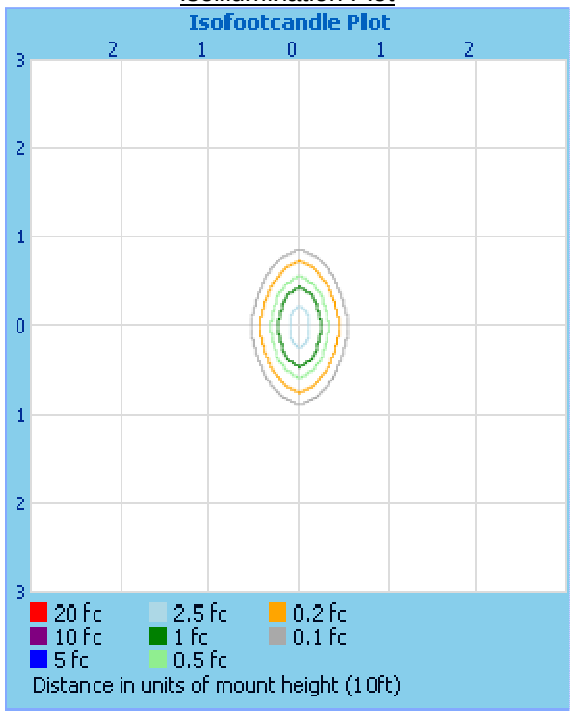
Illumination Plots

Model No.: H1977.040
Mounting Height: 10 ft.

Illuminance - Cone of Light



Isoillumination Plot



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
	H1977.040	
0-30	90.6	75.4
0-40	101.7	84.6
0-60	112.7	93.8
60-90	6.9	5.7
0-90	119.6	99.6
90-180	0.5	0.4
0-180	120.2	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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Attachment: None