



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

REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Project No. G100461820

Date: August 26, 2011

REPORT NO. 100461820CRT-011

TEST OF ONE LED PATHWAY LIGHT

FIXTURE MODEL NO. PD-2LED-CB

RENDERED TO

HUNTER INDUSTRIES
1940 DIAMOND ST
SAN MARCOS, CA 92078

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 500316643.

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 PD-2LED-CB. The sample was received by Intertek on July 13, 2011, in undamaged condition, and one sample was tested as received. The sample designation was H12304L.

DATES OF TESTS: August 22, 2011 through August 26, 2011.

SUMMARY

Model No.:	PD-2LED-CB
Description:	LED Pathway Light

Criteria	Result
Total Lumen Output	26.4 Lumens
Total Power	3.808 W
Luminaire Efficacy	6.933
Power Factor	0.770
Current ATHD	54.66%
Correlated Color Temperature (CCT)	3948 K
Color Rendering Index (CRI) - Ra	80.1
Color Rendering Index (CRI) - R9	23.7
Duv	0.003
Chromaticity Coordinate (x)	0.381
Chromaticity Coordinate (y)	0.371
Chromaticity Coordinate (u')	0.228
Chromaticity Coordinate (v')	0.499

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	T1357	10/12/10	10/12/11
Yokogawa Power Analyzer	WT1600	E462	06/22/11	06/22/12
30" Sphere	W/ CDS 1100	N310	w/use	w/use



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 DAS 1100 Diode 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

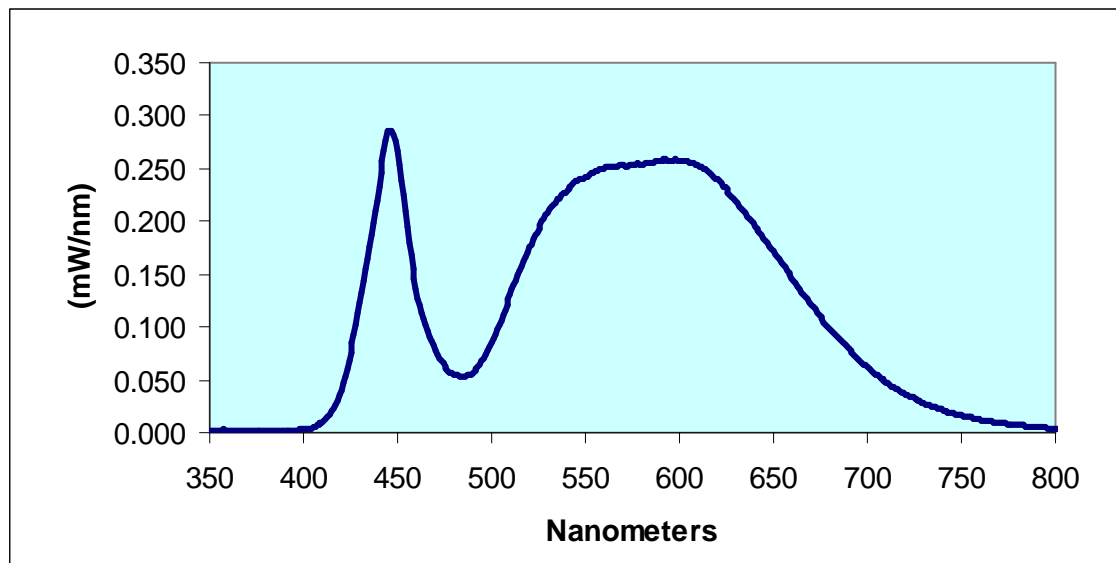
<u>Model No.</u>	<u>Total Hours</u>
PD-2LED-CB	3

RESULTS OF TESTS

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
PD-2LED-CB							
350	0.002	460	0.135	570	0.253	680	0.098
355	0.002	465	0.101	575	0.254	685	0.088
360	0.002	470	0.078	580	0.254	690	0.079
365	0.002	475	0.063	585	0.256	695	0.070
370	0.002	480	0.056	590	0.257	700	0.062
375	0.002	485	0.053	595	0.258	705	0.055
380	0.002	490	0.057	600	0.258	710	0.048
385	0.002	495	0.068	605	0.256	715	0.042
390	0.002	500	0.085	610	0.253	720	0.037
395	0.003	505	0.107	615	0.247	725	0.032
400	0.003	510	0.131	620	0.240	730	0.028
405	0.005	515	0.154	625	0.230	735	0.024
410	0.010	520	0.175	630	0.219	740	0.021
415	0.020	525	0.194	635	0.208	745	0.019
420	0.041	530	0.208	640	0.195	750	0.016
425	0.076	535	0.221	645	0.184	755	0.014
430	0.124	540	0.230	650	0.172	760	0.012
435	0.175	545	0.237	655	0.159	765	0.000
440	0.233	550	0.243	660	0.147	770	0.009
445	0.285	555	0.248	665	0.133	775	0.008
450	0.266	560	0.250	670	0.121	780	0.007
455	0.195	565	0.252	675	0.109		

Hunter Industries
Sample No. H12304L
Model No. PD-2LED-CB
Spectral Data Over Visible Wavelengths



RESULTS OF TESTS (cont'd)

Photometric Measurements at 25°C – Integrating Sphere Method

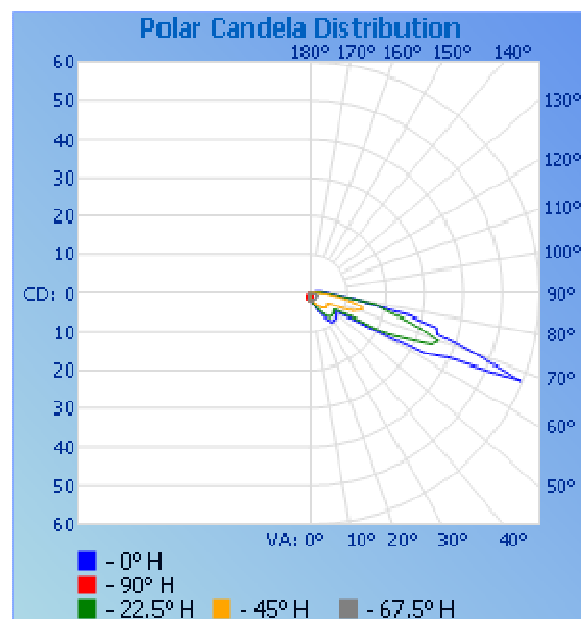
Intertek Sample No.	Correlated Color Temperature (K)	CRI -Ra	CRI -R9	Duv	Current ATHD (%)	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
PD-2LED-CB									
H12304L	3948	80.1	23.7	0.003	54.66	0.381	0.371	0.228	0.499

Photometric and Electrical Measurements – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
PD-2LED-CB							
H12304L	UP	12.0	411.4	3.808	0.770	26.4	6.933

Intensity (Candlepower) Summary at 25°C - Candelas

Angle	0	22.5	45	67.5	90
PD-2LED-CB					
0	2	2	2	2	2
5	2	2	2	2	2
10	2	2	2	2	2
15	3	2	2	2	2
20	3	3	2	2	2
25	4	4	3	2	2
30	6	5	3	2	2
35	8	7	4	2	1
40	10	8	5	2	1
45	10	8	6	2	1
50	9	8	6	2	1
55	9	8	6	2	1
60	16	11	6	2	0
65	40	28	9	2	0
70	46	36	13	2	0
75	34	25	14	2	0
80	15	18	10	2	0
85	8	8	6	2	0
90	5	4	3	1	0
95	4	3	2	0	0
100	3	2	1	0	0
105	2	1	0	0	0
110	1	1	0	0	0



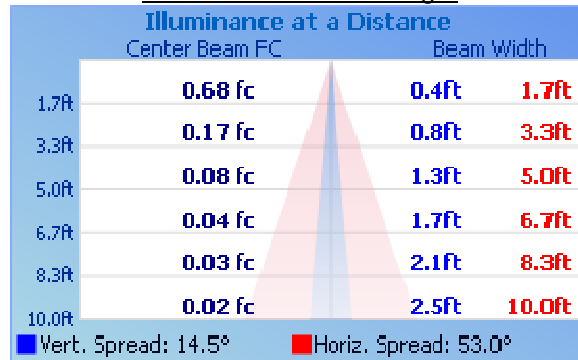
RESULTS OF TESTS (cont'd)

Illumination Plots

Model No.: PD-2LED-CB

Mounting Height: 10 ft.

Illuminance - Cone of Light



Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens	% Luminaire
PD-2LED-CB		
0-30	1.3	5.1
0-40	2.8	10.6
0-60	7.4	28.0
60-90	17.6	66.7
0-90	25.0	94.6
90-180	1.4	5.4
0-180	26.4	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 'Kenda Branch'.

Kenda Branch
Engineer
Lighting Division

Attachment: None

Report Reviewed By:

A handwritten signature in black ink, appearing to read 'Jeffery Davis'.

Jeffery Davis
Senior Associate Engineer
Lighting Division