

Test Report

Report Number: L14122

Date: Nov 20, 2014

Issued by:

Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Vigilant Highbay With Clear Acrylic Lens
Unit manufacturer: Dialight Corporation
Unit model number: HE1MN4DN-xxx

Issued to:

Dialight Corporation
1501 Route 34 South, Farmingdale, NJ 07727

Tests performed: Photometric characterization and temperature measurement per the described standards.

Dates of test: November 11, 2014 through November 20, 2014

Standards Used: All tests are performed in accordance with procedures and guidelines prescribed by the American National Standards Institute (ANSI) or Illuminating Engineering Society of North America (IES):

- IES LM-79:2008: Electrical and Photometric Measurements of Solid-State Lighting Products
- ANSI/UL 1598:2008: Underwriters Laboratories Inc. Standard for Safety: Luminaires
- ENERGY STAR Manufacturer's Guide for Qualifying Solid State Lighting Luminaires Version 2.1

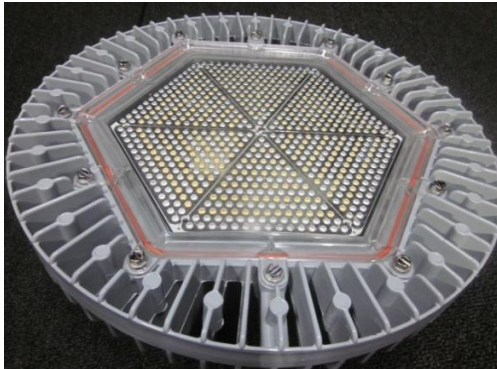
Description of sample:

Sample Number: L14122
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay With Clear Acrylic Lens
Model Number: HE1MN4DN-xxx

Report Summary

Sample number L14122
Dialight unit model number HE1MN4DN-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	10800 (lumens)	10820 (lumens)
Electrical Power:	88.3 (W)	88.5 (W)
Luminous Efficacy:	122.4 (lumens/W)	122.3 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 88.3 (W)
 Power Factor (120VAC): 0.991
 Current ATHD % (120VAC): 9.872
 Input Power (277VAC): 87.6 (W)
 Power Factor (277VAC): 0.924
 Current ATHD % (277VAC): 17.237

Color Measurements:

Correlated Color Temperature (CCT): 3852
 Color Rendering Index (CRI): 73.7
 Chromaticity Coordinate (x): 0.3877
 Chromaticity Coordinate (y): 0.3825
 Chromaticity Coordinate (u'): 0.2276
 Chromaticity Coordinate (v'): 0.3368
 DUV: 0.00063

Temperature Measurements:

In Situ LED Source Temperature: 47.8 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L14122.

Dialight unit model number HE1MN4DN-xxx

Test Conditions:

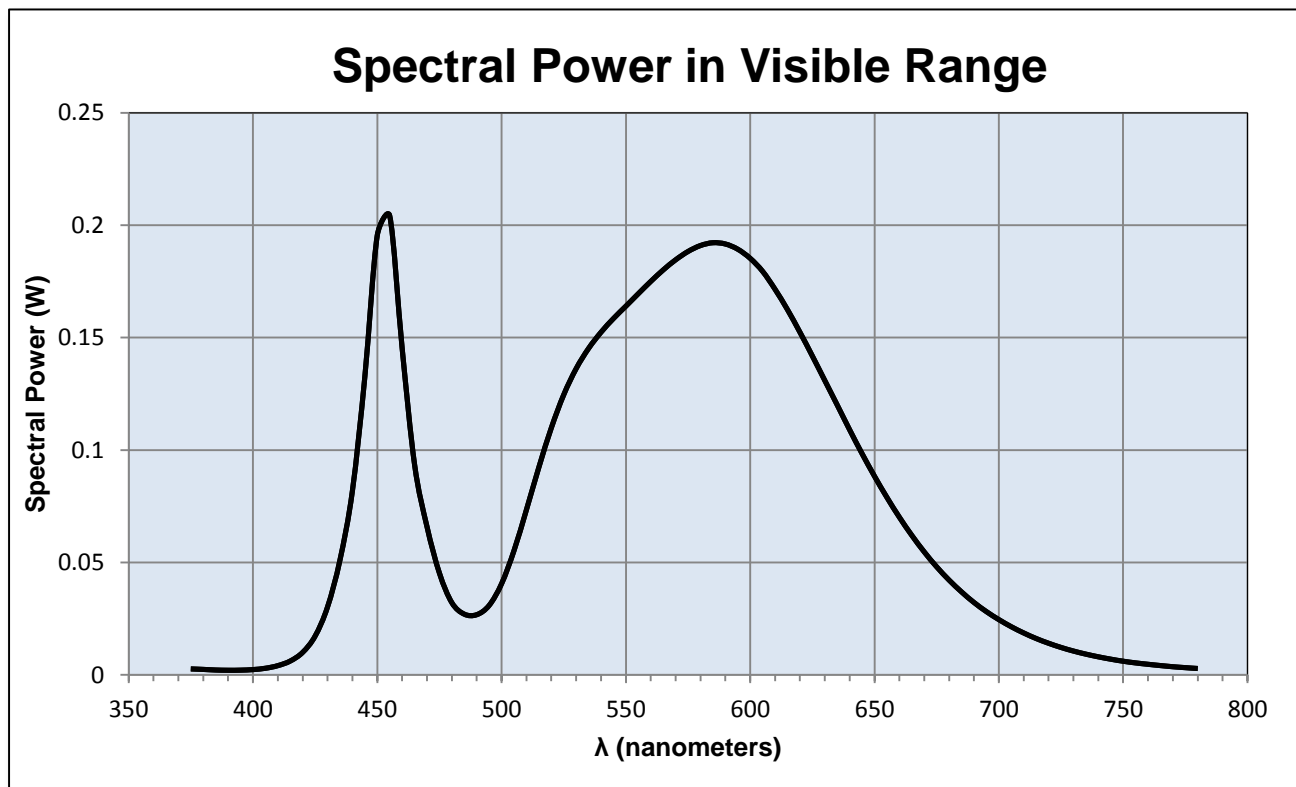
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
 Input Current: 0.74001 (A)
 Input Power: 88.3 (W)
 Input Power Factor: 0.991
 Current ATHD: 9.872 (%)

Photometric measurements:

Luminous Flux: 10800 (lumens)
 Luminous Efficacy: 122.4 (lumens/W)
 Correlated Color Temperature (CCT): 3852 (K)
 CRI -Ra: 73.7
 CRI -R9: -17.4
 DUV: 0.00063
 CIE Coordinate (x): 0.3877
 CIE Coordinate (y): 0.3825
 CIE Coordinate (u'): 0.2276
 CIE Coordinate (v'): 0.3368



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)
375	0.003	515	0.092	655	0.079
380	0.002	520	0.110	660	0.070
385	0.002	525	0.125	665	0.062
390	0.002	530	0.136	670	0.055
395	0.002	535	0.145	675	0.048
400	0.002	540	0.152	680	0.042
405	0.003	545	0.159	685	0.037
410	0.004	550	0.164	690	0.032
415	0.006	555	0.170	695	0.028
420	0.01	560	0.175	700	0.025
425	0.017	565	0.180	705	0.021
430	0.03	570	0.185	710	0.019
435	0.051	575	0.188	715	0.016
440	0.082	580	0.191	720	0.014
445	0.133	585	0.192	725	0.012
450	0.195	590	0.192	730	0.011
455	0.204	595	0.189	735	0.009
460	0.145	600	0.185	740	0.008
465	0.094	605	0.179	745	0.007
470	0.066	610	0.171	750	0.006
475	0.045	615	0.162	755	0.005
480	0.032	620	0.152	760	0.005
485	0.027	625	0.142	765	0.004
490	0.027	630	0.131	770	0.004
495	0.031	635	0.120	775	0.003
500	0.041	640	0.109	780	0.003
505	0.055	645	0.098		
510	0.073	650	0.088		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L14122.
Dialight unit model number HE1MN4DN-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.7435 (A)
Input Power: 88.5 (W)
Power Factor: 0.9908

Photometric measurements:

Absolute Luminous Flux: 10820.2 (lumens)
Luminous Efficacy: 122.3 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	4245	4245	4245	4245	4245	
5	4319	4319	4316	4315	4321	161
15	4176	4243	4219	4180	4245	908
25	4268	4282	4321	4281	4243	1689
35	4265	4257	4275	4280	4251	2449
45	3429	3442	3436	3441	3412	2753
55	1731	1732	1733	1732	1714	2055
65	326	331	333	329	323	712
75	22	23	23	23	24	88
85	0	0	0	0	0	7
95	0	0	0	0	0	0
105	0	0	0	0	0	0
115	0	0	0	0	0	0
125	0	0	0	0	0	0
135	0	0	0	0	0	0
145	0	0	0	0	0	0
155	0	0	0	0	0	0
165	0	0	0	0	0	0
175	0	0	0	0	0	0
180	0	0	0	0	0	0

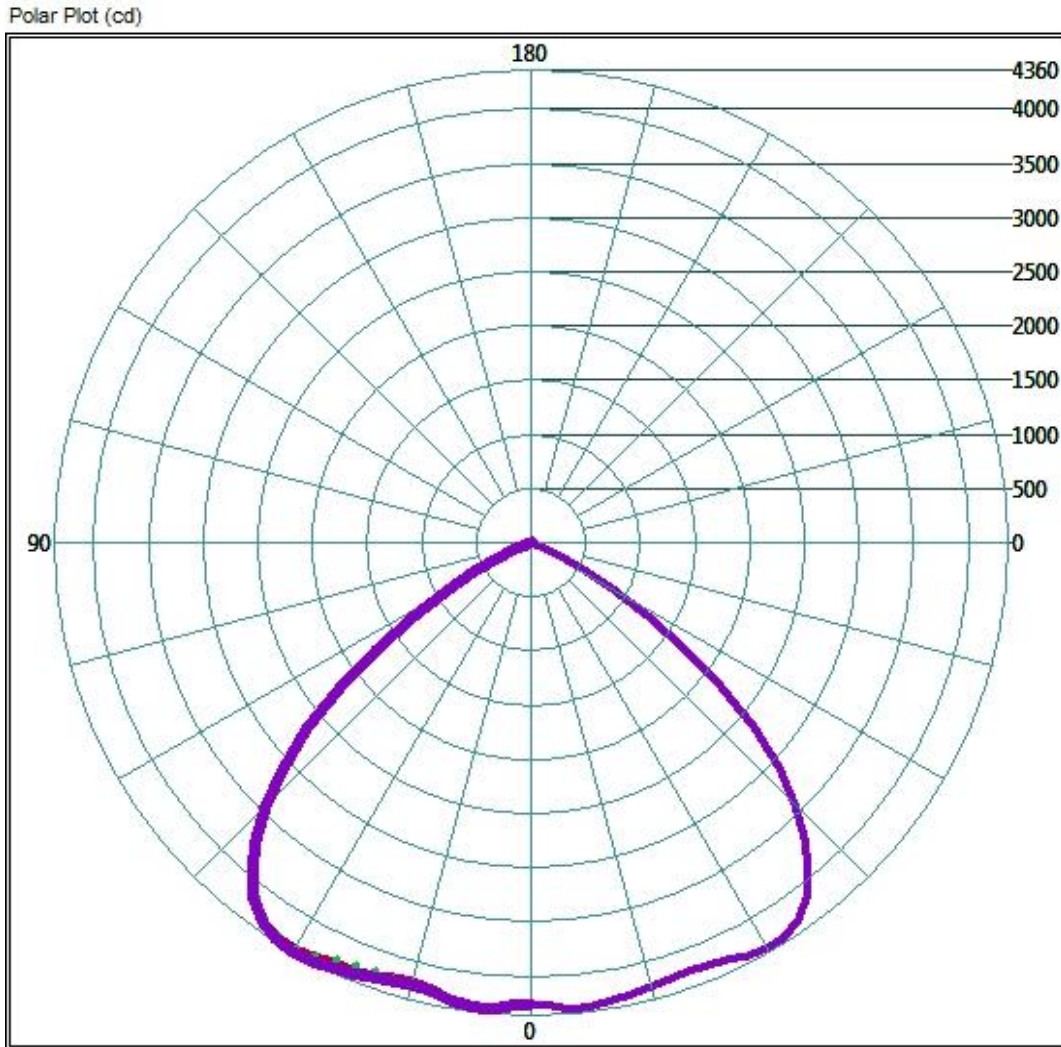
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	3897.66	36.0%
0-40	6600.32	61.0%
0-60	10509.48	97.1%
60-90	514.86	4.8%
0-90	10820.14	100.0%
90-180	0	0.0%
0-180	10820.14	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

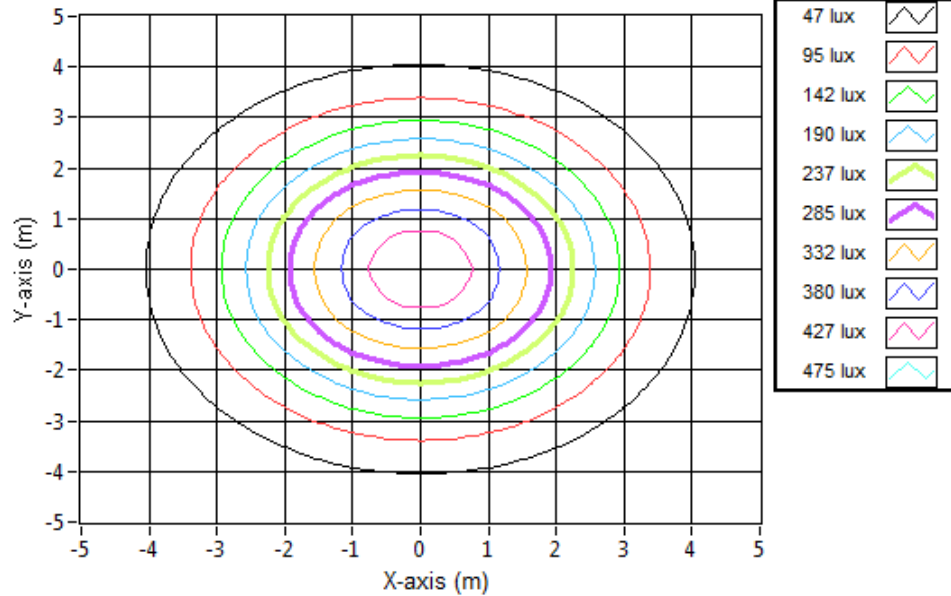


Test Results: Goniometer

Results continued from previous page.

Illuminance Plots:

Illuminance Contour Graph



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	8.08	8.05	457.0
6.096	16.16	16.11	114.2
9.144	24.24	24.16	50.8
12.192	32.32	32.22	28.6
15.24	40.40	40.27	18.3
18.288	48.49	48.33	12.7
21.336	56.57	56.38	9.3
24.384	64.65	64.44	7.1
27.432	72.73	72.49	5.6
30.48	80.81	80.54	4.6

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L14122.

Dialight unit model number HE1MN4DN-xxx

LED identified as Nichia part number Nichia NT2W757DT 5000K.

LED drive current (as indicated by customer): 100 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If):	300	(mA)
Maximum Rated Power Dissipation:	1.05	(W)
Maximum Junction Temp. (Tj):	120	(°C)
Thermal Resistance (Rth):	18	(°C/W)

Derived Specifications:

Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below

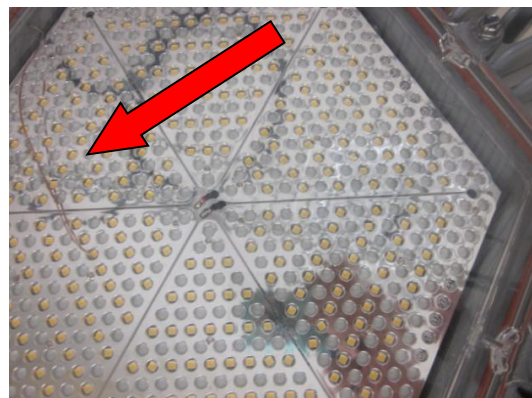
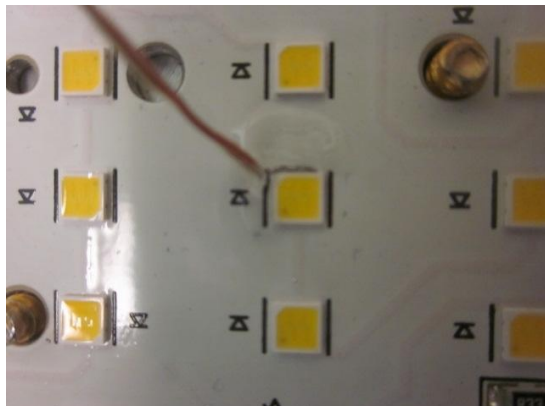
Ambient Temperature: $25^{\circ} \pm 1^{\circ}$ (°C)

Ambient temperature at time of measurement: 25.4 (°C)

Relative humidity at time of measurement: 18%

Results:

Measured LED source temperature: 47.8 (°C)



Equipment Used:

Equipment Name	Model Number	Calibration Due Date
Omega TC	Dpi8	3/7/2015
Fluke 8808A Digit Multimeter	8808A	4/7/2015
YOKOGAWA Digital Power Meter	760401	4/7/2015
LSI Standard Lamps	#30279	4/17/2015
LSI High Speed Mirror Goniometer	6240T	-
Instrument System Spectrometer	CAS140B-151	-
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System 1.5 Meter Sphere	ISP1500	-
Volttech Power Analyzer	PM1000+	4/17/2015
Delta Elektronika DC Power Supply	SM.300-5	-
Elgar AC Power Supply	CW1251P	-
Instek AC Power Supply	APS-9501	-
Sorensen DC Power Supply	XHR150-7	-
Extech Hygro-Thermometer	445703	-
Extech Hygro-Thermometer	445703	-
Fluke 52II Thermometer	52II Thermometer	3/6/2015
Volttech Power Analyzer	PM1000+	4/17/2015
Tenma AC Power Source	72-7675	-
BK Precision	1715A	-
TDK-Lambda	GEN1500W	-
Fluke 8808A Digit Multimeter	8808A	4/14/2015
TPI Digital Thermometer 343	343	4/17/2015
TPI Digital Thermometer 343	343	4/17/2015

Additional Notes:

Samples are received and tested in new and undamaged condition, unless otherwise noted.

The results shown in this report are representative only of the test samples submitted. This data has been issued to the assignee for further evaluation.

This report shall not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

This report shall not be reproduced, except in full, without the express written permission of Dialight Optics Laboratory.

Test Report Issued By:

Richard Huegi
Dialight Optics Laboratory
Senior Optical Engineering Technician
Lighting Division

Test Report Reviewed and Approved By:

Cecil Thomas
Dialight Optics Laboratory
Optical Engineering Manager
Approved Signatory