Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L14128 Date: Dec 9, 2014

Issued by:
Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Vigilant Highbay Fixture With Polycarbonate Dome Lens
Unit manufacturer: Dialight Corporation
Unit model number: HELMN4PN-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 25, 2014 through December 8, 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:	L14128
Manufacturer:	Dialight Corporation
Product Name:	Vigilant Highbay
Description:	Vigilant Highbay Fixture With Polycarbonate Dome Lens
Model Number:	HELMN4PN-xxx

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Report Summary

Sample number L14128

Dialight unit model number HELMN4PN-xxx

Photograph(s) of sample:

*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	23860 (lumens)	23869 (lumens)
Electrical Power:	211.1 (W)	211.2 (W)
Luminous Efficacy:	113.0 (lumens/W)	113.0 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	211.1	(W)
Power Factor (120VAC):	0.996	
Current ATHD % (120VAC):	5.505	
Input Power (277VAC):	204.7	(W)
Power Factor (277VAC):	0.966	
Current ATHD % (277VAC):	11.794	

Color Measurements:

Correlated Color Temperature (CCT):	3876
Color Rendering Index (CRI):	75.1
Chromaticity Coordinate (x):	0.3859
Chromaticity Coordinate (y):	0.3795
Chromaticity Coordinate (u'):	0.2276
Chromaticity Coordinate (v'):	0.3357
DUV:	0.00025

Temperature Measurements:

In Situ LED Source Temperature:	60.1	(°C)

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L14128.
Dialight unit model number HELMN4PN-xxx

Test Conditions:

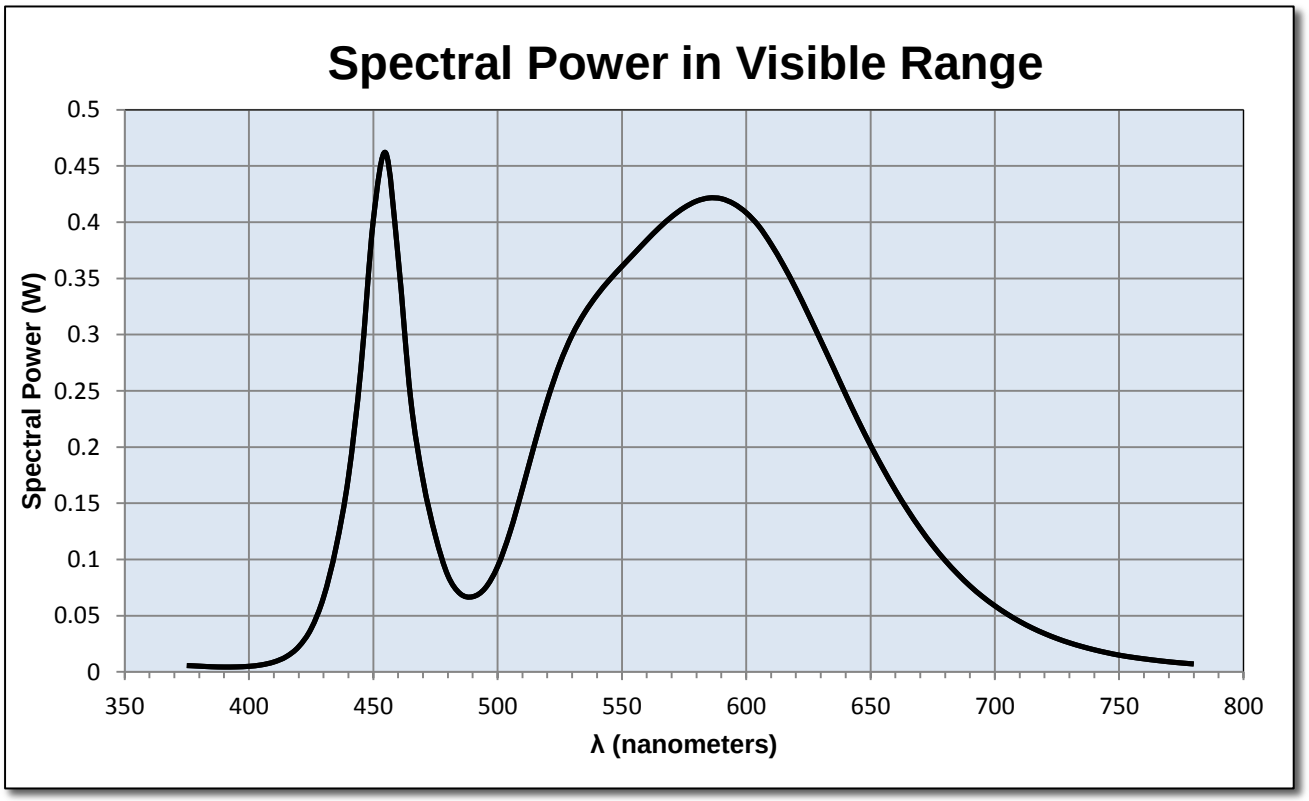
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	1.76	(A)
Input Power:	211.1	(W)
Input Power Factor:	0.996	
Current ATHD:	5.505	(%)

Photometric measurements:

Luminous Flux:	23860	(lumens)
Luminous Efficacy:	113.0	(lumens/W)
Correlated Color Temperature (CCT):	3876	(K)
CRI -Ra:	75.1	
CRI -R9:	-12	
DUV:	0.00025	
CIE Coordinate (x):	0.3859	
CIE Coordinate (y):	0.3795	
CIE Coordinate (u'):	0.2276	
CIE Coordinate (v'):	0.3357	



Test Results: Integrating Sphere

Results continued from previous page.

Tabulated Spectral Power in Visible Range:

λ(nm)	(W/nm)	λ(nm)	(W/nm)	λ(nm)	(W/nm)
375	0.006	515	0.204	655	0.181
380	0.005	520	0.242	660	0.162
385	0.005	525	0.274	665	0.144
390	0.004	530	0.300	670	0.127
395	0.004	535	0.319	675	0.112
400	0.005	540	0.335	680	0.099
405	0.006	545	0.349	685	0.087
410	0.009	550	0.361	690	0.076
415	0.014	555	0.372	695	0.067
420	0.022	560	0.384	700	0.059
425	0.038	565	0.395	705	0.051
430	0.066	570	0.405	710	0.045
435	0.111	575	0.413	715	0.039
440	0.173	580	0.419	720	0.034
445	0.269	585	0.422	725	0.030
450	0.401	590	0.421	730	0.026
455	0.462	595	0.416	735	0.023
460	0.369	600	0.408	740	0.020
465	0.244	605	0.397	745	0.017
470	0.171	610	0.380	750	0.015
475	0.121	615	0.362	755	0.013
480	0.086	620	0.341	760	0.012
485	0.07	625	0.318	765	0.010
490	0.067	630	0.295	770	0.009
495	0.074	635	0.271	775	0.008
500	0.094	640	0.247	780	0.007
505	0.124	645	0.224		
510	0.163	650	0.202		

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L14128.
Dialight unit model number HELMN4PN-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	1.765	(A)
Input Power:	211.2	(W)
Power Factor:	0.9967	

Photometric measurements:

Absolute Luminous Flux:	23868.5	(lumens)
Luminous Efficacy:	113.0	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	8793	8793	8793	8793	8793	
5	8797	8794	8793	8790	8792	328
15	8818	8818	8808	8800	8802	1881
25	8855	8856	8841	8829	8838	3509
35	8425	8424	8402	8404	8421	4905
45	6778	6756	6736	6744	6782	5385
55	4009	3979	3981	3986	4028	4309
65	1525	1520	1526	1539	1565	2252
75	441	439	445	455	459	779
85	189	189	191	196	197	276
95	116	122	121	127	131	164
105	35	36	36	41	45	75
115	0	0	0	0	0	7
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	

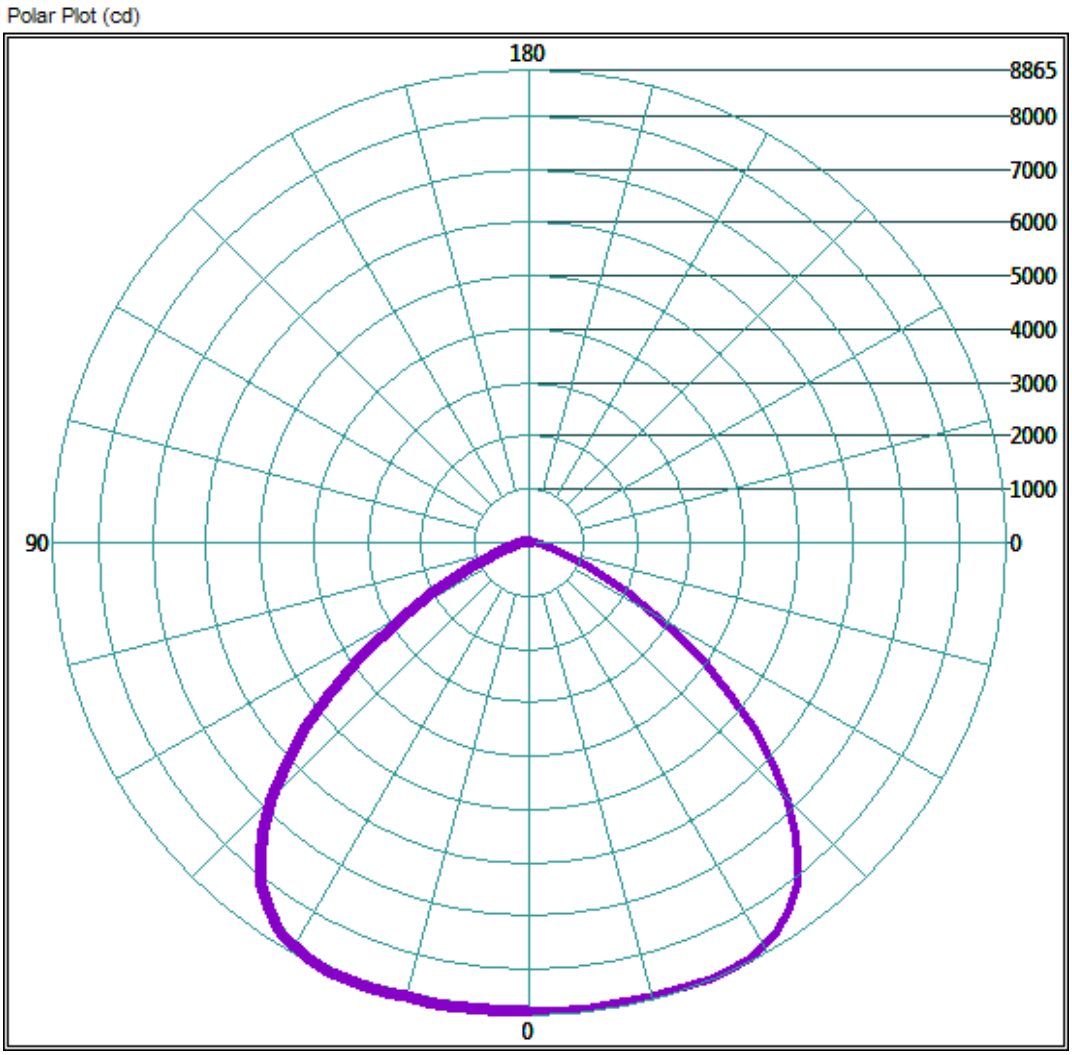
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	8031.3	33.6%
0-40	13346.94	55.9%
0-60	21694.32	90.9%
60-90	2640.28	11.1%
0-90	23713.82	99.4%
90-180	198.34	0.8%
0-180	23868.7	100.0%

Test Results: Goniometer

Results continued from previous page.

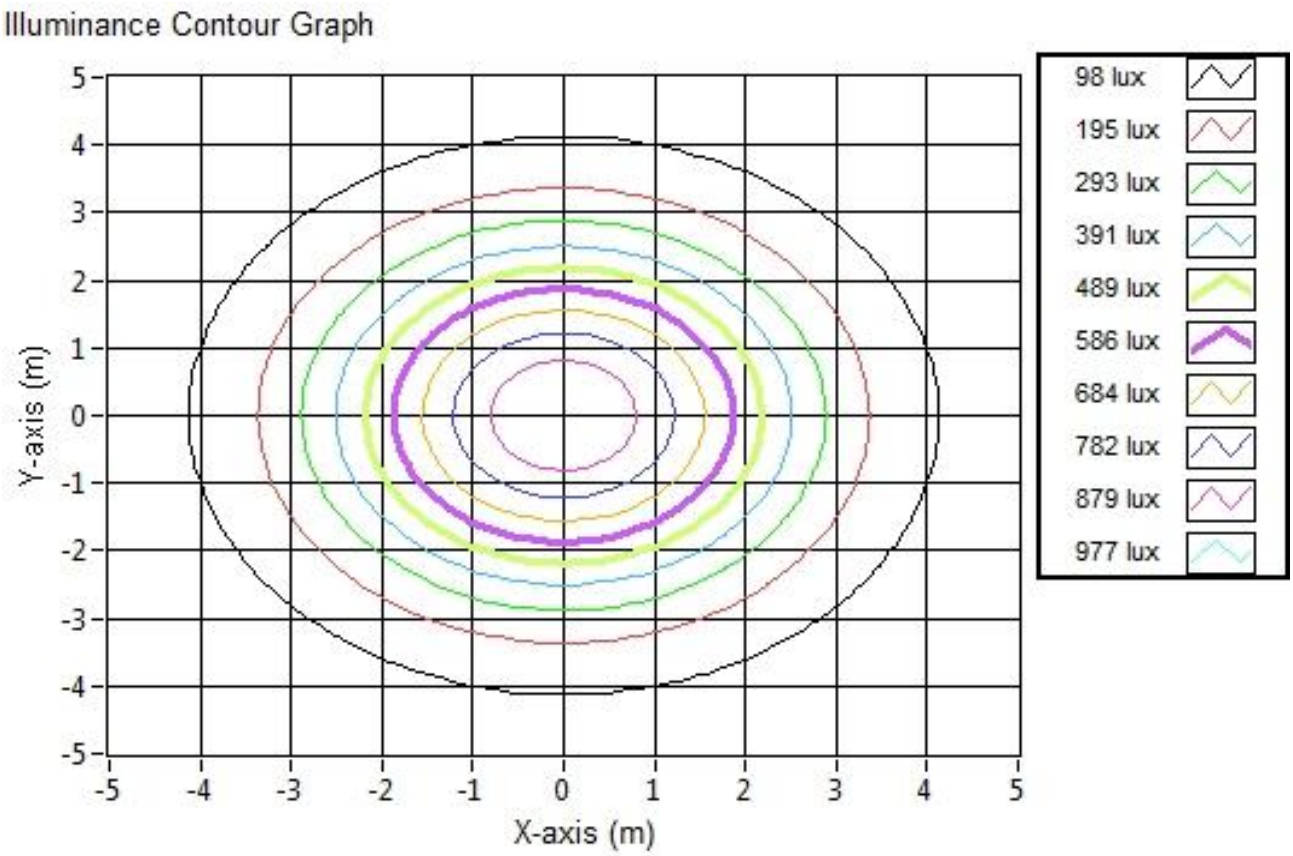
Polar Polt:



Test Results: Goniometer

Results continued from previous page.

Illuminance Plots:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	8.30	8.31	946.5
6.096	16.60	16.63	236.6
9.144	24.89	24.94	105.2
12.192	33.19	33.26	59.2
15.24	41.49	41.57	37.9
18.288	49.79	49.89	26.3
21.339	58.09	58.21	19.3
24.384	66.38	66.51	14.8
27.432	74.68	74.83	11.7
30.48	82.98	83.14	9.5

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L14128.
Dialight unit model number HELMN4PN-xxx

LED identified as Nichia part number Nichia NTLW757DT .

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:

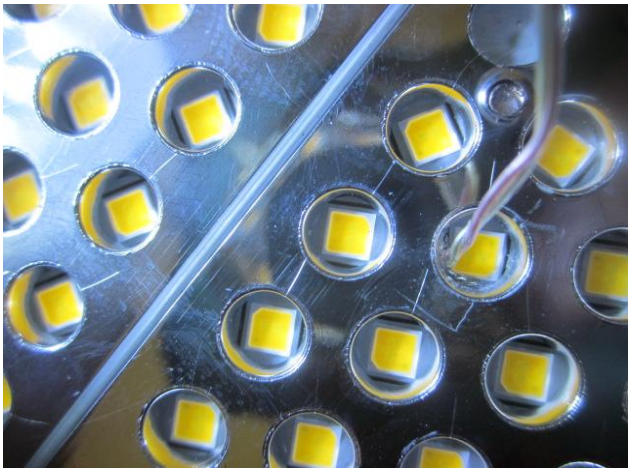
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

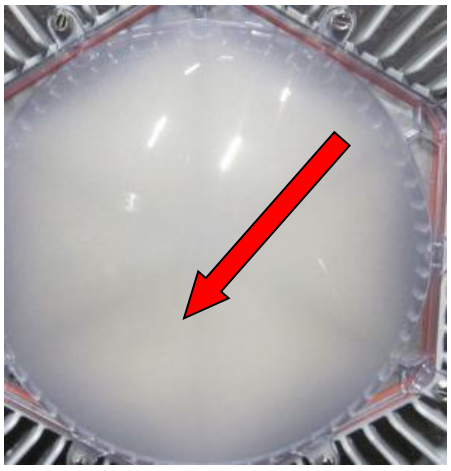
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 1°	(°C)
Ambient temperature at time of measurement:	24.6	(°C)
Relative humidity at time of measurement:	23%	

Results:

Measured LED source temperature:	60.1	(°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 Precison	1715A	-
TDK-Lambda	GEN1500W	-
Fluke 8808A Digit Multimeter	8808A	4/14/2015
TPI Digitial Thermometer 343	343	4/17/2015
TPI Digitial 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.

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