Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L15103 Date: Sep 11, 2015

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

Test of one Vigilant Highbay
Unit manufacturer: Dialight Corporation
Unit model number: HEC9NC4PN-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: September 8, 2015 through September 9, 2015

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:	L15103
Manufacturer:	Dialight Corporation
Product Name:	Vigilant
Description:	Vigilant Highbay
Model Number:	HEC9NC4PN-xxx

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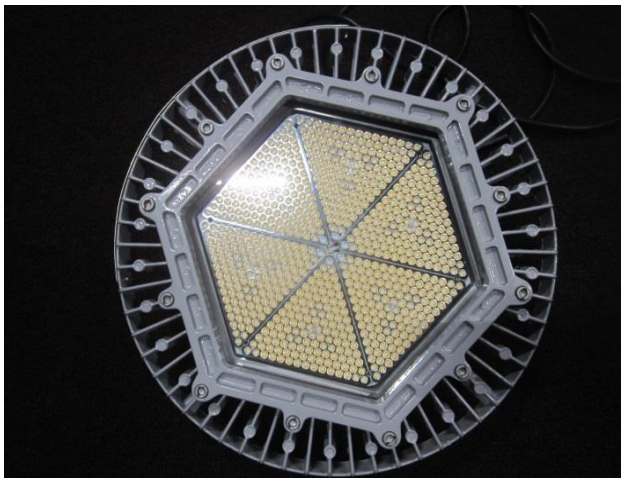
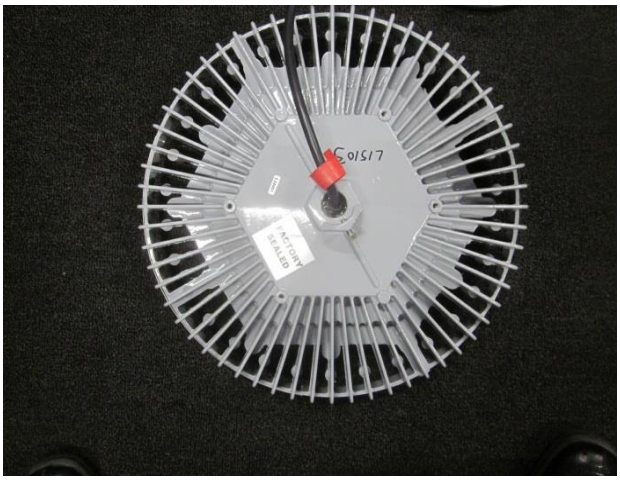
Report Summary

Sample number L15103

Dialight unit model number HEC9NC4PN-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	25160	(lumens)	25314	(lumens)
Electrical Power:	212.3	(W)	213.0	(W)
Luminous Efficacy:	118.5	(lumens/W)	118.8	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	212.3	(W)
Power Factor (120VAC):	0.997	
Current ATHD % (120VAC):	5.9	
Input Power (277VAC):	205.2	(W)
Power Factor (277VAC):	0.974	
Current ATHD % (277VAC):	13.21	

Color Measurements:

Correlated Color Temperature (CCT):	5024
Color Rendering Index (CRI):	78.6
Chromaticity Coordinate (x):	0.345
Chromaticity Coordinate (y):	0.355
Chromaticity Coordinate (u'):	0.21
Chromaticity Coordinate (v'):	0.324
DUV:	0.0017

Temperature Measurements:

In Situ LED Source Temperature:	52.5	(°C)

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Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15103.
Dialight unit model number HEC9NC4PN-xxx

Test Conditions:

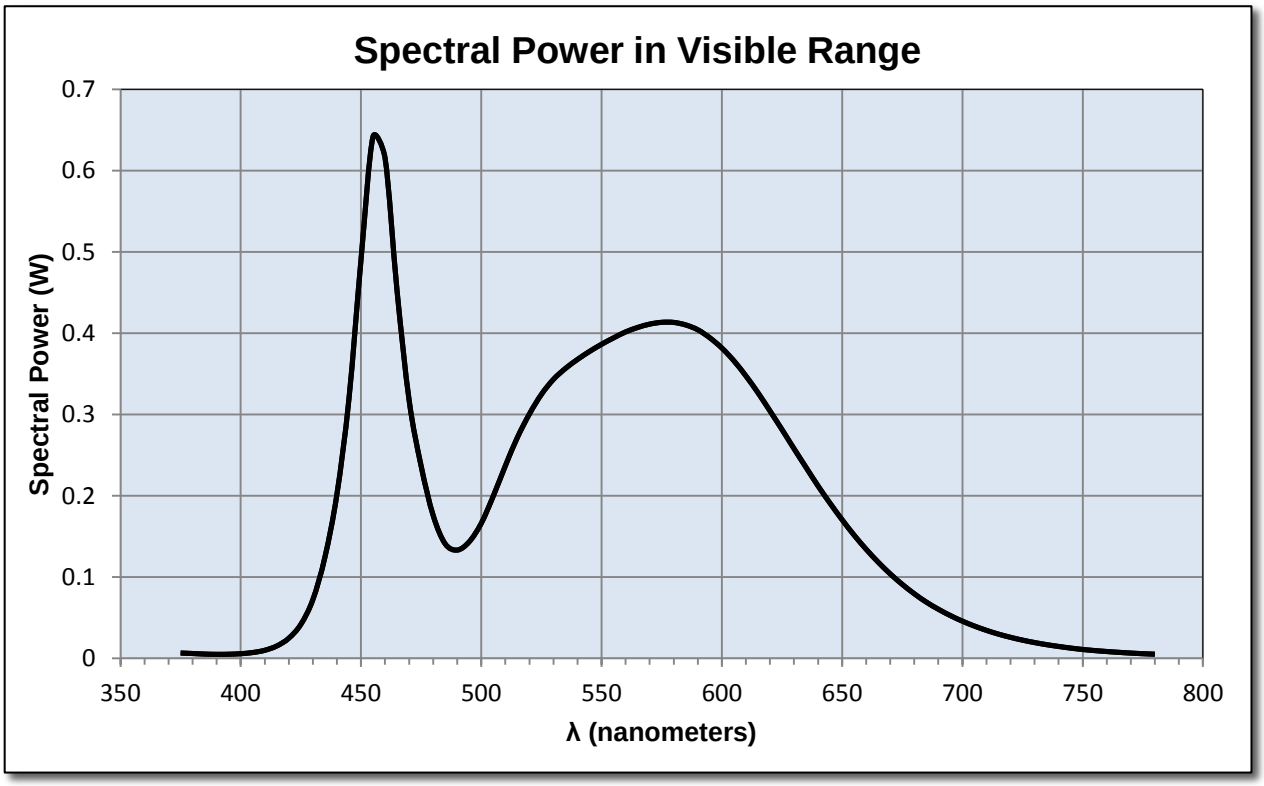
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	1.775	(A)
Input Power:	212.3	(W)
Input Power Factor:	0.997	
Current ATHD:	5.9	(%)

Photometric measurements:

Luminous Flux:	25160	(lumens)
Luminous Efficacy:	118.5	(lumens/W)
Correlated Color Temperature (CCT):	5024	(K)
CRI -Ra:	78.6	
CRI -R9:	-9.2	
DUV:	0.0017	
CIE Coordinate (x):	0.345	
CIE Coordinate (y):	0.355	
CIE Coordinate (u'):	0.21	
CIE Coordinate (v'):	0.324	



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	0.007	515	0.272	655	0.151
380	0.006	520	0.3	660	0.134
385	0.005	525	0.325	665	0.118
390	0.005	530	0.343	670	0.104
395	0.005	535	0.357	675	0.091
400	0.006	540	0.368	680	0.079
405	0.007	545	0.377	685	0.069
410	0.01	550	0.386	690	0.06
415	0.015	555	0.394	695	0.053
420	0.025	560	0.401	700	0.046
425	0.042	565	0.407	705	0.04
430	0.072	570	0.411	710	0.034
435	0.124	575	0.413	715	0.03
440	0.202	580	0.413	720	0.026
445	0.319	585	0.41	725	0.022
450	0.49	590	0.404	730	0.019
455	0.642	595	0.394	735	0.017
460	0.615	600	0.382	740	0.015
465	0.452	605	0.366	745	0.013
470	0.317	610	0.347	750	0.011
475	0.236	615	0.327	755	0.01
480	0.176	620	0.304	760	0.008
485	0.141	625	0.281	765	0.007
490	0.133	630	0.258	770	0.006
495	0.143	635	0.235	775	0.006
500	0.166	640	0.212	780	0.005
505	0.2	645	0.191		
510	0.237	650	0.17		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15103.
Dialight unit model number HEC9NC4PN-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	1.78	(A)
Input Power:	213.0	(W)
Power Factor:	0.997	

Photometric measurements:

Absolute Luminous Flux:	25314	(lumens)
Luminous Efficacy:	118.8	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	33371	33371	33371	33371	33371	
5	31052	31052	31052	31052	31052	1184
15	18422	18422	18422	18422	18422	4772
25	10844	10844	10844	10844	10844	5163
35	8163	8163	8163	8163	8163	5067
45	5941	5941	5941	5941	5941	4910
55	2519	2519	2519	2519	2519	3325
65	187	187	187	187	187	710
75	85	85	85	85	85	114
85	36	36	36	36	36	62
95	0	0	0	0	0	5
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	

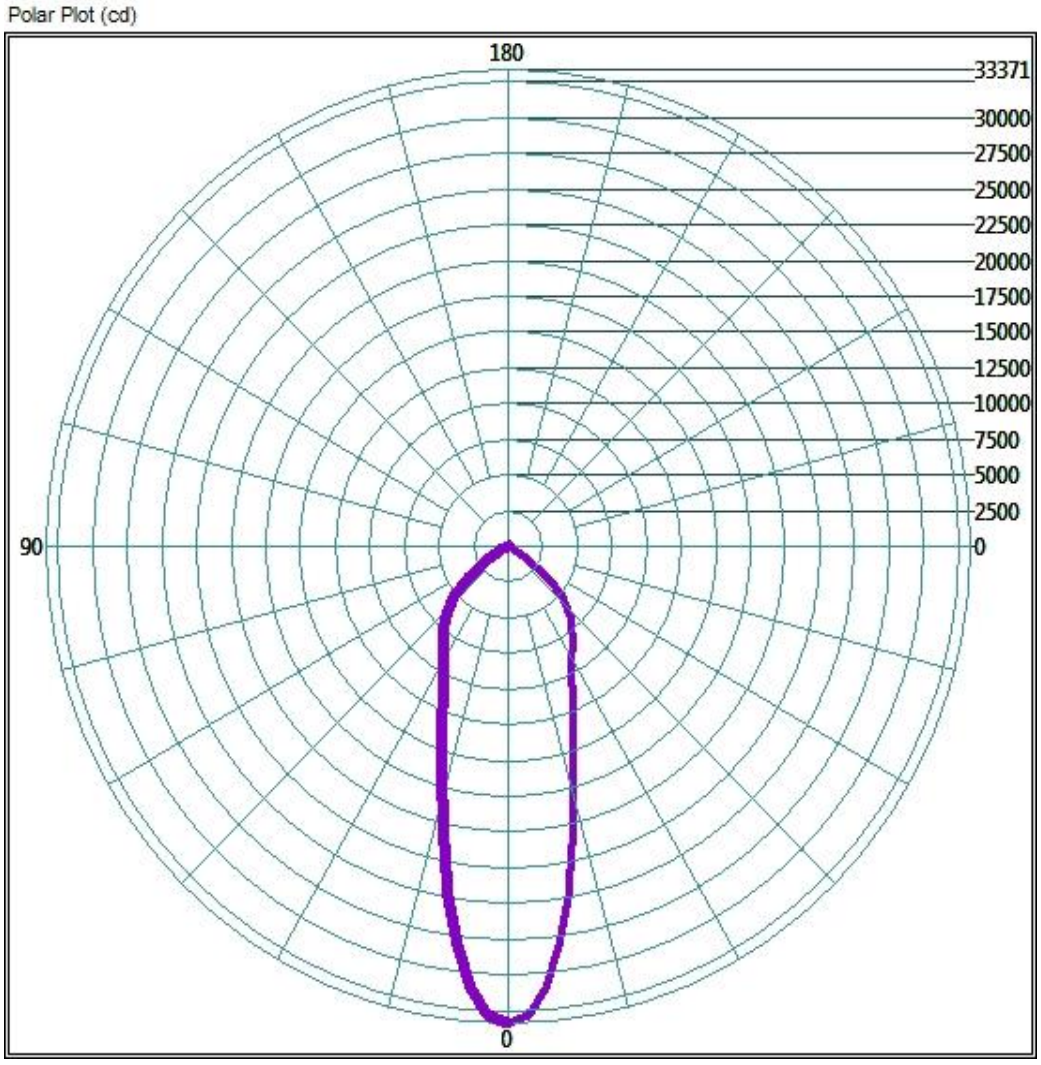
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	13625.6	53.8%
0-40	18725.12	74.0%
0-60	24984.32	98.7%
60-90	530.72	2.1%
0-90	25313.44	100.0%
90-180	0	0.0%
0-180	25313.44	100.0%

Test Results: Goniometer

Results continued from previous page.

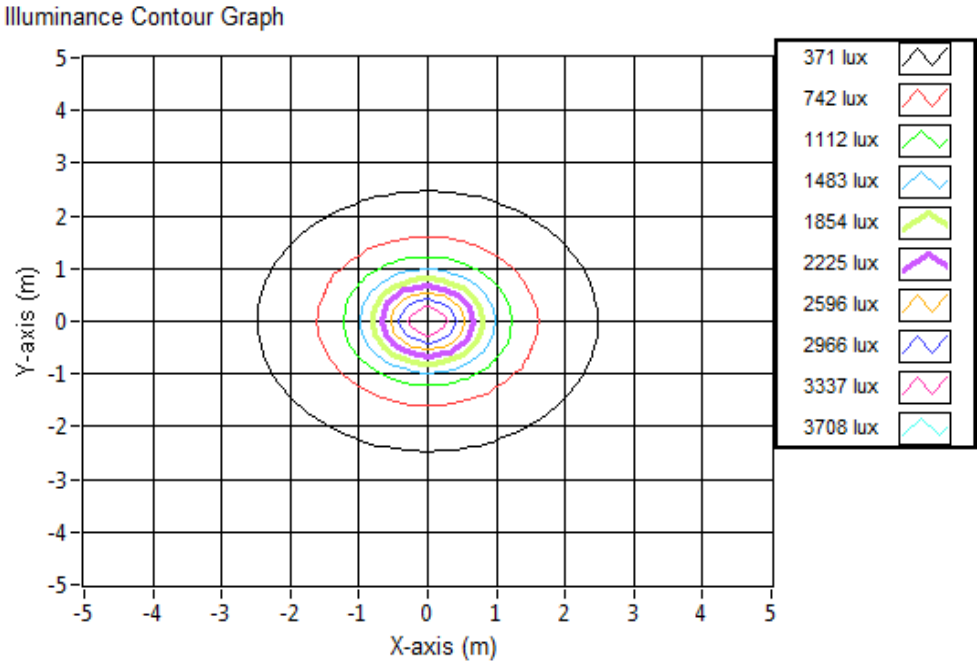
Polar Plot:



Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	1.84	1.84	3592.0
6.096	3.68	3.68	898.0
9.144	5.52	5.52	399.1
12.192	7.36	7.36	224.5
15.24	9.19	9.19	143.7
18.288	11.03	11.03	99.8
21.336	12.87	12.87	73.3
24.384	14.71	14.71	56.1
27.432	16.55	16.55	44.3
30.48	18.39	18.39	35.9

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Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15103.
Dialight unit model number HEC9NC4PN-xxx

LED identified as Nichia part number NT2W757DT.

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:

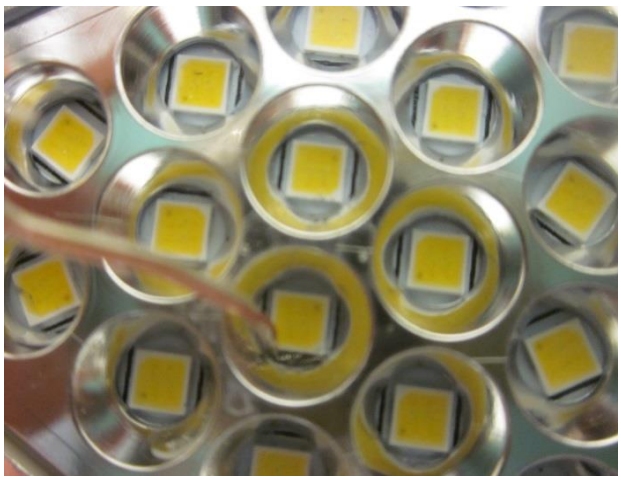
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

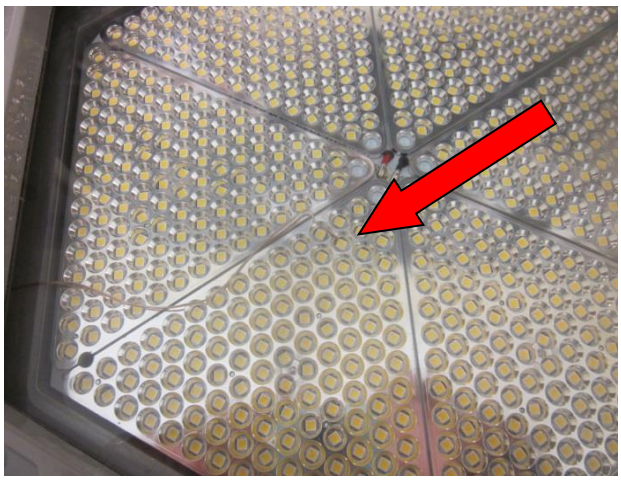
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 1‘	(°C)
Ambient temperature at time of measurement:	24.3	(°C)
Relative humidity at time of measurement:	49%	

Results:

Measured LED source temperature:	52.5	(°C)





Equipment Used:

Equipment Name	Model Number
Omega TC	Dpi8
Fluke 8808A Digit Multimeter	8808A
YOKOGAWA Digital Power Meter	11/26/3981
LSI High Speed Mirror Goniometer	6240T
Instrument System Spectrometer	CAS140B-151
Instrument System 1.5 Meter Sphere	ISP1500
Volttech Power Analyzer	PM1000+
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	4/16/3120
Extech Hygro-Thermometer	4/16/3120
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
BK Precison	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digitial Thermometer 343	TPI 343
TPI Digitial Thermometer 343	TPI 343
Step-Up Transformer	
Omega TC	Dpi8-C24
Agilent True RMS OLED Multimeter	U1273A
Adaptive Power Systems AC Power Supply	FC-210
Xitron Power Analyzer	XT2640

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:

Vishnu Shastry
Dialight Optics Laboratory
Optical Engineer
Approved Signatory