Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L15151 Date: Nov 20, 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: HEC9NC4GN-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 13, 2015 through November 18, 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: L15151
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay
Model Number: HEC9NC4GN-xxx

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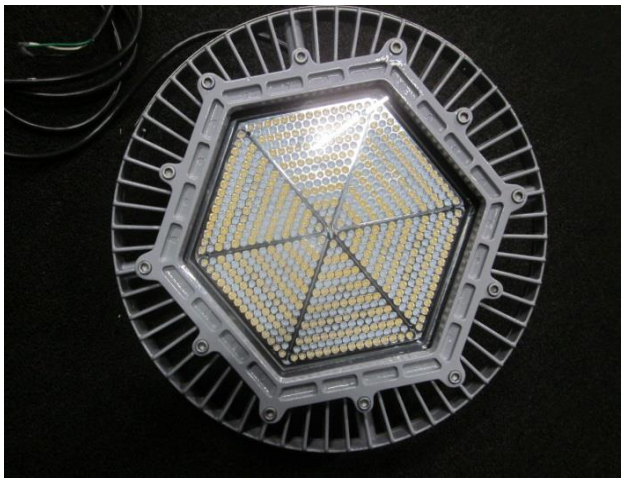
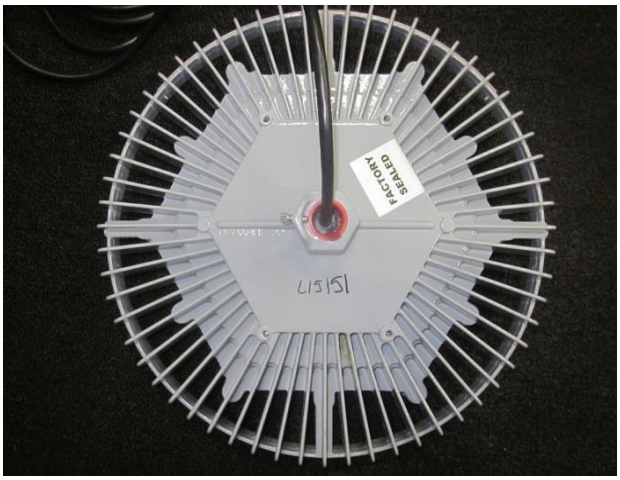
Report Summary

Sample number L15151

Dialight unit model number HEC9NC4GN-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	12930 (lumens)	13064 (lumens)
Electrical Power:	111.0 (W)	111.4 (W)
Luminous Efficacy:	116.5 (lumens/W)	117.3 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	111.0	(W)
Power Factor (120VAC):	0.992	
Current ATHD % (120VAC):	9.296	
Input Power (277VAC):	110.0	(W)
Power Factor (277VAC):	0.952	
Current ATHD % (277VAC):	17.5	

Color Measurements:

Correlated Color Temperature (CCT):	5058
Color Rendering Index (CRI):	79.5
Chromaticity Coordinate (x):	0.344
Chromaticity Coordinate (y):	0.353
Chromaticity Coordinate (u'):	0.21
Chromaticity Coordinate (v'):	0.324
DUV:	0.0013

Temperature Measurements:

In Situ LED Source Temperature:	52.4	(°C)

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Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15151.
Dialight unit model number HEC9NC4GN-xxx

Test Conditions:

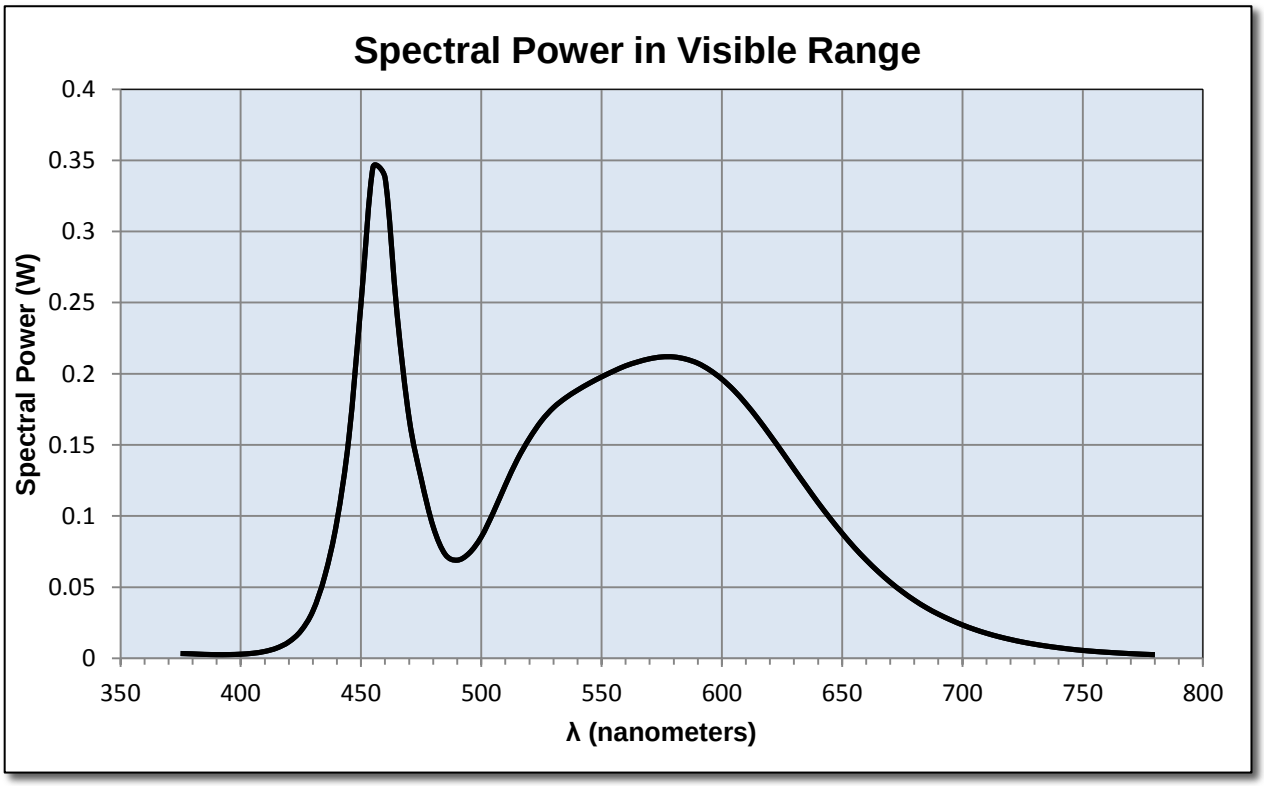
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.93	(A)
Input Power:	111.0	(W)
Input Power Factor:	0.992	
Current ATHD:	9.296	(%)

Photometric measurements:

Luminous Flux:	12930	(lumens)
Luminous Efficacy:	116.5	(lumens/W)
Correlated Color Temperature (CCT):	5058	(K)
CRI -Ra:	79.5	
CRI -R9:	-4.3	
DUV:	0.0013	
CIE Coordinate (x):	0.344	
CIE Coordinate (y):	0.353	
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	0.003	515	0.14	655	0.078
380	0.003	520	0.155	660	0.069
385	0.003	525	0.167	665	0.061
390	0.003	530	0.176	670	0.054
395	0.003	535	0.183	675	0.047
400	0.003	540	0.188	680	0.041
405	0.004	545	0.193	685	0.036
410	0.005	550	0.198	690	0.031
415	0.007	555	0.202	695	0.027
420	0.012	560	0.206	700	0.023
425	0.019	565	0.208	705	0.02
430	0.033	570	0.211	710	0.018
435	0.058	575	0.212	715	0.015
440	0.096	580	0.212	720	0.013
445	0.156	585	0.21	725	0.011
450	0.249	590	0.207	730	0.01
455	0.345	595	0.203	735	0.009
460	0.338	600	0.196	740	0.007
465	0.242	605	0.188	745	0.006
470	0.169	610	0.179	750	0.006
475	0.126	615	0.168	755	0.005
480	0.093	620	0.157	760	0.004
485	0.073	625	0.145	765	0.004
490	0.069	630	0.133	770	0.003
495	0.074	635	0.121	775	0.003
500	0.085	640	0.109	780	0.003
505	0.103	645	0.098		
510	0.122	650	0.088		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15151.
Dialight unit model number HEC9NC4GN-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.934	(A)
Input Power:	111.4	(W)
Power Factor:	0.992	

Photometric measurements:

Absolute Luminous Flux:	13064	(lumens)
Luminous Efficacy:	117.3	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	18645	18645	18645	18645	18645	
5	17132	17132	17132	17132	17132	655
15	9909	9909	9909	9909	9909	2584
25	5683	5683	5683	5683	5683	2741
35	4139	4139	4139	4139	4139	2586
45	2963	2963	2963	2963	2963	2486
55	1147	1147	1147	1147	1147	1580
65	113	113	113	113	113	328
75	48	48	48	48	48	65
85	19	19	19	19	19	35
95	0	0	0	0	0	3
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	

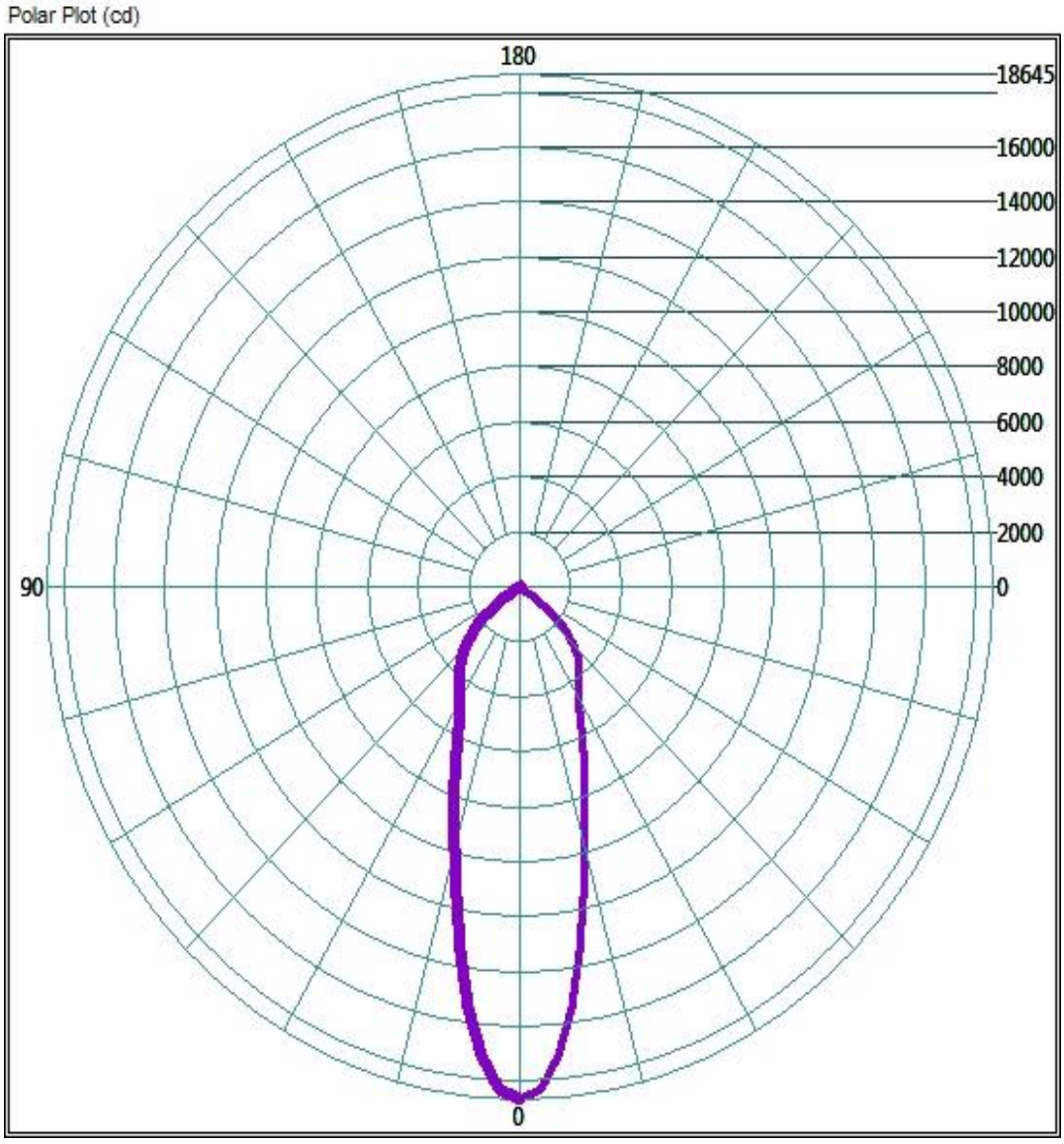
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	7268.64	55.6%
0-40	9858.24	75.5%
0-60	12885.12	98.6%
60-90	268.48	2.1%
0-90	13063.52	100.0%
90-180	0	0.0%
0-180	13063.52	100.0%

Test Results: Goniometer

Results continued from previous page.

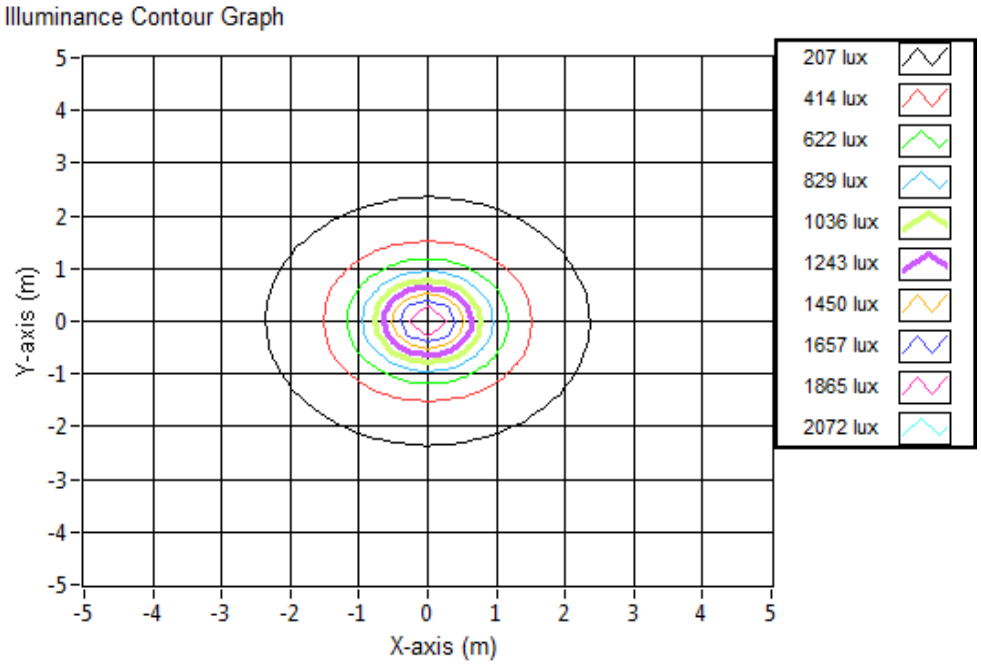
Polar Plot:



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	1.76	1.76	2007.0
6.096	3.52	3.52	501.7
9.144	5.28	5.28	223.0
12.192	7.04	7.04	125.4
15.24	8.79	8.79	80.3
18.288	10.55	10.55	55.7
21.336	12.31	12.31	41.0
24.384	14.07	14.07	31.4
27.432	15.83	15.83	24.8
30.48	17.59	17.59	20.1

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Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15151.
Dialight unit model number HEC9NC4GN-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:

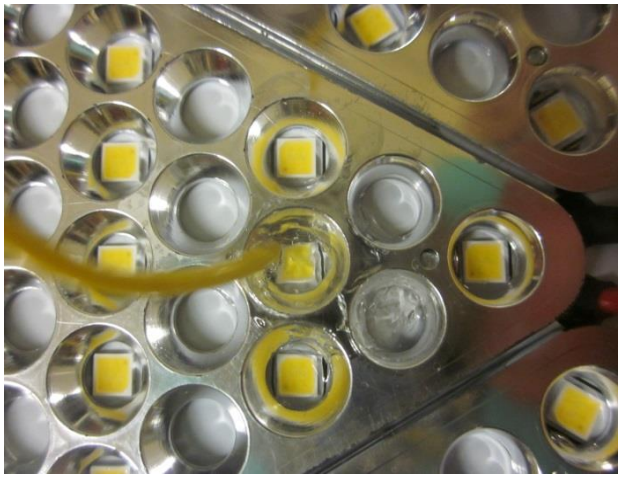
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

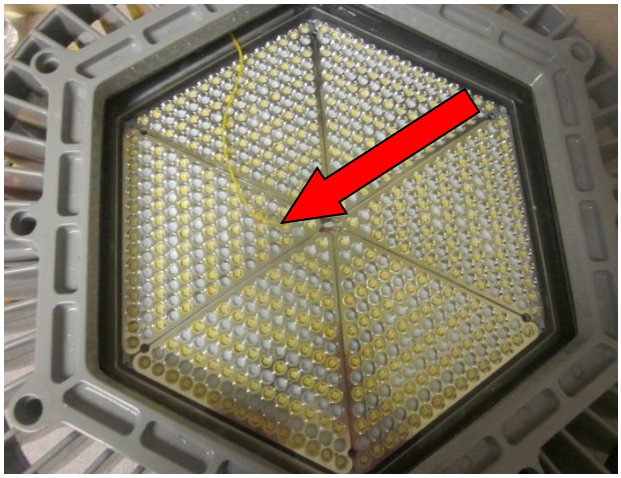
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 1‘	(°C)
Ambient temperature at time of measurement:	25.1	(°C)
Relative humidity at time of measurement:	25%	

Results:

Measured LED source temperature:	52.4	(°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