

# Test Report

Report Number: L15148

Date: Nov 3, 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: HEC9NC4KN-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:** October 29, 2015 through November 2, 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

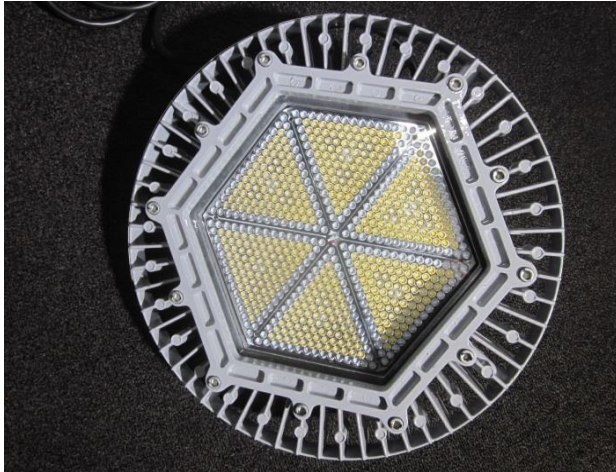
**Description of sample:**

Sample Number: L15148  
Manufacturer: Dialight Corporation  
Product Name: Vigilant  
Description: Vigilant Highbay  
Model Number: HEC9NC4KN-xxx

## Report Summary

Sample number L15148  
Dialight unit model number HEC9NC4KN-xxx

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	17140 (lumens)	17038 (lumens)
Electrical Power:	142.8 (W)	142.7 (W)
Luminous Efficacy:	120.2 (lumens/W)	119.4 (lumens/W)

### Electrical Measurements:

Input Power (120VAC): 142.8 (W)  
 Power Factor (120VAC): 0.994  
 Current ATHD % (120VAC): 8.362  
 Input Power (277VAC): 140.3 (W)  
 Power Factor (277VAC): 0.969  
 Current ATHD % (277VAC): 14.57

### Color Measurements:

Correlated Color Temperature (CCT): 4983  
 Color Rendering Index (CRI): 78.4  
 Chromaticity Coordinate (x): 0.346  
 Chromaticity Coordinate (y): 0.354  
 Chromaticity Coordinate (u'): 0.211  
 Chromaticity Coordinate (v'): 0.324  
 DUV: 0.00081

### Temperature Measurements:

In Situ LED Source Temperature: 50.4 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15148.

Dialight unit model number HEC9NC4KN-xxx

### Test Conditions:

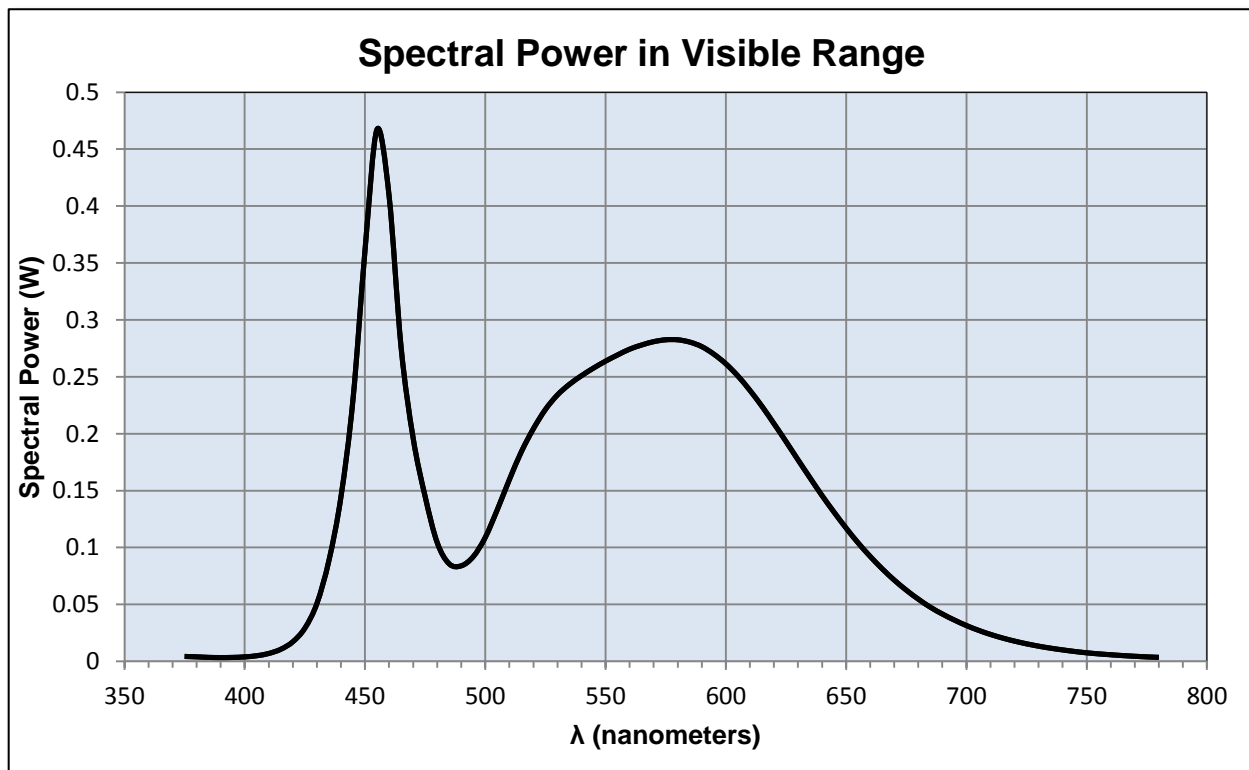
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input Current: 1.194 (A)  
Input Power: 142.8 (W)  
Input Power Factor: 0.994  
Current ATHD: 8.362 (%)

### Photometric measurements:

Luminous Flux: 17140 (lumens)  
Luminous Efficacy: 120.2 (lumens/W)  
Correlated Color Temperature (CCT): 4983 (K)  
CRI -Ra: 78.4  
CRI -R9: -8  
DUV: 0.00081  
CIE Coordinate (x): 0.346  
CIE Coordinate (y): 0.354  
CIE Coordinate (u'): 0.211  
CIE Coordinate (v'): 0.324



## 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	0.004	515	0.184	655	0.104
380	0.004	520	0.204	660	0.092
385	0.003	525	0.221	665	0.081
390	0.003	530	0.234	670	0.071
395	0.003	535	0.243	675	0.063
400	0.004	540	0.251	680	0.055
405	0.005	545	0.258	685	0.048
410	0.007	550	0.264	690	0.042
415	0.011	555	0.269	695	0.036
420	0.017	560	0.274	700	0.031
425	0.029	565	0.278	705	0.027
430	0.051	570	0.281	710	0.024
435	0.089	575	0.282	715	0.021
440	0.144	580	0.282	720	0.018
445	0.23	585	0.28	725	0.015
450	0.361	590	0.276	730	0.013
455	0.467	595	0.27	735	0.012
460	0.409	600	0.261	740	0.01
465	0.276	605	0.251	745	0.009
470	0.196	610	0.238	750	0.008
475	0.145	615	0.224	755	0.007
480	0.104	620	0.209	760	0.006
485	0.086	625	0.193	765	0.005
490	0.084	630	0.177	770	0.004
495	0.092	635	0.161	775	0.004
500	0.109	640	0.146	780	0.003
505	0.133	645	0.131		
510	0.16	650	0.117		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15148.  
Dialight unit model number HEC9NC4KN-xxx

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input current: 1.19 (A)  
Input Power: 142.7 (W)  
Power Factor: 0.995

### Photometric measurements:

Absolute Luminous Flux: 17038 (lumens)  
Luminous Efficacy: 119.4 (lumens/W)

### Intensity Summary:

<b>INTENSITY (CANDLEPOWER) SUMMARY</b>						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	23067	23067	23067	23067	23067	
5	21279	21279	21279	21279	21279	813
15	12428	12428	12428	12428	12428	3231
25	7344	7344	7344	7344	7344	3471
35	5604	5604	5604	5604	5604	3475
45	4027	4027	4027	4027	4027	3350
55	1552	1552	1552	1552	1552	2141
65	144	144	144	144	144	446
75	53	53	53	53	53	76
85	16	16	16	16	16	33
95	0	0	0	0	0	2
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

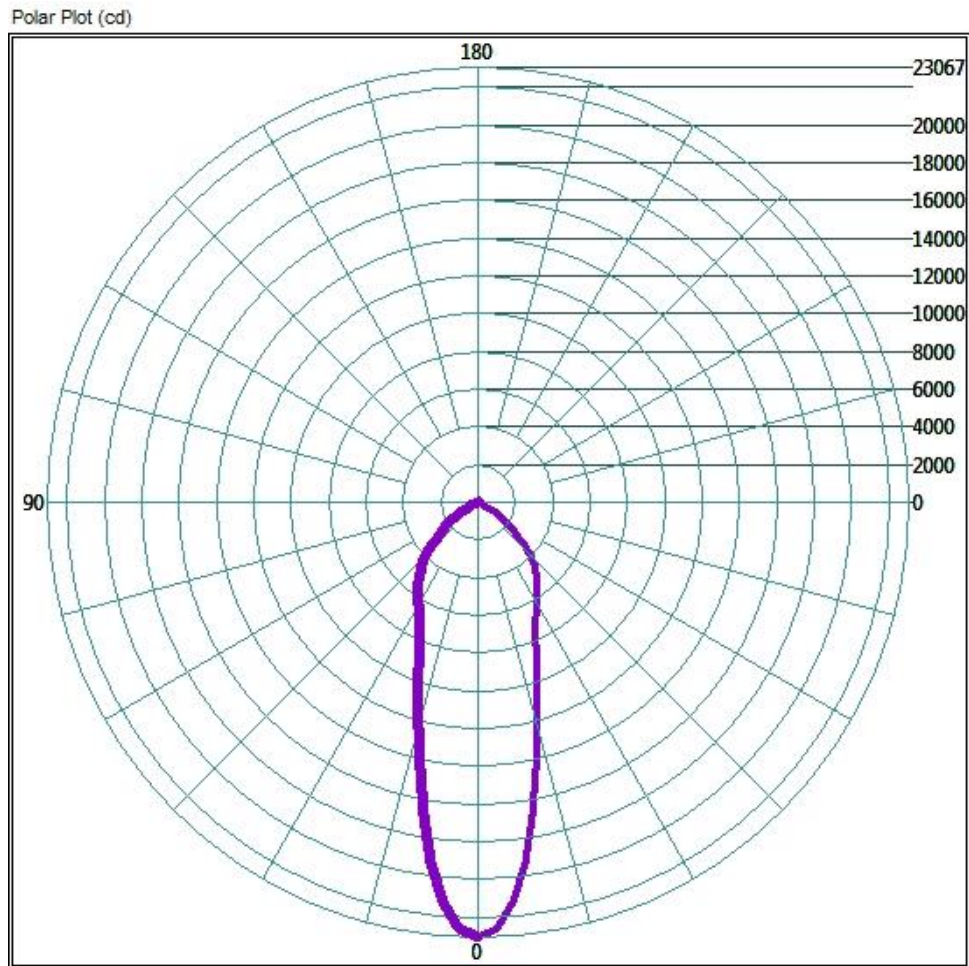
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	9230.4	54.2%
0-40	12726.24	74.7%
0-60	16824.64	98.8%
60-90	337.44	2.0%
0-90	17037.6	100.0%
90-180	0	0.0%
0-180	17037.6	100.0%

## Test Results: Goniometer

Results continued from previous page.

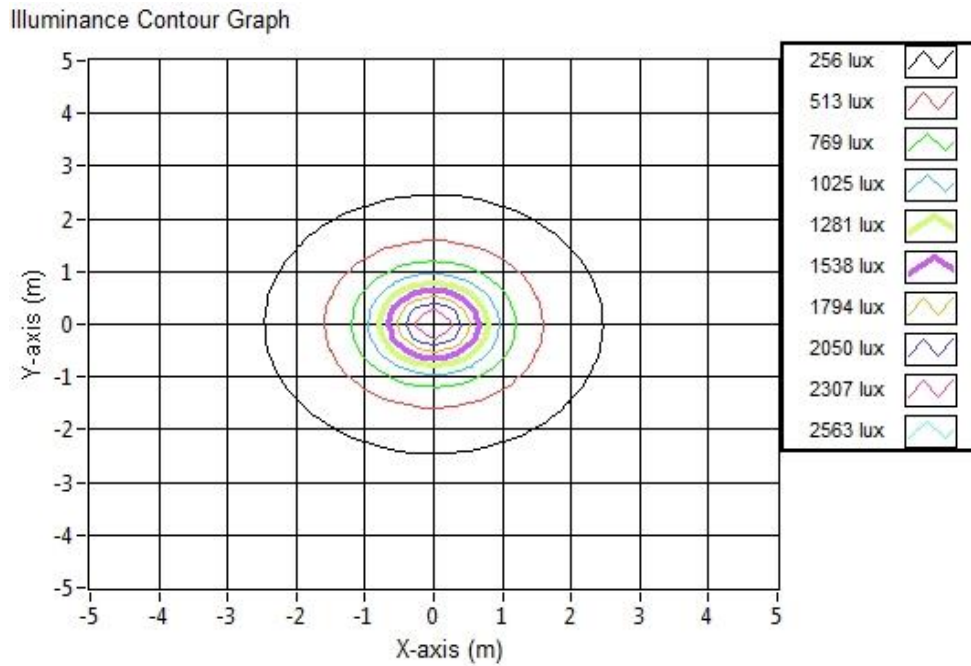
### Polar Plot:



## 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	1.79	1.79	2482.9
6.096	3.57	3.57	620.7
9.144	5.36	5.36	275.9
12.192	7.14	7.14	155.2
15.24	8.93	8.93	99.3
18.288	10.71	10.71	69.0
21.336	12.50	12.50	50.7
24.384	14.28	14.28	38.8
27.432	16.07	16.07	30.7
30.48	17.85	17.85	24.8

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15148.  
Dialight unit model number HEC9NC4KN-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:

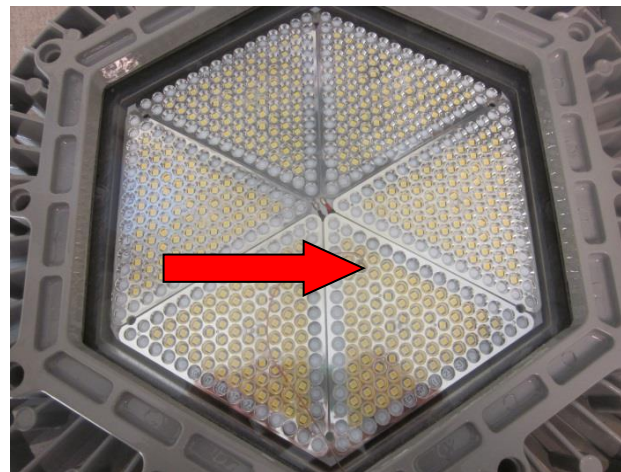
Maximum Power at Indicated Current: 0.35 (W)  
Maximum Source Temperature: 113.7 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature:  $25^{\circ} \pm 1^{\circ}$  (°C)  
Ambient temperature at time of measurement: 24.1 (°C)  
Relative humidity at time of measurement: 43%

### Results:

**Measured LED source temperature: 50.4 (°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 Precision	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digital Thermometer 343	TPI 343
TPI Digital 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. This report shall not be reproduced, except in full, without the express written permission of Dialight Optics Laboratory.

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Approved Signatory