

Test Report

Report Number: L15109

Date: Oct 8, 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: HEC9MC4KN-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 5, 2015 through October 8, 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

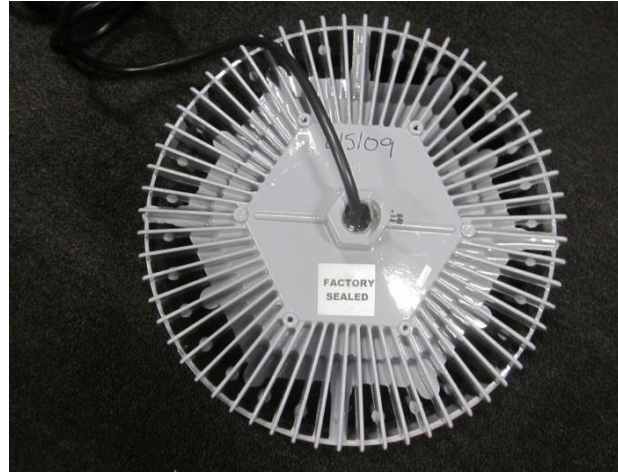
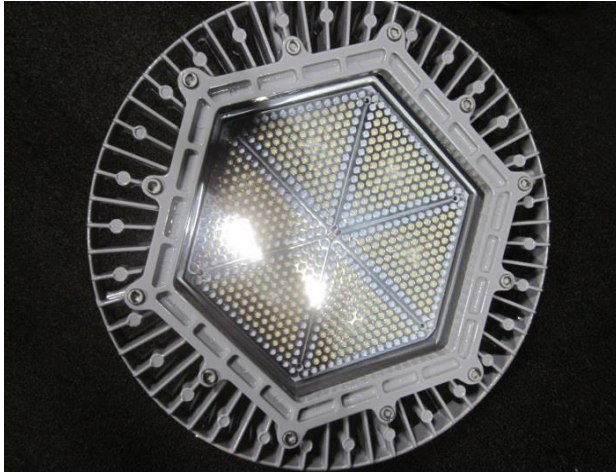
Description of sample:

Sample Number: L15109
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay
Model Number: HEC9MC4KN-xxx

Report Summary

Sample number L15109
Dialight unit model number HEC9MC4KN-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	16450 (lumens)	16125 (lumens)
Electrical Power:	143.5 (W)	143.4 (W)
Luminous Efficacy:	114.7 (lumens/W)	112.5 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 143.5 (W)
 Power Factor (120VAC): 0.995
 Current ATHD % (120VAC): 8.155
 Input Power (277VAC): 141.2 (W)
 Power Factor (277VAC): 0.968
 Current ATHD % (277VAC): 14.22

Color Measurements:

Correlated Color Temperature (CCT): 4992
 Color Rendering Index (CRI): 78.5
 Chromaticity Coordinate (x): 0.346
 Chromaticity Coordinate (y): 0.356
 Chromaticity Coordinate (u'): 0.21
 Chromaticity Coordinate (v'): 0.325
 DUV: 0.002

Temperature Measurements:

In Situ LED Source Temperature: 53.7 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15109.

Dialight unit model number HEC9MC4KN-xxx

Test Conditions:

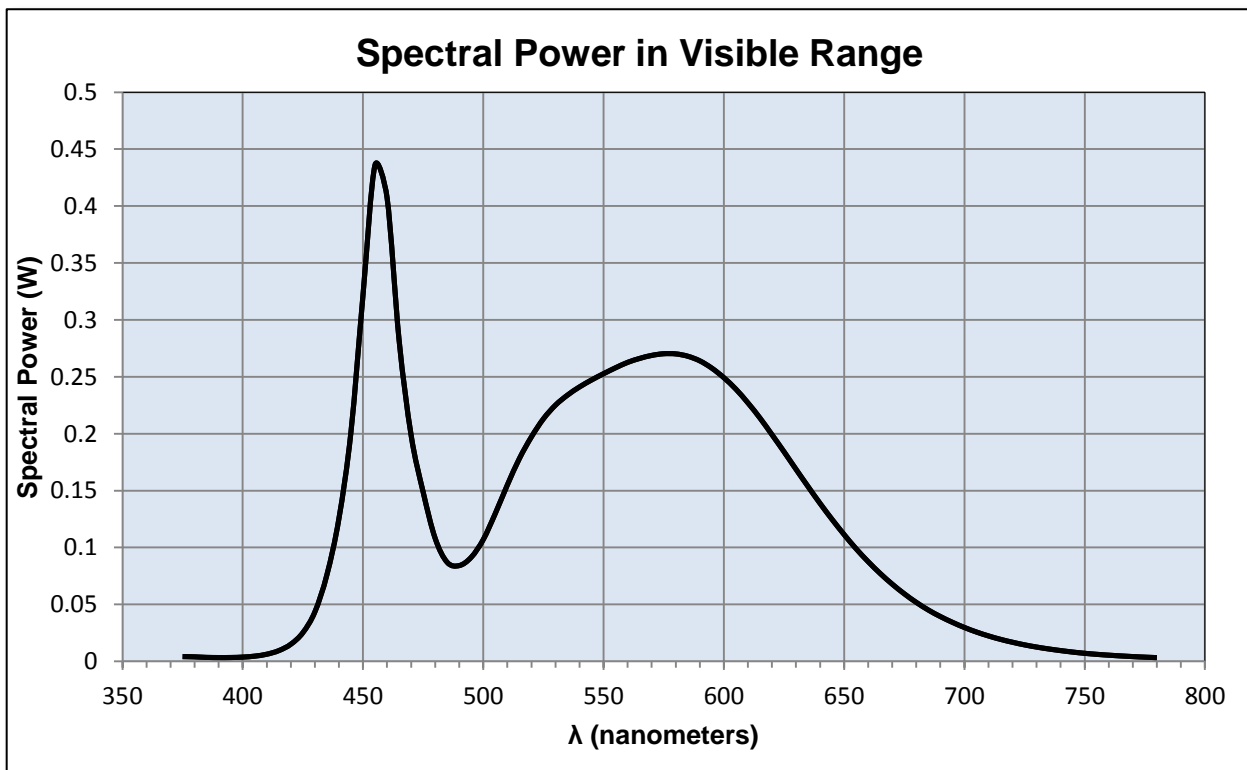
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120.5 (VAC)
Input Current: 1.198 (A)
Input Power: 143.5 (W)
Input Power Factor: 0.995
Current ATHD: 8.155 (%)

Photometric measurements:

Luminous Flux: 16450 (lumens)
Luminous Efficacy: 114.7 (lumens/W)
Correlated Color Temperature (CCT): 4992 (K)
CRI -Ra: 78.5
CRI -R9: -9.2
DUV: 0.002
CIE Coordinate (x): 0.346
CIE Coordinate (y): 0.356
CIE Coordinate (u'): 0.21
CIE Coordinate (v'): 0.325



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	0.178	655	0.099
380	0.004	520	0.197	660	0.088
385	0.003	525	0.213	665	0.077
390	0.003	530	0.225	670	0.068
395	0.003	535	0.234	675	0.059
400	0.004	540	0.241	680	0.052
405	0.005	545	0.247	685	0.045
410	0.006	550	0.253	690	0.039
415	0.009	555	0.258	695	0.034
420	0.015	560	0.263	700	0.03
425	0.025	565	0.266	705	0.026
430	0.043	570	0.269	710	0.022
435	0.076	575	0.27	715	0.019
440	0.126	580	0.27	720	0.017
445	0.202	585	0.268	725	0.014
450	0.322	590	0.264	730	0.013
455	0.436	595	0.258	735	0.011
460	0.407	600	0.249	740	0.009
465	0.282	605	0.239	745	0.008
470	0.199	610	0.227	750	0.007
475	0.149	615	0.214	755	0.006
480	0.108	620	0.199	760	0.005
485	0.087	625	0.184	765	0.005
490	0.084	630	0.169	770	0.004
495	0.091	635	0.154	775	0.004
500	0.107	640	0.139	780	0.003
505	0.13	645	0.125		
510	0.155	650	0.111		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15109.
Dialight unit model number HEC9MC4KN-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 1.19 (A)
Input Power: 143.4 (W)
Power Factor: 0.995

Photometric measurements:

Absolute Luminous Flux: 16125 (lumens)
Luminous Efficacy: 112.5 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	6307	6307	6307	6307	6307	
5	6364	6364	6364	6364	6364	237
15	6548	6548	6548	6548	6548	1388
25	7181	7181	7181	7181	7181	2766
35	7000	7000	7000	7000	7000	4102
45	4893	4893	4893	4893	4893	4153
55	1951	1951	1951	1951	1951	2566
65	359	359	359	359	359	753
75	57	57	57	57	57	121
85	19	19	19	19	19	36
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	0

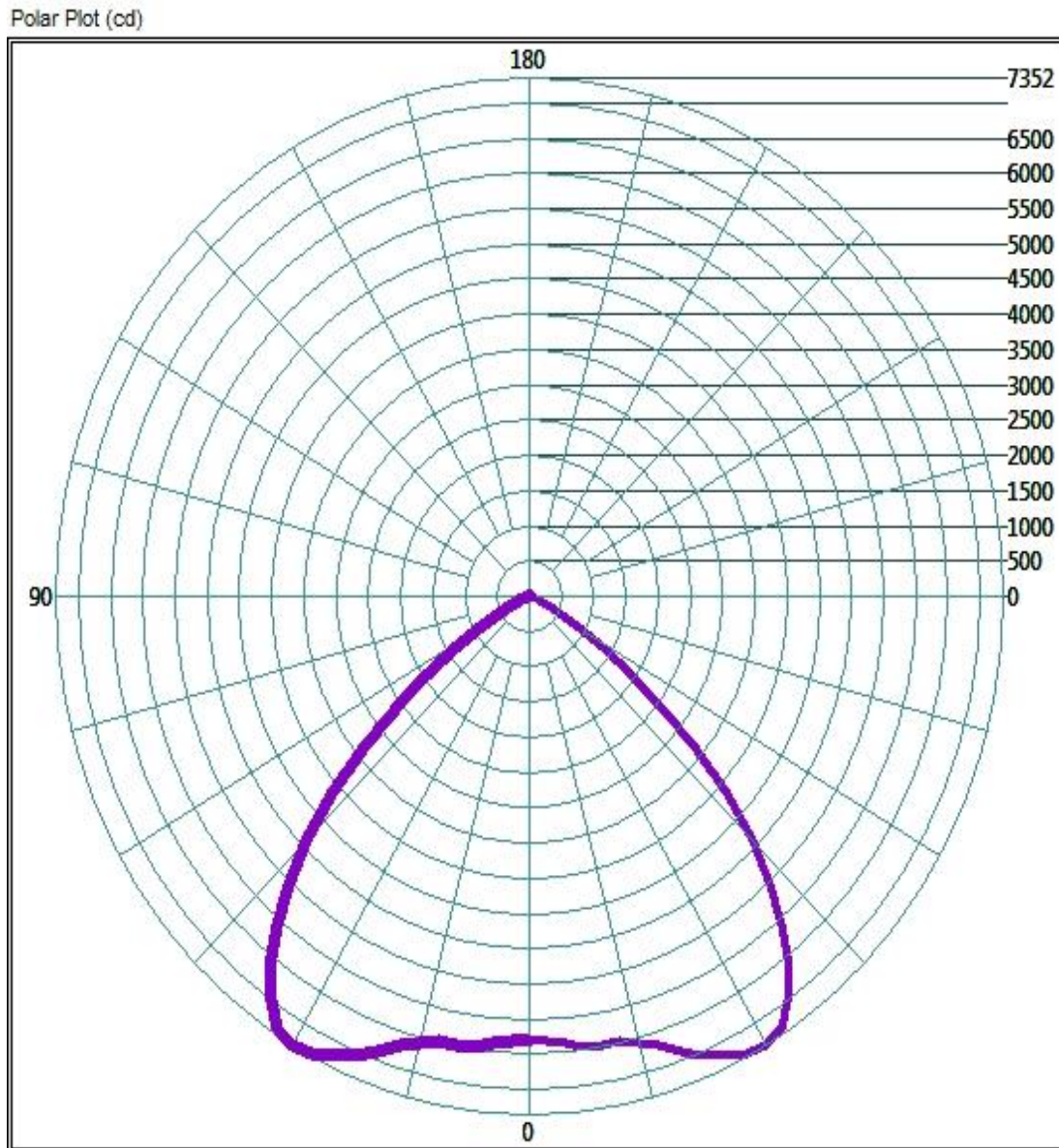
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	6322.4	39.2%
0-40	10672.64	66.2%
0-60	15737.28	97.6%
60-90	599.84	3.7%
0-90	16125.28	100.0%
90-180	0	0.0%
0-180	16125.28	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

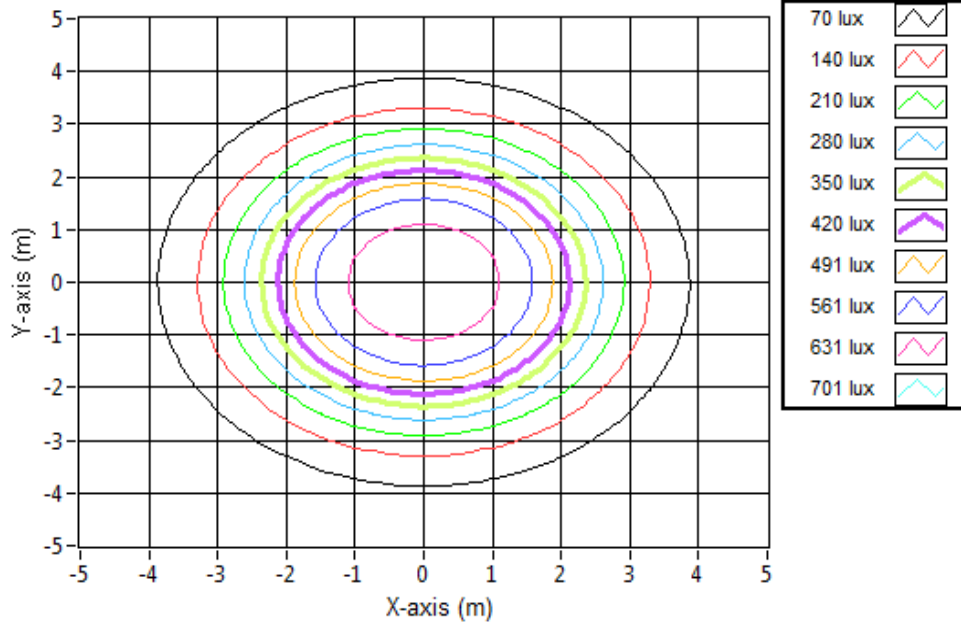


Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:

Illuminance Contour Graph



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	7.47	7.47	678.9
6.096	14.95	14.95	169.7
9.144	22.42	22.42	75.4
12.192	29.89	29.89	42.4
15.24	37.37	37.37	27.2
18.288	44.84	44.84	18.9
21.336	52.31	52.31	13.9
24.384	59.79	59.79	10.6
27.432	67.26	67.26	8.4
30.48	74.73	74.73	6.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15109.
Dialight unit model number HEC9MC4KN-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:

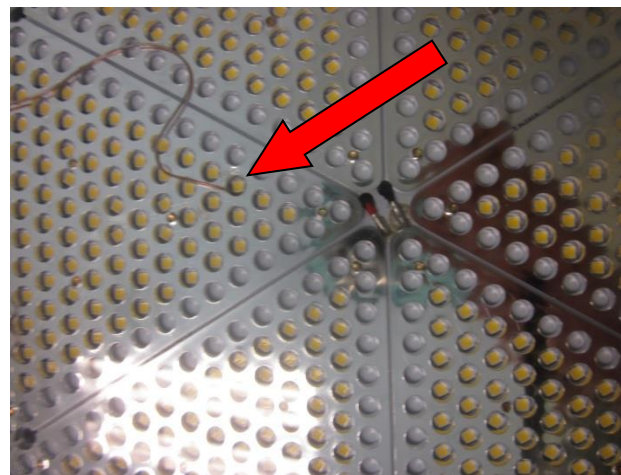
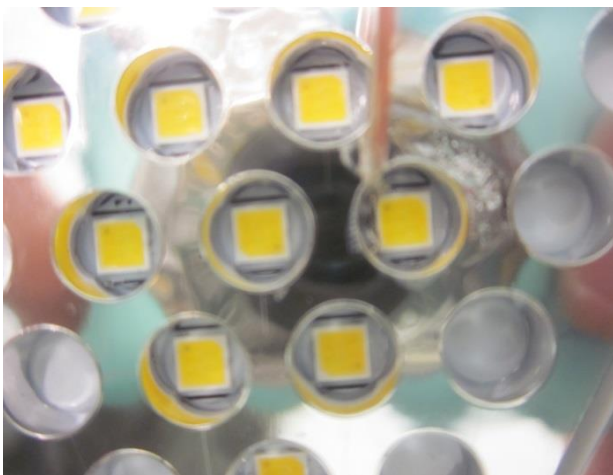
Maximum Power at Indicated Current: 0.35 (W)
Maximum Source Temperature: 113.7 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 1^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.3 (°C)
Relative humidity at time of measurement: 36%

Results:

Measured LED source temperature: 53.7 (°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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