

Test Report

Report Number: L15045

Date: Apr 7, 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: HEC9RC4DN-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: March 31, 2015 through April 1, 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

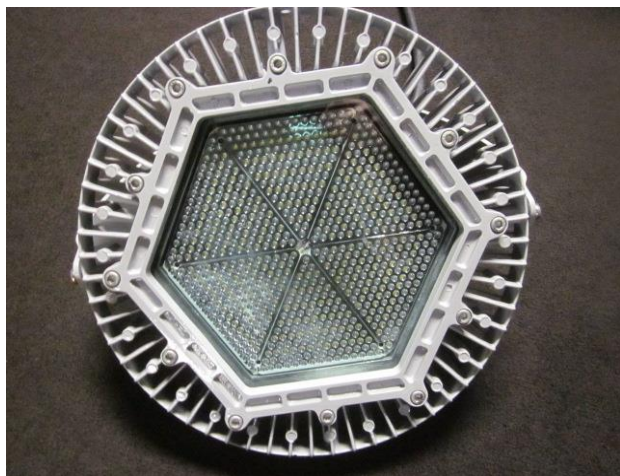
Description of sample:

Sample Number: L15045
Manufacturer: Dialight Corporation
Product Name: Vigilant Highbay
Description: Vigilant Highbay
Model Number: HEC9RC4DN-xxx

Report Summary

Sample number L15045
Dialight unit model number HEC9RC4DN-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	9396 (lumens)	9356 (lumens)
Electrical Power:	89.6 (W)	89.9 (W)
Luminous Efficacy:	105 (lumens/W)	104 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 89.6 (W)
Power Factor (120VAC): 0.991
Current ATHD % (120VAC): 9.957
Input Power (277VAC): 88.9 (W)
Power Factor (277VAC): 0.926
Current ATHD % (277VAC): 16.99

Color Measurements:

Correlated Color Temperature (CCT): 5260
Color Rendering Index (CRI): 76.2
Chromaticity Coordinate (x): 0.339
Chromaticity Coordinate (y): 0.359
Chromaticity Coordinate (u'): 0.205
Chromaticity Coordinate (v'): 0.487
DUV: 0.006

Temperature Measurements:

In Situ LED Source Temperature: 46.5 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15045.

Dialight unit model number HEC9RC4DN-xxx

Test Conditions:

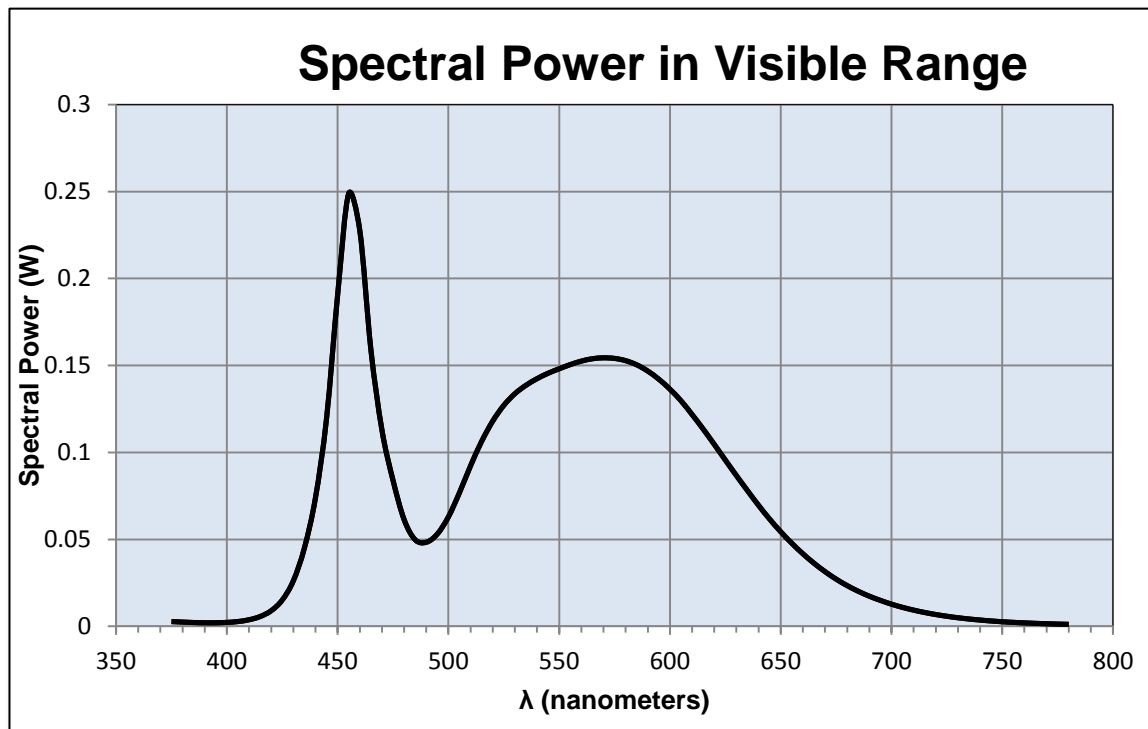
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 0.751 (A)
Input Power: 89.6 (W)
Input Power Factor: 0.991
Current ATHD: 9.957 (%)

Photometric measurements:

Luminous Flux: 9396 (lumens)
Luminous Efficacy: 105.0 (lumens/W)
Correlated Color Temperature (CCT): 5260 (K)
CRI -Ra: 76.2
CRI -R9: -23.5
DUV: 0.006
CIE Coordinate (x): 0.339
CIE Coordinate (y): 0.359
CIE Coordinate (u'): 0.205
CIE Coordinate (v'): 0.487



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	0.003	515	0.106	655	0.048
380	0.002	520	0.118	660	0.042
385	0.002	525	0.127	665	0.036
390	0.002	530	0.134	670	0.031
395	0.002	535	0.139	675	0.027
400	0.002	540	0.142	680	0.023
405	0.003	545	0.146	685	0.02
410	0.004	550	0.148	690	0.017
415	0.006	555	0.15	695	0.015
420	0.009	560	0.152	700	0.013
425	0.015	565	0.154	705	0.011
430	0.026	570	0.154	710	0.009
435	0.045	575	0.154	715	0.008
440	0.074	580	0.153	720	0.007
445	0.12	585	0.15	725	0.006
450	0.191	590	0.147	730	0.005
455	0.249	595	0.142	735	0.004
460	0.228	600	0.136	740	0.004
465	0.159	605	0.13	745	0.003
470	0.113	610	0.122	750	0.003
475	0.084	615	0.113	755	0.002
480	0.061	620	0.105	760	0.002
485	0.05	625	0.096	765	0.002
490	0.048	630	0.087	770	0.001
495	0.053	635	0.078	775	0.001
500	0.063	640	0.07	780	0.001
505	0.077	645	0.062		
510	0.092	650	0.054		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15045.
Dialight unit model number HEC9RC4DN-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.755 (A)
Input Power: 89.9 (W)
Power Factor: 0.991

Photometric measurements:

Absolute Luminous Flux: 9356 (lumens)
Luminous Efficacy: 104.0 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	3670	3670	3670	3670	3670	
5	3659	3663	3665	3664	3660	137
15	3557	3516	3523	3556	3514	768
25	3592	3654	3644	3589	3626	1413
35	4194	4206	4226	4216	4213	2257
45	3854	3873	3854	3846	3895	3037
55	740	751	753	745	756	1606
65	29	28	28	30	29	128
75	5	5	5	5	5	11
85	0	0	0	0	0	1
95	0	0	0	0	0	0
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

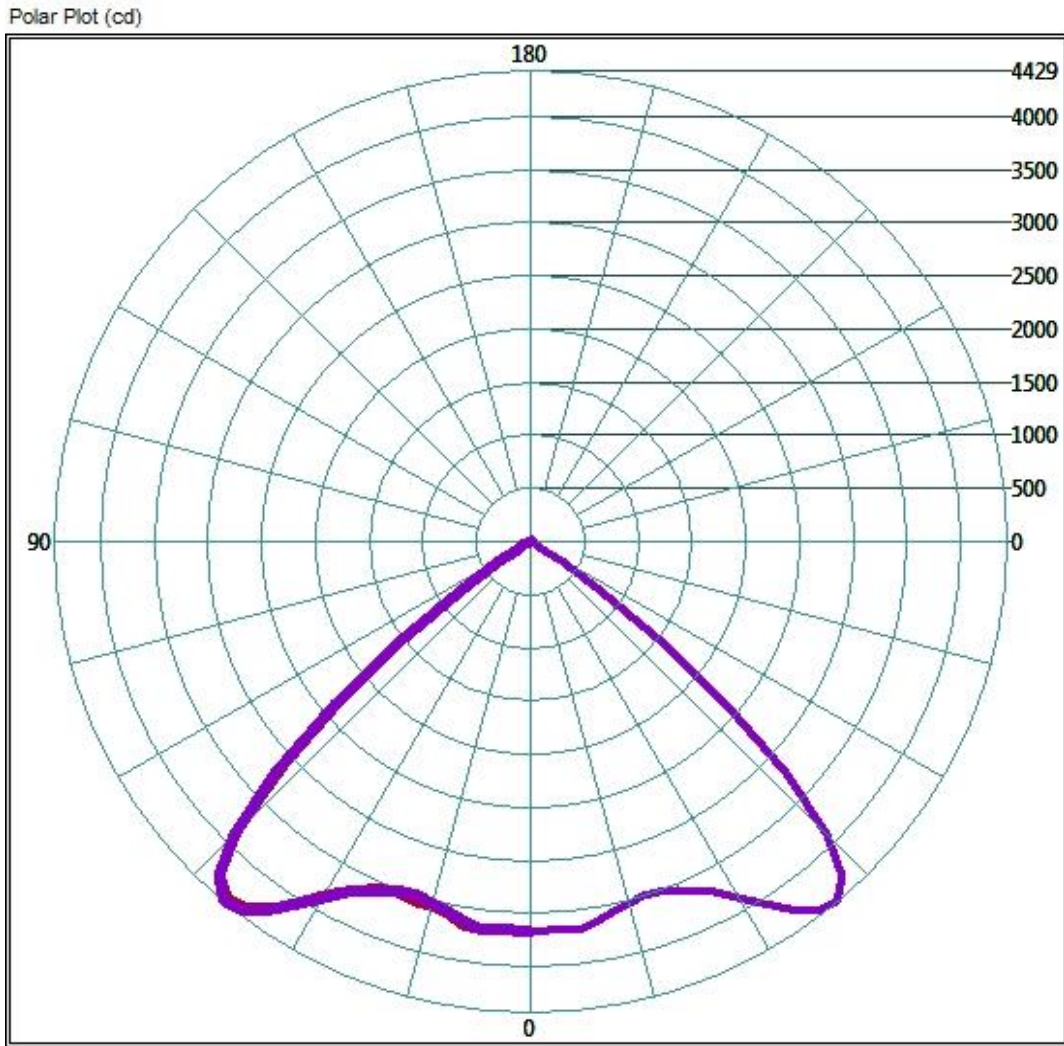
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	3316.56	35.4%
0-40	6074.06	64.9%
0-60	9325.32	99.7%
60-90	61.58	0.7%
0-90	9356.5	100.0%
90-180	0	0.0%
0-180	9356.5	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

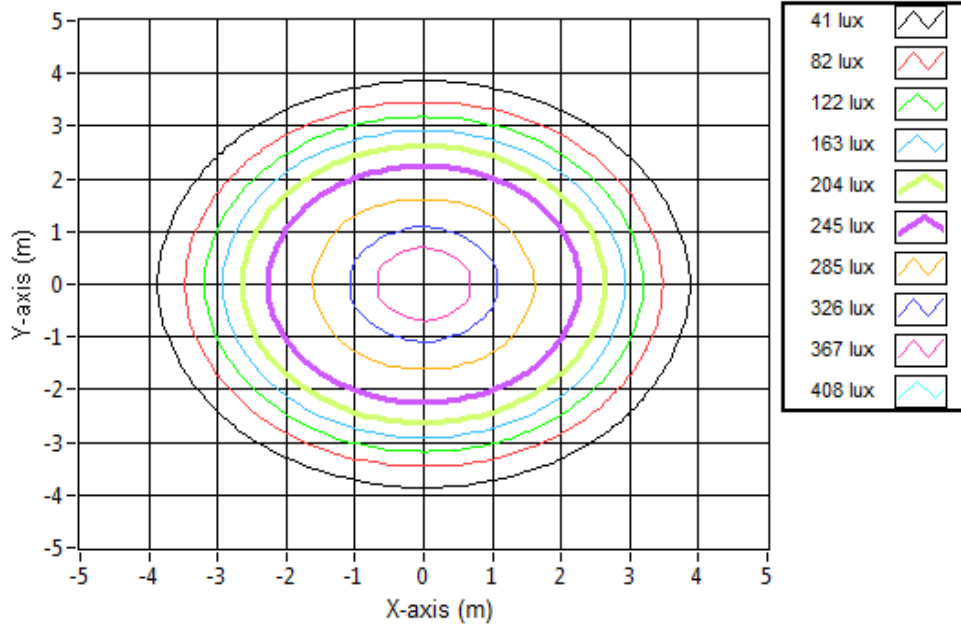


Test Results: Goniometer

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	7.60	7.66	395.0
6.096	15.20	15.33	98.8
9.144	22.80	22.99	43.9
12.192	30.40	30.65	24.7
15.24	38.00	38.32	15.8
18.288	45.60	45.98	11.0
21.336	53.20	53.64	8.1
24.384	60.80	61.31	6.2
27.432	68.40	68.97	4.9
30.48	76.00	76.63	4.0

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15045.
Dialight unit model number HEC9RC4DN-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:

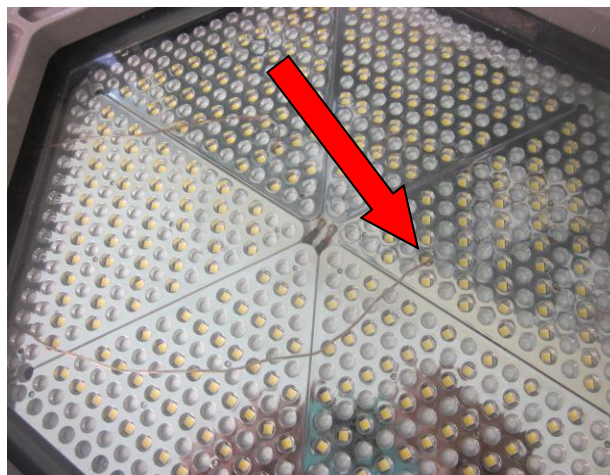
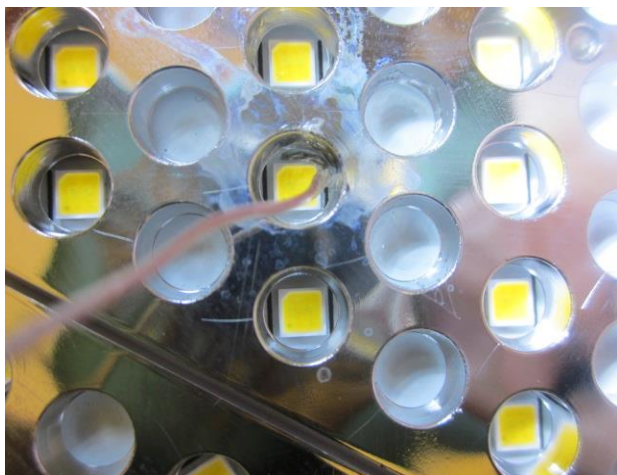
Maximum Power at Indicated Current: 0.35 (W)
Maximum Source Temperature: 113.7 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 1^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.5 (°C)
Relative humidity at time of measurement: 18%

Results:

Measured LED source temperature: 46.5 (°C)



Equipment Used:

Equipment Name	Model Number
Omega TC	Dpi8
Fluke 8808A Digit Multimeter	8808A
YOKOGAWA Digital Power Meter	760401
LSI Standard Lamps	#30279
LSI High Speed Mirror Goniometer	6240T
Instrument System Spectrometer	CAS140B-151
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3
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	445703
Extech Hygro-Thermometer	445703
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
Tenma AC Power Source	72-7675
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

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.

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