

Test Report

Report Number: L14139

Date: Jul 21, 2015

Issued by:

Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Vigilant Highbay Fixture
Unit manufacturer: Dialight Corporation
Unit model number: HEC9MC4GN-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 1, 2014 through November 3, 2014

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

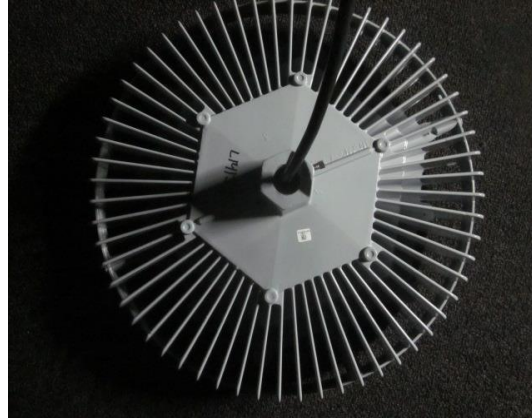
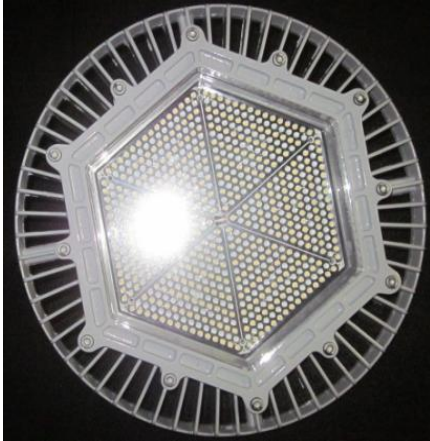
Description of sample:

Sample Number: L14139
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay Fixture
Model Number: HEC9MC4GN-xxx

Report Summary

Sample number L14139
Dialight unit model number HEC9MC4GN-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	12222 (lumens)	12145 (lumens)
Electrical Power:	112.6 (W)	112.4 (W)
Luminous Efficacy:	108.5 (lumens/W)	108.1 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 112.6 (W)
Power Factor (120VAC): 0.993
Current ATHD % (120VAC): 8.788
Input Power (277VAC): 110.9 (W)
Power Factor (277VAC): 0.938
Current ATHD % (277VAC): 15.564

Color Measurements:

Correlated Color Temperature (CCT): 4933
Color Rendering Index (CRI): 77
Chromaticity Coordinate (x): 0.3475
Chromaticity Coordinate (y): 0.3574
Chromaticity Coordinate (u'): 0.2108
Chromaticity Coordinate (v'): 0.3252
DUV: 0.0019

Temperature Measurements:

In Situ LED Source Temperature: 44.6 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L14139.

Dialight unit model number HEC9MC4GN-xxx

Test Conditions:

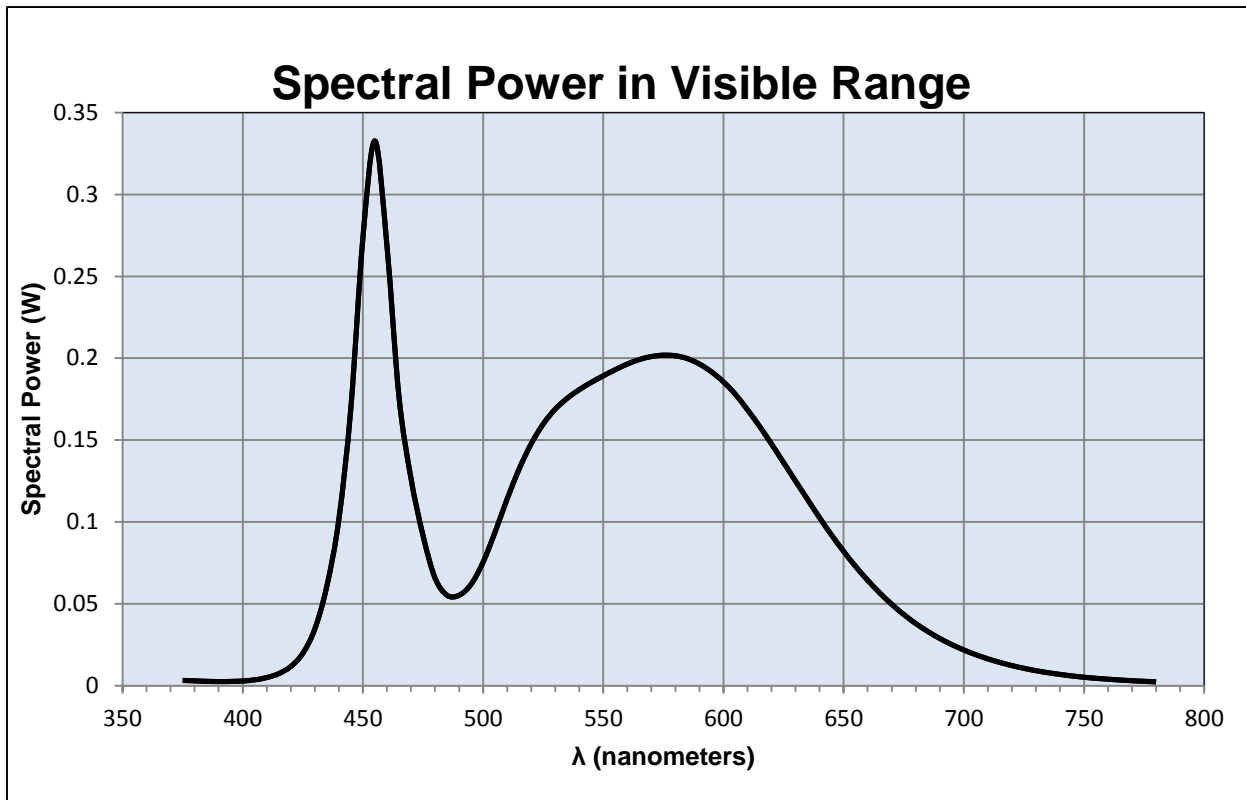
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
 Input Current: 0.944 (A)
 Input Power: 112.6 (W)
 Input Power Factor: 0.993
 Current ATHD: 8.788 (%)

Photometric measurements:

Luminous Flux: 12222 (lumens)
 Luminous Efficacy: 108.5 (lumens/W)
 Correlated Color Temperature (CCT): 4933 (K)
 CRI -Ra: 77
 CRI -R9: -12.7
 DUV: 0.0019
 CIE Coordinate (x): 0.3475
 CIE Coordinate (y): 0.3574
 CIE Coordinate (u'): 0.2108
 CIE Coordinate (v'): 0.3252



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	0.132	655	0.073
380	0.003	520	0.148	660	0.064
385	0.003	525	0.160	665	0.057
390	0.003	530	0.169	670	0.050
395	0.003	535	0.176	675	0.043
400	0.003	540	0.181	680	0.038
405	0.004	545	0.185	685	0.033
410	0.005	550	0.189	690	0.029
415	0.007	555	0.193	695	0.025
420	0.012	560	0.196	700	0.022
425	0.02	565	0.199	705	0.019
430	0.035	570	0.201	710	0.016
435	0.061	575	0.202	715	0.014
440	0.102	580	0.201	720	0.012
445	0.17	585	0.200	725	0.011
450	0.273	590	0.196	730	0.009
455	0.333	595	0.192	735	0.008
460	0.269	600	0.186	740	0.007
465	0.177	605	0.178	745	0.006
470	0.127	610	0.168	750	0.005
475	0.092	615	0.158	755	0.005
480	0.066	620	0.148	760	0.004
485	0.055	625	0.136	765	0.003
490	0.055	630	0.125	770	0.003
495	0.062	635	0.114	775	0.003
500	0.075	640	0.103	780	0.002
505	0.094	645	0.092		
510	0.114	650	0.082		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L14139.
Dialight unit model number HEC9MC4GN-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.941 (A)
Input Power: 112.4 (W)
Power Factor: 0.9929

Photometric measurements:

Absolute Luminous Flux: 12145.2 (lumens)
Luminous Efficacy: 108.1 (lumens/W)

Intensity Summary:

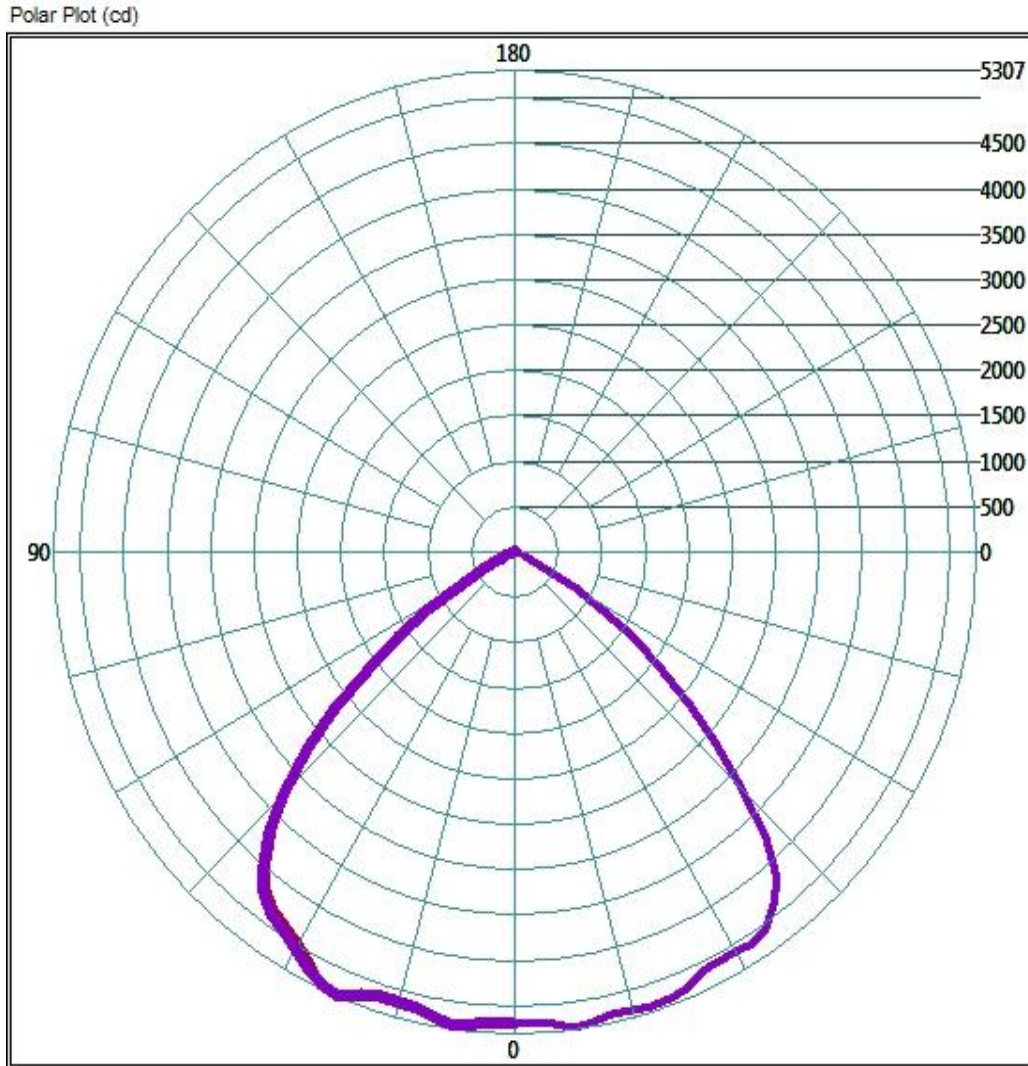
INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	5208	5208	5208	5208	5208	
5	5225	5224	5225	5226	5225	195
15	5112	5177	5138	5129	5217	1110
25	5273	5112	5233	5263	5104	2069
35	4829	4990	4884	4877	5047	2864
45	3730	3743	3729	3757	3683	3084
55	1615	1694	1653	1626	1673	2072
65	263	271	271	260	283	632
75	42	43	43	43	43	87
85	16	16	16	16	16	31
95	0	0	0	0	0	1
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	4722.74	38.9%
0-40	7824.7	64.4%
0-60	11846	97.5%
60-90	479.78	4.0%
0-90	12145.06	100.0%
90-180	0	0.0%
0-180	12145.06	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

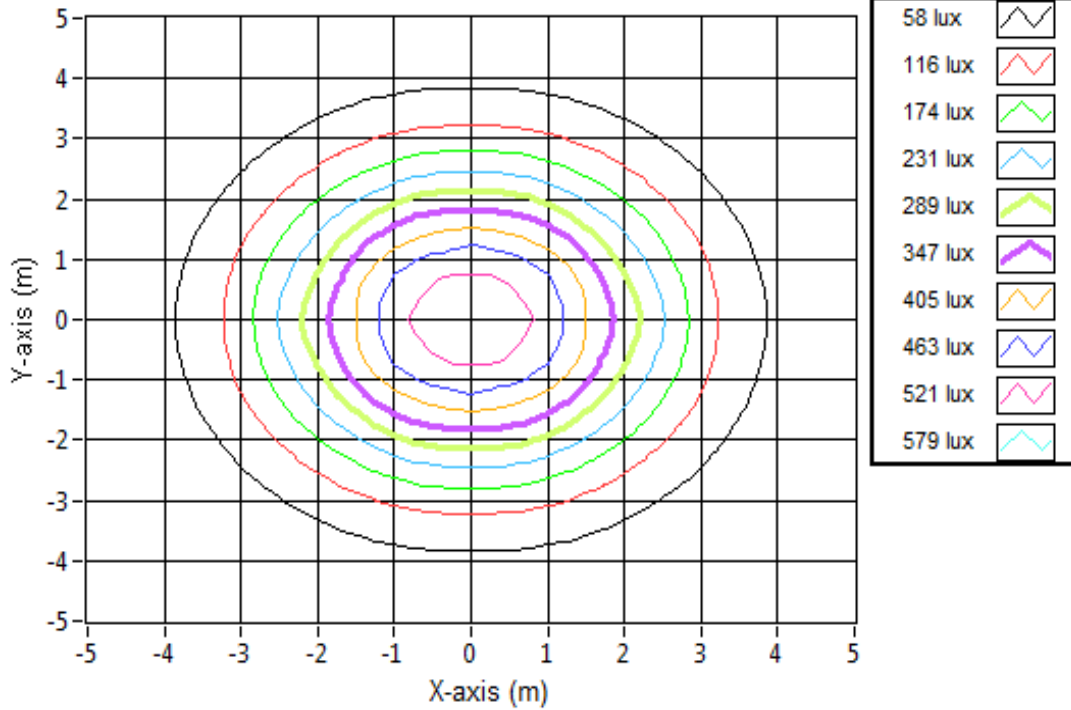


Test Results: Goniometer

Results continued from previous page.

Illuminance Plots:

Illuminance Contour Graph



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	7.34	7.33	560.6
6.095	14.68	14.66	140.2
9.144	22.02	21.99	62.3
12.192	29.36	29.33	35.0
15.24	36.69	36.66	22.4
18.288	44.03	43.99	15.6
21.336	51.37	51.32	11.4
24.384	58.71	58.65	8.8
27.342	65.83	65.77	7.0
30.48	73.39	73.32	5.6

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L14139.

Dialight unit model number HEC9MC4GN-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:

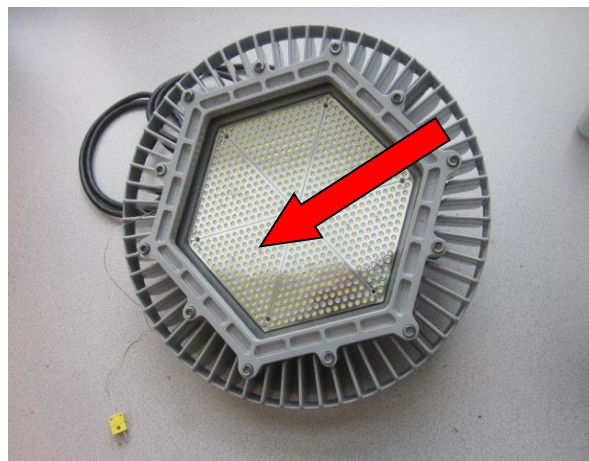
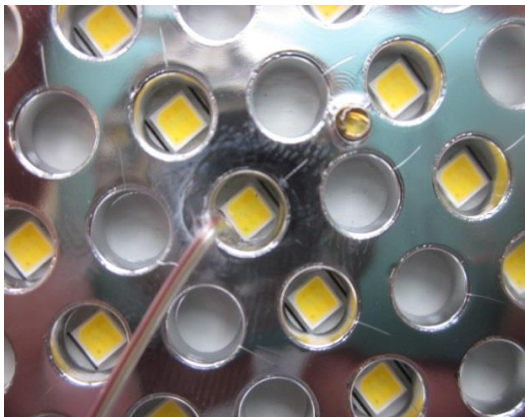
Maximum Power at Indicated Current: 0.35 (W)
Maximum Source Temperature: 113.7 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 1^{\circ}$ (°C)
Ambient temperature at time of measurement: 25.1 (°C)
Relative humidity at time of measurement: 19%

Results:

Measured LED source temperature: 44.6 (°C)



Equipment Used:

Equipment Name	Model Number	Calibration Due Date
Omega TC	Dpi8	3/7/2015
Fluke 8808A Digit Multimeter	8808A	4/7/2015
YOKOGAWA Digital Power Meter	760401	4/7/2015
Instrument System Spectrometer	CAS140B-151	-
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System Sphere Lamps (Osram Sylvania)	STD-20WF-3	4/17/2015
Instrument System 1.5 Meter Sphere	ISP1500	-
Volttech Power Analyzer	PM1000+	4/17/2015
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	3/6/2015
Volttech Power Analyzer	PM1000+	4/17/2015
Tenma AC Power Source	72-7675	-
BK Precision	1715A	-
TDK-Lambda	GEN1500W	-
Fluke 8808A Digit Multimeter	8808A	4/14/2015
TPI Digital Thermometer 343	343	4/17/2015
TPI Digital Thermometer 343	343	4/17/2015

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.

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