Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L15127 Date: Oct 13, 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: HEF2MC4GN-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 12, 2015 through October 13, 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: L15127
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay
Model Number: HEF2MC4GN-xxx

Dialight OPTICS LABORATORY

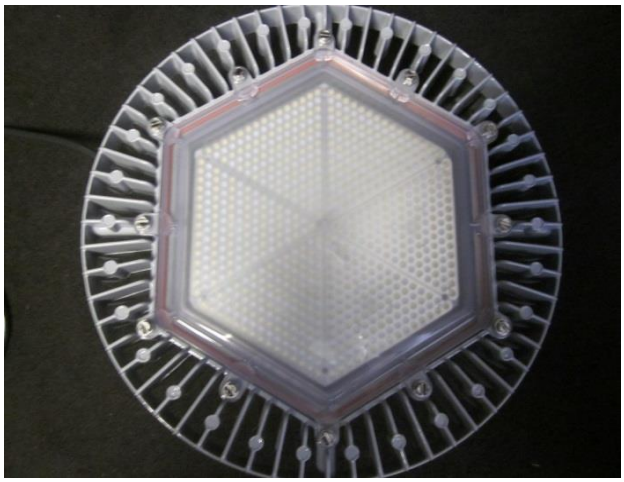
NVLAP Lab Code 201033-0

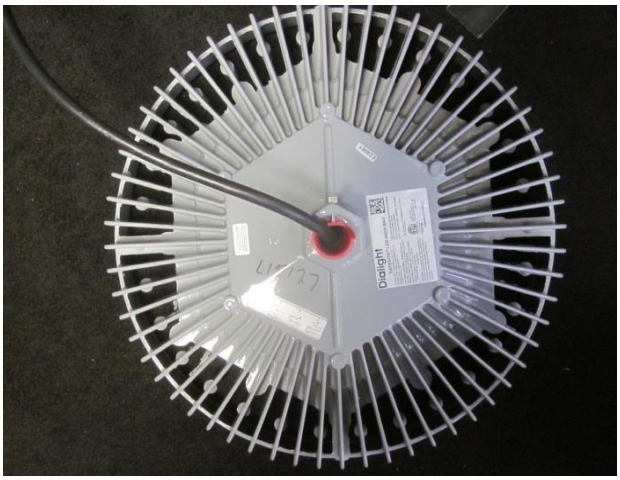
Report Summary

Sample number L15127

Dialight unit model number HEF2MC4GN-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	11950 (lumens)	11800 (lumens)
Electrical Power:	112.0 (W)	112.2 (W)
Luminous Efficacy:	106.8 (lumens/W)	105.2 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	112.0	(W)
Power Factor (120VAC):	0.993	
Current ATHD % (120VAC):	9.361	
Input Power (277VAC):	110.4	(W)
Power Factor (277VAC):	0.954	
Current ATHD % (277VAC):	17.14	

Color Measurements:

Correlated Color Temperature (CCT):	4987
Color Rendering Index (CRI):	80.8
Chromaticity Coordinate (x):	0.346
Chromaticity Coordinate (y):	0.352
Chromaticity Coordinate (u'):	0.212
Chromaticity Coordinate (v'):	0.323
DUV:	0.000024

Temperature Measurements:

In Situ LED Source Temperature:	50.5	(°C)

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15127.
Dialight unit model number HEF2MC4GN-xxx

Test Conditions:

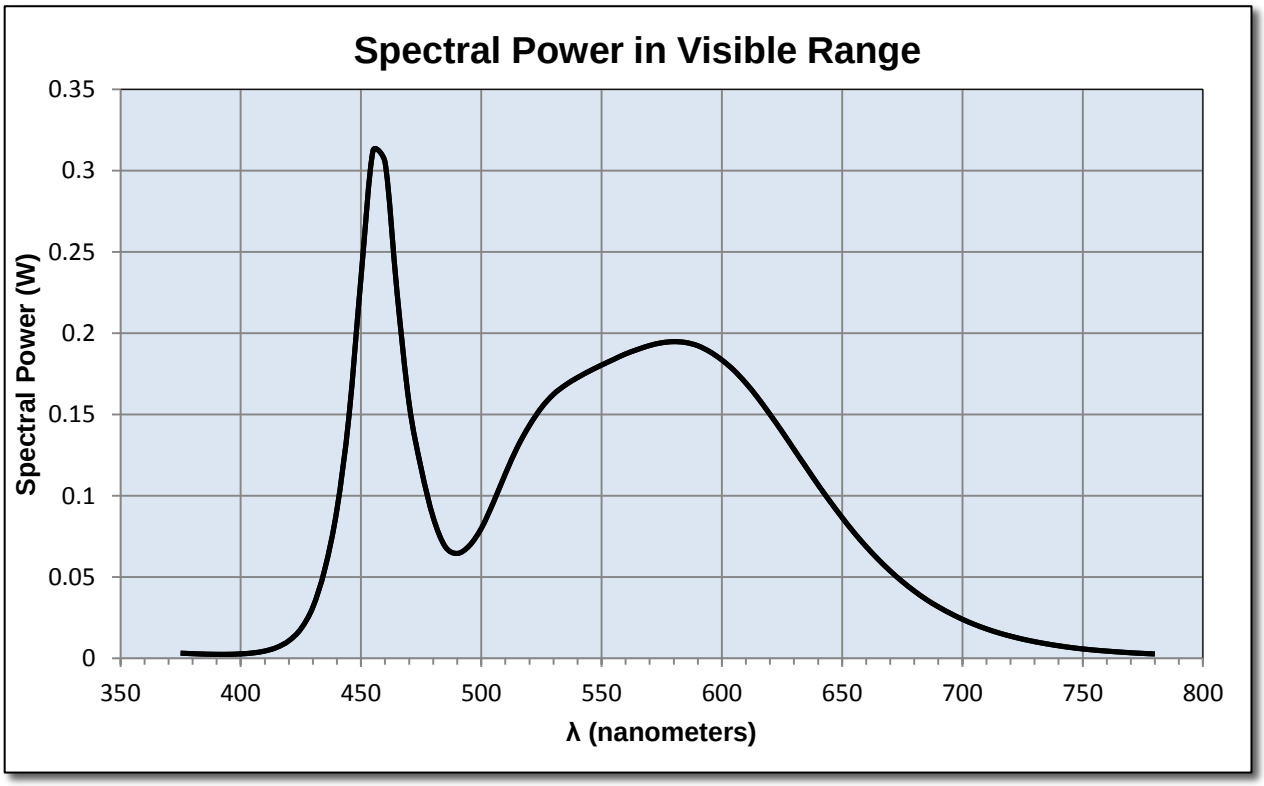
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.932	(A)
Input Power:	112.0	(W)
Input Power Factor:	0.993	
Current ATHD:	9.361	(%)

Photometric measurements:

Luminous Flux:	11950	(lumens)
Luminous Efficacy:	106.8	(lumens/W)
Correlated Color Temperature (CCT):	4987	(K)
CRI -Ra:	80.8	
CRI -R9:	2.7	
DUV:	0.000024	
CIE Coordinate (x):	0.346	
CIE Coordinate (y):	0.352	
CIE Coordinate (u'):	0.212	
CIE Coordinate (v'):	0.323	



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	0.13	655	0.077
380	0.003	520	0.143	660	0.069
385	0.003	525	0.154	665	0.061
390	0.002	530	0.162	670	0.054
395	0.002	535	0.168	675	0.047
400	0.003	540	0.173	680	0.041
405	0.003	545	0.177	685	0.036
410	0.005	550	0.18	690	0.032
415	0.007	555	0.184	695	0.028
420	0.011	560	0.187	700	0.024
425	0.018	565	0.19	705	0.021
430	0.032	570	0.192	710	0.018
435	0.055	575	0.194	715	0.016
440	0.092	580	0.195	720	0.014
445	0.149	585	0.194	725	0.012
450	0.234	590	0.192	730	0.01
455	0.312	595	0.189	735	0.009
460	0.305	600	0.183	740	0.008
465	0.225	605	0.177	745	0.007
470	0.157	610	0.169	750	0.006
475	0.117	615	0.16	755	0.005
480	0.087	620	0.15	760	0.004
485	0.069	625	0.14	765	0.004
490	0.065	630	0.129	770	0.003
495	0.069	635	0.118	775	0.003
500	0.08	640	0.107	780	0.003
505	0.096	645	0.096		
510	0.113	650	0.087		

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15127.
Dialight unit model number HEF2MC4GN-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.941	(A)
Input Power:	112.2	(W)
Power Factor:	0.993	

Photometric measurements:

Absolute Luminous Flux:	11800	(lumens)
Luminous Efficacy:	105.2	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	4818	4818	4818	4818	4818	
5	4826	4826	4826	4826	4826	180
15	4868	4868	4868	4868	4868	1037
25	4859	4859	4859	4859	4859	1937
35	4307	4307	4307	4307	4307	2592
45	3049	3049	3049	3049	3049	2555
55	1690	1690	1690	1690	1690	1847
65	781	781	781	781	781	1028
75	310	310	310	310	310	479
85	44	44	44	44	44	140
95	0	0	0	0	0	4
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	

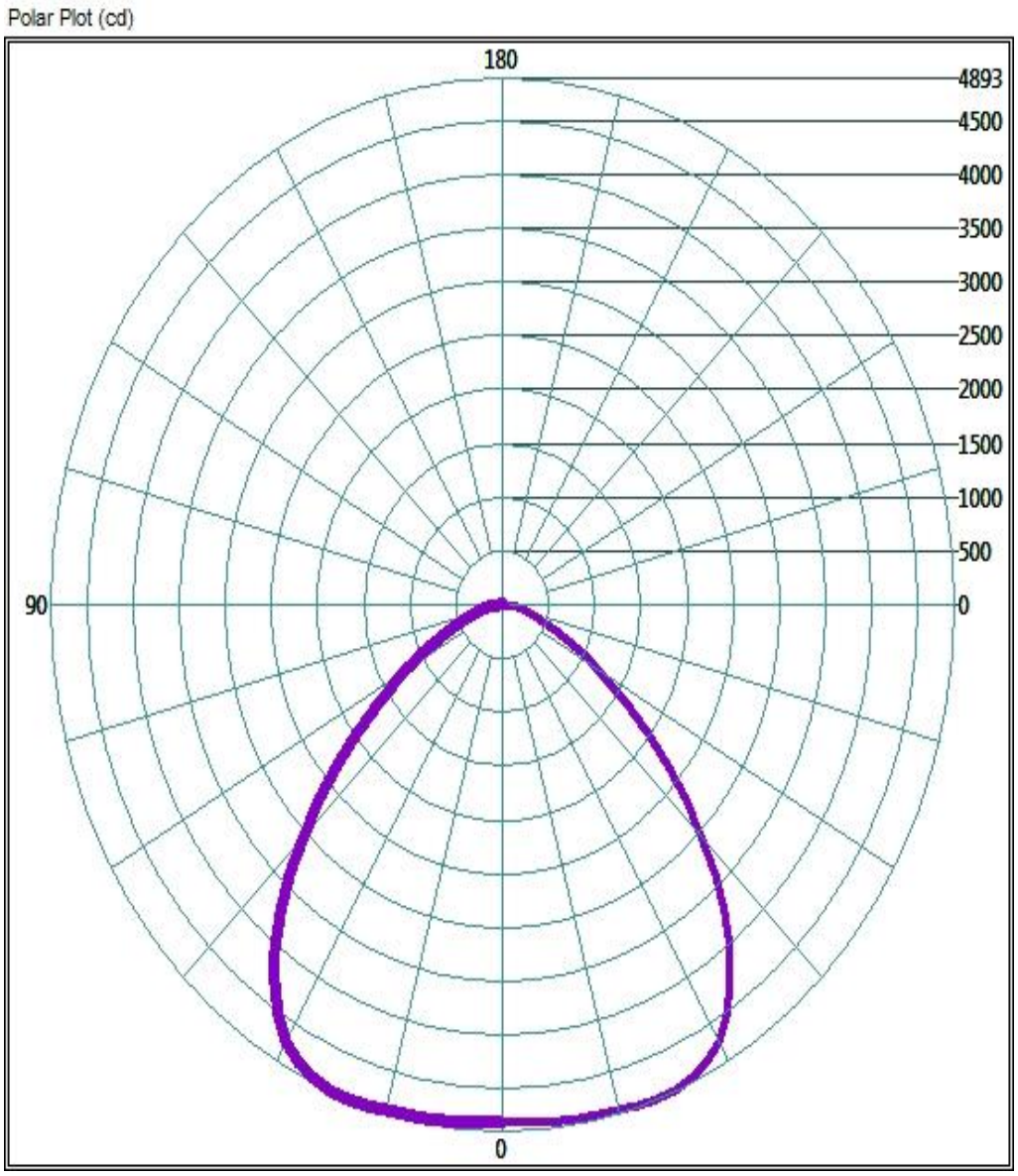
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	4402.56	37.3%
0-40	7079.36	60.0%
0-60	10750.24	91.1%
60-90	1325.6	11.2%
0-90	11799.68	100.0%
90-180	0	0.0%
0-180	11799.68	100.0%

Test Results: Goniometer

Results continued from previous page.

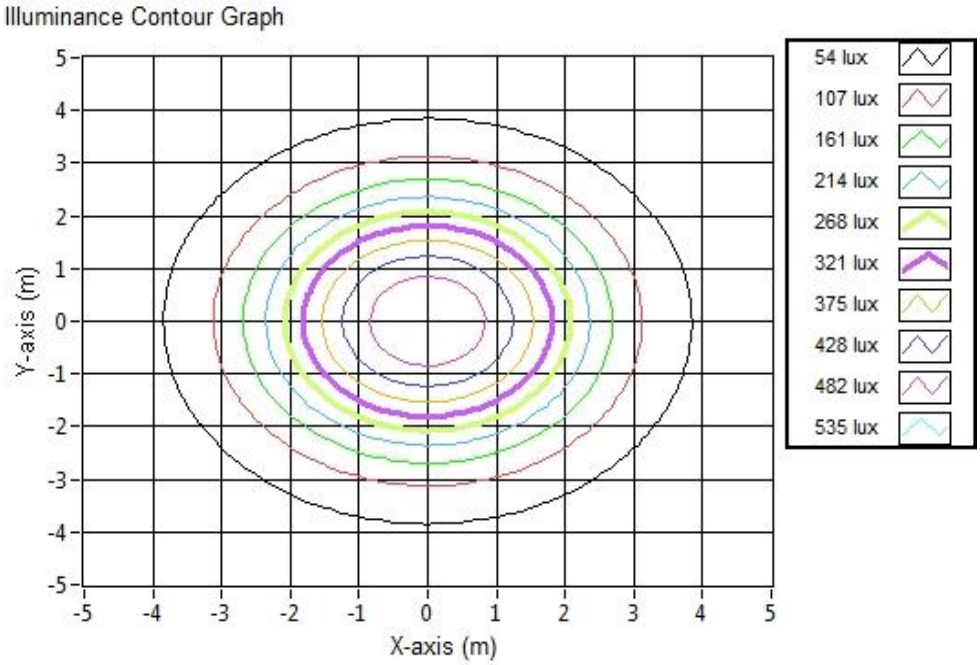
Polar Plot:



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	7.13	7.13	518.6
6.096	14.25	14.25	129.7
9.144	21.38	21.38	57.6
12.192	28.51	28.51	32.4
15.24	35.64	35.64	20.7
18.288	42.76	42.76	14.4
21.336	49.89	49.89	10.6
24.384	57.02	57.02	8.1
27.432	64.15	64.15	6.4
30.48	71.27	71.27	5.2

Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15127.
Dialight unit model number HEF2MC4GN-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:

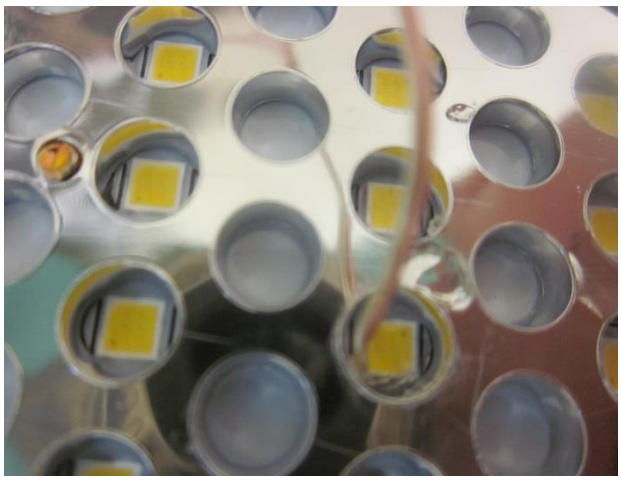
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

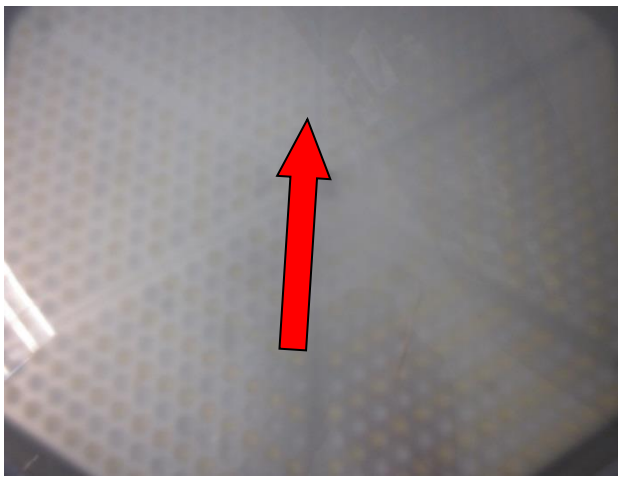
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 1‘	(°C)
Ambient temperature at time of measurement:	25.9	(°C)
Relative humidity at time of measurement:	26%	

Results:

Measured LED source temperature:	50.5	(°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