Test Report

Report Number: L16092 Date: Feb 1, 2017

Issued by:
Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Vigilant Highbay
Unit manufacturer: Dialight Corporation
Unit model number: HEA9RC4PN-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: December 5, 2016 through January 13, 2017

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

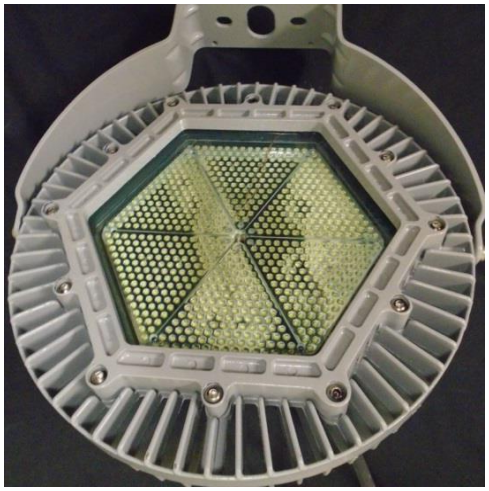
Description of sample:

Sample Number: L16092
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay
Model Number: HEA9RC4PN-xxx

Report Summary

Sample number L16092
Dialight unit model number HEA9RC4PN-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	23150	(lumens)	22991	(lumens)
Electrical Power:	215.6	(W)	214.6	(W)
Luminous Efficacy:	107.4	(lumens/W)	107.2	(lumens/W)

Electrical Measurements:

Input Power (120VAC):	215.6	(W)
Power Factor (120VAC):	0.996	
Current ATHD % (120VAC):	5.816	
Input Power (240VAC):	207.8	(W)
Power Factor (240VAC):	0.962	
Current ATHD % (240VAC):	12.83	

Color Measurements:

Correlated Color Temperature (CCT):	5228
Color Rendering Index (CRI):	75.1
Chromaticity Coordinate (x):	0.34
Chromaticity Coordinate (y):	0.358
Chromaticity Coordinate (u'):	0.205
Chromaticity Coordinate (v'):	0.325
DUV:	0.0056

Temperature Measurements:

In Situ LED Source Temperature:	66.5	(°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16092.
Dialight unit model number HEA9RC4PN-xxx

Test Conditions:

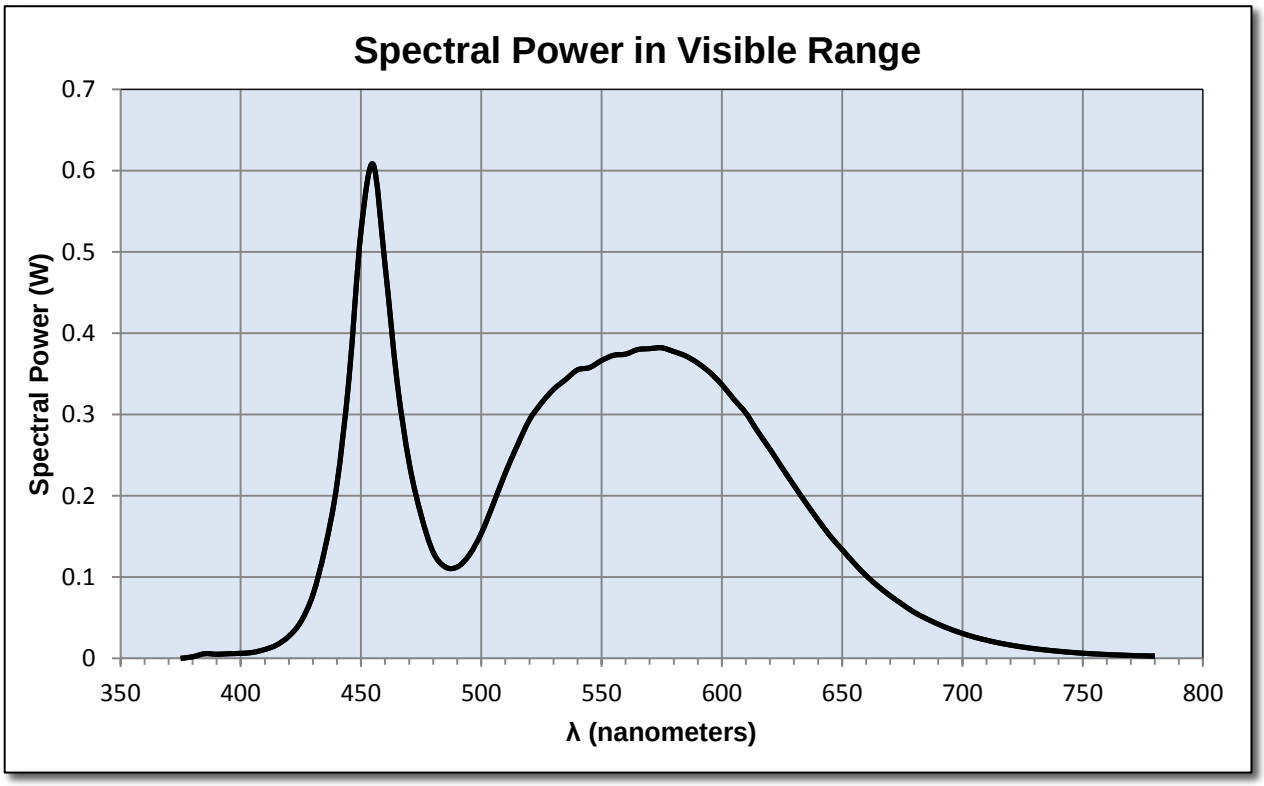
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	1.803	(A)
Input Power:	215.6	(W)
Input Power Factor:	0.996	
Current ATHD:	5.816	(%)

Photometric measurements:

Luminous Flux:	23150	(lumens)
Luminous Efficacy:	107.4	(lumens/W)
Correlated Color Temperature (CCT):	5228	(K)
CRI -Ra:	75.1	
CRI -R9:	-28.1	
DUV:	0.0056	
CIE Coordinate (x):	0.34	
CIE Coordinate (y):	0.358	
CIE Coordinate (u'):	0.205	
CIE Coordinate (v'):	0.325	



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	0.000	515	0.262	655	0.117
380	0.002	520	0.293	660	0.102
385	0.006	525	0.314	665	0.089
390	0.005	530	0.331	670	0.077
395	0.006	535	0.343	675	0.066
400	0.006	540	0.355	680	0.057
405	0.007	545	0.358	685	0.049
410	0.011	550	0.366	690	0.042
415	0.017	555	0.373	695	0.036
420	0.027	560	0.374	700	0.031
425	0.045	565	0.380	705	0.026
430	0.078	570	0.381	710	0.022
435	0.135	575	0.382	715	0.019
440	0.214	580	0.377	720	0.016
445	0.344	585	0.372	725	0.014
450	0.525	590	0.363	730	0.012
455	0.608	595	0.352	735	0.010
460	0.484	600	0.337	740	0.009
465	0.340	605	0.319	745	0.007
470	0.241	610	0.302	750	0.006
475	0.176	615	0.279	755	0.005
480	0.131	620	0.257	760	0.005
485	0.112	625	0.235	765	0.004
490	0.112	630	0.213	770	0.004
495	0.127	635	0.191	775	0.003
500	0.154	640	0.170	780	0.003
505	0.190	645	0.151		
510	0.228	650	0.134		

Dialight OPTICS LABORATORY

NVLAP TESTING NVLAP LAB CODE 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16092.
Dialight unit model number HEA9RC4PN-xxx

Electrical Measurements:

Input Voltage:	120.1	(VAC)
Input current:	1.794	(A)
Input Power:	214.6	(W)
Power Factor:	0.996	

Photometric measurements:

Absolute Luminous Flux:	22991	(lumens)
Luminous Efficacy:	107.2	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	9120	9120	9120	9120	9120	
5	9140	9140	9140	9140	9140	341
15	8822	8822	8822	8822	8822	1908
25	8742	8742	8742	8742	8742	3479
35	8963	8963	8963	8963	8963	5038
45	8491	8491	8491	8491	8491	6404
55	3311	3311	3311	3311	3311	4663
65	284	284	284	284	284	948
75	94	94	94	94	94	132
85	47	47	47	47	47	72
95	0	0	0	0	0	6
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	

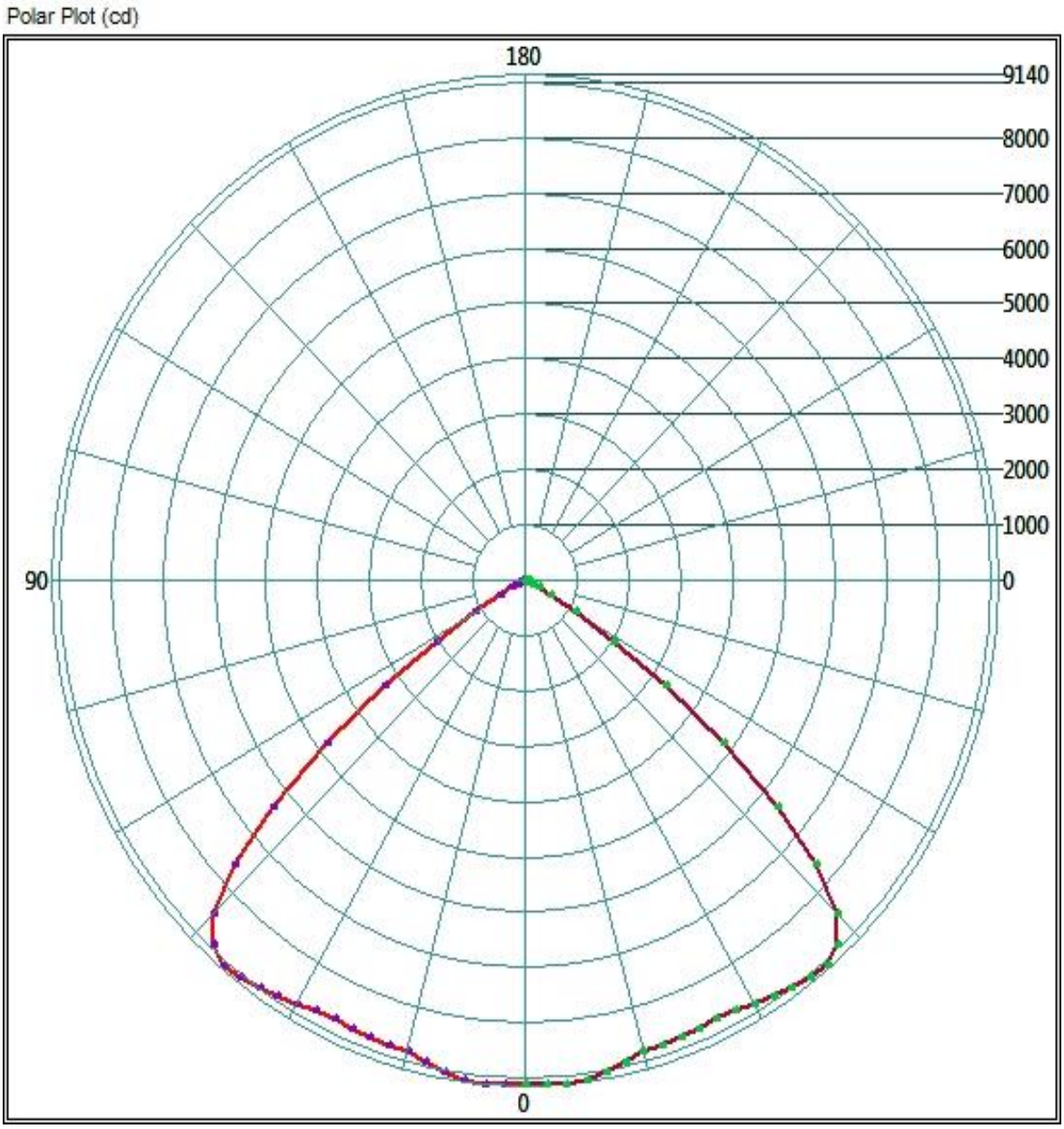
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	8046.72	35.0%
0-40	13870.4	60.3%
0-60	22574.24	98.2%
60-90	683.84	3.0%
0-90	22990.56	100.0%
90-180	0	0.0%
0-180	22990.56	100.0%

Test Results: Goniometer

Results continued from previous page.

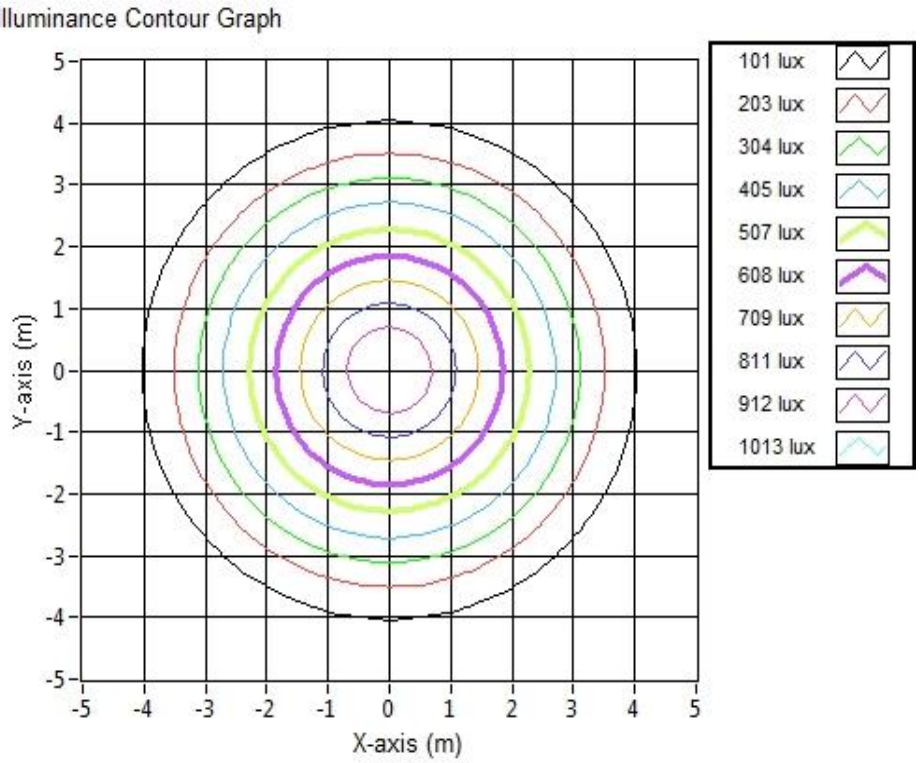
Polar Plot:



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	8.07	8.07	981.7
6.096	16.14	16.14	245.4
9.144	24.21	24.21	109.1
12.192	32.28	32.28	61.4
15.24	40.34	40.34	39.3
18.288	48.41	48.41	27.3
21.336	56.48	56.48	20.0
24.384	64.55	64.55	15.3
27.432	72.62	72.62	12.1
30.48	80.69	80.69	9.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16092.
Dialight unit model number HEA9RC4PN-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:

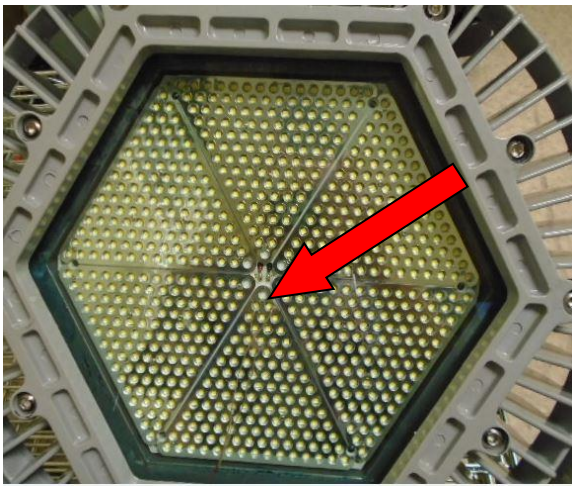
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	25.3	(°C)
Relative humidity at time of measurement:	13%	

Results:

Measured LED source temperature:	66.5	(°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
Fluke 971 Humidity Meter	971
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:

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Lighting Division

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Optical Engineer