Dialight OPTICS LABORATORY

NVLAP Lab Code 201033-0

Test Report

Report Number: L15130 Date: Oct 16, 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: HEC9RC4GN-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 14, 2015 through October 15, 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:	L15130
Manufacturer:	Dialight Corporation
Product Name:	Vigilant
Description:	Vigilant Highbay
Model Number:	HEC9RC4GN-xxx

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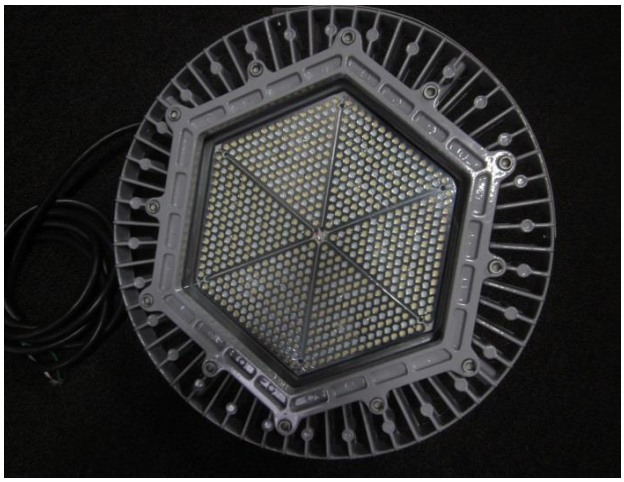
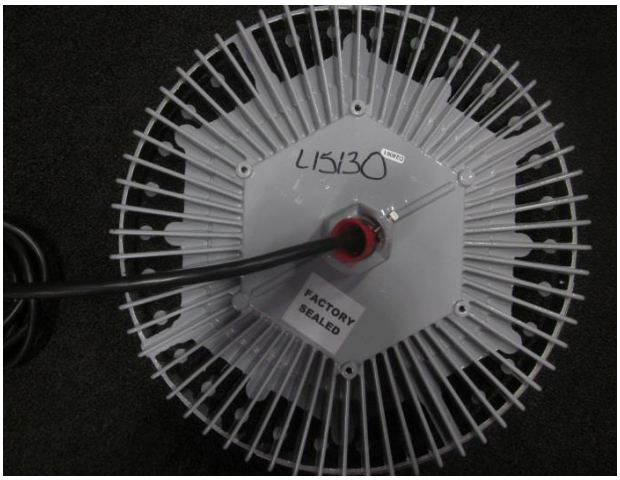
Report Summary

Sample number L15130

Dialight unit model number HEC9RC4GN-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere	Goniophotometer
Luminous Flux:	12780 (lumens)	12703 (lumens)
Electrical Power:	112.0 (W)	112.7 (W)
Luminous Efficacy:	114.1 (lumens/W)	112.8 (lumens/W)

Electrical Measurements:

Input Power (120VAC):	112.0	(W)
Power Factor (120VAC):	0.993	
Current ATHD % (120VAC):	9.207	
Input Power (277VAC):	110.6	(W)
Power Factor (277VAC):	0.954	
Current ATHD % (277VAC):	17.35	

Color Measurements:

Correlated Color Temperature (CCT):	4926
Color Rendering Index (CRI):	76.5
Chromaticity Coordinate (x):	0.348
Chromaticity Coordinate (y):	0.358
Chromaticity Coordinate (u'):	0.211
Chromaticity Coordinate (v'):	0.325
DUV:	0.0021

Temperature Measurements:

In Situ LED Source Temperature:	50.2	(°C)

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Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L15130.
Dialight unit model number HEC9RC4GN-xxx

Test Conditions:

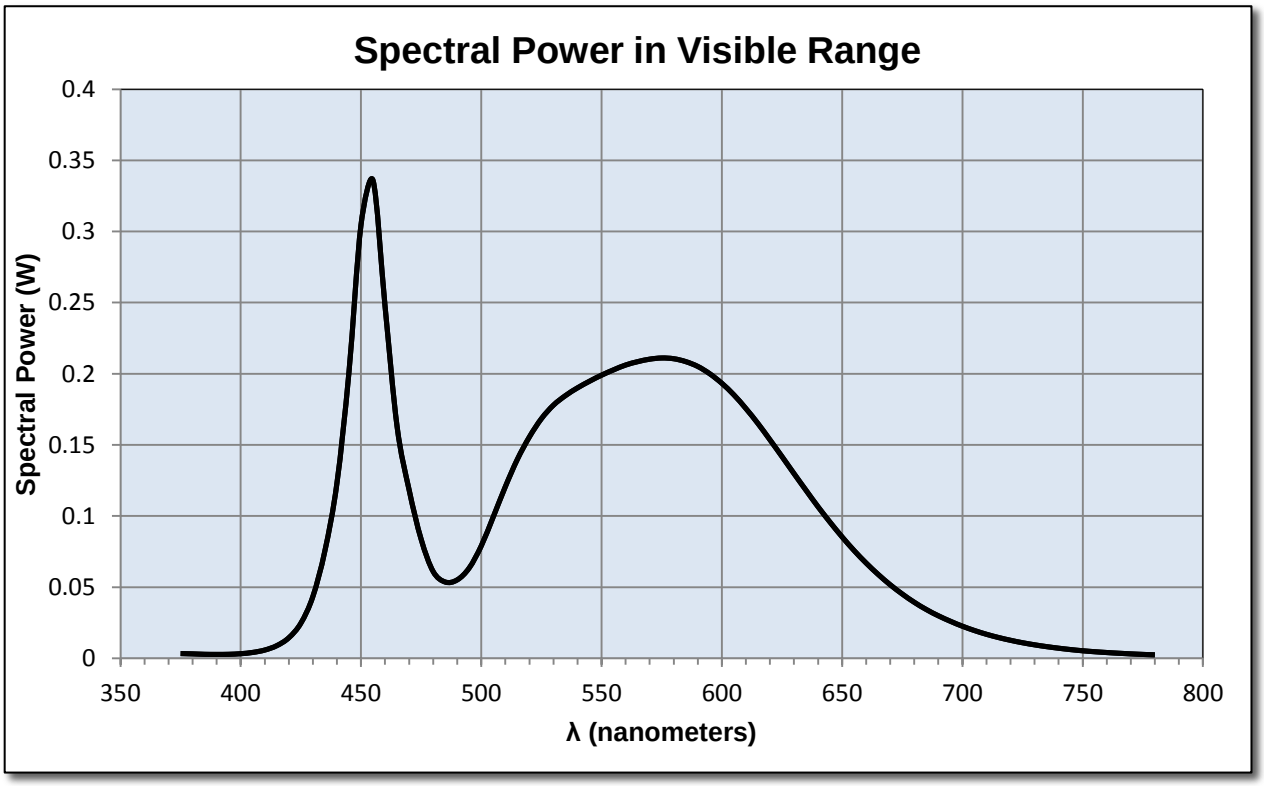
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.94	(A)
Input Power:	112.0	(W)
Input Power Factor:	0.993	
Current ATHD:	9.207	(%)

Photometric measurements:

Luminous Flux:	12780	(lumens)
Luminous Efficacy:	114.1	(lumens/W)
Correlated Color Temperature (CCT):	4926	(K)
CRI -Ra:	76.5	
CRI -R9:	-14.4	
DUV:	0.0021	
CIE Coordinate (x):	0.348	
CIE Coordinate (y):	0.358	
CIE Coordinate (u'):	0.211	
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	0.003	515	0.14	655	0.076
380	0.003	520	0.156	660	0.067
385	0.003	525	0.168	665	0.059
390	0.003	530	0.178	670	0.052
395	0.003	535	0.185	675	0.045
400	0.003	540	0.19	680	0.039
405	0.004	545	0.195	685	0.034
410	0.006	550	0.199	690	0.03
415	0.009	555	0.203	695	0.026
420	0.014	560	0.206	700	0.023
425	0.025	565	0.209	705	0.02
430	0.044	570	0.21	710	0.017
435	0.076	575	0.211	715	0.015
440	0.123	580	0.211	720	0.013
445	0.201	585	0.209	725	0.011
450	0.305	590	0.205	730	0.009
455	0.336	595	0.2	735	0.008
460	0.247	600	0.193	740	0.007
465	0.163	605	0.185	745	0.006
470	0.118	610	0.176	750	0.005
475	0.084	615	0.165	755	0.005
480	0.061	620	0.154	760	0.004
485	0.054	625	0.142	765	0.004
490	0.055	630	0.13	770	0.003
495	0.064	635	0.118	775	0.003
500	0.079	640	0.107	780	0.002
505	0.1	645	0.096		
510	0.121	650	0.085		

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Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L15130.
Dialight unit model number HEC9RC4GN-xxx

Electrical Measurements:

Input Voltage:	120	(VAC)
Input current:	0.944	(A)
Input Power:	112.7	(W)
Power Factor:	0.993	

Photometric measurements:

Absolute Luminous Flux:	12703	(lumens)
Luminous Efficacy:	112.8	(lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	5257	5257	5257	5257	5257	
5	5279	5279	5279	5279	5279	197
15	5085	5085	5085	5085	5085	1104
25	4910	4910	4910	4910	4910	1985
35	4977	4977	4977	4977	4977	2790
45	4613	4613	4613	4613	4613	3536
55	1752	1752	1752	1752	1752	2478
65	145	145	145	145	145	497
75	54	54	54	54	54	70
85	25	25	25	25	25	41
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	

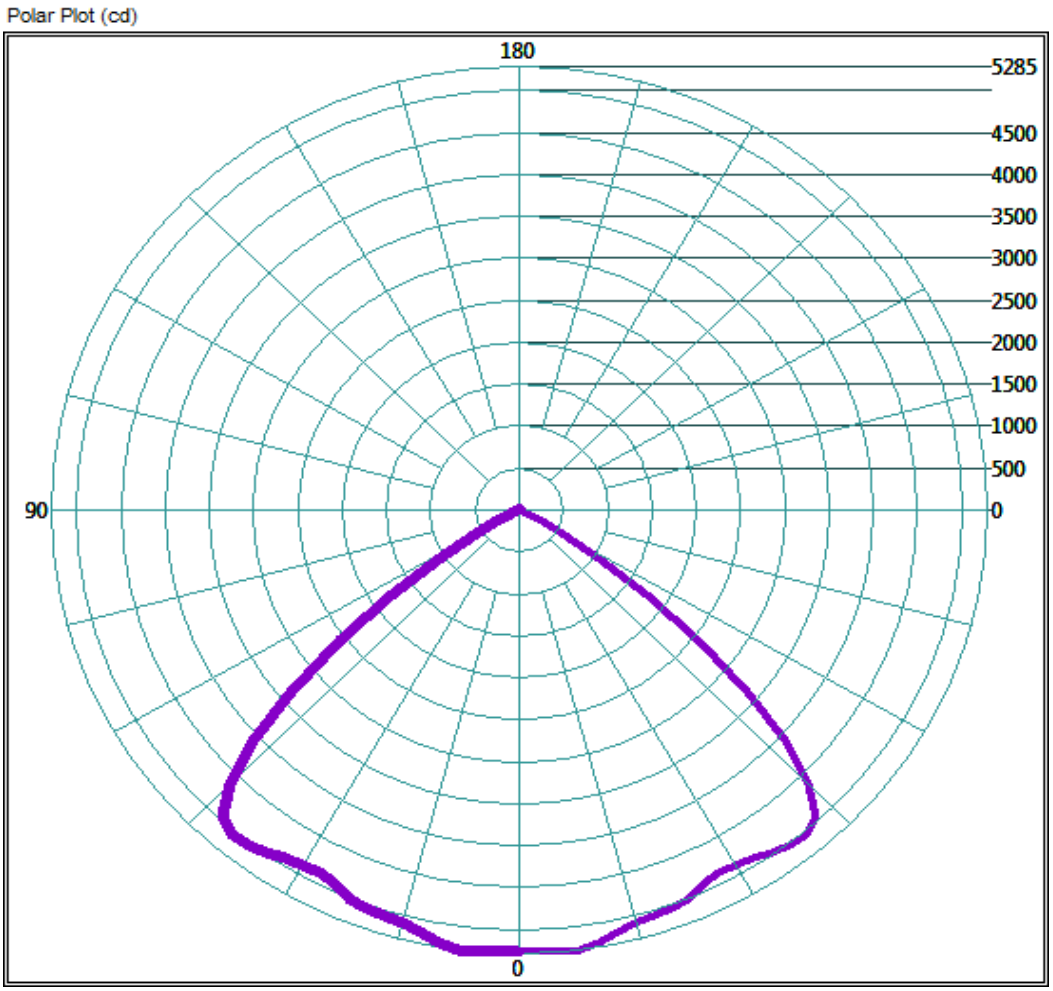
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	4569.92	36.0%
0-40	7802.56	61.4%
0-60	12480.64	98.3%
60-90	362.24	2.9%
0-90	12702.4	100.0%
90-180	0	0.0%
0-180	12702.4	100.0%

Test Results: Goniometer

Results continued from previous page.

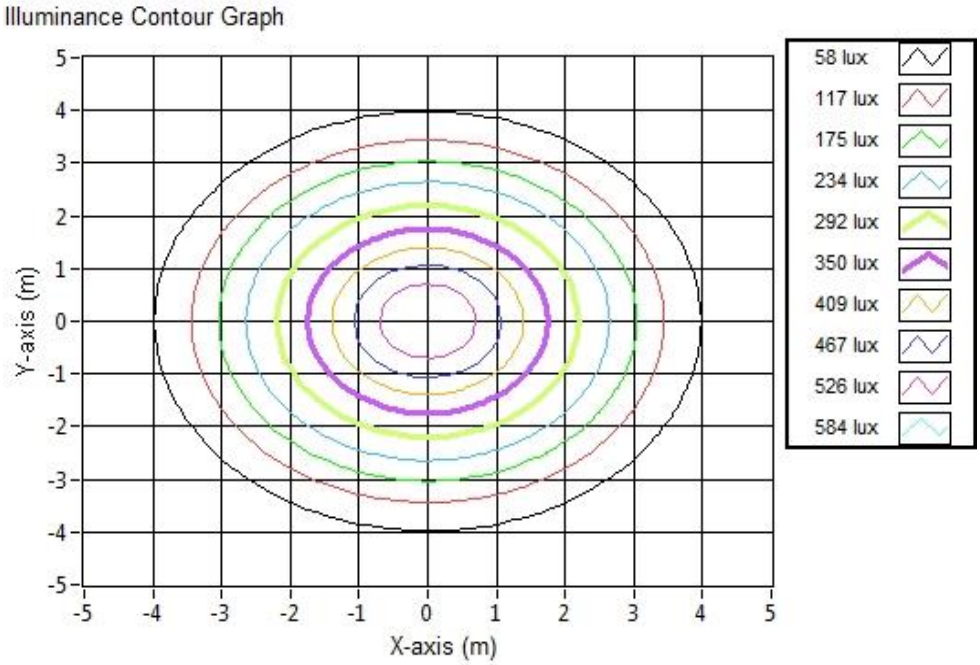
Polar Plot:



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	7.88	7.88	565.8
6.096	15.75	15.75	141.5
9.144	23.63	23.63	62.9
12.192	31.50	31.50	35.4
15.24	39.38	39.38	22.6
18.288	47.25	47.25	15.7
21.336	55.13	55.13	11.5
24.384	63.00	63.00	8.8
27.432	70.88	70.88	7.0
30.48	78.76	78.76	5.7

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Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L15130.
Dialight unit model number HEC9RC4GN-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:

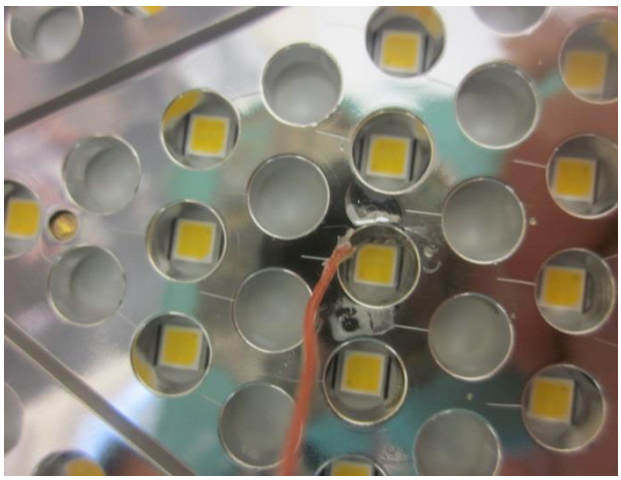
Maximum Power at Indicated Current:	0.35	(W)
Maximum Source Temperature:	113.7	(°C)

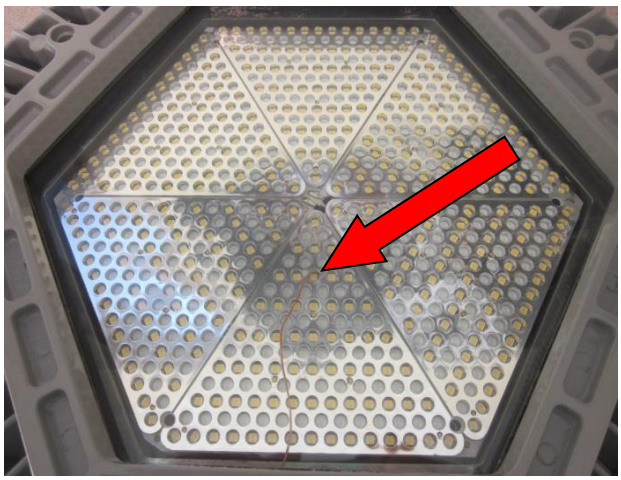
Test Conditions:

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:	29%	

Results:

Measured LED source temperature:	50.2	(°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.
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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