

Test Report

Report Number: L14120

Date: Nov 19, 2014

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

Test of one Vigilant Highbay With Polycarbonate Dome Lens
Unit manufacturer: Dialight Corporation
Unit model number: HELMN4DN-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 10, 2014 through November 18, 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

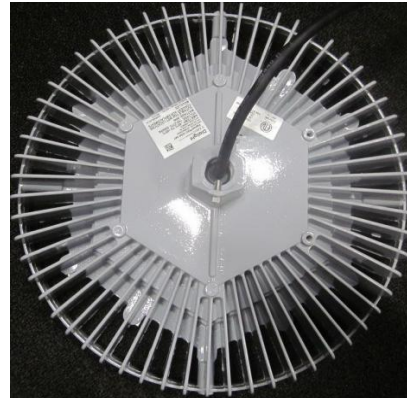
Description of sample:

Sample Number: L14120
Manufacturer: Dialight Corporation
Product Name: Vigilant
Description: Vigilant Highbay With Polycarbonate Dome Lens
Model Number: HELMN4DN-xxx

Report Summary

Sample number L14120
Dialight unit model number HELMN4DN-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	10100 (lumens)	10047 (lumens)
Electrical Power:	88.4 (W)	88.4 (W)
Luminous Efficacy:	114.2 (lumens/W)	113.6 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 88.4 (W)
 Power Factor (120VAC): 0.991
 Current ATHD % (120VAC): 9.843
 Input Power (277VAC): 87.7 (W)
 Power Factor (277VAC): 0.924
 Current ATHD % (277VAC): 17.243

Color Measurements:

Correlated Color Temperature (CCT): 3880
 Color Rendering Index (CRI): 74.5
 Chromaticity Coordinate (x): 0.3799
 Chromaticity Coordinate (y): 0.2274
 Chromaticity Coordinate (u'): 0.2274
 Chromaticity Coordinate (v'): 0.3358
 DUV: 0.3858

Temperature Measurements:

In Situ LED Source Temperature: 46.9 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L14120.

Dialight unit model number HELMN4DN-xxx

Test Conditions:

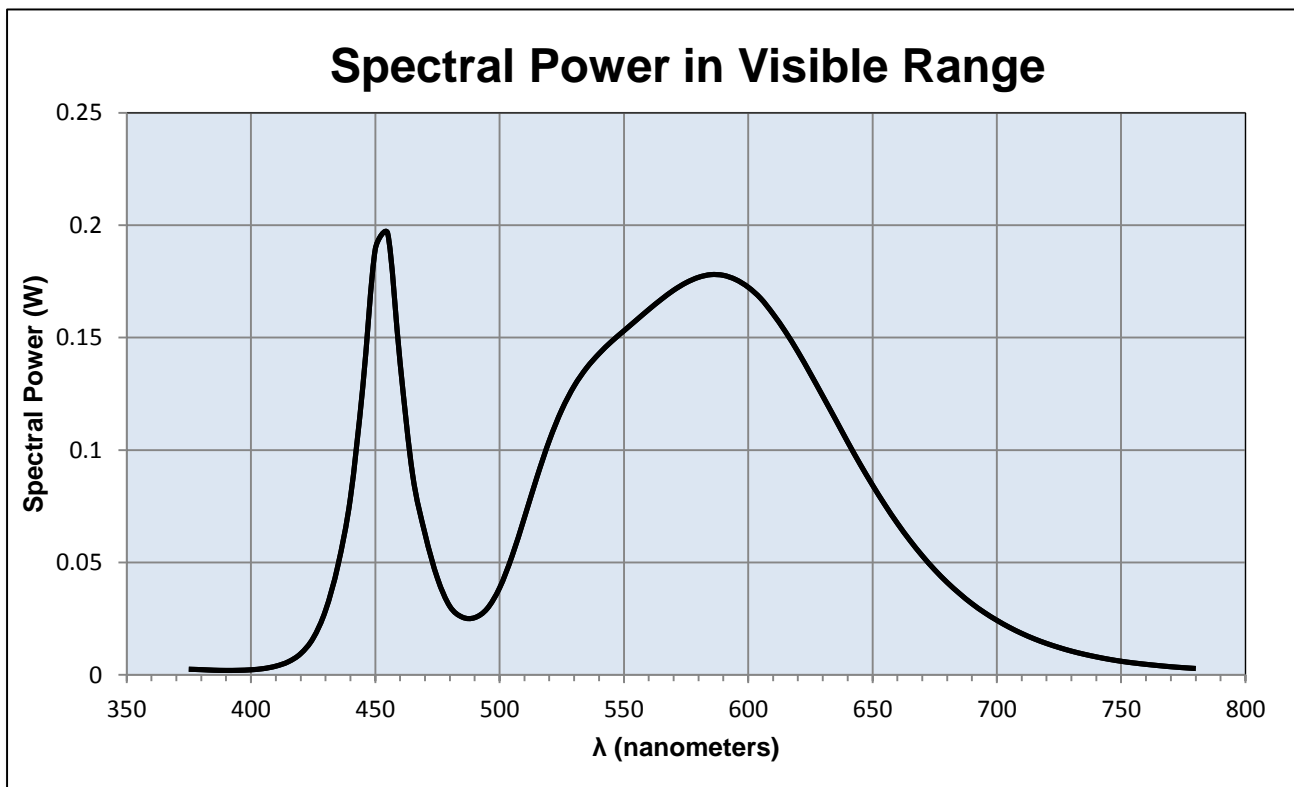
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
 Input Current: 0.7432 (A)
 Input Power: 88.4 (W)
 Input Power Factor: 0.991
 Current ATHD: 9.843 (%)

Photometric measurements:

Luminous Flux: 10100 (lumens)
 Luminous Efficacy: 114.2 (lumens/W)
 Correlated Color Temperature (CCT): 3880 (K)
 CRI -Ra: 74.5
 CRI -R9: -13.8
 DUV: 0.3858
 CIE Coordinate (x): 0.3799
 CIE Coordinate (y): 0.2274
 CIE Coordinate (u'): 0.2274
 CIE Coordinate (v'): 0.3358



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	0.088	655	0.076
380	0.002	520	0.104	660	0.067
385	0.002	525	0.118	665	0.060
390	0.002	530	0.128	670	0.053
395	0.002	535	0.137	675	0.047
400	0.002	540	0.143	680	0.041
405	0.003	545	0.148	685	0.036
410	0.004	550	0.153	690	0.032
415	0.006	555	0.158	695	0.028
420	0.009	560	0.162	700	0.024
425	0.016	565	0.167	705	0.021
430	0.029	570	0.171	710	0.018
435	0.049	575	0.174	715	0.016
440	0.079	580	0.177	720	0.014
445	0.128	585	0.178	725	0.012
450	0.189	590	0.178	730	0.011
455	0.196	595	0.176	735	0.009
460	0.139	600	0.172	740	0.008
465	0.089	605	0.167	745	0.007
470	0.063	610	0.161	750	0.006
475	0.043	615	0.153	755	0.005
480	0.03	620	0.144	760	0.005
485	0.026	625	0.134	765	0.004
490	0.025	630	0.124	770	0.004
495	0.029	635	0.114	775	0.003
500	0.039	640	0.104	780	0.003
505	0.053	645	0.094		
510	0.07	650	0.084		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L14120.
Dialight unit model number HELMN4DN-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 0.7423 (A)
Input Power: 88.4 (W)
Power Factor: 0.9908

Photometric measurements:

Absolute Luminous Flux: 10047 (lumens)
Luminous Efficacy: 113.6 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	22.5	45	67.5	ACROSS	OUTPUT LUMENS
0	3697	3697	3697	3697	3697	
5	3692	3694	3692	3692	3690	138
15	3664	3663	3660	3659	3656	784
25	3661	3660	3657	3649	3645	1451
35	3529	3523	3524	3513	3509	2040
45	2902	2905	2908	2892	2890	2288
55	1742	1752	1755	1747	1747	1876
65	648	651	654	653	659	977
75	168	167	167	170	171	314
85	64	62	64	66	64	96
95	42	39	41	45	43	55
105	13	10	11	14	13	25
115	0	0	0	0	0	2
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

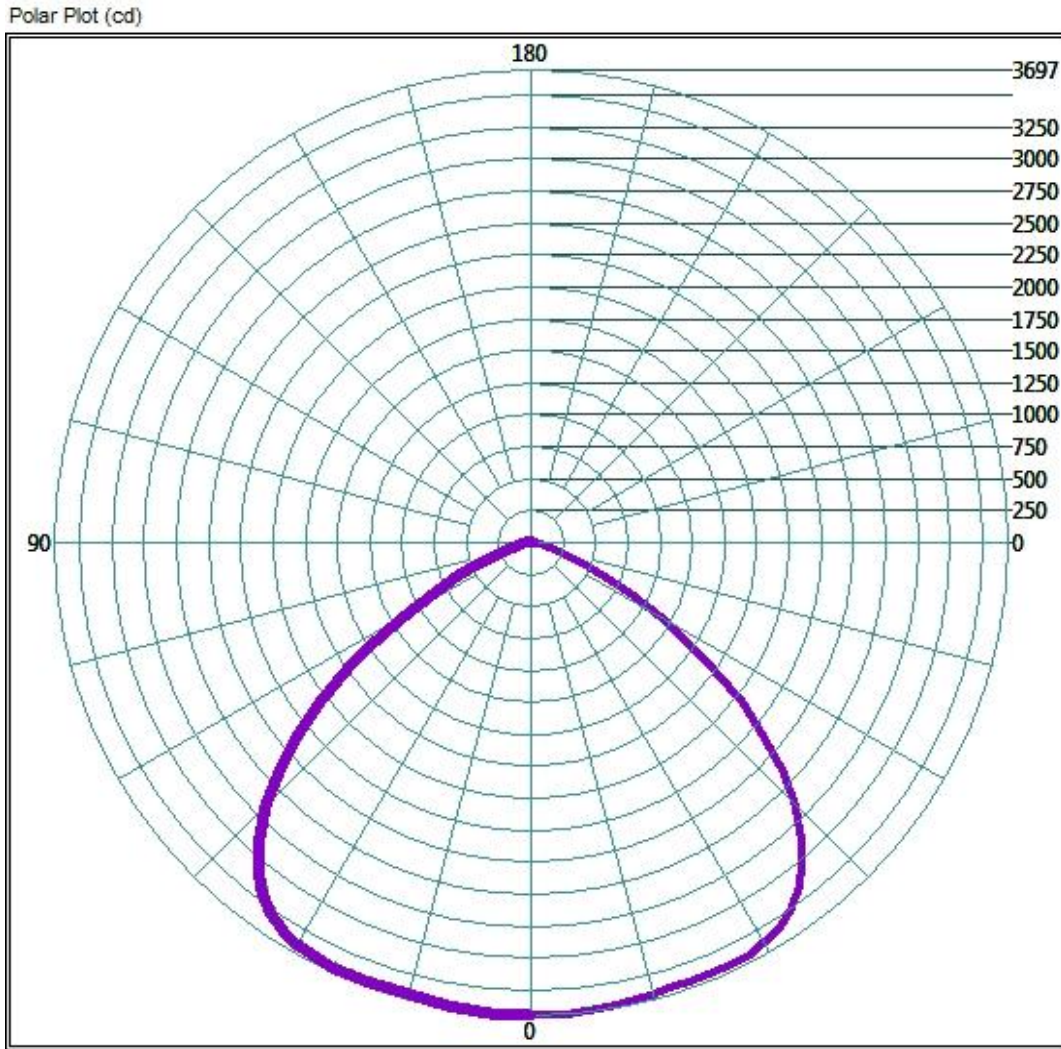
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	3331.88	33.2%
0-40	5563.5	55.4%
0-60	9180.02	91.4%
60-90	1085.98	10.8%
0-90	9995.6	99.5%
90-180	66.16	0.7%
0-180	10047.04	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

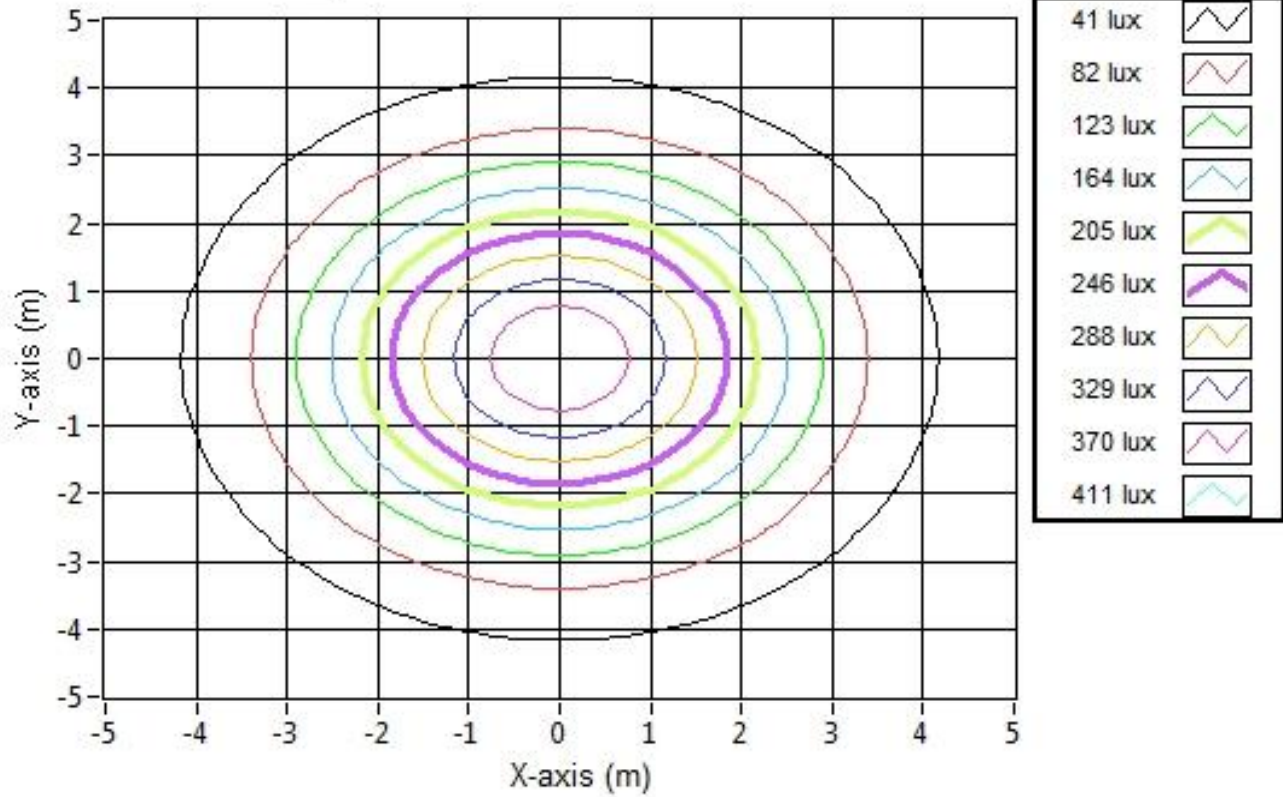


Test Results: Goniometer

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	8.44	8.45	397.9
6.096	16.88	16.90	99.5
9.144	25.33	25.35	44.2
12.192	33.77	33.79	24.9
15.24	42.21	42.24	15.9
18.288	50.65	50.69	11.1
21.336	59.09	59.14	8.1
24.384	67.53	67.59	6.2
27.432	75.98	76.04	4.9
30.48	84.42	84.48	4.0

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L14120.

Dialight unit model number HELMN4DN-xxx

LED identified as Nichia part number Nichia NT2W757DT 5000K.

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

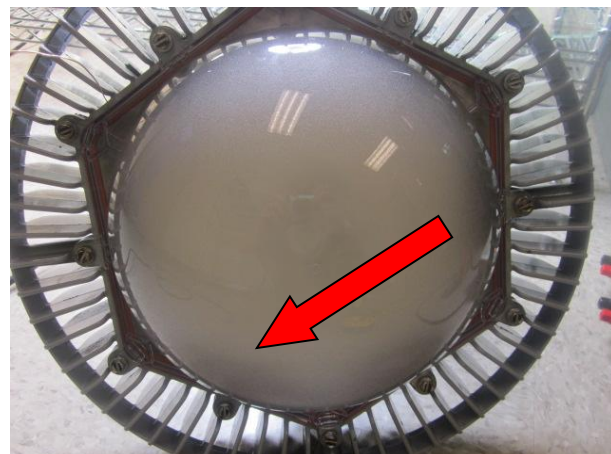
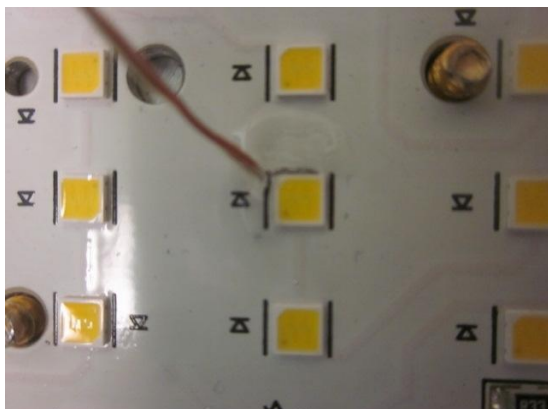
Ambient Temperature: $25^{\circ} \pm 1^{\circ}$ (°C)

Ambient temperature at time of measurement: 24.2 (°C)

Relative humidity at time of measurement: 22%

Results:

Measured LED source temperature: 46.9 (°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
LSI Standard Lamps	#30279	4/17/2015
LSI High Speed Mirror Goniometer	6240T	-
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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Lighting Division

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Approved Signatory