

# Test Report

Report Number: L16033

Date: Apr 18, 2016

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: HELMM4Kx-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:** April 4, 2016 through April 6, 2016

**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

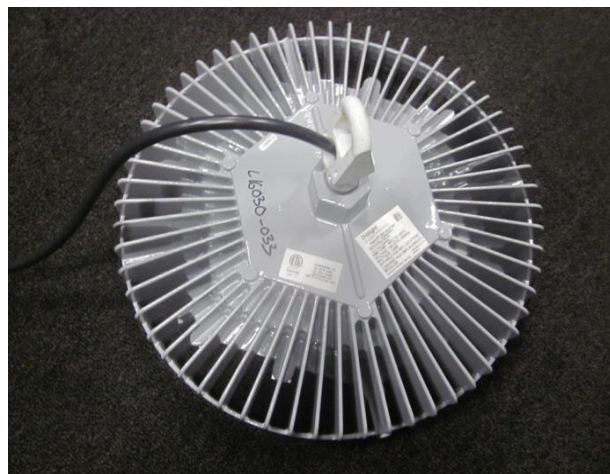
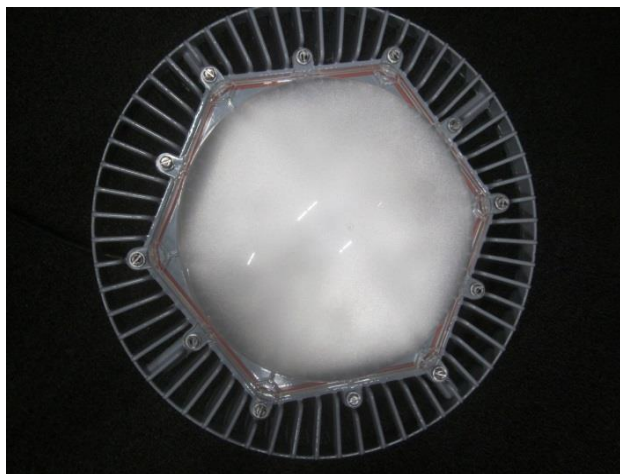
**Description of sample:**

Sample Number: L16033  
Manufacturer: Dialight Corporation  
Product Name: Vigilant Highbay  
Description: Vigilant Highbay With Polycarbonate Dome Lens  
Model Number: HELMM4Kx-xxx

## Report Summary

Sample number L16033  
Dialight unit model number HELMM4Kx-xxx

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	16710 (lumens)	16385 (lumens)
Electrical Power:	143.5 (W)	143.3 (W)
Luminous Efficacy:	116.4 (lumens/W)	114.4 (lumens/W)

### Electrical Measurements:

Input Power (120VAC): 143.5 (W)  
 Power Factor (120VAC): 0.995  
 Current ATHD % (120VAC): 8.212  
 Input Power (277VAC): 140.7 (W)  
 Power Factor (277VAC): 0.97  
 Current ATHD % (277VAC): 13.72

### Color Measurements:

Correlated Color Temperature (CCT): 3961  
 Color Rendering Index (CRI): 82.6  
 Chromaticity Coordinate (x): 0.384  
 Chromaticity Coordinate (y): 0.385  
 Chromaticity Coordinate (u'): 0.224  
 Chromaticity Coordinate (v'): 0.337  
 DUV: 0.0029

### Temperature Measurements:

In Situ LED Source Temperature: 55.9 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16033.  
Dialight unit model number HELMM4Kx-xxx

### Test Conditions:

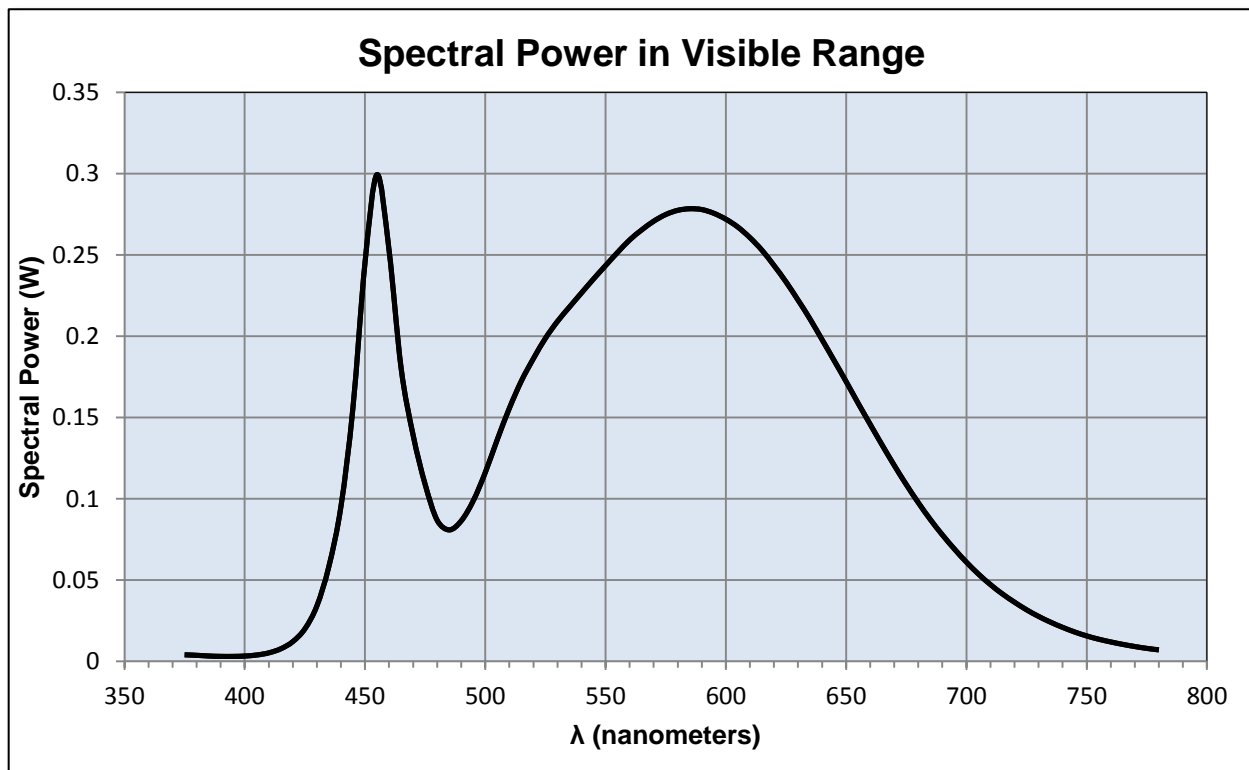
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input Current: 1.202 (A)  
Input Power: 143.5 (W)  
Input Power Factor: 0.995  
Current ATHD: 8.212 (%)

### Photometric measurements:

Luminous Flux: 16710 (lumens)  
Luminous Efficacy: 116.4 (lumens/W)  
Correlated Color Temperature (CCT): 3961 (K)  
CRI -Ra: 82.6  
CRI -R9: 19.1  
DUV: 0.0029  
CIE Coordinate (x): 0.384  
CIE Coordinate (y): 0.385  
CIE Coordinate (u'): 0.224  
CIE Coordinate (v'): 0.337



## Test Results: Integrating Sphere

Results continued from previous page.

### Tabulated Spectral Power in Visible Range:

$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)	$\lambda(\text{nm})$	(W/nm)
375	0.004	515	0.172	655	0.159
380	0.004	520	0.186	660	0.146
385	0.003	525	0.199	665	0.133
390	0.003	530	0.209	670	0.121
395	0.003	535	0.218	675	0.109
400	0.003	540	0.227	680	0.098
405	0.004	545	0.235	685	0.087
410	0.005	550	0.243	690	0.078
415	0.008	555	0.251	695	0.069
420	0.012	560	0.259	700	0.061
425	0.020	565	0.265	705	0.054
430	0.034	570	0.271	710	0.047
435	0.058	575	0.275	715	0.041
440	0.095	580	0.277	720	0.036
445	0.156	585	0.278	725	0.032
450	0.245	590	0.278	730	0.028
455	0.299	595	0.276	735	0.024
460	0.253	600	0.272	740	0.021
465	0.180	605	0.267	745	0.018
470	0.139	610	0.261	750	0.016
475	0.109	615	0.253	755	0.014
480	0.087	620	0.243	760	0.012
485	0.081	625	0.233	765	0.010
490	0.086	630	0.222	770	0.009
495	0.099	635	0.211	775	0.008
500	0.116	640	0.198	780	0.007
505	0.136	645	0.185		
510	0.156	650	0.172		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16033.  
Dialight unit model number HELMM4Kx-xxx

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input current: 1.19 (A)  
Input Power: 143.3 (W)  
Power Factor: 0.995

### Photometric measurements:

Absolute Luminous Flux: 16385 (lumens)  
Luminous Efficacy: 114.4 (lumens/W)

### Intensity Summary:

<b>INTENSITY (CANDLEPOWER) SUMMARY</b>						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	5823	5823	5823	5823	5823	
5	5858	5858	5858	5858	5858	218
15	6085	6085	6085	6085	6085	1283
25	6341	6341	6341	6341	6341	2490
35	5992	5992	5992	5992	5992	3515
45	4624	4624	4624	4624	4624	3748
55	2588	2588	2588	2588	2588	2855
65	1025	1025	1025	1025	1025	1466
75	331	331	331	331	331	550
85	160	160	160	160	160	219
95	0	0	0	0	0	40
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

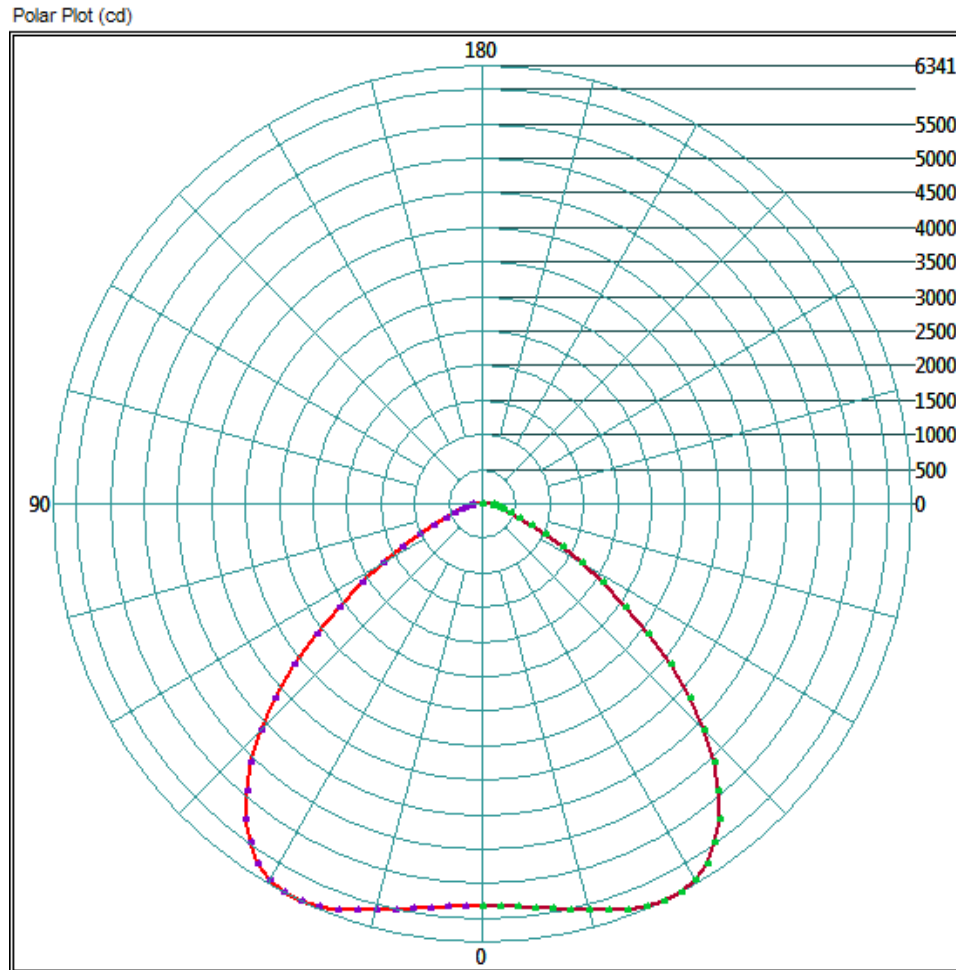
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	5654.4	34.5%
0-40	9420.8	57.5%
0-60	14998.24	91.5%
60-90	1787.52	10.9%
0-90	16384.96	100.0%
90-180	0	0.0%
0-180	16384.96	100.0%

## Test Results: Goniometer

Results continued from previous page.

### Polar Plot:

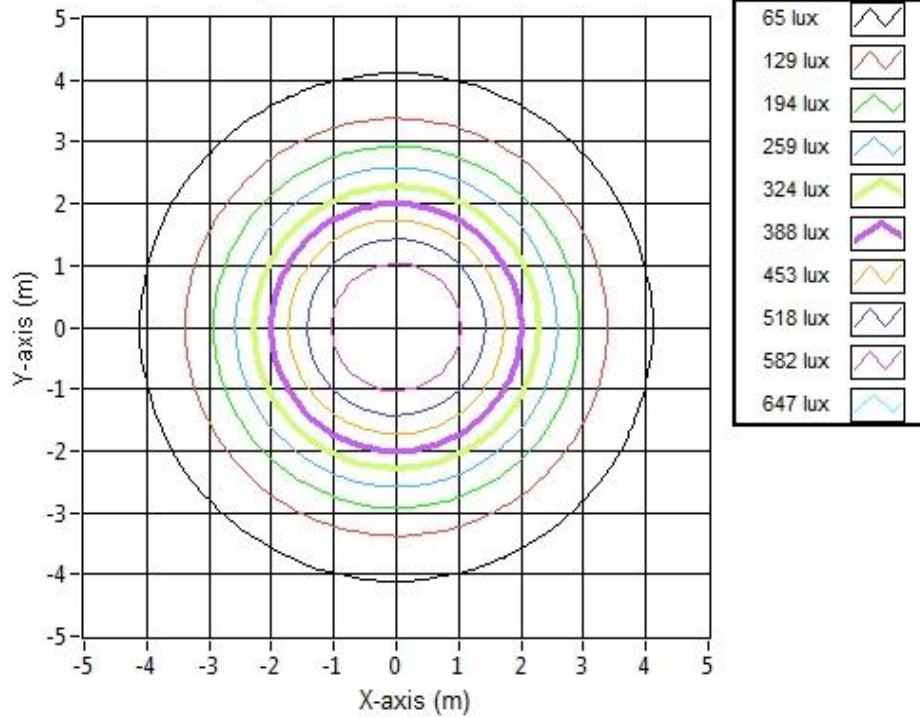


## Test Results: Goniometer

Results continued from previous page.

### Illuminance Plot:

Illuminance Contour Graph



### Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	8.22	8.22	626.8
6.096	16.43	16.43	156.7
9.144	24.65	24.65	69.6
12.192	32.86	32.86	39.2
15.24	41.08	41.08	25.1
18.288	49.30	49.30	17.4
21.336	57.51	57.51	12.8
24.384	65.73	65.73	9.8
27.432	73.95	73.95	7.7
30.48	82.16	82.16	6.3



## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16033.  
Dialight unit model number HELMM4Kx-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:

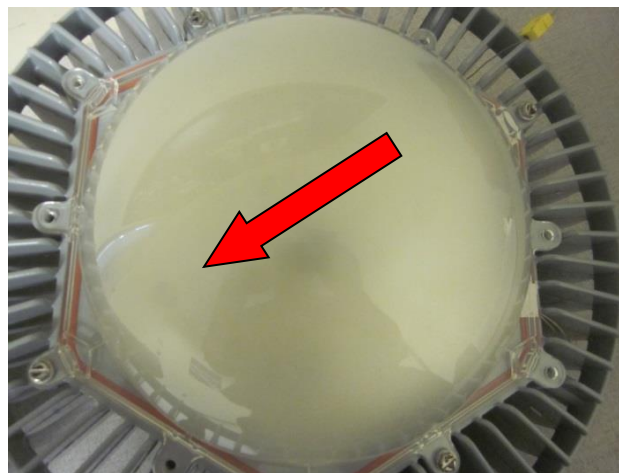
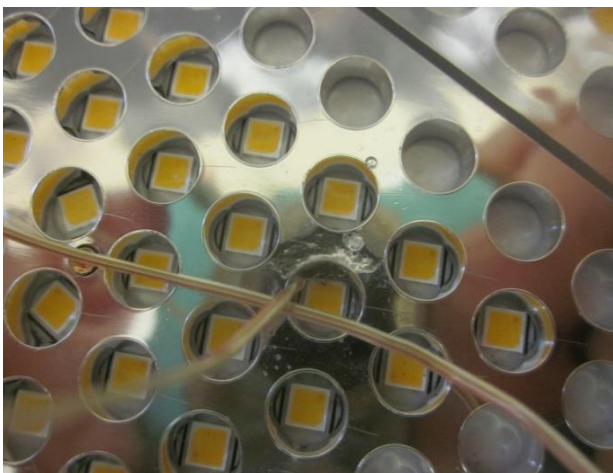
Maximum Power at Indicated Current: 0.35 (W)  
Maximum Source Temperature: 113.7 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature:  $25^{\circ} \pm 5^{\circ}$  (°C)  
Ambient temperature at time of measurement: 23.9 (°C)  
Relative humidity at time of measurement: 20%

### Results:

**Measured LED source temperature: 55.9 (°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 Precision	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digital Thermometer 343	TPI 343
TPI Digital 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. This report shall not be reproduced, except in full, without the express written permission of Dialight Optics Laboratory.

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 Optical Engineer  
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