

Test Report

Report Number: L16011

Date: Feb 12, 2016

Issued by:

Dialight Optics Laboratory
1501 Route 34 South, Farmingdale, NJ 07727

Test of one Vigilant Highbay With Ultraclear Polycarbonate Lens
Unit manufacturer: Dialight Corporation
Unit model number: HE2MC4Kx-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: February 2, 2016 through February 12, 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

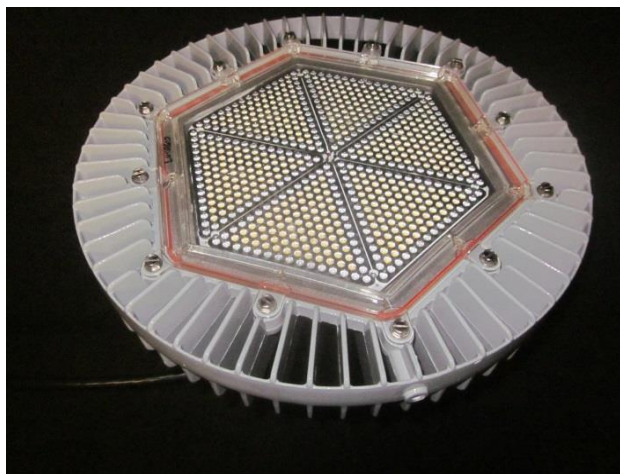
Description of sample:

Sample Number: L16011
Manufacturer: Dialight Corporation
Product Name: Vigilant Highbay With Ultraclear Polycarbonate Lens
Description: Vigilant Highbay With Ultraclear Polycarbonate Lens
Model Number: HE2MC4Kx-xxx

Report Summary

Sample number L16011
Dialight unit model number HE2MC4Kx-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	18320 (lumens)	18177 (lumens)
Electrical Power:	144.8 (W)	144.9 (W)
Luminous Efficacy:	126.6 (lumens/W)	125.5 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 144.8 (W)
 Power Factor (120VAC): 0.994
 Current ATHD % (120VAC): 8.316
 Input Power (277VAC): 142.3 (W)
 Power Factor (277VAC): 0.969
 Current ATHD % (277VAC): 14.51

Color Measurements:

Correlated Color Temperature (CCT): 4919
 Color Rendering Index (CRI): 78.4
 Chromaticity Coordinate (x): 0.348
 Chromaticity Coordinate (y): 0.354
 Chromaticity Coordinate (u'): 0.212
 Chromaticity Coordinate (v'): 0.324
 DUV: 0.00038

Temperature Measurements:

In Situ LED Source Temperature: 52.5 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16011.

Dialight unit model number HE2MC4Kx-xxx

Test Conditions:

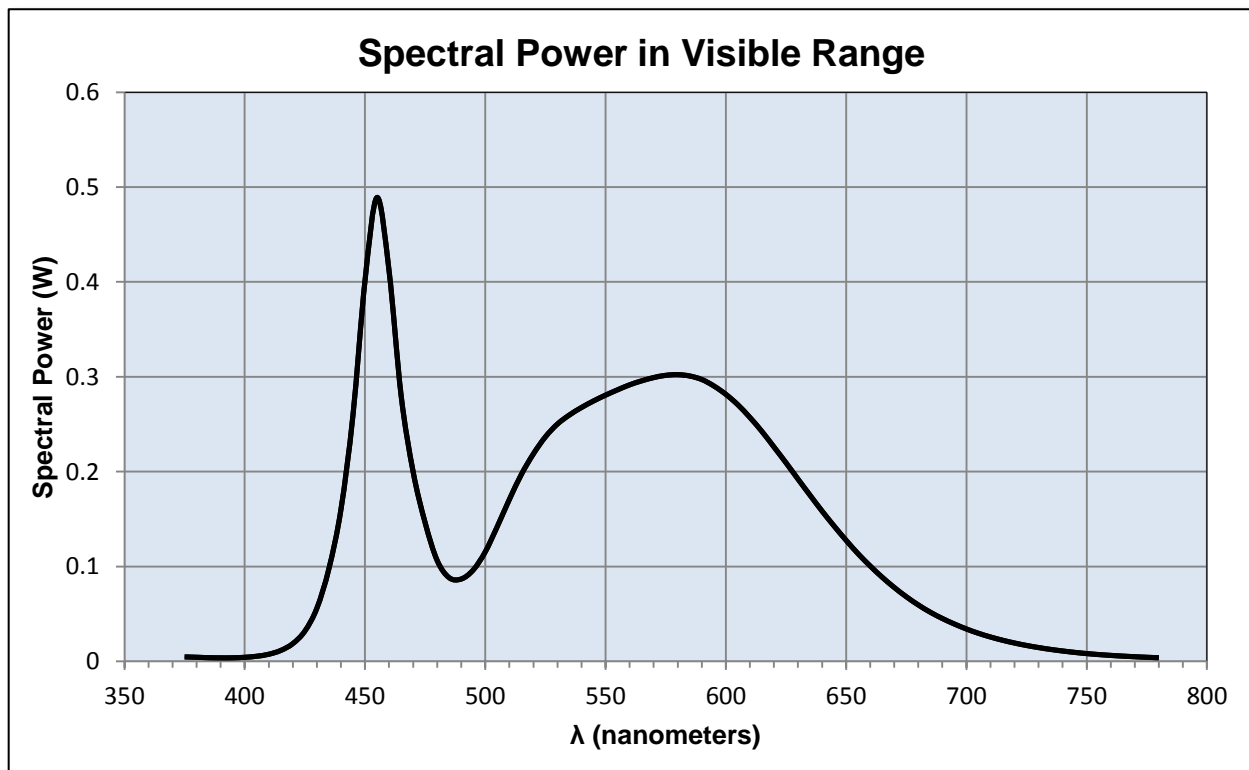
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 1.212 (A)
Input Power: 144.8 (W)
Input Power Factor: 0.994
Current ATHD: 8.316 (%)

Photometric measurements:

Luminous Flux: 18320 (lumens)
Luminous Efficacy: 126.6 (lumens/W)
Correlated Color Temperature (CCT): 4919 (K)
CRI -Ra: 78.4
CRI -R9: -6.2
DUV: 0.00038
CIE Coordinate (x): 0.348
CIE Coordinate (y): 0.354
CIE Coordinate (u'): 0.212
CIE Coordinate (v'): 0.324



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	0.005	515	0.197	655	0.113
380	0.004	520	0.219	660	0.101
385	0.004	525	0.237	665	0.089
390	0.004	530	0.25	670	0.078
395	0.004	535	0.26	675	0.068
400	0.004	540	0.268	680	0.059
405	0.005	545	0.274	685	0.052
410	0.007	550	0.281	690	0.045
415	0.011	555	0.286	695	0.039
420	0.019	560	0.292	700	0.034
425	0.032	565	0.296	705	0.03
430	0.056	570	0.299	710	0.026
435	0.098	575	0.302	715	0.022
440	0.16	580	0.302	720	0.019
445	0.26	585	0.301	725	0.017
450	0.401	590	0.297	730	0.015
455	0.489	595	0.29	735	0.013
460	0.412	600	0.281	740	0.011
465	0.281	605	0.27	745	0.009
470	0.2	610	0.257	750	0.008
475	0.146	615	0.242	755	0.007
480	0.106	620	0.226	760	0.006
485	0.088	625	0.209	765	0.006
490	0.087	630	0.192	770	0.005
495	0.096	635	0.175	775	0.004
500	0.115	640	0.158	780	0.004
505	0.142	645	0.143		
510	0.171	650	0.128		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16011.
Dialight unit model number HE2MC4Kx-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 1.2 (A)
Input Power: 144.9 (W)
Power Factor: 0.995

Photometric measurements:

Absolute Luminous Flux: 18177 (lumens)
Luminous Efficacy: 125.5 (lumens/W)

Intensity Summary:

INTENSITY (CANDLEPOWER) SUMMARY						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	6760	6760	6760	6760	6760	
5	6929	6929	6929	6929	6929	257
15	7274	7274	7274	7274	7274	1526
25	7985	7985	7985	7985	7985	3080
35	7626	7626	7626	7626	7626	4478
45	5536	5536	5536	5536	5536	4623
55	2344	2344	2344	2344	2344	2990
65	574	574	574	574	574	1026
75	46	46	46	46	46	175
85	9	9	9	9	9	22
95	0	0	0	0	0	1
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

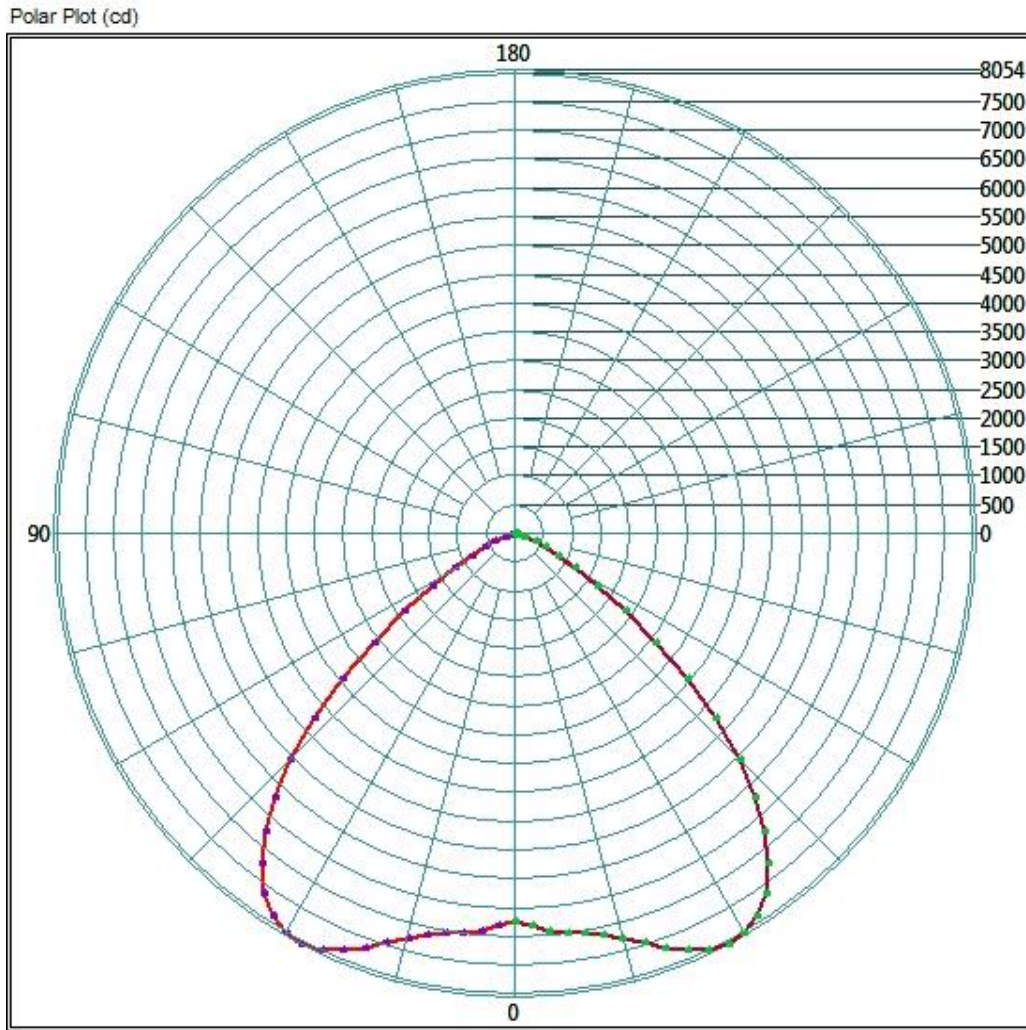
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	6981.28	38.4%
0-40	11740.8	64.6%
0-60	17632.8	97.0%
60-90	830.72	4.6%
0-90	18177.12	100.0%
90-180	0	0.0%
0-180	18177.12	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

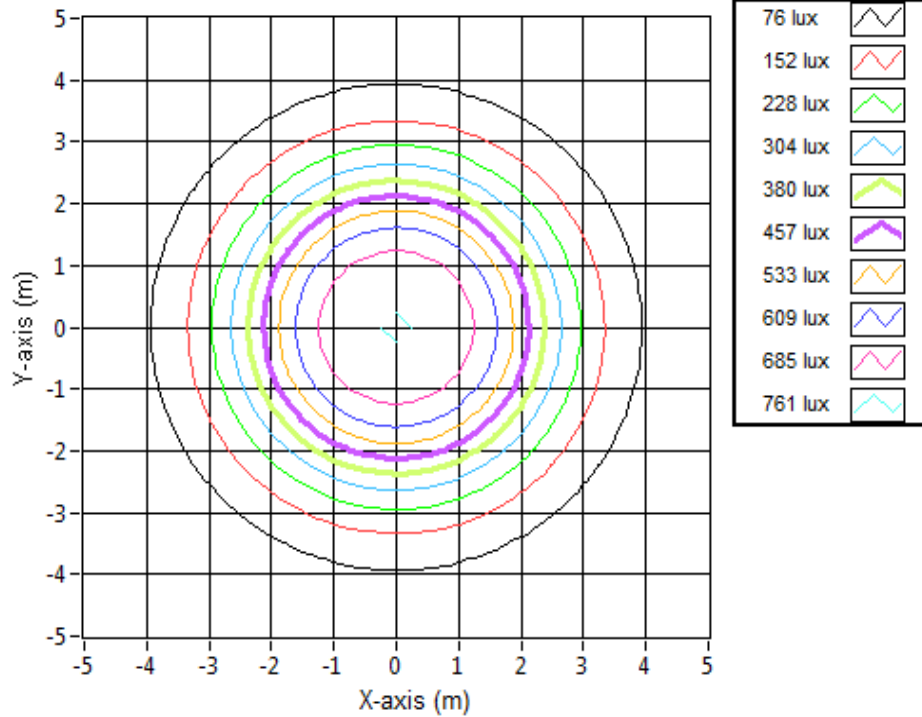


Test Results: Goniometer

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	7.71	7.71	727.6
6.096	15.42	15.42	181.9
9.144	23.13	23.13	80.8
12.192	30.85	30.85	45.5
15.24	38.56	38.56	29.1
18.288	46.27	46.27	20.2
21.336	53.98	53.98	14.8
24.384	61.69	61.69	11.4
27.432	69.40	69.40	9.0
30.48	77.11	77.11	7.3

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16011.
Dialight unit model number HE2MC4Kx-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:

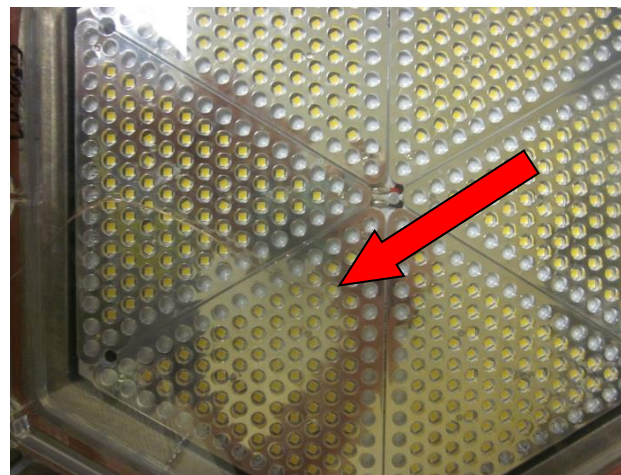
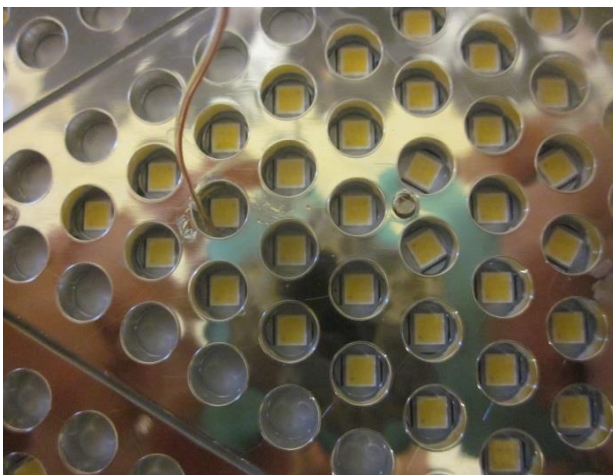
Maximum Power at Indicated Current: 0.35 (W)
Maximum Source Temperature: 113.7 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 1^{\circ}$ (°C)
Ambient temperature at time of measurement: 25.5 (°C)
Relative humidity at time of measurement: 21%

Results:

Measured LED source temperature: 52.5 (°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 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.

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