

# Test Report

Report Number: L16010

Date: Feb 12, 2016

Issued by:

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

Test of one Vigilant 18K With Clear Acrylic Lens  
Unit manufacturer: Dialight Corporation  
Unit model number: HE1MC4Kx-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 8, 2016 through February 11, 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

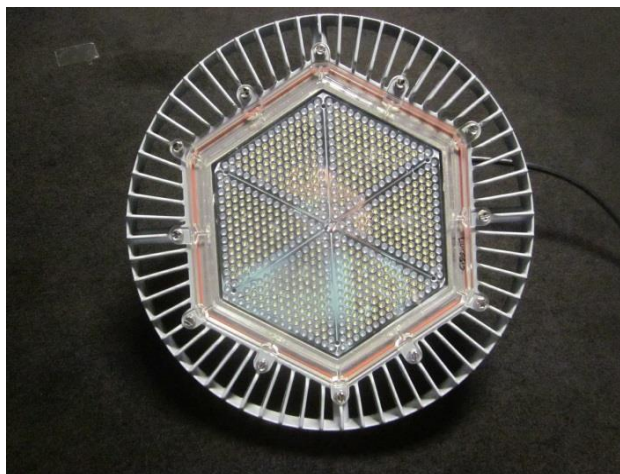
**Description of sample:**

Sample Number: L16010  
Manufacturer: Dialight Corporation  
Product Name: Vigilant 18K With Clear Acrylic Lens  
Description: Vigilant 18K With Clear Acrylic Lens  
Model Number: HE1MC4Kx-xxx

## Report Summary

Sample number L16010  
Dialight unit model number HE1MC4Kx-xxx

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	18350 (lumens)	18251 (lumens)
Electrical Power:	144.9 (W)	144.8 (W)
Luminous Efficacy:	126.7 (lumens/W)	126.1 (lumens/W)

### Electrical Measurements:

Input Power (120VAC): 144.9 (W)  
Power Factor (120VAC): 0.995  
Current ATHD % (120VAC): 8.253  
Input Power (277VAC): 142.1 (W)  
Power Factor (277VAC): 0.969  
Current ATHD % (277VAC): 14.29

### Color Measurements:

Correlated Color Temperature (CCT): 4939  
Color Rendering Index (CRI): 78.4  
Chromaticity Coordinate (x): 0.347  
Chromaticity Coordinate (y): 0.354  
Chromaticity Coordinate (u'): 0.212  
Chromaticity Coordinate (v'): 0.324  
DUV: 0.00027

### Temperature Measurements:

In Situ LED Source Temperature: 52.4 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16010.

Dialight unit model number HE1MC4Kx-xxx

### Test Conditions:

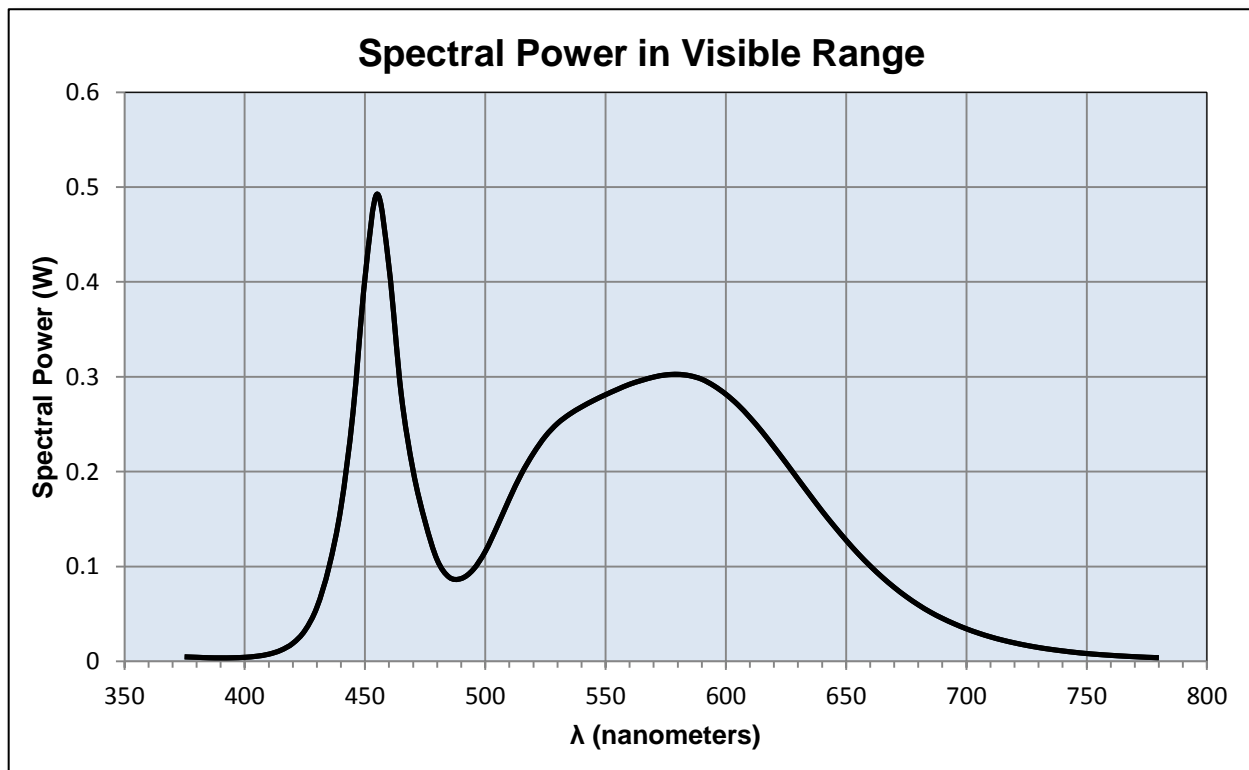
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 120 (VAC)  
 Input Current: 1.212 (A)  
 Input Power: 144.9 (W)  
 Input Power Factor: 0.995  
 Current ATHD: 8.253 (%)

### Photometric measurements:

Luminous Flux: 18350 (lumens)  
 Luminous Efficacy: 126.7 (lumens/W)  
 Correlated Color Temperature (CCT): 4939 (K)  
 CRI -Ra: 78.4  
 CRI -R9: -6.6  
 DUV: 0.00027  
 CIE Coordinate (x): 0.347  
 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	0.198	655	0.114
380	0.004	520	0.219	660	0.101
385	0.004	525	0.237	665	0.089
390	0.004	530	0.251	670	0.078
395	0.004	535	0.26	675	0.068
400	0.004	540	0.268	680	0.06
405	0.005	545	0.275	685	0.052
410	0.008	550	0.281	690	0.045
415	0.012	555	0.287	695	0.04
420	0.019	560	0.292	700	0.034
425	0.032	565	0.296	705	0.03
430	0.057	570	0.3	710	0.026
435	0.099	575	0.302	715	0.022
440	0.162	580	0.303	720	0.019
445	0.262	585	0.301	725	0.017
450	0.404	590	0.297	730	0.015
455	0.493	595	0.291	735	0.013
460	0.415	600	0.282	740	0.011
465	0.283	605	0.271	745	0.01
470	0.201	610	0.257	750	0.008
475	0.147	615	0.242	755	0.007
480	0.107	620	0.226	760	0.006
485	0.089	625	0.209	765	0.006
490	0.087	630	0.192	770	0.005
495	0.097	635	0.175	775	0.004
500	0.116	640	0.158	780	0.004
505	0.143	645	0.143		
510	0.171	650	0.128		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16010.  
Dialight unit model number HE1MC4Kx-xxx

### Electrical Measurements:

Input Voltage: 120 (VAC)  
Input current: 1.2 (A)  
Input Power: 144.8 (W)  
Power Factor: 0.994

### Photometric measurements:

Absolute Luminous Flux: 18251 (lumens)  
Luminous Efficacy: 126.1 (lumens/W)

### Intensity Summary:

<b>INTENSITY (CANDLEPOWER) SUMMARY</b>						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	6809	6809	6809	6809	6809	
5	6938	6938	6938	6938	6938	258
15	7296	7296	7296	7296	7296	1528
25	8012	8012	8012	8012	8012	3090
35	7653	7653	7653	7653	7653	4491
45	5573	5573	5573	5573	5573	4647
55	2366	2366	2366	2366	2366	3016
65	575	575	575	575	575	1031
75	40	40	40	40	40	168
85	9	9	9	9	9	20
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

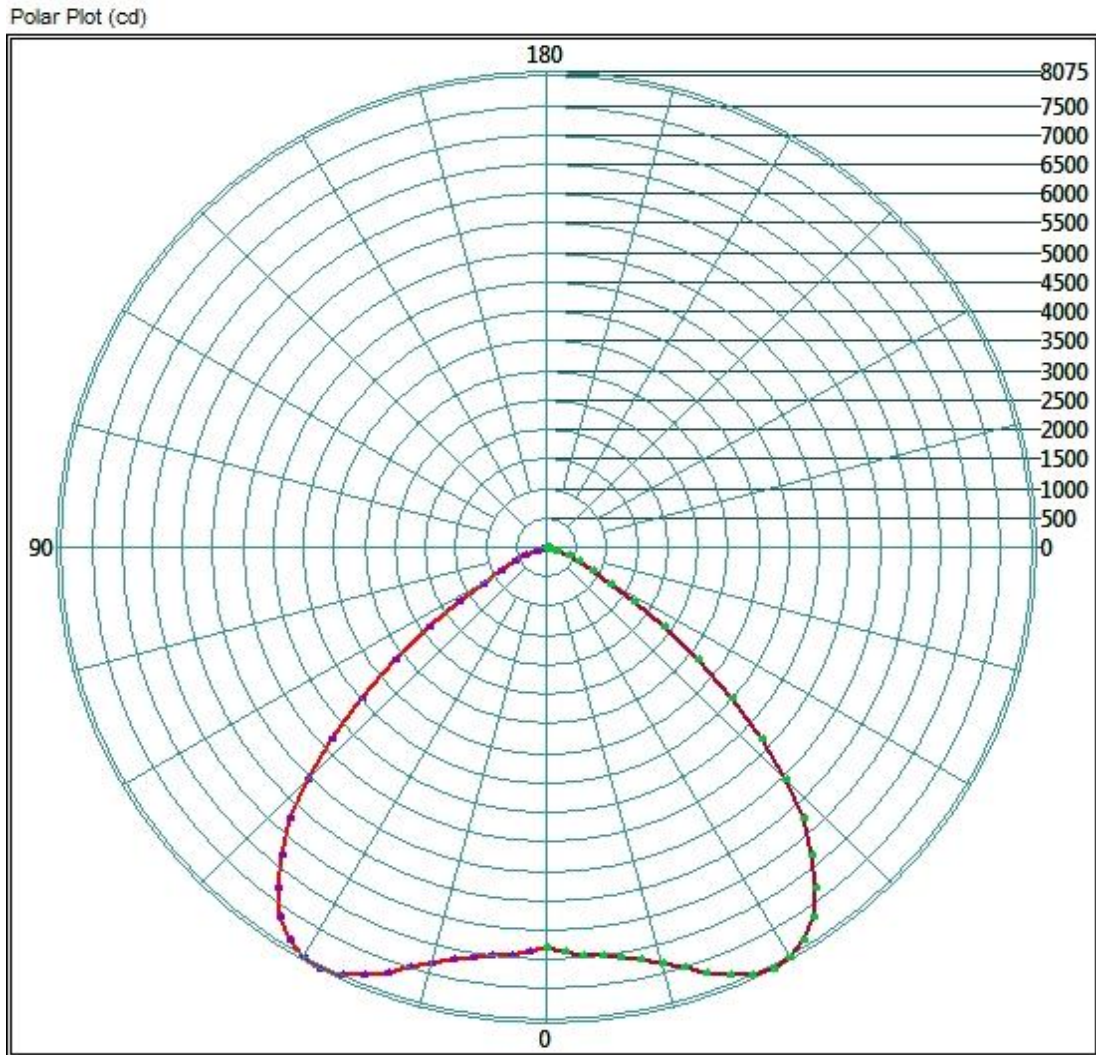
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	7000.32	38.4%
0-40	11777.76	64.5%
0-60	17716.16	97.1%
60-90	823.04	4.5%
0-90	18250.88	100.0%
90-180	0	0.0%
0-180	18250.88	100.0%

## Test Results: Goniometer

Results continued from previous page.

### Polar Plot:

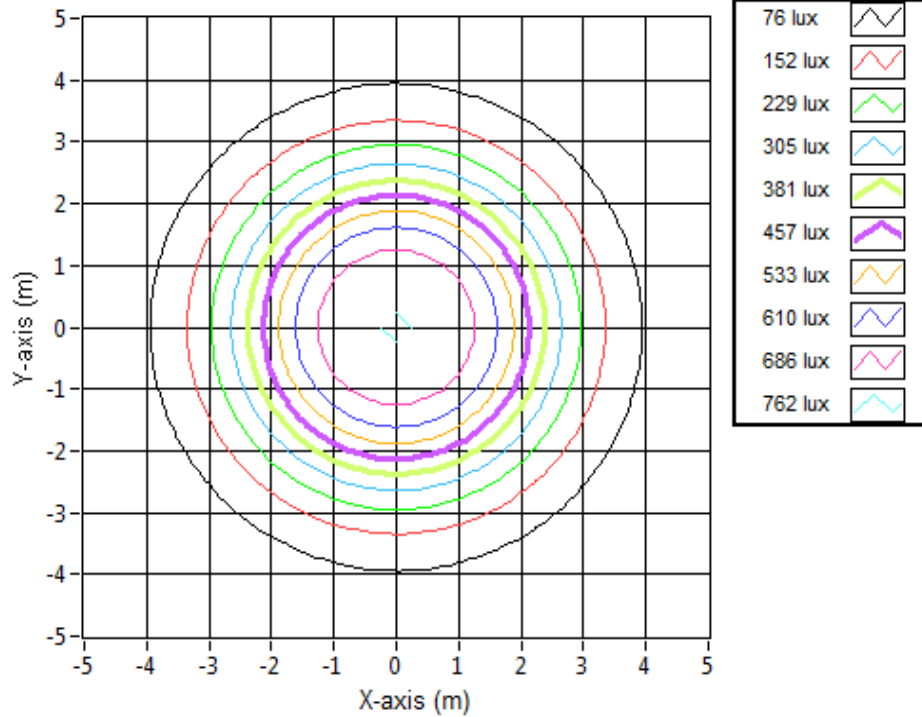


## Test Results: Goniometer

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	7.72	7.72	733.0
6.096	15.44	15.44	183.2
9.144	23.15	23.15	81.4
12.192	30.87	30.87	45.8
15.24	38.59	38.59	29.3
18.288	46.31	46.31	20.4
21.336	54.03	54.03	15.0
24.384	61.75	61.75	11.5
27.432	69.46	69.46	9.0
30.48	77.18	77.18	7.3

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16010.  
Dialight unit model number HE1MC4Kx-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:

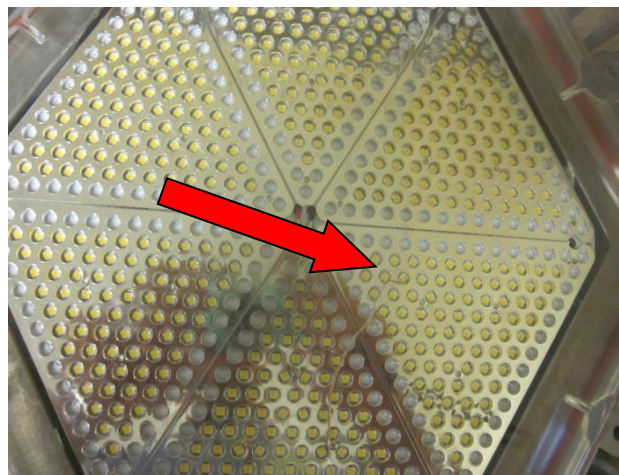
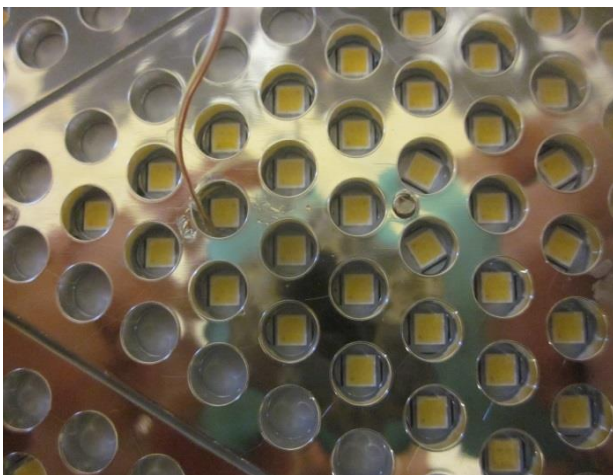
Maximum Power at Indicated Current: 0.35 (W)  
Maximum Source Temperature: 113.7 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature:  $25^{\circ} \pm 1^{\circ}$  (°C)  
Ambient temperature at time of measurement: 25.6 (°C)  
Relative humidity at time of measurement: 17%

### Results:

**Measured LED source temperature: 52.4 (°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