

Test Report

Report Number: L16012

Date: Feb 12, 2016

Issued by:

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

Test of one Vigilant 18K With Diffused Dome Lens
Unit manufacturer: Dialight Corporation
Unit model number: HELMC4Kx-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 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

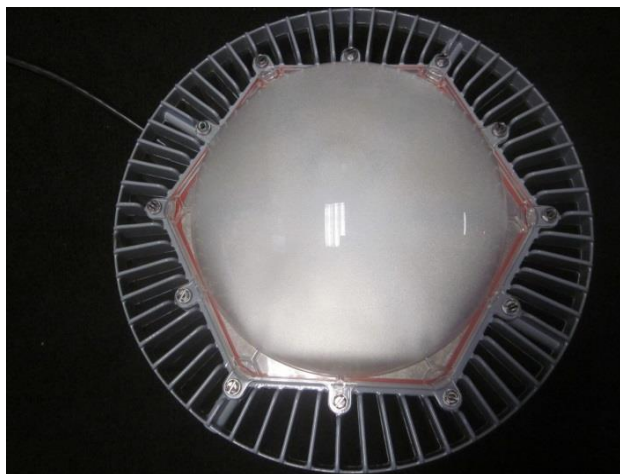
Description of sample:

Sample Number: L16012
Manufacturer: Dialight Corporation
Product Name: Vigilant 18K With Diffused Dome Lens
Description: Vigilant 18K With Diffused Dome Lens
Model Number: HELMC4Kx-xxx

Report Summary

Sample number L16012
Dialight unit model number HELMC4Kx-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	18150 (lumens)	17680 (lumens)
Electrical Power:	144.7 (W)	144.8 (W)
Luminous Efficacy:	125.5 (lumens/W)	122.1 (lumens/W)

Electrical Measurements:

Input Power (120VAC): 144.7 (W)
 Power Factor (120VAC): 0.994
 Current ATHD % (120VAC): 8.255
 Input Power (277VAC): 142.0 (W)
 Power Factor (277VAC): 0.969
 Current ATHD % (277VAC): 14.13

Color Measurements:

Correlated Color Temperature (CCT): 4900
 Color Rendering Index (CRI): 78.5
 Chromaticity Coordinate (x): 0.348
 Chromaticity Coordinate (y): 0.355
 Chromaticity Coordinate (u'): 0.212
 Chromaticity Coordinate (v'): 0.325
 DUV: 0.00051

Temperature Measurements:

In Situ LED Source Temperature: 53.2 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L16012.

Dialight unit model number HELMC4Kx-xxx

Test Conditions:

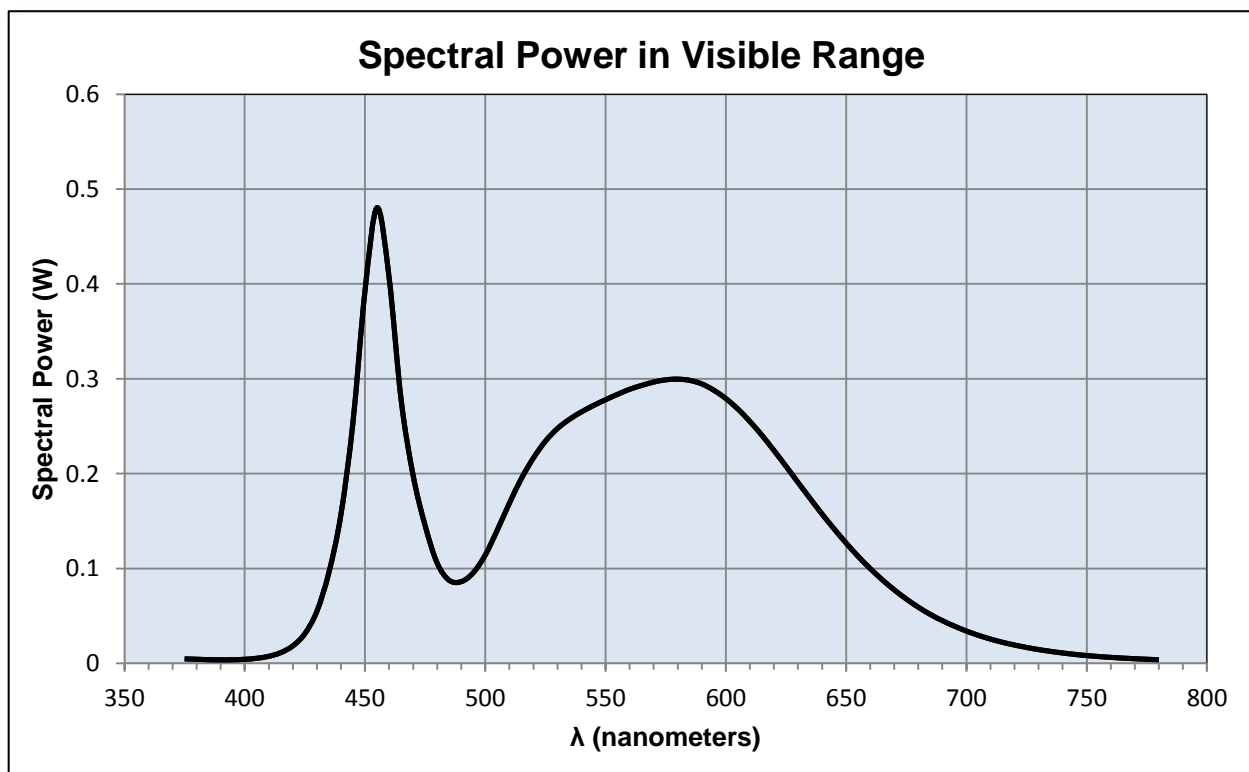
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 1.21 (A)
Input Power: 144.7 (W)
Input Power Factor: 0.994
Current ATHD: 8.255 (%)

Photometric measurements:

Luminous Flux: 18150 (lumens)
Luminous Efficacy: 125.5 (lumens/W)
Correlated Color Temperature (CCT): 4900 (K)
CRI -Ra: 78.5
CRI -R9: -5.8
DUV: 0.00051
CIE Coordinate (x): 0.348
CIE Coordinate (y): 0.355
CIE Coordinate (u'): 0.212
CIE Coordinate (v'): 0.325



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	0.195	655	0.113
380	0.004	520	0.216	660	0.1
385	0.004	525	0.234	665	0.088
390	0.004	530	0.248	670	0.077
395	0.004	535	0.257	675	0.068
400	0.004	540	0.265	680	0.059
405	0.005	545	0.272	685	0.052
410	0.007	550	0.278	690	0.045
415	0.011	555	0.284	695	0.039
420	0.018	560	0.289	700	0.034
425	0.031	565	0.293	705	0.03
430	0.055	570	0.297	710	0.026
435	0.096	575	0.299	715	0.022
440	0.157	580	0.3	720	0.019
445	0.254	585	0.298	725	0.017
450	0.393	590	0.295	730	0.015
455	0.48	595	0.288	735	0.013
460	0.407	600	0.279	740	0.011
465	0.278	605	0.268	745	0.009
470	0.198	610	0.255	750	0.008
475	0.145	615	0.24	755	0.007
480	0.106	620	0.224	760	0.006
485	0.088	625	0.208	765	0.006
490	0.086	630	0.191	770	0.005
495	0.096	635	0.174	775	0.004
500	0.114	640	0.157	780	0.004
505	0.141	645	0.142		
510	0.169	650	0.127		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L16012.
Dialight unit model number HELMC4Kx-xxx

Electrical Measurements:

Input Voltage: 120 (VAC)
Input current: 1.212 (A)
Input Power: 144.8 (W)
Power Factor: 0.995

Photometric measurements:

Absolute Luminous Flux: 17680 (lumens)
Luminous Efficacy: 122.1 (lumens/W)

Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	23	45	68	ACROSS	OUTPUT LUMENS
0	6279	6279	6279	6279	6279	
5	6323	6323	6323	6323	6323	236
15	6577	6577	6577	6577	6577	1386
25	6801	6801	6801	6801	6801	2679
35	6363	6363	6363	6363	6363	3745
45	4892	4892	4892	4892	4892	3968
55	2790	2790	2790	2790	2790	3042
65	1181	1181	1181	1181	1181	1635
75	412	412	412	412	412	661
85	202	202	202	202	202	277
95	0	0	0	0	0	51
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

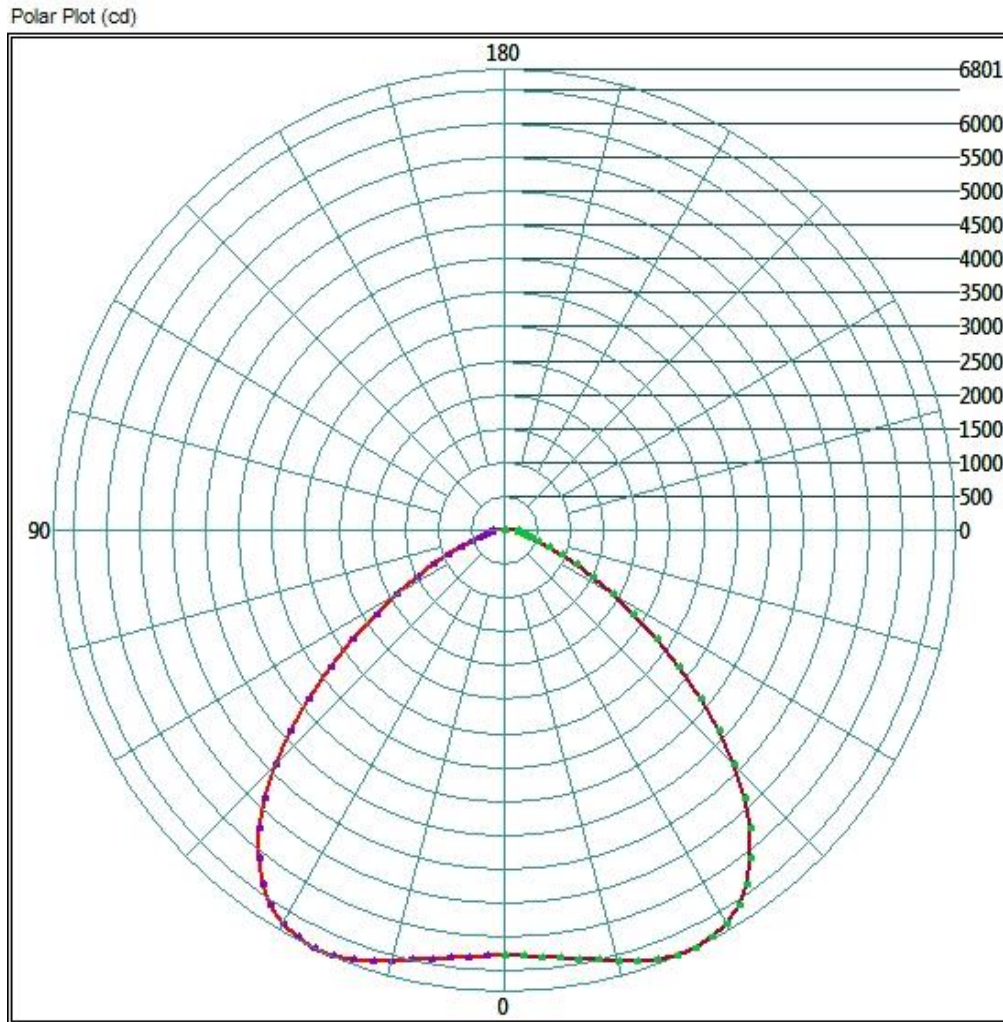
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	6078.24	34.4%
0-40	10075.52	57.0%
0-60	16034.4	90.7%
60-90	2090.88	11.8%
0-90	17680.64	100.0%
90-180	0	0.0%
0-180	17680.64	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

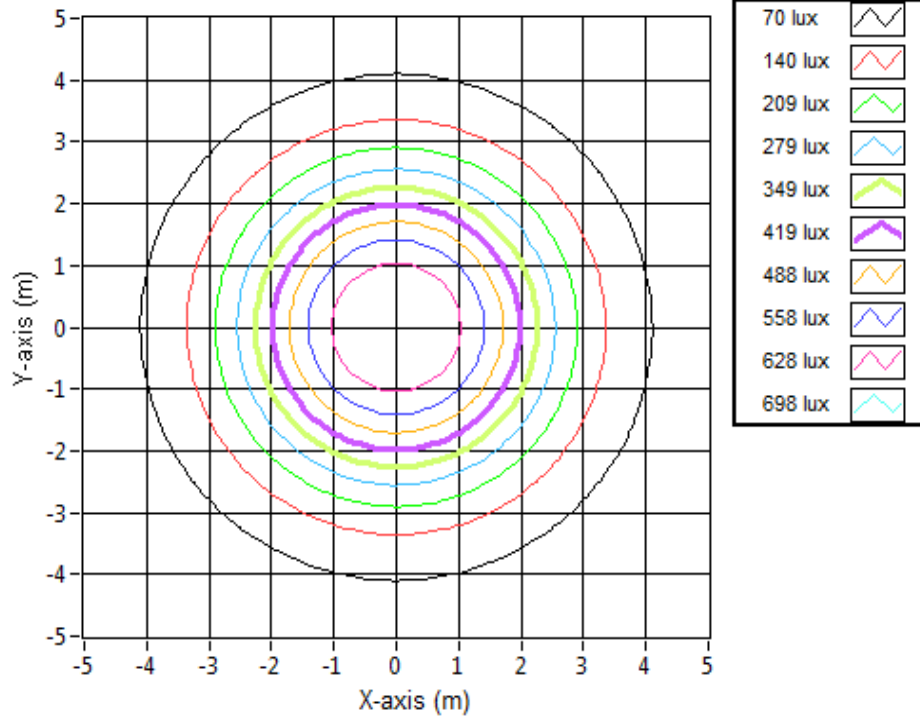


Test Results: Goniometer

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	8.19	8.19	675.9
6.096	16.37	16.37	169.0
9.144	24.56	24.56	75.1
12.192	32.75	32.75	42.2
15.24	40.94	40.94	27.0
18.288	49.12	49.12	18.8
21.336	57.31	57.31	13.8
24.384	65.50	65.50	10.6
27.432	73.68	73.68	8.3
30.48	81.87	81.87	6.8

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L16012.
Dialight unit model number HELMC4Kx-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:

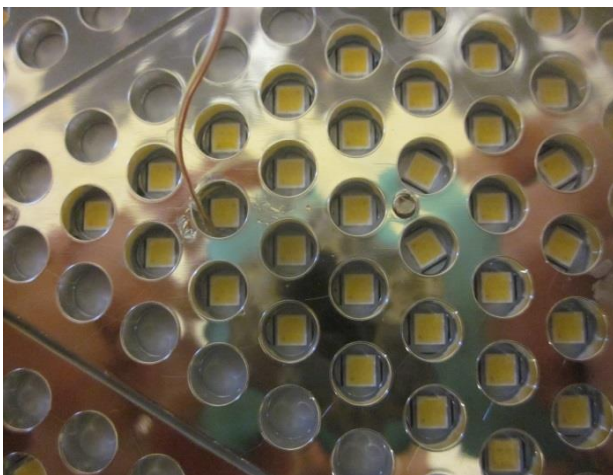
Maximum Power at Indicated Current: 0.35 (W)
Maximum Source Temperature: 113.7 (°C)

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: 15%

Results:

Measured LED source temperature: 53.2 (°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 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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