

Test Report

Report Number: L17018

Date: May 10, 2017

Issued by:

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

Test of one Vigilant 60K
Unit manufacturer: Dialight Corporation
Unit model number: HEA9RC4Gx-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 28, 2017 through May 2, 2017

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

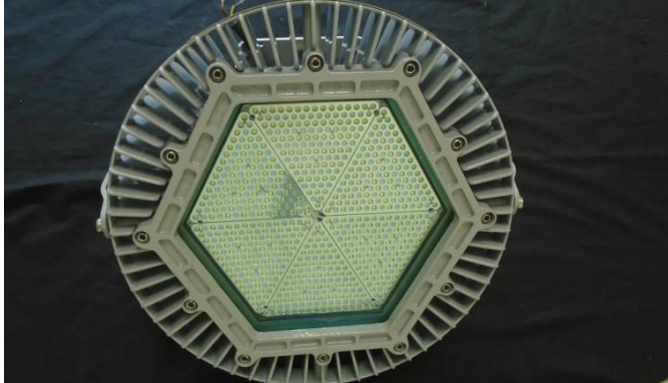
Description of sample:

Sample Number: L17018
Manufacturer: Dialight Corporation
Product Name: Vigilant 60K
Description: Vigilant 60K
Model Number: HEA9RC4Gx-xxx

Report Summary

Sample number L17018
Dialight unit model number HEA9RC4Gx-xxx

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	12170 (lumens)	12232 (lumens)
Electrical Power:	110.5 (W)	110.6 (W)
Luminous Efficacy:	110.1 (lumens/W)	110.6 (lumens/W)

Electrical Measurements:

Input Power (240VAC): 110.5 (W)
Power Factor (240VAC): 0.973
Current ATHD % (240VAC): 14.59

Color Measurements:

Correlated Color Temperature (CCT): 5256
Color Rendering Index (CRI): 75.6
Chromaticity Coordinate (x): 0.339
Chromaticity Coordinate (y): 0.359
Chromaticity Coordinate (u'): 0.205
Chromaticity Coordinate (v'): 0.325
DUV: 0.006

Temperature Measurements:

In Situ LED Source Temperature: 66.2 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L17018.

Dialight unit model number HEA9RC4Gx-xxx

Test Conditions:

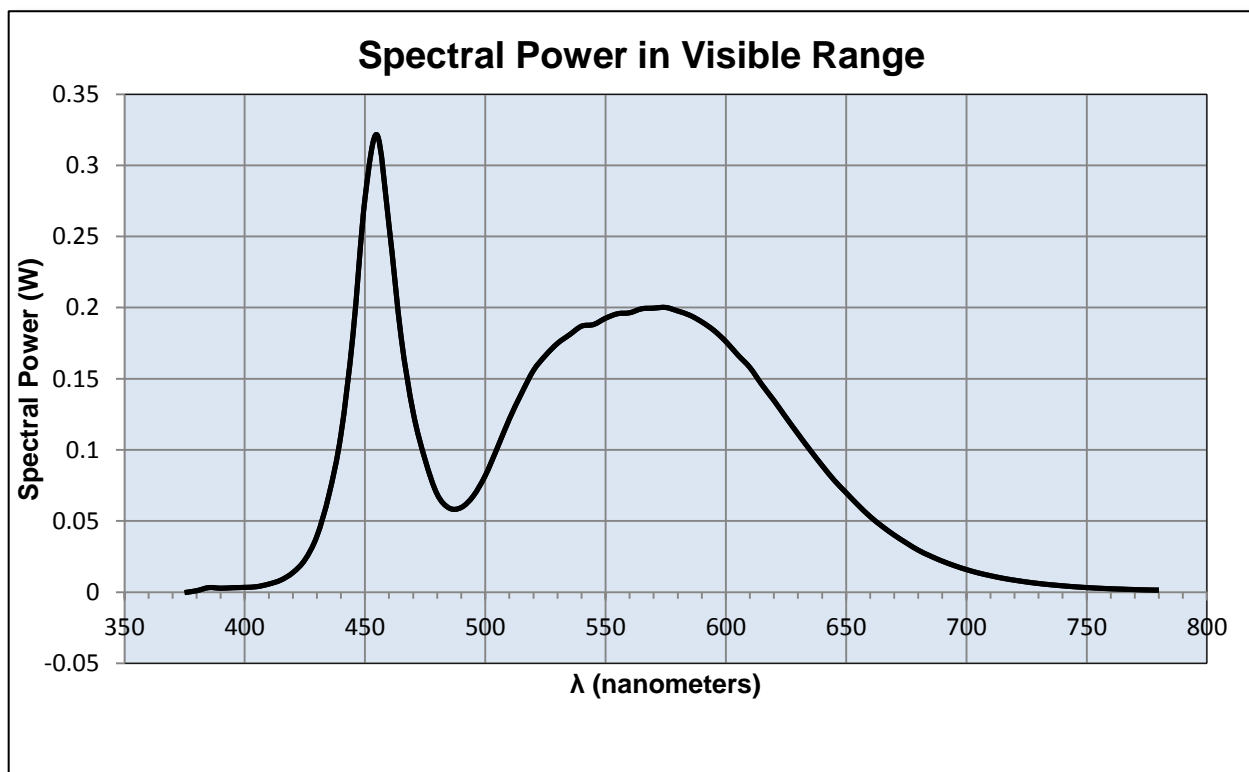
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 120 (VAC)
Input Current: 0.473 (A)
Input Power: 110.5 (W)
Input Power Factor: 0.973
Current ATHD: 14.59 (%)

Photometric measurements:

Luminous Flux: 12170 (lumens)
Luminous Efficacy: 110.1 (lumens/W)
Correlated Color Temperature (CCT): 5256 (K)
CRI -Ra: 75.6
CRI -R9: -25.9
DUV: 0.006
CIE Coordinate (x): 0.339
CIE Coordinate (y): 0.359
CIE Coordinate (u'): 0.205
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	0.000	515	0.140	655	0.061
380	0.001	520	0.156	660	0.053
385	0.003	525	0.166	665	0.046
390	0.003	530	0.175	670	0.040
395	0.003	535	0.181	675	0.035
400	0.003	540	0.187	680	0.030
405	0.004	545	0.188	685	0.025
410	0.006	550	0.193	690	0.022
415	0.008	555	0.196	695	0.019
420	0.014	560	0.196	700	0.016
425	0.023	565	0.199	705	0.014
430	0.039	570	0.200	710	0.012
435	0.068	575	0.200	715	0.010
440	0.111	580	0.198	720	0.008
445	0.181	585	0.195	725	0.007
450	0.277	590	0.190	730	0.006
455	0.321	595	0.184	735	0.005
460	0.257	600	0.176	740	0.004
465	0.180	605	0.167	745	0.004
470	0.127	610	0.158	750	0.003
475	0.093	615	0.146	755	0.003
480	0.069	620	0.135	760	0.002
485	0.059	625	0.123	765	0.002
490	0.060	630	0.111	770	0.002
495	0.068	635	0.100	775	0.002
500	0.082	640	0.089	780	0.001
505	0.101	645	0.079		
510	0.122	650	0.070		

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L17018.
Dialight unit model number HEA9RC4Gx-xxx

Electrical Measurements:

Input Voltage: 240 (VAC)
Input current: 0.479 (A)
Input Power: 110.6 (W)
Power Factor: 0.96

Photometric measurements:

Absolute Luminous Flux: 12232 (lumens)
Luminous Efficacy: 110.6 (lumens/W)

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	4872	4872	4872	4872	4872	
5	4889	4889	4889	4889	4889	182
15	4714	4714	4714	4714	4714	1019
25	4654	4654	4654	4654	4654	1860
35	4673	4673	4673	4673	4673	2637
45	4566	4566	4566	4566	4566	3398
55	1801	1801	1801	1801	1801	2539
65	130	130	130	130	130	487
75	50	50	50	50	50	64
85	28	28	28	28	28	41
95	0	0	0	0	0	3
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

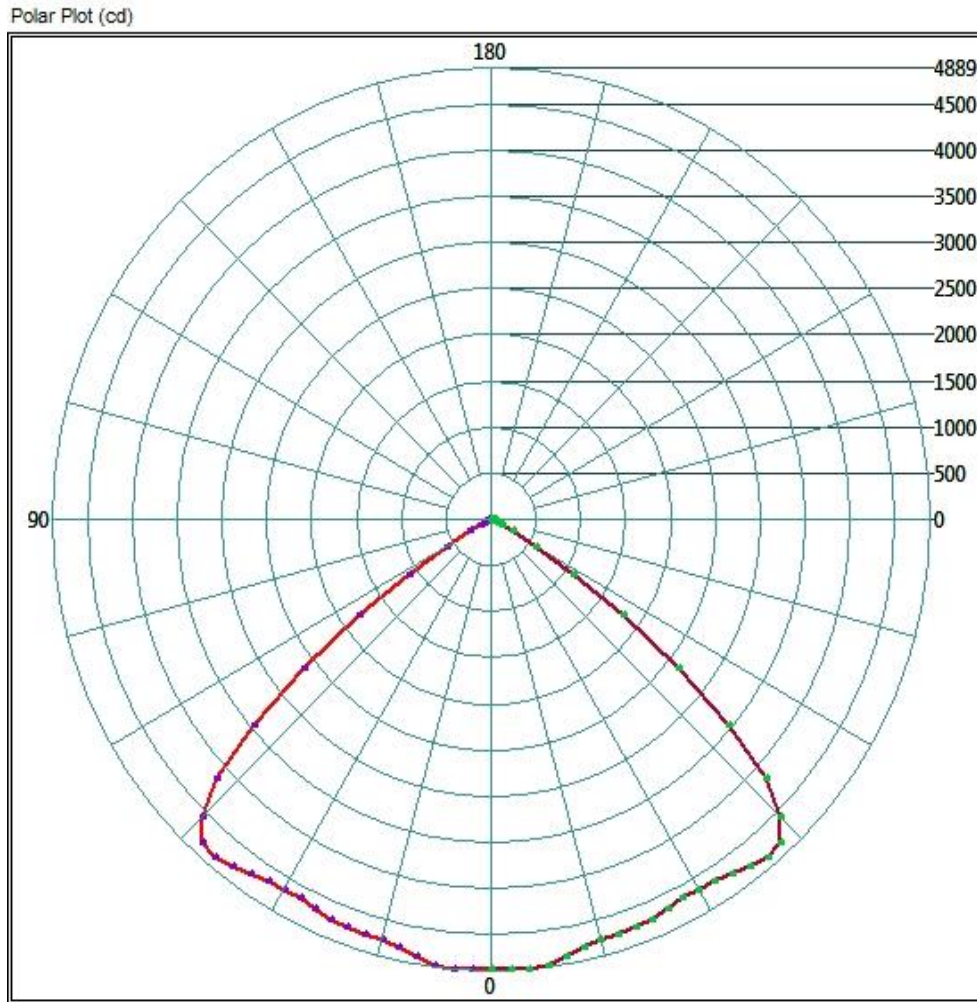
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	4280.34	35.0%
0-40	7329.34	59.9%
0-60	12023.8	98.3%
60-90	343.26	2.8%
0-90	12230.24	100.0%
90-180	0	0.0%
0-180	12230.24	100.0%

Test Results: Goniometer

Results continued from previous page.

Polar Plot:

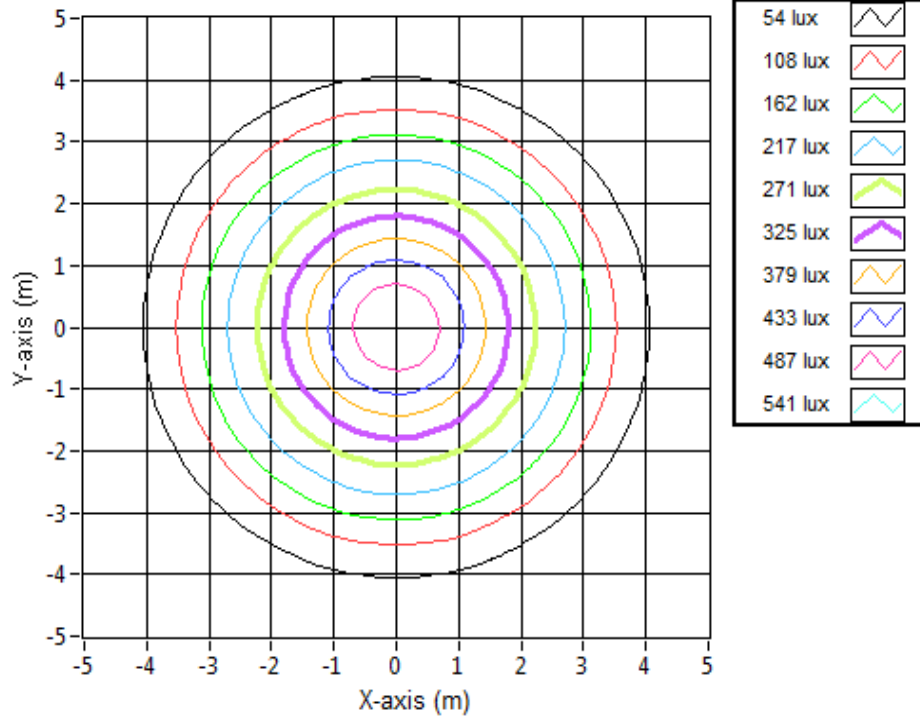


Test Results: Goniometer

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	8.12	8.12	524.4
6.096	16.23	16.23	131.1
9.144	24.35	24.35	58.3
12.192	32.46	32.46	32.8
15.24	40.58	40.58	21.0
18.288	48.69	48.69	14.6
21.336	56.81	56.81	10.7
24.384	64.92	64.92	8.2
27.432	73.04	73.04	6.5
30.48	81.15	81.15	5.2

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L17018.
Dialight unit model number HEA9RC4Gx-xxx

LED identified as SEOUL part number STW7C2SA.

LED drive current (as indicated by customer): 47 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If): 200 (mA)
Maximum Rated Power Dissipation: 1.44 (W)
Maximum Junction Temp. (Tj): 125 (°C)
Thermal Resistance (Rth): 10 (°C/W)

Derived Specifications:

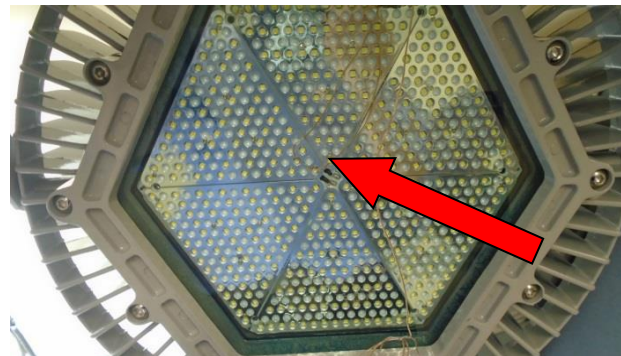
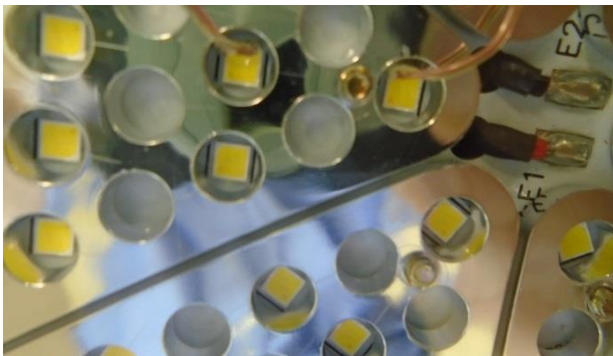
Maximum Power at Indicated Current: 0.338 (W)
Maximum Source Temperature: 121.6 (°C)

Test Conditions:

Temperature Measurement Location: See Photographs Below
Ambient Temperature: $25^{\circ} \pm 5^{\circ}$ (°C)
Ambient temperature at time of measurement: 24.3 (°C)
Relative humidity at time of measurement: 20%

Results:

Measured LED source temperature: 66.2 (°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
Fluke 971 Humidity Meter	971
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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