Test Report

Report Number: L17019 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: HEA9RC4Dx-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 9, 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

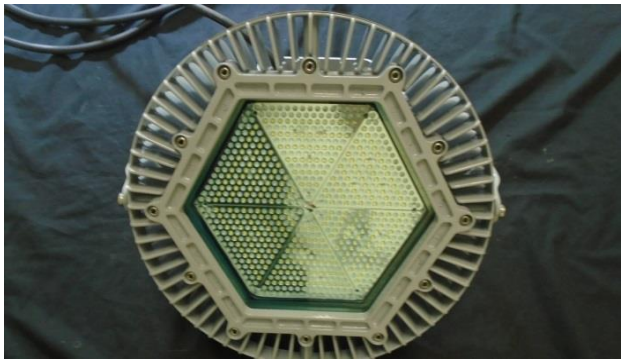
Description of sample:

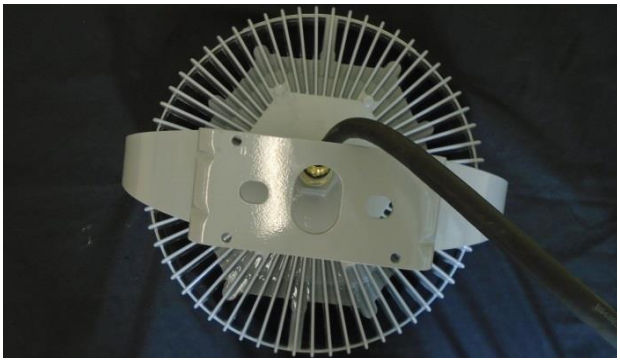
Sample Number: L17019
Manufacturer: Dialight Corporation
Product Name: Vigilant 60K
Description: Vigilant 60K
Model Number: HEA9RC4Dx-xxx

Report Summary

Sample number L17019
Dialight unit model number HEA9RC4Dx-xxx

Photograph(s) of sample:





*Photographs not to scale. For reference only.

Summary of Results:

	Integrating Sphere		Goniophotometer	
Luminous Flux:	9812	(lumens)	9889	(lumens)
Electrical Power:	88.0	(W)	88.2	(W)
Luminous Efficacy:	111.6	(lumens/W)	112.2	(lumens/W)

Electrical Measurements:

Input Power (240VAC):	88.0	(W)
Power Factor (240VAC):	0.956	
Current ATHD % (240VAC):	14.91	

Color Measurements:

Correlated Color Temperature (CCT):	5266
Color Rendering Index (CRI):	75.8
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:	49.5	(°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L17019.
Dialight unit model number HEA9RC4Dx-xxx

Test Conditions:

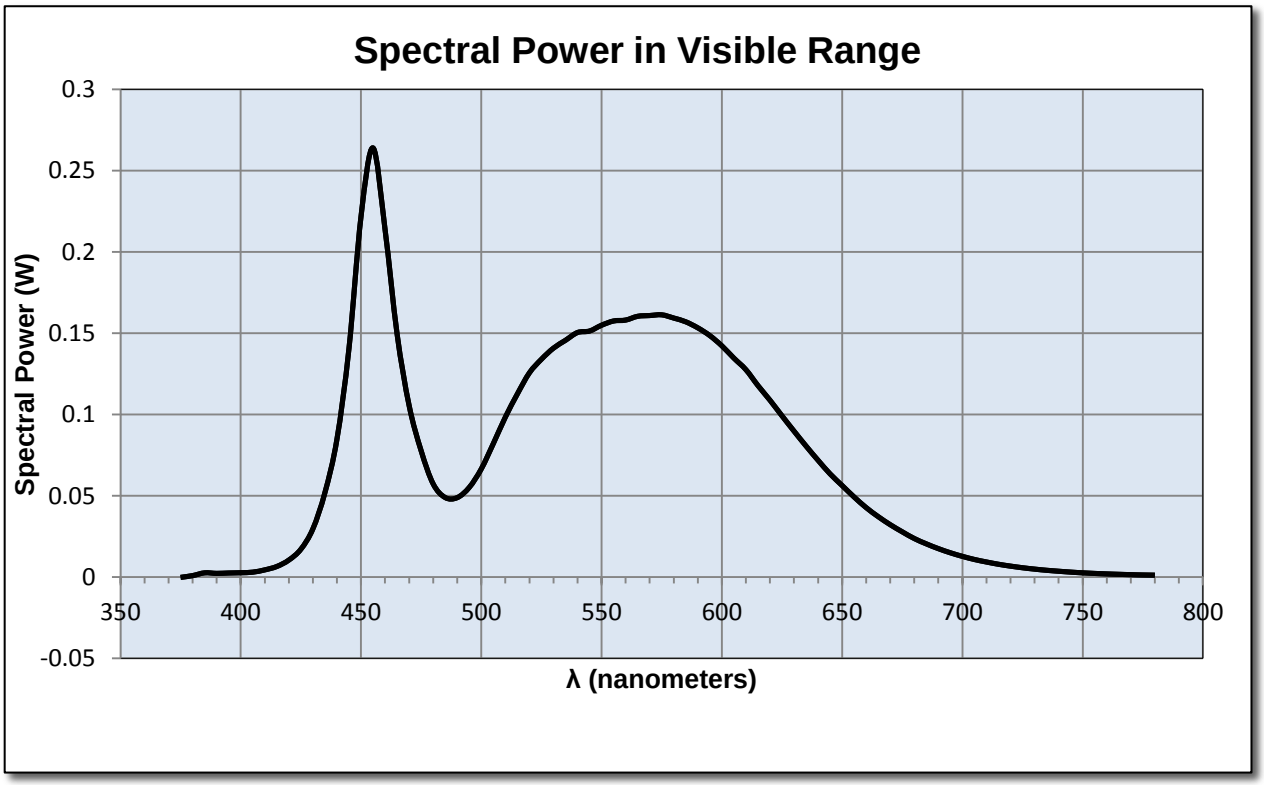
Ambient Temperature:	25 ± 1	(°C)

Electrical Measurements:

Input Voltage:	120	(VAC)
Input Current:	0.383	(A)
Input Power:	88.0	(W)
Input Power Factor:	0.956	
Current ATHD:	14.91	(%)

Photometric measurements:

Luminous Flux:	9812	(lumens)
Luminous Efficacy:	111.6	(lumens/W)
Correlated Color Temperature (CCT):	5266	(K)
CRI -Ra:	75.8	
CRI -R9:	-25.6	
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:

λ(nm)	(W/nm)	λ(nm)	(W/nm)	λ(nm)	(W/nm)
375	0.000	515	0.113	655	0.049
380	0.001	520	0.126	660	0.043
385	0.003	525	0.134	665	0.037
390	0.002	530	0.141	670	0.032
395	0.002	535	0.146	675	0.028
400	0.003	540	0.150	680	0.024
405	0.003	545	0.151	685	0.020
410	0.004	550	0.155	690	0.017
415	0.006	555	0.157	695	0.015
420	0.010	560	0.158	700	0.013
425	0.017	565	0.160	705	0.011
430	0.030	570	0.161	710	0.009
435	0.052	575	0.161	715	0.008
440	0.085	580	0.159	720	0.007
445	0.141	585	0.157	725	0.006
450	0.222	590	0.153	730	0.005
455	0.264	595	0.148	735	0.004
460	0.214	600	0.142	740	0.004
465	0.149	605	0.135	745	0.003
470	0.105	610	0.128	750	0.003
475	0.078	615	0.118	755	0.002
480	0.057	620	0.109	760	0.002
485	0.049	625	0.099	765	0.002
490	0.049	630	0.090	770	0.001
495	0.055	635	0.081	775	0.001
500	0.066	640	0.072	780	0.001
505	0.082	645	0.063		
510	0.098	650	0.056		

Dialight OPTICS LABORATORY

NVLAP TESTING NVLAP LAB CODE 201033-0

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L17019.
Dialight unit model number HEA9RC4Dx-xxx

Electrical Measurements:

Input Voltage:	240	(VAC)
Input current:	0.384	(A)
Input Power:	88.2	(W)
Power Factor:	0.956	

Photometric measurements:

Absolute Luminous Flux:	9889	(lumens)
Luminous Efficacy:	112.2	(lumens/W)

INTENSITY (CANDLEPOWER) SUMMARY

ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	3786	3786	3786	3786	3786	
5	3797	3797	3797	3797	3797	142
15	3665	3665	3665	3665	3665	792
25	3671	3671	3671	3671	3671	1452
35	3843	3843	3843	3843	3843	2147
45	3678	3678	3678	3678	3678	2768
55	1574	1574	1574	1574	1574	2091
65	102	102	102	102	102	454
75	19	19	19	19	19	30
85	7	7	7	7	7	12
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	

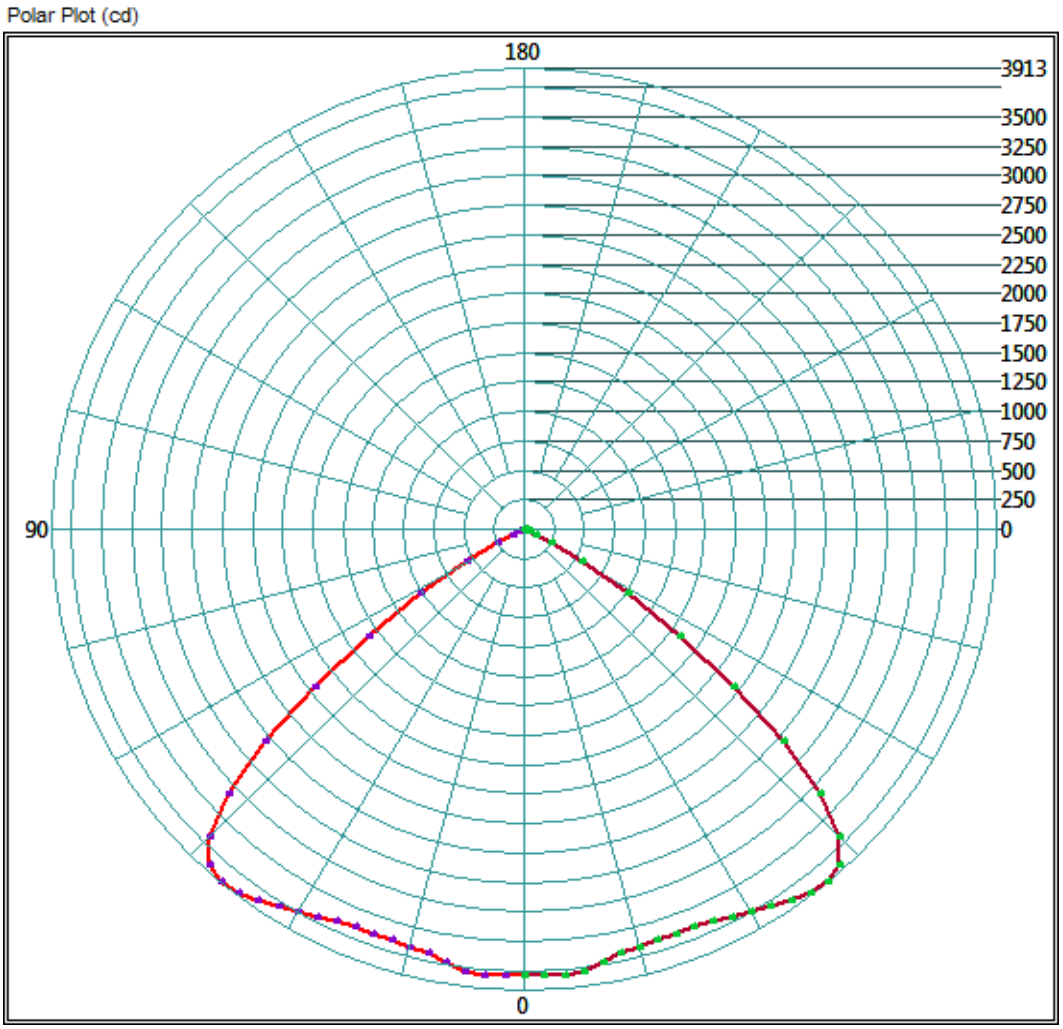
ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	3369.4	34.1%
0-40	5871.38	59.4%
0-60	9758.24	98.7%
60-90	262.56	2.7%
0-90	9888.62	100.0%
90-180	0	0.0%
0-180	9888.62	100.0%

Test Results: Goniometer

Results continued from previous page.

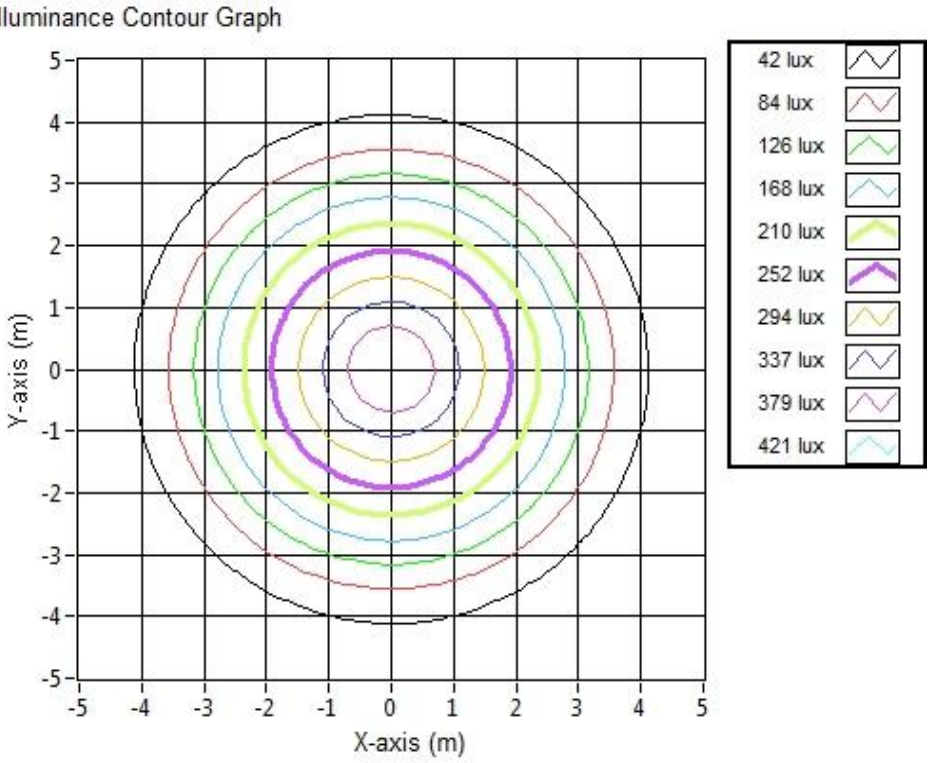
Polar Plot:



Test Results: Goniometer

Results continued from previous page.

Illuminance Plot:



Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone Width (m)	Projected Illuminance (lux)
3.048	8.34	8.27	407.4
6.096	16.69	16.54	101.9
9.144	25.03	24.81	45.3
12.192	33.38	33.08	25.5
15.24	41.72	41.34	16.3
18.288	50.06	49.61	11.3
21.336	58.41	57.88	8.3
24.384	66.75	66.15	6.4
27.432	75.09	74.42	5.0
30.48	83.44	82.69	4.1

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L17019.
Dialight unit model number HEA9RC4Dx-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:

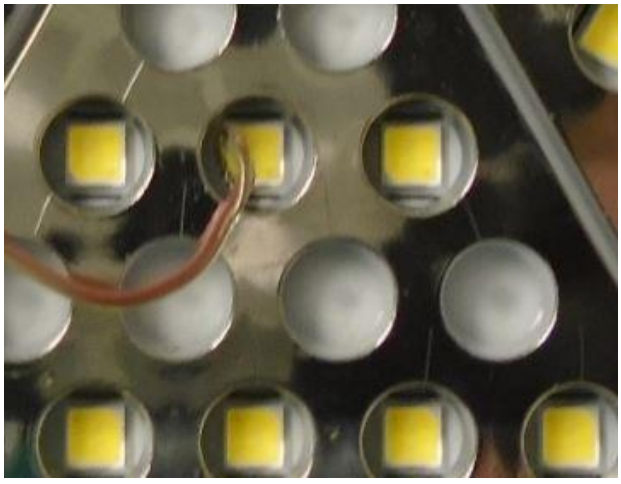
Maximum Power at Indicated Current:	0.338	(W)
Maximum Source Temperature:	121.6	(°C)

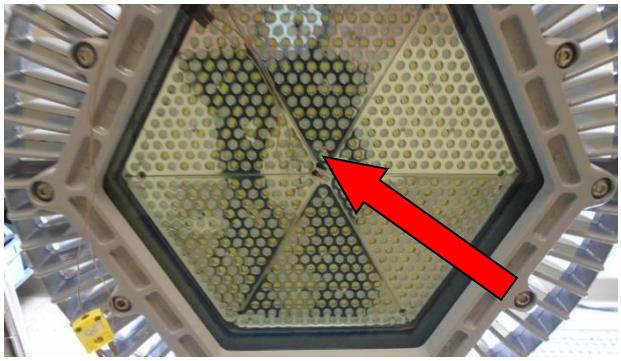
Test Conditions:

Temperature Measurement Location:	See Photographs Below	
Ambient Temperature:	25° ± 5‘	(°C)
Ambient temperature at time of measurement:	24.3	(°C)
Relative humidity at time of measurement:	20%	

Results:

Measured LED source temperature:	49.5	(°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
Fluke 971 Humidity Meter	971
Extech Hygro-Thermometer	4/16/3120
Fluke 52II Thermometer	52II Thermometer
Volttech Power Analyzer	PM1000+
BK Precison	1715A
TDK-Lambda	GEN1500W
Fluke 8808A Digit Multimeter	8808A
TPI Digitial Thermometer 343	TPI 343
TPI Digitial 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.
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Optical Engineer
Approved Signatory