

# Test Report

Report Number: L20049

Date: Aug 13, 2020

Issued by:

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

Test of one Vigilant Bullhead  
Unit manufacturer: Dialight Corporation  
Unit model number: BHx4BN26xxxxxN

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:** August 13, 2020 through August 13, 2020

**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: L20049  
Manufacturer: Dialight Corporation  
Product Name: BH CL CIR NW 6klm  
Description: Vigilant Bullhead  
Model Number: BHx4BN26xxxxxN

## Report Summary

Sample number L20049  
Dialight unit model number BHx4BN26xxxxxN

### Photograph(s) of sample:



\*Photographs not to scale. For reference only.

### Summary of Results:

	<u>Integrating Sphere</u>	<u>Goniophotometer</u>
Luminous Flux:	6699 (lumens)	6697 (lumens)
Electrical Power:	44.7 (W)	44.6 (W)
Luminous Efficacy:	149.8 (lumens/W)	150.3 (lumens/W)

### Electrical Measurements:

Input Power (240VAC): 44.7 (W)  
Power Factor (240VAC): 0.982  
Current ATHD % (240VAC): 9.63  
Input Power (120VAC): 45.7 (W)  
Power Factor (120VAC): 0.992  
Current ATHD % (120VAC): 12.5

### Color Measurements:

Correlated Color Temperature (CCT): 4067  
Color Rendering Index (CRI): 81.52  
Chromaticity Coordinate (x): 0.378  
Chromaticity Coordinate (y): 0.376  
Chromaticity Coordinate (u'): 0.224  
Chromaticity Coordinate (v'): 0.334  
DUV: 0.0003

### Temperature Measurements:

In Situ LED Source Temperature: 43.4 (°C)

## Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L20049.

Dialight unit model number BHx4BN26xxxxxN

### Test Conditions:

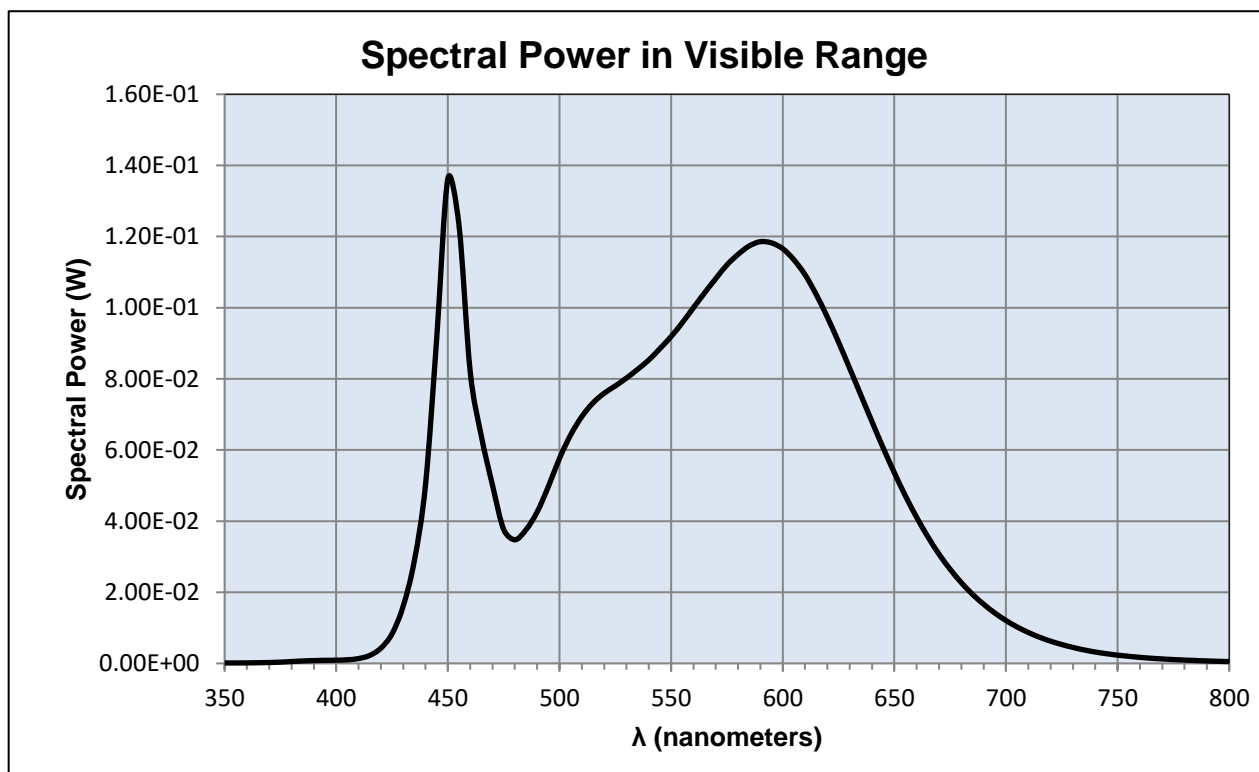
Ambient Temperature:  $25 \pm 1$  (°C)

### Electrical Measurements:

Input Voltage: 240 (VAC)  
Input Current: 0.189 (A)  
Input Power: 44.7 (W)  
Input Power Factor: 0.982  
Current ATHD: 9.63 (%)

### Photometric measurements:

Luminous Flux: 6699 (lumens)  
Luminous Efficacy: 149.8 (lumens/W)  
Correlated Color Temperature (CCT): 4067 (K)  
CRI -Ra: 81.52  
CRI -R9: -2.45  
DUV: 0.0003  
CIE Coordinate (x): 0.378  
CIE Coordinate (y): 0.376  
CIE Coordinate (u'): 0.224  
CIE Coordinate (v'): 0.334



## Test Results: Integrating Sphere

Results continued from previous page.

### Tabulated Spectral Power in Visible Range:

$\lambda$ (nm)	(W/nm)	$\lambda$ (nm)	(W/nm)	$\lambda$ (nm)	(W/nm)	$\lambda$ (nm)	(W/nm)
350	0.00013	490	0.04258	630	0.08295	770	0.00126
355	0.00014	495	0.04968	635	0.07544	775	0.00109
360	0.00015	500	0.05763	640	0.06794	780	0.00094
365	0.00020	505	0.06424	645	0.06058	785	0.00082
370	0.00026	510	0.06939	650	0.05361	790	0.00070
375	0.00036	515	0.07324	655	0.04704	795	0.00060
380	0.00053	520	0.07594	660	0.04106	800	0.00053
385	0.00069	525	0.07801	665	0.03561		
390	0.00080	530	0.08022	670	0.03072		
395	0.00087	535	0.08267	675	0.02647		
400	0.00091	540	0.08530	680	0.02271		
405	0.00103	545	0.08850	685	0.01944		
410	0.00136	550	0.09189	690	0.01663		
415	0.00225	555	0.09576	695	0.01417		
420	0.00429	560	0.10000	700	0.01207		
425	0.00833	565	0.10417	705	0.01025		
430	0.01613	570	0.10818	710	0.00870		
435	0.02889	575	0.11202	715	0.00737		
440	0.05029	580	0.11499	720	0.00625		
445	0.09125	585	0.11736	725	0.00531		
450	0.13626	590	0.11857	730	0.00450		
455	0.12312	595	0.11821	735	0.00379		
460	0.08211	600	0.11659	740	0.00321		
465	0.06392	605	0.11349	745	0.00273		
470	0.05011	610	0.10927	750	0.00233		
475	0.03767	615	0.10371	755	0.00200		
480	0.03476	620	0.09735	760	0.00171		
485	0.03756	625	0.09033	765	0.00146		

## Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L20049.  
Dialight unit model number BHx4BN26xxxxxN

### Electrical Measurements:

Input Voltage: 240 (VAC)  
Input current: 0.19 (A)  
Input Power: 44.6 (W)  
Power Factor: 0.982

### Photometric measurements:

Absolute Luminous Flux: 6697 (lumens)  
Luminous Efficacy: 150.3 (lumens/W)

### Intensity Summary:

<u>INTENSITY (CANDLEPOWER) SUMMARY</u>						
ANGLE	ALONG	25	45	72.5	ACROSS	OUTPUT LUMENS
0	2729	2729	2729	2729	2729	
5	2715	2724	2721	2718	2726	102
15	2690	2700	2702	2693	2701	578
25	2664	2678	2679	2670	2669	1064
35	2649	2669	2664	2666	2657	1509
45	2483	2510	2530	2541	2555	1889
55	605	596	603	591	586	1162
65	158	167	173	184	188	258
75	43	57	68	72	84	107
85	0	3	7	9	10	28
95	0	0	0	0	0	0
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

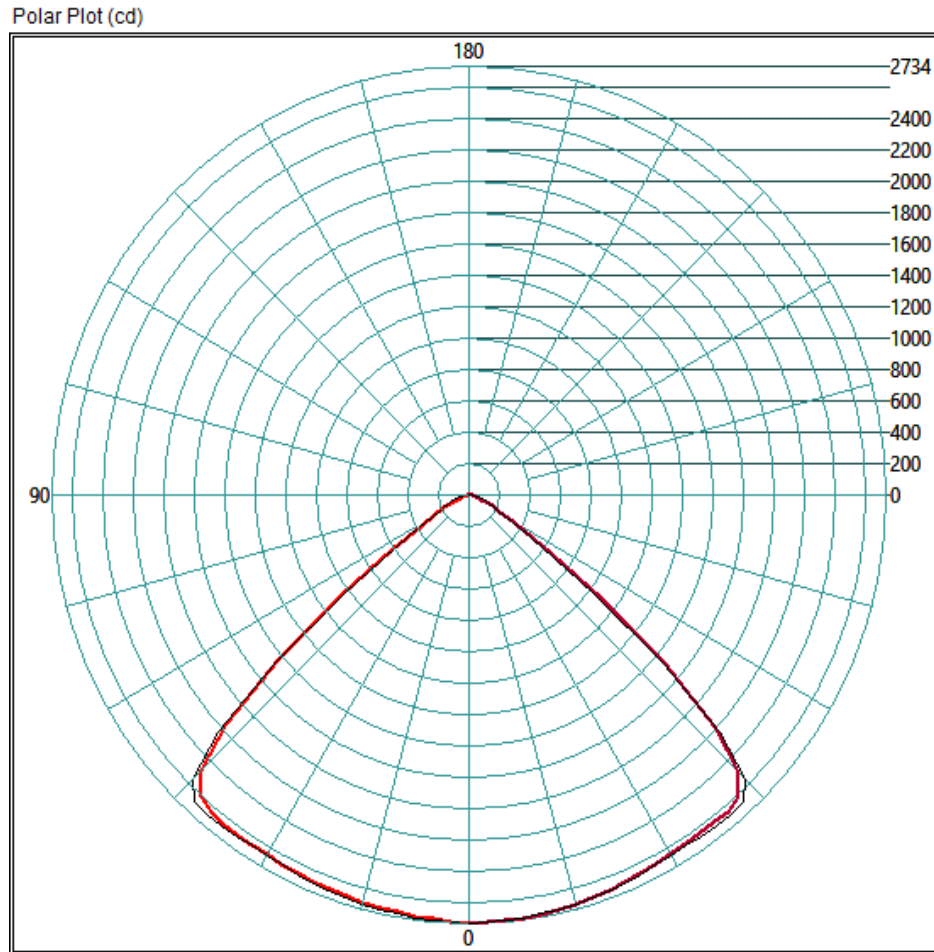
### ZONAL LUMEN AND PERCENTAGES

ZONE	LUMENS	% LUMINAIRE
0-30	2444.94	36.5%
0-40	4165.01	62.2%
0-60	6463.56	96.5%
60-90	301.31	4.5%
0-90	6696.91	100.0%
90-180	0	0.0%
0-180	6696.91	100.0%

## Test Results: Goniometer

Results continued from previous page.

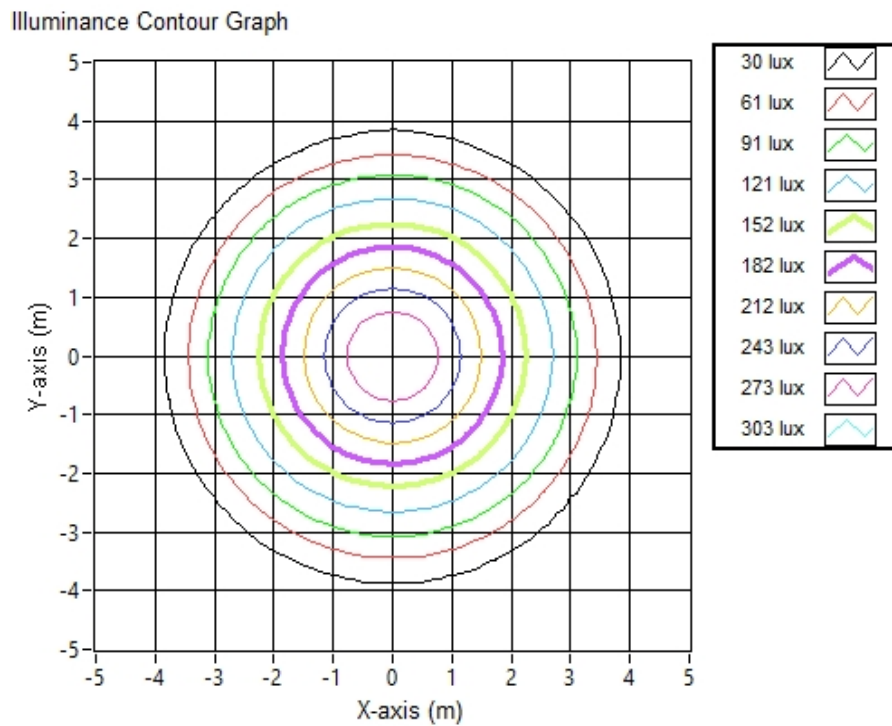
### Polar Plot:



## Test Results: Goniometer

Results continued from previous page.

### Illuminance Plot:



### Illuminance-Cone of Light:

Mounting Height (m)	Beam Cone Width (m)	Orthogonal Beam Cone	Projected Illuminance (lux)
3.048	7.60	7.57	293.8
6.096	15.19	15.13	73.4
9.144	22.79	22.70	32.6
12.192	30.39	30.27	18.4
15.124	37.69	37.54	11.9
18.288	45.58	45.40	8.2
21.336	53.17	52.96	6.0
24.384	60.77	60.53	4.6
27.432	68.37	68.10	3.6
30.48	75.96	75.66	2.9

## Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L20049.  
Dialight unit model number BHx4BN26xxxxxN

LED identified as SOUL part number STW8C12C-E0.

LED drive current (as indicated by customer): 125 (mA)

### LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

Maximum Forward Current (If): 200 (mA)  
Maximum Rated Power Dissipation: 0.6 (W)  
Maximum Junction Temp. (Tj): 125 (°C)  
Thermal Resistance (Rth): 7.5 (°C/W)

Derived Specifications:

Maximum Power at Indicated Current: 0.375 (W)  
Maximum Source Temperature: 122.2 (°C)

### Test Conditions:

Temperature Measurement Location: See Photographs Below  
Ambient Temperature:  $25^{\circ} \pm 5^{\circ}$  (°C)  
Ambient temperature at time of measurement: 23.9 (°C)  
Relative humidity at time of measurement: 35%

### Results:

**Measured LED source temperature: 43.4 (°C)**





**Equipment Used:**

Equipment Name	Model Number
Omega TC	DPi8
YOKOGAWA Digital Power Meter	11/26/3981
LSI High Speed Mirror Goniometer	6240T
Elgar AC Power Supply	CW1251P
Sorensen DC Power Supply	XHR150-7
Dialight Confirmation Sample	HB1N4N
Dialight Confirmation Sample	HB1N4J
Fluke 8808A Digit Multimeter	8808A
Step-Up Transformer	
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
ITL Osram Calibraton lamps for Goniometer	J9a8
Fluke 971 Humdity Meter	8/28/1902
GwINSTEK DC Power Supply	GEP172679
Dialight Confirmation Sample	1/0/1900
Labsphere calibration lamp for 2M sphere	SCL-1400
Labshere 2M sphere	Illumia Plus 2600-1
Labshere Controller	PM-150-140
Labshere Spectrameter- CDS 2600 Spectrometer	CDS-2600
Xitron Power Analyzer	9/1/1907
LED Bulb for Electrical Confirmation Test-Gold Sample	Monte Carlo
LED Bulb for Electrical Confirmation Test-Gold Sample	Monte Carlo
LED Bulb for Electrical Confirmation Test-Gold Sample	Monte Carlo

**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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