

Test Report

Report Number: L20057

Date: Sep 23, 2020

Issued by:

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

Test of one Vigilant High Output High Bay
Unit manufacturer: Dialight Corporation
Unit model number: H7x-7MC[B,D]-Rxxx-xxN

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 25, 2020 through September 9, 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

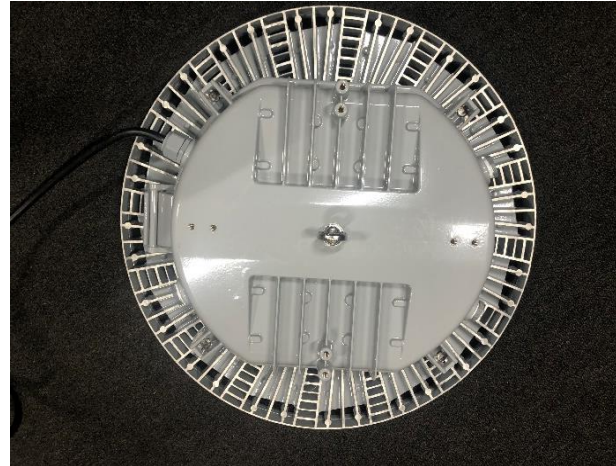
Description of sample:

Sample Number: L20057
Manufacturer: Dialight Corporation
Product Name: Vigilant High Output High Bay
Description: Vigilant High Output High Bay
Model Number: H7x-7MC[B,D]-Rxxx-xxN

Report Summary

Sample number L20057
Dialight unit model number H7x-7MC[B,D]-Rxxx-xxN

Photograph(s) of sample:



*Photographs not to scale. For reference only.

Summary of Results:

| | <u>Integrating Sphere</u> | <u>Goniophotometer</u> |
|--------------------|---------------------------|------------------------|
| Luminous Flux: | 67515 (lumens) | 68595 (lumens) |
| Electrical Power: | 496.9 (W) | 495.9 (W) |
| Luminous Efficacy: | 135.9 (lumens/W) | 138.3 (lumens/W) |

Electrical Measurements:

Input Power (480 VAC): 496.9 (W)
Power Factor (480 VAC): 0.984
Current ATHD % (480 VAC): 9.78
Input Power (347VAC): 498.7 (W)
Power Factor (347VAC): 0.995
Current ATHD % (347VAC): 6.2

Color Measurements:

Correlated Color Temperature (CCT): 5005
Color Rendering Index (CRI): 83.74
Chromaticity Coordinate (x): 0.346
Chromaticity Coordinate (y): 0.360
Chromaticity Coordinate (u'): 0.209
Chromaticity Coordinate (v'): 0.326
DUV: 0.0041

Temperature Measurements:

In Situ LED Source Temperature: 59.7 (°C)

Test Results: Integrating Sphere

Results include unit color, flux, efficacy and electrical power for sample number L20057.

Dialight unit model number H7x-7MC[B,D]-Rxxx-xxN

Test Conditions:

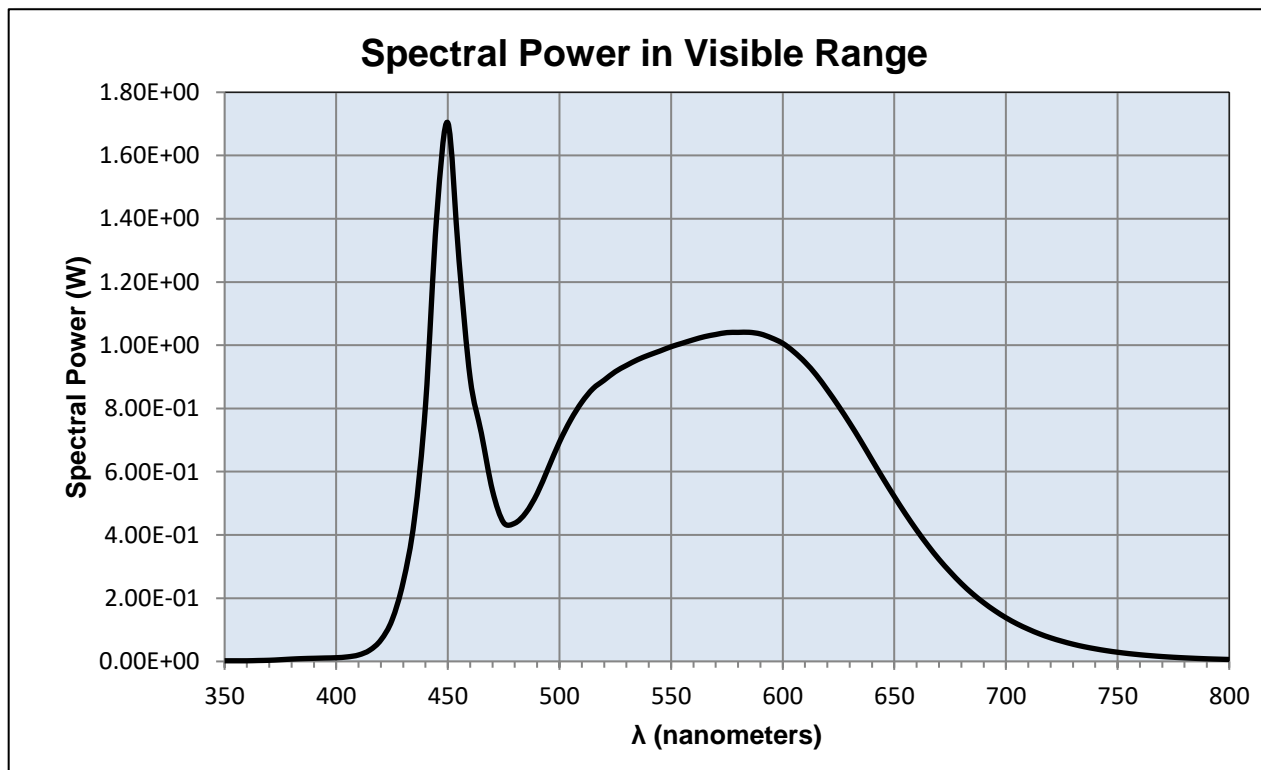
Ambient Temperature: 25 ± 1 (°C)

Electrical Measurements:

Input Voltage: 480 (VAC)
Input Current: 1.054 (A)
Input Power: 496.9 (W)
Input Power Factor: 0.984
Current ATHD: 9.78 (%)

Photometric measurements:

Luminous Flux: 67515 (lumens)
Luminous Efficacy: 135.9 (lumens/W)
Correlated Color Temperature (CCT): 5005 (K)
CRI -Ra: 83.74
CRI -R9: 11.79
DUV: 0.0041
CIE Coordinate (x): 0.346
CIE Coordinate (y): 0.360
CIE Coordinate (u'): 0.209
CIE Coordinate (v'): 0.326



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) | $\lambda(\text{nm})$ | (W/nm) |
|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|
| 350 | 0.00201 | 490 | 0.53079 | 630 | 0.75371 | 770 | 0.01539 |
| 355 | 0.00205 | 495 | 0.61183 | 635 | 0.69662 | 775 | 0.01318 |
| 360 | 0.00207 | 500 | 0.69406 | 640 | 0.63689 | 780 | 0.01136 |
| 365 | 0.00285 | 505 | 0.76361 | 645 | 0.57807 | 785 | 0.00973 |
| 370 | 0.00361 | 510 | 0.81991 | 650 | 0.52113 | 790 | 0.00833 |
| 375 | 0.00541 | 515 | 0.86270 | 655 | 0.46650 | 795 | 0.00715 |
| 380 | 0.00743 | 520 | 0.88953 | 660 | 0.41508 | 800 | 0.00616 |
| 385 | 0.00896 | 525 | 0.91632 | 665 | 0.36718 | | |
| 390 | 0.00991 | 530 | 0.93617 | 670 | 0.32290 | | |
| 395 | 0.01078 | 535 | 0.95427 | 675 | 0.28321 | | |
| 400 | 0.01173 | 540 | 0.96881 | 680 | 0.24652 | | |
| 405 | 0.01432 | 545 | 0.98171 | 685 | 0.21415 | | |
| 410 | 0.02045 | 550 | 0.99536 | 690 | 0.18569 | | |
| 415 | 0.03549 | 555 | 1.00636 | 695 | 0.16050 | | |
| 420 | 0.06772 | 560 | 1.01741 | 700 | 0.13809 | | |
| 425 | 0.13083 | 565 | 1.02716 | 705 | 0.11871 | | |
| 430 | 0.25152 | 570 | 1.03401 | 710 | 0.10203 | | |
| 435 | 0.44860 | 575 | 1.03996 | 715 | 0.08725 | | |
| 440 | 0.81074 | 580 | 1.04065 | 720 | 0.07466 | | |
| 445 | 1.40637 | 585 | 1.04087 | 725 | 0.06400 | | |
| 450 | 1.70317 | 590 | 1.03567 | 730 | 0.05456 | | |
| 455 | 1.26822 | 595 | 1.02303 | 735 | 0.04661 | | |
| 460 | 0.89559 | 600 | 1.00607 | 740 | 0.03987 | | |
| 465 | 0.72199 | 605 | 0.97929 | 745 | 0.03397 | | |
| 470 | 0.54014 | 610 | 0.94626 | 750 | 0.02901 | | |
| 475 | 0.43883 | 615 | 0.90603 | 755 | 0.02477 | | |
| 480 | 0.43721 | 620 | 0.85839 | 760 | 0.02113 | | |
| 485 | 0.47077 | 625 | 0.80762 | 765 | 0.01806 | | |

Test Results: Goniometer

Results include unit flux, distribution, efficacy, and electrical power for sample number L20057.
Dialight unit model number H7x-7MC[B,D]-Rxxx-xxN

Electrical Measurements:

Input Voltage: 480 (VAC)
Input current: 1.038 (A)
Input Power: 495.9 (W)
Power Factor: 0.983

Photometric measurements:

Absolute Luminous Flux: 68595 (lumens)
Luminous Efficacy: 138.3 (lumens/W)

Intensity Summary:

| <u>INTENSITY (CANDLEPOWER) SUMMARY</u> | | | | | | |
|--|-------|-------|-------|-------|--------|---------------|
| ANGLE | ALONG | 23 | 45 | 67.5 | ACROSS | OUTPUT LUMENS |
| 0 | 26508 | 26508 | 26508 | 26508 | 26508 | |
| 5 | 26377 | 26369 | 26372 | 26374 | 26377 | 987 |
| 15 | 25760 | 25759 | 25715 | 25674 | 25632 | 5550 |
| 25 | 28404 | 28150 | 27988 | 27930 | 28000 | 10696 |
| 35 | 34448 | 34124 | 33835 | 33730 | 33760 | 18477 |
| 45 | 25016 | 24542 | 24430 | 24340 | 24250 | 22317 |
| 55 | 3827 | 3700 | 3639 | 3639 | 3579 | 9270 |
| 65 | 225 | 212 | 209 | 214 | 212 | 1226 |
| 75 | 28 | 28 | 29 | 29 | 27 | 70 |
| 85 | 0 | 0 | 0 | 0 | 0 | 2 |
| 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 | 1 | 1 | 1 | 1 | 1 | 0 |
| 180 | 0 | 0 | 0 | 0 | 0 | 0 |

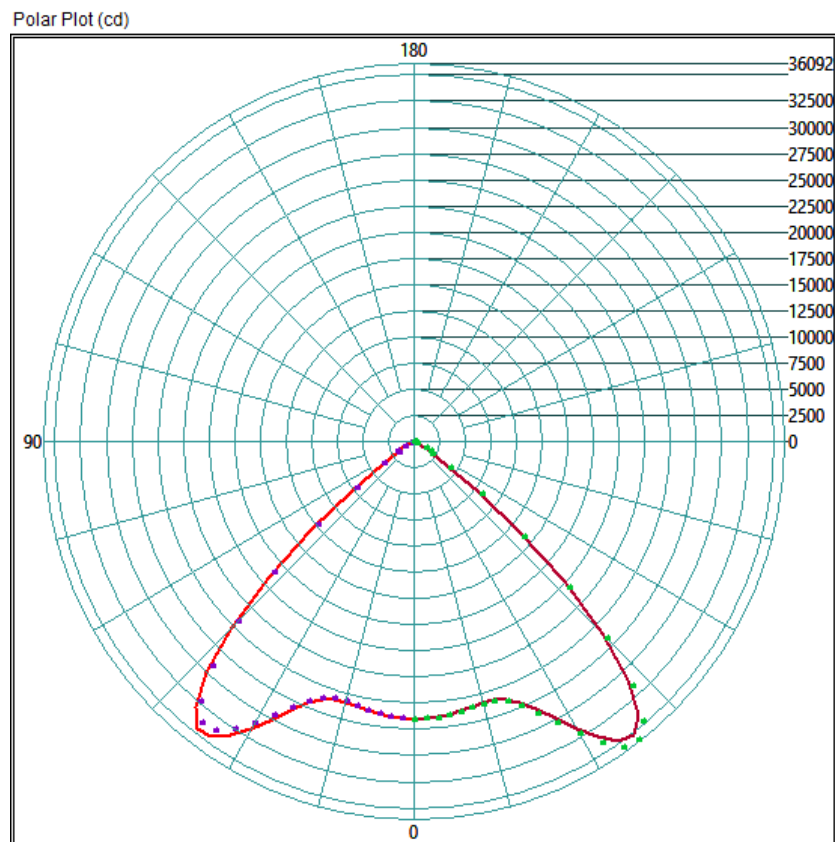
ZONAL LUMEN AND PERCENTAGES

| ZONE | LUMENS | % LUMINAIRE |
|--------|----------|-------------|
| 0-30 | 25349.18 | 37.0% |
| 0-40 | 47468.43 | 69.2% |
| 0-60 | 68187.36 | 99.4% |
| 60-90 | 849.66 | 1.2% |
| 0-90 | 68595.38 | 100.0% |
| 90-180 | 0.01 | 0.0% |
| 0-180 | 68595.39 | 100.0% |

Test Results: Goniometer

Results continued from previous page.

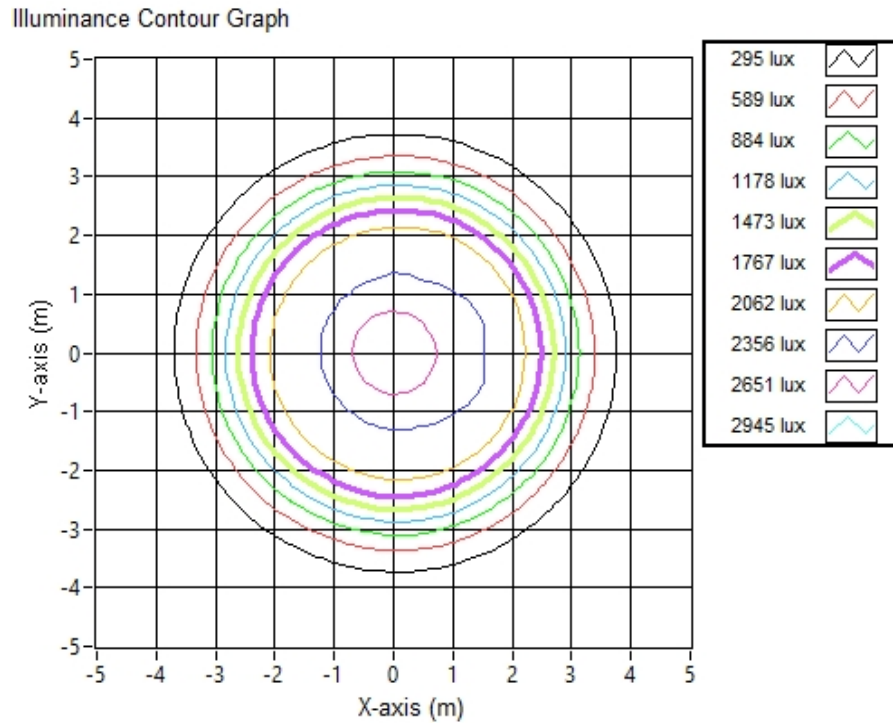
Polar Plot:



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 | 7.26 | 7.26 | 2853.3 |
| 6.096 | 14.53 | 14.53 | 713.3 |
| 9.144 | 21.79 | 21.79 | 317.0 |
| 12.192 | 29.06 | 29.05 | 178.3 |
| 15.124 | 36.05 | 36.04 | 115.9 |
| 18.288 | 43.59 | 43.58 | 79.3 |
| 21.336 | 50.85 | 50.84 | 58.2 |
| 24.384 | 58.12 | 58.10 | 44.6 |
| 27.432 | 65.38 | 65.37 | 35.2 |
| 30.48 | 72.64 | 72.63 | 28.5 |

Test Results: In Situ Temperature Measurement Test

Results include maximum LED chip temperature for sample number L20057.

Dialight unit model number H7x-7MC[B,D]-Rxxx-xxN

LED identified as Seoul Semi part number SAW8C22BNZ.

LED drive current (as indicated by customer): 52 (mA)

LED Specifications:

LED specifications are taken from LED manufacturer datasheet:

| | | |
|----------------------------------|-----|--------|
| Maximum Forward Current (If): | 250 | (mA) |
| Maximum Rated Power Dissipation: | 1.5 | (W) |
| Maximum Junction Temp. (Tj): | 125 | (°C) |
| Thermal Resistance (Rth): | 17 | (°C/W) |

Derived Specifications:

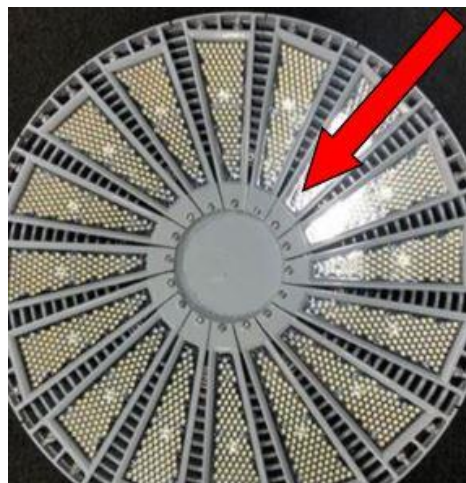
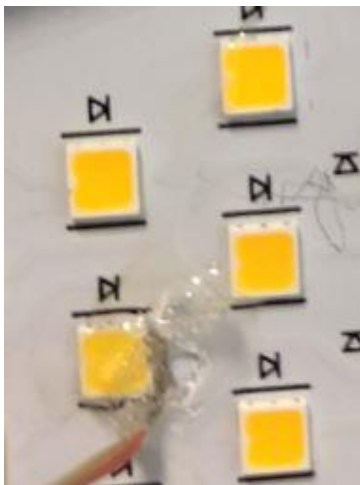
| | | |
|-------------------------------------|-------|------|
| Maximum Power at Indicated Current: | 0.27 | (W) |
| Maximum Source Temperature: | 120.4 | (°C) |

Test Conditions:

| | |
|---|-----------------------|
| Temperature Measurement Location: | See Photographs Below |
| Ambient Temperature: | 25° ± 5' (°C) |
| Ambient temperature at time of measurement: | 23.8 (°C) |
| Relative humidity at time of measurement: | 39% |

Results:

Measured LED source temperature: 59.7 (°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 |
| Fuke 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 |
| Fuke 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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Senior Optical Engineering Technician
Lighting Division

Test Report Reviewed and Approved By:

Vishnu Shastry
Dialight Optics Laboratory
Optical Engineer
Approved Signatory