

LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

Brand: FAIL-SAFE

Report Number: P518037

Luminaire Tested: HVL8-4-LD4-1LO-40-UNV-O-EDD-90

Issue Date: 4/27/2021

Tested By:

Approved By:



NVLAP Lab Code: 200050-0

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**Test Information**

Test Method: LM-79-2019  
Report Number: P518037  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-1LO-40-UNV-O-EDD-90  
Description: 4 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2609.0 lumens  
Efficiency: N/A  
Efficacy: 113.4 lumens/watt  
Spacing Criteria (0/90/45): 1.25 / 1.27 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 4' x H: 0.17')  
CIE Type: Direct

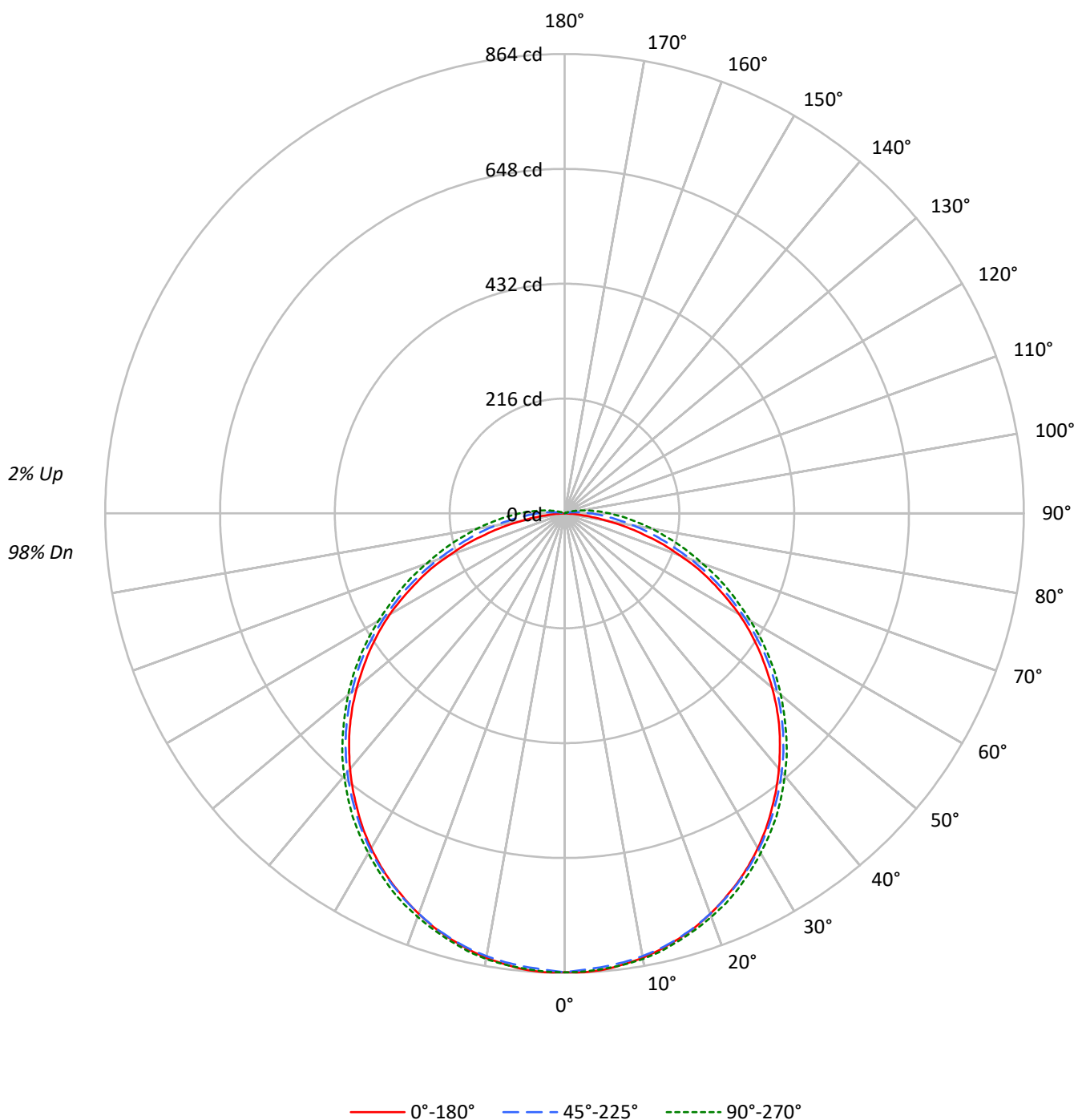
Input Watts (W): 23  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | P3                    | 10/30/2015       | 4/30/2016            |
| Power Meter                    | IN0214                | 1/12/2016        | 1/12/2017            |
| AC Power Source                | IN0062                | 1/12/2016        | 1/12/2017            |
| DC Power Supply                | --                    | --               | --                   |
| Room Thermometer               | IN0145                | 1/13/2016        | 1/13/2017            |

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### Luminous Intensity Polar Plot



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     |     | 20  |     |     |     |     | 20  |     |     |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     |     | 50  |     |     |     |     | 30  |     |     |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 110 | 110 | 110 | 105 | 105 | 105 | 101 | 101 | 101 |    |    | 98 |
| 1   | 108 | 102 | 98  | 94  | 105 | 100 | 96  | 92  | 95  | 92  | 89  | 91  | 88  | 86  | 87  | 85  | 83  |    |    | 81 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 77  | 73  | 79  | 75  | 71  | 76  | 72  | 69  |    |    | 67 |
| 3   | 89  | 78  | 69  | 63  | 86  | 76  | 68  | 62  | 73  | 66  | 61  | 70  | 64  | 59  | 67  | 62  | 58  |    |    | 56 |
| 4   | 81  | 69  | 60  | 53  | 79  | 67  | 59  | 52  | 65  | 57  | 52  | 62  | 56  | 51  | 60  | 54  | 50  |    |    | 47 |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 52  | 45  | 58  | 50  | 44  | 56  | 49  | 44  | 54  | 48  | 43  |    |    | 41 |
| 6   | 69  | 55  | 46  | 40  | 67  | 54  | 46  | 39  | 52  | 45  | 39  | 50  | 44  | 38  | 49  | 43  | 38  |    |    | 36 |
| 7   | 64  | 50  | 41  | 35  | 62  | 49  | 41  | 35  | 47  | 40  | 34  | 46  | 39  | 34  | 44  | 38  | 34  |    |    | 32 |
| 8   | 59  | 46  | 37  | 31  | 58  | 45  | 37  | 31  | 43  | 36  | 31  | 42  | 35  | 30  | 41  | 35  | 30  |    |    | 28 |
| 9   | 55  | 42  | 34  | 28  | 54  | 41  | 33  | 28  | 40  | 33  | 28  | 39  | 32  | 27  | 38  | 32  | 27  |    |    | 25 |
| 10  | 52  | 39  | 31  | 25  | 51  | 38  | 30  | 25  | 37  | 30  | 25  | 36  | 29  | 25  | 35  | 29  | 25  |    |    | 23 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3483 | 3483 | 3483 |
| 5°  | 3476 | 3405 | 3408 |
| 10° | 3453 | 3344 | 3340 |
| 15° | 3423 | 3277 | 3258 |
| 20° | 3391 | 3202 | 3179 |
| 25° | 3353 | 3124 | 3098 |
| 30° | 3309 | 3042 | 3006 |
| 35° | 3253 | 2951 | 2915 |
| 40° | 3195 | 2855 | 2808 |
| 45° | 3132 | 2751 | 2694 |
| 50° | 3051 | 2631 | 2570 |
| 55° | 2963 | 2499 | 2435 |
| 60° | 2858 | 2328 | 2276 |
| 65° | 2688 | 2136 | 2118 |
| 70° | 2443 | 1911 | 1935 |
| 75° | 2095 | 1664 | 1769 |
| 80° | 1576 | 1420 | 1617 |
| 85° | 844  | 1175 | 1473 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3132 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 81.7   | 3.1       |
| 10°-20°   | 234.2  | 9.0       |
| 20°-30°   | 355.4  | 13.6      |
| 30°-40°   | 429.7  | 16.5      |
| 40°-50°   | 448.4  | 17.2      |
| 50°-60°   | 410.0  | 15.7      |
| 60°-70°   | 319.6  | 12.2      |
| 70°-80°   | 199.9  | 7.7       |
| 80°-90°   | 90.8   | 3.5       |
| 90°-100°  | 30.4   | 1.2       |
| 100°-110° | 7.6    | 0.3       |
| 110°-120° | 1.2    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 0.0       |
| 140°-150° | 0.0    | 0.0       |
| 150°-160° | 0.0    | 0.0       |
| 160°-170° | 0.0    | 0.0       |
| 170°-180° | 0.0    | 0.0       |
| 0°-30°    | 671.3  | 25.7      |
| 0°-40°    | 1101.0 | 42.2      |
| 0°-60°    | 1959.4 | 75.1      |
| 0°-90°    | 2569.7 | 98.5      |
| 90°-120°  | 39.3   | 1.5       |
| 90°-150°  | 39.3   | 1.5       |
| 90°-180°  | 39.0   | 1.5       |
| 0°-180°   | 2609.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 863 | 863   | 863 | 863   | 863 |      |
| 5°   | 861 | 859   | 856 | 860   | 860 | 82   |
| 15°  | 828 | 830   | 828 | 832   | 832 | 234  |
| 25°  | 768 | 768   | 769 | 775   | 777 | 354  |
| 35°  | 679 | 682   | 685 | 692   | 695 | 425  |
| 45°  | 572 | 577   | 581 | 587   | 590 | 440  |
| 55°  | 446 | 451   | 460 | 466   | 470 | 399  |
| 65°  | 307 | 312   | 323 | 335   | 341 | 303  |
| 75°  | 155 | 165   | 189 | 211   | 219 | 165  |
| 85°  | 27  | 50    | 85  | 113   | 123 | 34   |
| 90°  | 0   | 18    | 50  | 76    | 85  | 1    |
| 95°  | 0   | 5     | 26  | 47    | 54  | 0    |
| 105° | 0   | 1     | 4   | 13    | 17  | 0    |
| 115° | 1   | 1     | 1   | 2     | 3   | 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    |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|--------|-------|-------|-------|-------|-------|
| 0°     | 862.9 | 862.9 | 862.9 | 862.9 | 862.9 |
| 2.5°   | 863.9 | 862.7 | 858.8 | 862.7 | 862.5 |
| 5°     | 861.1 | 859.4 | 855.6 | 859.6 | 859.6 |
| 7.5°   | 855.4 | 854.8 | 851.3 | 856.0 | 856.0 |
| 10°    | 848.7 | 848.5 | 845.6 | 850.7 | 850.9 |
| 12.5°  | 839.3 | 840.1 | 837.5 | 842.4 | 843.0 |
| 15°    | 828.3 | 829.7 | 827.5 | 832.2 | 832.0 |
| 17.5°  | 816.3 | 817.1 | 815.5 | 820.8 | 820.6 |
| 20°    | 801.5 | 802.5 | 801.3 | 806.8 | 807.4 |
| 22.5°  | 785.0 | 786.4 | 786.2 | 791.9 | 793.5 |
| 25°    | 767.5 | 768.1 | 768.9 | 775.4 | 776.7 |
| 27.5°  | 748.2 | 749.2 | 750.6 | 756.5 | 757.7 |
| 30°    | 727.0 | 728.6 | 730.3 | 736.4 | 738.0 |
| 32.5°  | 704.6 | 706.3 | 708.3 | 716.2 | 717.0 |
| 35°    | 679.4 | 682.5 | 685.3 | 692.2 | 695.1 |
| 37.5°  | 654.2 | 658.1 | 660.7 | 668.0 | 670.3 |
| 40°    | 627.5 | 631.4 | 635.7 | 643.4 | 644.8 |
| 42.5°  | 599.7 | 604.2 | 609.2 | 616.2 | 618.6 |
| 45°    | 571.6 | 576.7 | 581.4 | 587.1 | 589.9 |
| 47.5°  | 541.3 | 546.4 | 552.1 | 558.6 | 560.4 |
| 50°    | 510.0 | 515.9 | 522.0 | 528.1 | 531.3 |
| 52.5°  | 477.8 | 484.9 | 491.9 | 498.4 | 501.4 |
| 55°    | 446.1 | 451.4 | 459.7 | 466.4 | 469.5 |
| 57.5°  | 413.1 | 417.6 | 425.1 | 436.1 | 437.8 |
| 60°    | 379.6 | 383.6 | 391.4 | 400.3 | 404.0 |
| 62.5°  | 342.6 | 348.0 | 356.2 | 367.6 | 370.8 |
| 65°    | 306.6 | 311.8 | 322.6 | 335.4 | 340.7 |
| 67.5°  | 271.8 | 273.6 | 287.4 | 300.9 | 309.4 |
| 70°    | 230.7 | 237.6 | 253.7 | 270.1 | 276.6 |
| 72.5°  | 195.3 | 202.2 | 219.9 | 239.2 | 247.4 |
| 75°    | 155.2 | 164.8 | 188.8 | 211.4 | 219.3 |
| 77.5°  | 120.0 | 130.6 | 160.3 | 183.1 | 192.2 |
| 80°    | 83.8  | 100.3 | 132.6 | 158.3 | 168.2 |
| 82.5°  | 52.7  | 73.0  | 107.6 | 134.5 | 143.2 |
| 85°    | 26.9  | 49.6  | 85.2  | 112.7 | 122.7 |
| 87.5°  | 7.1   | 32.1  | 66.3  | 92.6  | 102.7 |
| 90°    | 0.2   | 18.5  | 50.2  | 75.5  | 84.6  |
| 92.5°  | 0.2   | 10.4  | 37.4  | 60.0  | 69.4  |
| 95°    | 0.2   | 4.9   | 26.0  | 47.2  | 54.5  |
| 97.5°  | 0.2   | 2.0   | 17.9  | 35.6  | 42.9  |
| 100°   | 0.2   | 1.0   | 11.4  | 25.8  | 32.1  |
| 102.5° | 0.4   | 0.6   | 7.1   | 18.5  | 23.6  |
| 105°   | 0.4   | 0.6   | 4.3   | 12.6  | 16.9  |
| 107.5° | 0.4   | 0.6   | 2.4   | 8.5   | 11.6  |
| 110°   | 0.6   | 0.6   | 1.4   | 5.3   | 7.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.6 | 0.6   | 0.8 | 3.5   | 5.1 |
| 115°   | 0.6 | 0.6   | 0.8 | 2.2   | 3.3 |
| 117.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 120°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 122.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 125°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 127.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 130°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 132.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 135°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 137.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 140°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 142.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 145°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 147.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 150°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 152.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 155°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 157.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 160°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 162.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 165°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 167.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 170°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 172.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 175°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 177.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 180°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |

(END OF REPORT)