

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: P517772

Luminaire Tested: HVL8-1-LD4-2HI-30-UNV-C-EDD

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: P517772  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-1-LD4-2HI-30-UNV-C-EDD  
Description: 1 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 3000K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2139.0 lumens  
Efficiency: N/A  
Efficacy: 99.5 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 1' x H: 0.17')  
CIE Type: Direct

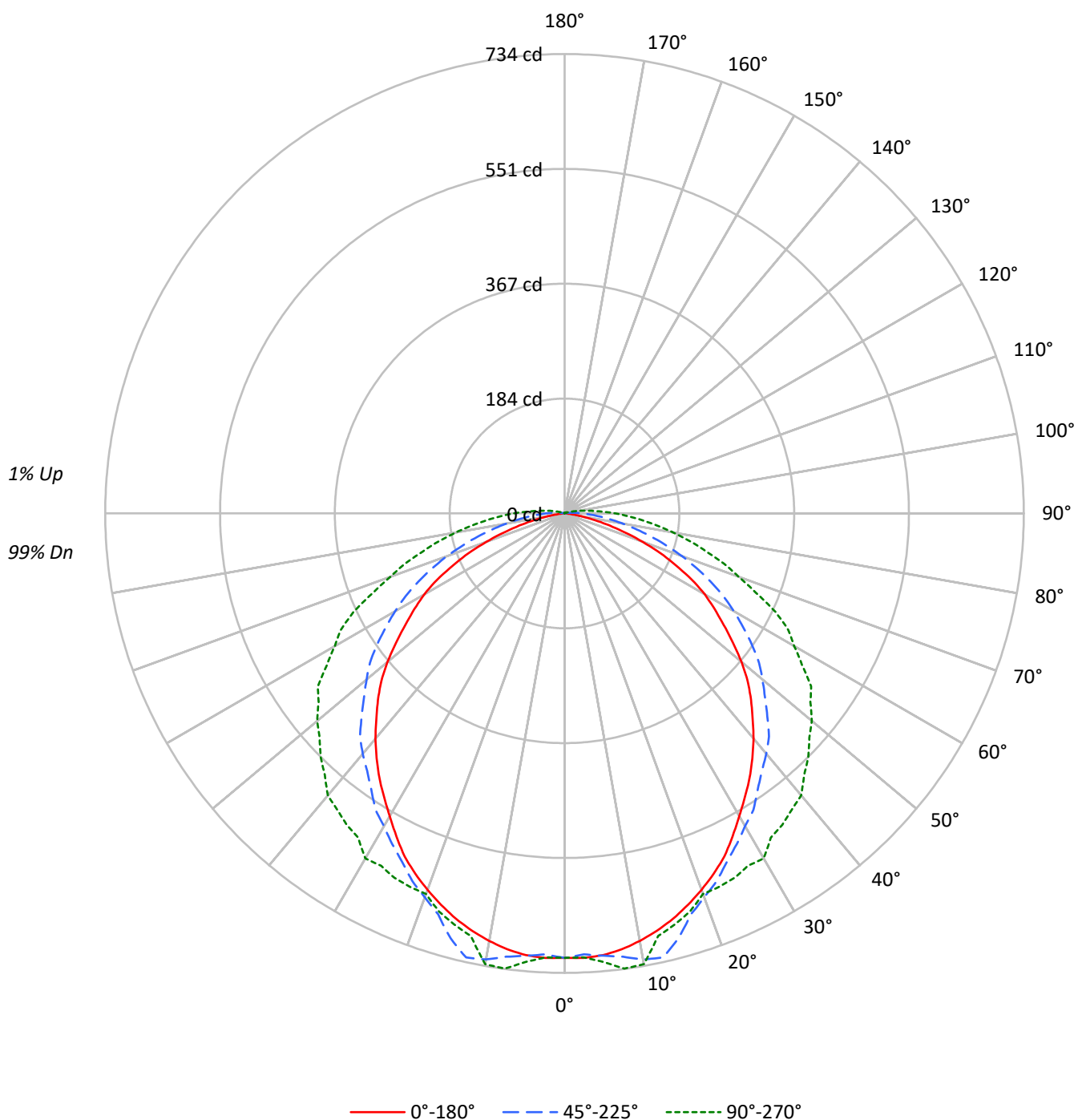
Input Watts (W): 21.5  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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 |    |    | 99 |
| 1   | 108 | 103 | 98  | 94  | 105 | 100 | 96  | 92  | 96  | 92  | 89  | 91  | 89  | 86  | 87  | 85  | 83  |    |    | 81 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 78  | 73  | 80  | 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  | 51  | 62  | 56  | 51  | 60  | 54  | 50  |    |    | 47 |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 51  | 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°  | 11464 | 11464 | 11464 |
| 5°  | 11315 | 11207 | 11409 |
| 10° | 11045 | 11276 | 11479 |
| 15° | 10727 | 10889 | 10654 |
| 20° | 10367 | 10127 | 10189 |
| 25° | 9996  | 9617  | 10252 |
| 30° | 9498  | 9195  | 10366 |
| 35° | 9106  | 8794  | 10182 |
| 40° | 8692  | 8475  | 10246 |
| 45° | 8251  | 8085  | 10061 |
| 50° | 7741  | 7676  | 9984  |
| 55° | 7060  | 7243  | 9979  |
| 60° | 6487  | 6683  | 9552  |
| 65° | 5533  | 6030  | 9249  |
| 70° | 4300  | 5217  | 8294  |
| 75° | 2857  | 4266  | 7570  |
| 80° | 1429  | 3324  | 6794  |
| 85° | 427   | 2375  | 5988  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 10061 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 68.2   | 3.2       |
| 10°-20°   | 194.3  | 9.1       |
| 20°-30°   | 289.2  | 13.5      |
| 30°-40°   | 347.6  | 16.2      |
| 40°-50°   | 365.8  | 17.1      |
| 50°-60°   | 339.4  | 15.9      |
| 60°-70°   | 268.4  | 12.5      |
| 70°-80°   | 163.9  | 7.7       |
| 80°-90°   | 71.4   | 3.3       |
| 90°-100°  | 22.2   | 1.0       |
| 100°-110° | 5.0    | 0.2       |
| 110°-120° | 2.0    | 0.1       |
| 120°-130° | 1.1    | 0.1       |
| 130°-140° | 0.3    | 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°    | 551.7  | 25.8      |
| 0°-40°    | 899.3  | 42.0      |
| 0°-60°    | 1604.6 | 75.0      |
| 0°-90°    | 2108.3 | 98.6      |
| 90°-120°  | 29.2   | 1.4       |
| 90°-150°  | 30.7   | 1.4       |
| 90°-180°  | 31.0   | 1.4       |
| 0°-180°   | 2139.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 710 | 710   | 710 | 710   | 710 |      |
| 5°   | 708 | 707   | 709 | 717   | 719 | 67   |
| 15°  | 670 | 696   | 703 | 680   | 680 | 189  |
| 25°  | 605 | 643   | 614 | 632   | 643 | 278  |
| 35°  | 516 | 530   | 538 | 587   | 607 | 322  |
| 45°  | 422 | 424   | 458 | 531   | 551 | 325  |
| 55°  | 310 | 316   | 366 | 446   | 481 | 279  |
| 65°  | 197 | 203   | 258 | 341   | 372 | 195  |
| 75°  | 74  | 98    | 144 | 221   | 235 | 81   |
| 85°  | 7   | 23    | 56  | 109   | 125 | 10   |
| 90°  | 0   | 7     | 29  | 69    | 81  | 0    |
| 95°  | 0   | 2     | 13  | 38    | 46  | 0    |
| 105° | 0   | 1     | 3   | 7     | 10  | 0    |
| 115° | 0   | 1     | 2   | 3     | 4   | 0    |
| 125° | 0   | 0     | 1   | 2     | 3   | 0    |
| 135° | 0   | 0     | 0   | 1     | 1   | 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°     | 710.0 | 710.0 | 710.0 | 710.0 | 710.0 |
| 2.5°   | 710.9 | 709.0 | 705.1 | 708.9 | 709.9 |
| 5°     | 708.3 | 706.8 | 709.3 | 717.3 | 719.3 |
| 7.5°   | 702.4 | 707.9 | 714.4 | 728.8 | 733.5 |
| 10°    | 693.5 | 704.0 | 723.5 | 735.8 | 731.0 |
| 12.5°  | 682.8 | 700.5 | 726.7 | 702.7 | 691.5 |
| 15°    | 670.4 | 696.1 | 702.9 | 679.7 | 680.1 |
| 17.5°  | 655.8 | 692.5 | 671.6 | 671.0 | 666.8 |
| 20°    | 640.0 | 680.4 | 652.6 | 651.5 | 647.0 |
| 22.5°  | 623.1 | 664.3 | 635.8 | 633.5 | 645.7 |
| 25°    | 604.7 | 643.4 | 614.0 | 632.4 | 642.6 |
| 27.5°  | 581.7 | 615.9 | 595.8 | 621.8 | 634.7 |
| 30°    | 558.5 | 587.5 | 577.1 | 613.4 | 636.3 |
| 32.5°  | 536.6 | 557.9 | 561.8 | 610.2 | 614.0 |
| 35°    | 515.9 | 530.2 | 538.2 | 587.1 | 607.0 |
| 37.5°  | 493.2 | 497.1 | 518.2 | 577.4 | 596.6 |
| 40°    | 470.1 | 467.6 | 501.5 | 561.5 | 588.1 |
| 42.5°  | 445.2 | 444.3 | 483.7 | 553.5 | 566.8 |
| 45°    | 421.6 | 423.5 | 458.4 | 531.0 | 550.8 |
| 47.5°  | 397.5 | 399.9 | 434.4 | 506.2 | 530.8 |
| 50°    | 369.4 | 372.6 | 412.9 | 484.3 | 515.9 |
| 52.5°  | 339.0 | 345.1 | 392.1 | 463.4 | 495.4 |
| 55°    | 310.5 | 315.6 | 365.6 | 445.6 | 481.1 |
| 57.5°  | 284.5 | 287.5 | 338.3 | 423.2 | 450.0 |
| 60°    | 258.9 | 259.6 | 312.6 | 398.3 | 423.9 |
| 62.5°  | 229.5 | 230.8 | 286.1 | 369.0 | 403.3 |
| 65°    | 196.6 | 202.8 | 257.6 | 340.9 | 371.9 |
| 67.5°  | 165.8 | 176.6 | 228.5 | 315.2 | 331.4 |
| 70°    | 132.8 | 151.1 | 200.0 | 284.9 | 296.4 |
| 72.5°  | 102.5 | 124.1 | 170.8 | 251.1 | 267.1 |
| 75°    | 74.3  | 98.5  | 143.6 | 220.7 | 234.6 |
| 77.5°  | 50.0  | 74.6  | 118.2 | 187.2 | 205.5 |
| 80°    | 29.9  | 54.5  | 95.5  | 156.1 | 176.7 |
| 82.5°  | 15.3  | 36.6  | 74.1  | 130.9 | 149.4 |
| 85°    | 6.7   | 23.1  | 56.0  | 108.6 | 124.7 |
| 87.5°  | 1.9   | 13.2  | 41.2  | 87.8  | 101.4 |
| 90°    | 0.1   | 6.9   | 29.4  | 68.8  | 81.1  |
| 92.5°  | 0.1   | 3.3   | 20.7  | 52.1  | 61.5  |
| 95°    | 0.1   | 1.7   | 12.9  | 37.8  | 46.1  |
| 97.5°  | 0.1   | 1.0   | 7.8   | 26.8  | 33.8  |
| 100°   | 0.1   | 0.9   | 4.6   | 17.8  | 24.2  |
| 102.5° | 0.1   | 1.0   | 3.2   | 11.3  | 15.8  |
| 105°   | 0.1   | 1.0   | 2.6   | 7.4   | 10.4  |
| 107.5° | 0.3   | 1.0   | 2.3   | 5.5   | 7.2   |
| 110°   | 0.1   | 0.9   | 2.5   | 4.2   | 5.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.3 | 0.7   | 2.3 | 3.5   | 4.2 |
| 115°   | 0.1 | 0.6   | 2.0 | 3.3   | 3.5 |
| 117.5° | 0.3 | 0.4   | 1.6 | 3.3   | 3.5 |
| 120°   | 0.3 | 0.3   | 1.3 | 3.2   | 3.6 |
| 122.5° | 0.3 | 0.3   | 1.0 | 2.9   | 3.5 |
| 125°   | 0.1 | 0.3   | 0.9 | 2.2   | 3.0 |
| 127.5° | 0.3 | 0.3   | 0.7 | 1.7   | 2.3 |
| 130°   | 0.3 | 0.3   | 0.6 | 1.3   | 1.7 |
| 132.5° | 0.3 | 0.3   | 0.4 | 1.0   | 1.3 |
| 135°   | 0.3 | 0.3   | 0.3 | 0.7   | 1.0 |
| 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)