

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: P518058

Luminaire Tested: HVL8-4-LD4-1STD-50-UNV-O-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: P518058  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-1STD-50-UNV-O-EDD  
Description: 4 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 5000K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2974.0 lumens  
Efficiency: N/A  
Efficacy: 91.2 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

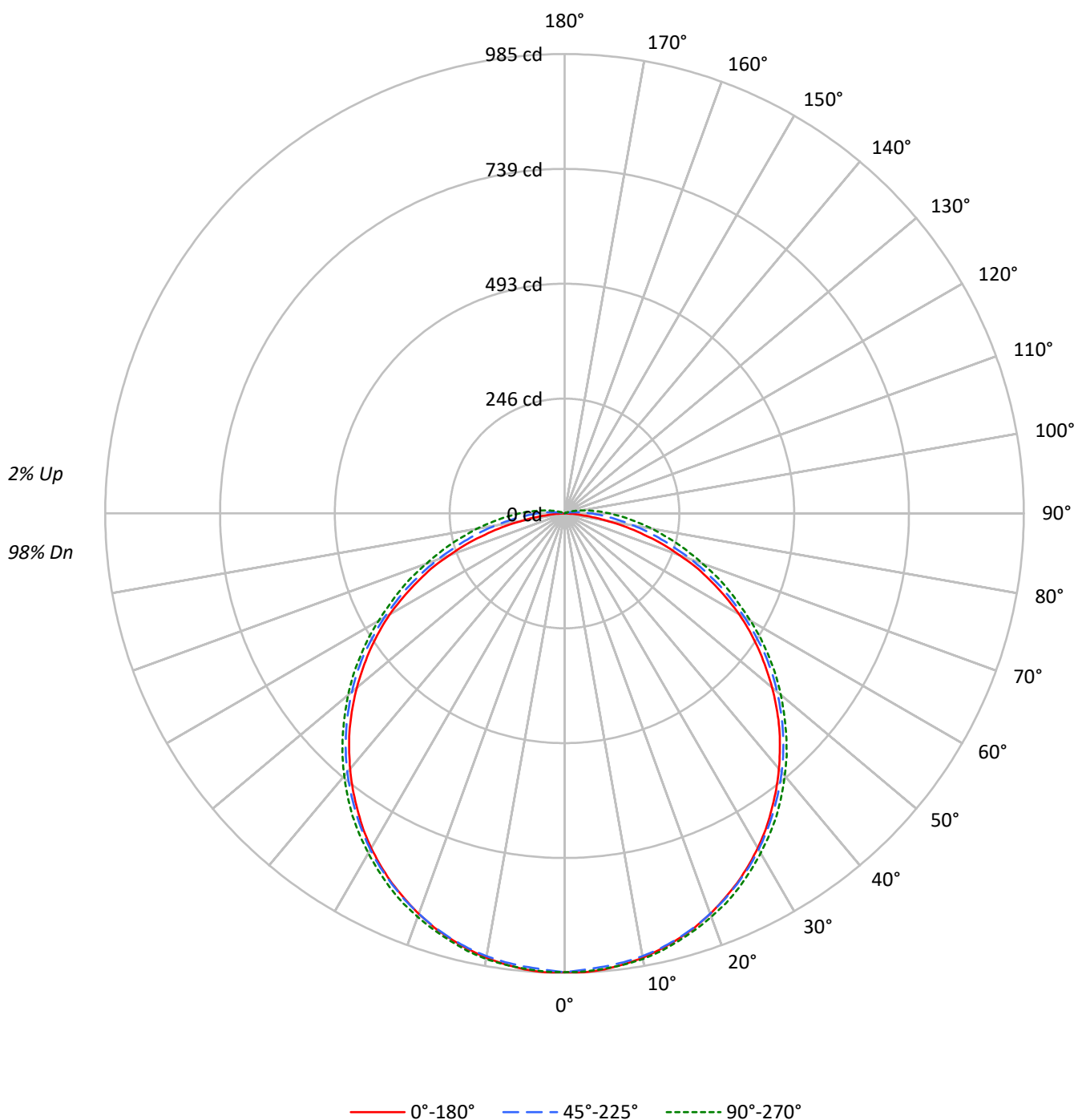
Input Watts (W): 32.6  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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°  | 3970 | 3970 | 3970 |
| 5°  | 3962 | 3882 | 3885 |
| 10° | 3936 | 3812 | 3807 |
| 15° | 3902 | 3735 | 3714 |
| 20° | 3866 | 3650 | 3623 |
| 25° | 3822 | 3561 | 3531 |
| 30° | 3772 | 3467 | 3426 |
| 35° | 3708 | 3364 | 3322 |
| 40° | 3642 | 3255 | 3201 |
| 45° | 3571 | 3136 | 3071 |
| 50° | 3478 | 2999 | 2930 |
| 55° | 3377 | 2848 | 2775 |
| 60° | 3258 | 2653 | 2594 |
| 65° | 3063 | 2436 | 2415 |
| 70° | 2784 | 2178 | 2206 |
| 75° | 2388 | 1896 | 2017 |
| 80° | 1796 | 1620 | 1844 |
| 85° | 960  | 1341 | 1678 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3571 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 93.1   | 3.1       |
| 10°-20°   | 267.0  | 9.0       |
| 20°-30°   | 405.1  | 13.6      |
| 30°-40°   | 489.9  | 16.5      |
| 40°-50°   | 511.1  | 17.2      |
| 50°-60°   | 467.3  | 15.7      |
| 60°-70°   | 364.3  | 12.2      |
| 70°-80°   | 227.9  | 7.7       |
| 80°-90°   | 103.5  | 3.5       |
| 90°-100°  | 34.7   | 1.2       |
| 100°-110° | 8.7    | 0.3       |
| 110°-120° | 1.4    | 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°    | 765.2  | 25.7      |
| 0°-40°    | 1255.0 | 42.2      |
| 0°-60°    | 2233.5 | 75.1      |
| 0°-90°    | 2929.2 | 98.5      |
| 90°-120°  | 44.8   | 1.5       |
| 90°-150°  | 44.8   | 1.5       |
| 90°-180°  | 45.0   | 1.5       |
| 0°-180°   | 2974.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 984 | 984   | 984 | 984   | 984 |      |
| 5°   | 982 | 980   | 975 | 980   | 980 | 93   |
| 15°  | 944 | 946   | 943 | 949   | 948 | 267  |
| 25°  | 875 | 876   | 876 | 884   | 885 | 403  |
| 35°  | 774 | 778   | 781 | 789   | 792 | 485  |
| 45°  | 652 | 657   | 663 | 669   | 672 | 502  |
| 55°  | 508 | 514   | 524 | 532   | 535 | 454  |
| 65°  | 349 | 356   | 368 | 382   | 388 | 346  |
| 75°  | 177 | 188   | 215 | 241   | 250 | 189  |
| 85°  | 31  | 57    | 97  | 128   | 140 | 39   |
| 90°  | 0   | 21    | 57  | 86    | 96  | 1    |
| 95°  | 0   | 6     | 30  | 54    | 62  | 0    |
| 105° | 0   | 1     | 5   | 14    | 19  | 1    |
| 115° | 1   | 1     | 1   | 3     | 4   | 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°     | 983.6 | 983.6 | 983.6 | 983.6 | 983.6 |
| 2.5°   | 984.8 | 983.4 | 979.0 | 983.4 | 983.2 |
| 5°     | 981.5 | 979.7 | 975.3 | 979.9 | 979.9 |
| 7.5°   | 975.0 | 974.3 | 970.4 | 975.7 | 975.7 |
| 10°    | 967.4 | 967.2 | 963.9 | 969.7 | 969.9 |
| 12.5°  | 956.7 | 957.6 | 954.6 | 960.2 | 960.9 |
| 15°    | 944.2 | 945.8 | 943.3 | 948.6 | 948.4 |
| 17.5°  | 930.5 | 931.4 | 929.6 | 935.6 | 935.4 |
| 20°    | 913.6 | 914.8 | 913.4 | 919.6 | 920.3 |
| 22.5°  | 894.8 | 896.4 | 896.2 | 902.7 | 904.5 |
| 25°    | 874.9 | 875.6 | 876.5 | 883.9 | 885.3 |
| 27.5°  | 852.8 | 854.0 | 855.6 | 862.3 | 863.7 |
| 30°    | 828.7 | 830.6 | 832.4 | 839.4 | 841.2 |
| 32.5°  | 803.2 | 805.1 | 807.4 | 816.4 | 817.4 |
| 35°    | 774.5 | 777.9 | 781.2 | 789.1 | 792.3 |
| 37.5°  | 745.7 | 750.1 | 753.1 | 761.5 | 764.0 |
| 40°    | 715.3 | 719.7 | 724.6 | 733.4 | 735.0 |
| 42.5°  | 683.6 | 688.7 | 694.5 | 702.4 | 705.1 |
| 45°    | 651.6 | 657.4 | 662.7 | 669.2 | 672.4 |
| 47.5°  | 617.0 | 622.8 | 629.3 | 636.7 | 638.8 |
| 50°    | 581.3 | 588.0 | 595.0 | 602.0 | 605.7 |
| 52.5°  | 544.7 | 552.8 | 560.7 | 568.1 | 571.6 |
| 55°    | 508.5 | 514.5 | 524.0 | 531.7 | 535.2 |
| 57.5°  | 470.9 | 476.0 | 484.6 | 497.1 | 499.0 |
| 60°    | 432.7 | 437.3 | 446.1 | 456.3 | 460.5 |
| 62.5°  | 390.5 | 396.7 | 406.0 | 419.0 | 422.7 |
| 65°    | 349.4 | 355.5 | 367.8 | 382.4 | 388.4 |
| 67.5°  | 309.8 | 311.9 | 327.6 | 342.9 | 352.7 |
| 70°    | 262.9 | 270.8 | 289.1 | 307.9 | 315.4 |
| 72.5°  | 222.6 | 230.5 | 250.7 | 272.7 | 282.0 |
| 75°    | 176.9 | 187.8 | 215.2 | 240.9 | 250.0 |
| 77.5°  | 136.8 | 148.9 | 182.7 | 208.7 | 219.1 |
| 80°    | 95.5  | 114.3 | 151.2 | 180.4 | 191.8 |
| 82.5°  | 60.1  | 83.2  | 122.7 | 153.3 | 163.2 |
| 85°    | 30.6  | 56.6  | 97.2  | 128.5 | 139.8 |
| 87.5°  | 8.1   | 36.6  | 75.6  | 105.5 | 117.1 |
| 90°    | 0.2   | 21.1  | 57.3  | 86.0  | 96.5  |
| 92.5°  | 0.2   | 11.8  | 42.7  | 68.4  | 79.1  |
| 95°    | 0.2   | 5.6   | 29.7  | 53.8  | 62.1  |
| 97.5°  | 0.2   | 2.3   | 20.4  | 40.6  | 48.9  |
| 100°   | 0.2   | 1.2   | 13.0  | 29.4  | 36.6  |
| 102.5° | 0.5   | 0.7   | 8.1   | 21.1  | 26.9  |
| 105°   | 0.5   | 0.7   | 4.9   | 14.4  | 19.2  |
| 107.5° | 0.5   | 0.7   | 2.8   | 9.7   | 13.2  |
| 110°   | 0.7   | 0.7   | 1.6   | 6.0   | 8.8   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.7 | 0.7   | 0.9 | 3.9   | 5.8 |
| 115°   | 0.7 | 0.7   | 0.9 | 2.6   | 3.7 |
| 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)