

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: P518106

Luminaire Tested: HVL8-4-LD4-2STD-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: P518106  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-2STD-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: 5648.0 lumens  
Efficiency: N/A  
Efficacy: 86.4 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

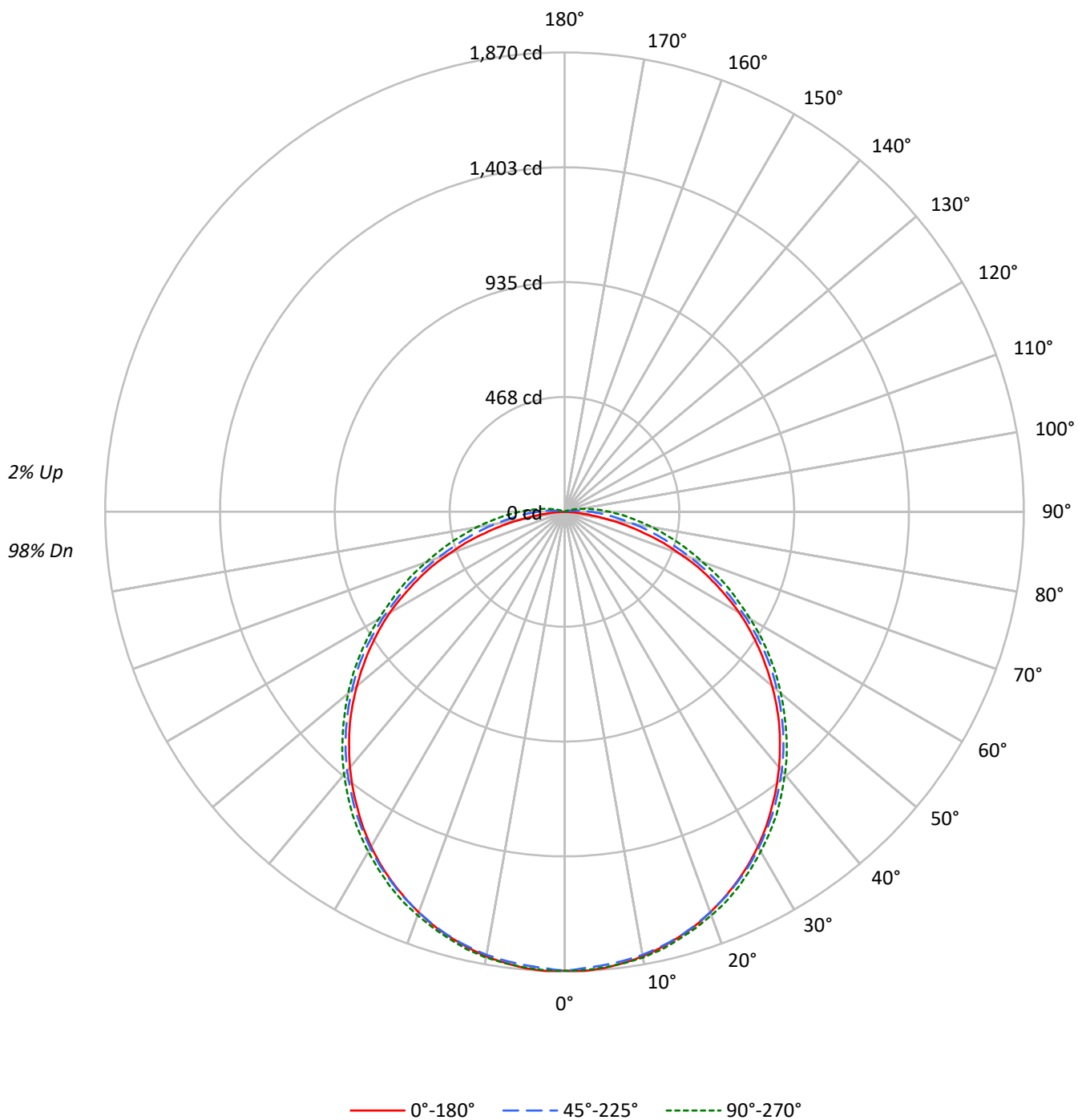
Input Watts (W): 65.4  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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  |     |     |    |    | 0  |
| 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°  | 7540 | 7540 | 7540 |
| 5°  | 7526 | 7372 | 7379 |
| 10° | 7475 | 7240 | 7231 |
| 15° | 7411 | 7094 | 7054 |
| 20° | 7341 | 6931 | 6881 |
| 25° | 7259 | 6763 | 6706 |
| 30° | 7163 | 6584 | 6507 |
| 35° | 7042 | 6388 | 6310 |
| 40° | 6916 | 6181 | 6080 |
| 45° | 6781 | 5956 | 5832 |
| 50° | 6605 | 5696 | 5565 |
| 55° | 6414 | 5410 | 5271 |
| 60° | 6187 | 5040 | 4927 |
| 65° | 5818 | 4625 | 4586 |
| 70° | 5288 | 4136 | 4190 |
| 75° | 4535 | 3601 | 3830 |
| 80° | 3411 | 3076 | 3501 |
| 85° | 1823 | 2545 | 3187 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 6781 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 176.8  | 3.1       |
| 10°-20°   | 507.1  | 9.0       |
| 20°-30°   | 769.4  | 13.6      |
| 30°-40°   | 930.3  | 16.5      |
| 40°-50°   | 970.7  | 17.2      |
| 50°-60°   | 887.5  | 15.7      |
| 60°-70°   | 691.9  | 12.2      |
| 70°-80°   | 432.8  | 7.7       |
| 80°-90°   | 196.6  | 3.5       |
| 90°-100°  | 65.9   | 1.2       |
| 100°-110° | 16.5   | 0.3       |
| 110°-120° | 2.6    | 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       |
| <hr/>     |        |           |
| 0°-30°    | 1453.2 | 25.7      |
| 0°-40°    | 2383.5 | 42.2      |
| 0°-60°    | 4241.8 | 75.1      |
| 0°-90°    | 5563.0 | 98.5      |
| 90°-120°  | 85.0   | 1.5       |
| 90°-150°  | 85.0   | 1.5       |
| 90°-180°  | 85.0   | 1.5       |
| 0°-180°   | 5648.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1868 | 1868  | 1868 | 1868  | 1868 |      |
| 5°   | 1864 | 1860  | 1852 | 1861  | 1861 | 177  |
| 15°  | 1793 | 1796  | 1791 | 1802  | 1801 | 506  |
| 25°  | 1662 | 1663  | 1665 | 1679  | 1681 | 766  |
| 35°  | 1471 | 1477  | 1484 | 1499  | 1505 | 921  |
| 45°  | 1237 | 1248  | 1259 | 1271  | 1277 | 953  |
| 55°  | 966  | 977   | 995  | 1010  | 1016 | 863  |
| 65°  | 664  | 675   | 698  | 726   | 738  | 657  |
| 75°  | 336  | 357   | 409  | 458   | 475  | 358  |
| 85°  | 58   | 107   | 184  | 244   | 266  | 74   |
| 90°  | 0    | 40    | 109  | 163   | 183  | 2    |
| 95°  | 0    | 11    | 56   | 102   | 118  | 0    |
| 105° | 1    | 1     | 9    | 27    | 37   | 1    |
| 115° | 1    | 1     | 2    | 5     | 7    | 1    |
| 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°     | 1868.0 | 1868.0 | 1868.0 | 1868.0 | 1868.0 |
| 2.5°   | 1870.2 | 1867.6 | 1859.2 | 1867.6 | 1867.1 |
| 5°     | 1864.1 | 1860.5 | 1852.2 | 1861.0 | 1861.0 |
| 7.5°   | 1851.7 | 1850.4 | 1842.9 | 1853.0 | 1853.0 |
| 10°    | 1837.2 | 1836.8 | 1830.6 | 1841.6 | 1842.0 |
| 12.5°  | 1816.9 | 1818.7 | 1813.0 | 1823.5 | 1824.9 |
| 15°    | 1793.2 | 1796.2 | 1791.4 | 1801.5 | 1801.1 |
| 17.5°  | 1767.2 | 1768.9 | 1765.4 | 1776.9 | 1776.4 |
| 20°    | 1735.0 | 1737.2 | 1734.6 | 1746.5 | 1747.8 |
| 22.5°  | 1699.4 | 1702.4 | 1702.0 | 1714.3 | 1717.9 |
| 25°    | 1661.5 | 1662.8 | 1664.6 | 1678.7 | 1681.3 |
| 27.5°  | 1619.7 | 1621.9 | 1624.9 | 1637.7 | 1640.3 |
| 30°    | 1573.9 | 1577.4 | 1580.9 | 1594.1 | 1597.6 |
| 32.5°  | 1525.4 | 1528.9 | 1533.3 | 1550.5 | 1552.3 |
| 35°    | 1470.8 | 1477.4 | 1483.6 | 1498.6 | 1504.7 |
| 37.5°  | 1416.2 | 1424.6 | 1430.3 | 1446.2 | 1451.0 |
| 40°    | 1358.5 | 1366.9 | 1376.1 | 1392.9 | 1395.9 |
| 42.5°  | 1298.2 | 1307.9 | 1318.9 | 1333.9 | 1339.1 |
| 45°    | 1237.4 | 1248.4 | 1258.6 | 1270.9 | 1277.1 |
| 47.5°  | 1171.8 | 1182.8 | 1195.1 | 1209.2 | 1213.2 |
| 50°    | 1104.0 | 1116.8 | 1130.0 | 1143.2 | 1150.2 |
| 52.5°  | 1034.4 | 1049.8 | 1064.8 | 1078.9 | 1085.5 |
| 55°    | 965.7  | 977.2  | 995.2  | 1009.8 | 1016.4 |
| 57.5°  | 894.4  | 904.1  | 920.4  | 944.1  | 947.7  |
| 60°    | 821.7  | 830.5  | 847.3  | 866.6  | 874.6  |
| 62.5°  | 741.6  | 753.5  | 771.1  | 795.7  | 802.8  |
| 65°    | 663.6  | 675.1  | 698.4  | 726.2  | 737.6  |
| 67.5°  | 588.3  | 592.3  | 622.2  | 651.3  | 669.8  |
| 70°    | 499.4  | 514.3  | 549.1  | 584.8  | 598.9  |
| 72.5°  | 422.7  | 437.7  | 476.0  | 517.9  | 535.5  |
| 75°    | 336.0  | 356.7  | 408.7  | 457.5  | 474.7  |
| 77.5°  | 259.8  | 282.7  | 347.0  | 396.3  | 416.1  |
| 80°    | 181.4  | 217.1  | 287.1  | 342.6  | 364.2  |
| 82.5°  | 114.1  | 158.1  | 233.0  | 291.1  | 310.0  |
| 85°    | 58.1   | 107.4  | 184.5  | 244.0  | 265.5  |
| 87.5°  | 15.4   | 69.6   | 143.6  | 200.4  | 222.4  |
| 90°    | 0.4    | 40.1   | 108.8  | 163.4  | 183.2  |
| 92.5°  | 0.4    | 22.5   | 81.0   | 129.9  | 150.2  |
| 95°    | 0.4    | 10.6   | 56.4   | 102.2  | 118.0  |
| 97.5°  | 0.4    | 4.4    | 38.8   | 77.1   | 92.9   |
| 100°   | 0.4    | 2.2    | 24.7   | 55.9   | 69.6   |
| 102.5° | 0.9    | 1.3    | 15.4   | 40.1   | 51.1   |
| 105°   | 0.9    | 1.3    | 9.2    | 27.3   | 36.6   |
| 107.5° | 0.9    | 1.3    | 5.3    | 18.5   | 25.1   |
| 110°   | 1.3    | 1.3    | 3.1    | 11.4   | 16.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90°  |
|--------|-----|-------|-----|-------|------|
| 112.5° | 1.3 | 1.3   | 1.8 | 7.5   | 11.0 |
| 115°   | 1.3 | 1.3   | 1.8 | 4.8   | 7.0  |
| 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)