

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: P518065

Luminaire Tested: HVL8-4-LD4-2HI-35-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: P518065  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-2HI-35-UNV-O-EDD-90  
Description: 4 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 6805.0 lumens  
Efficiency: N/A  
Efficacy: 79.0 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

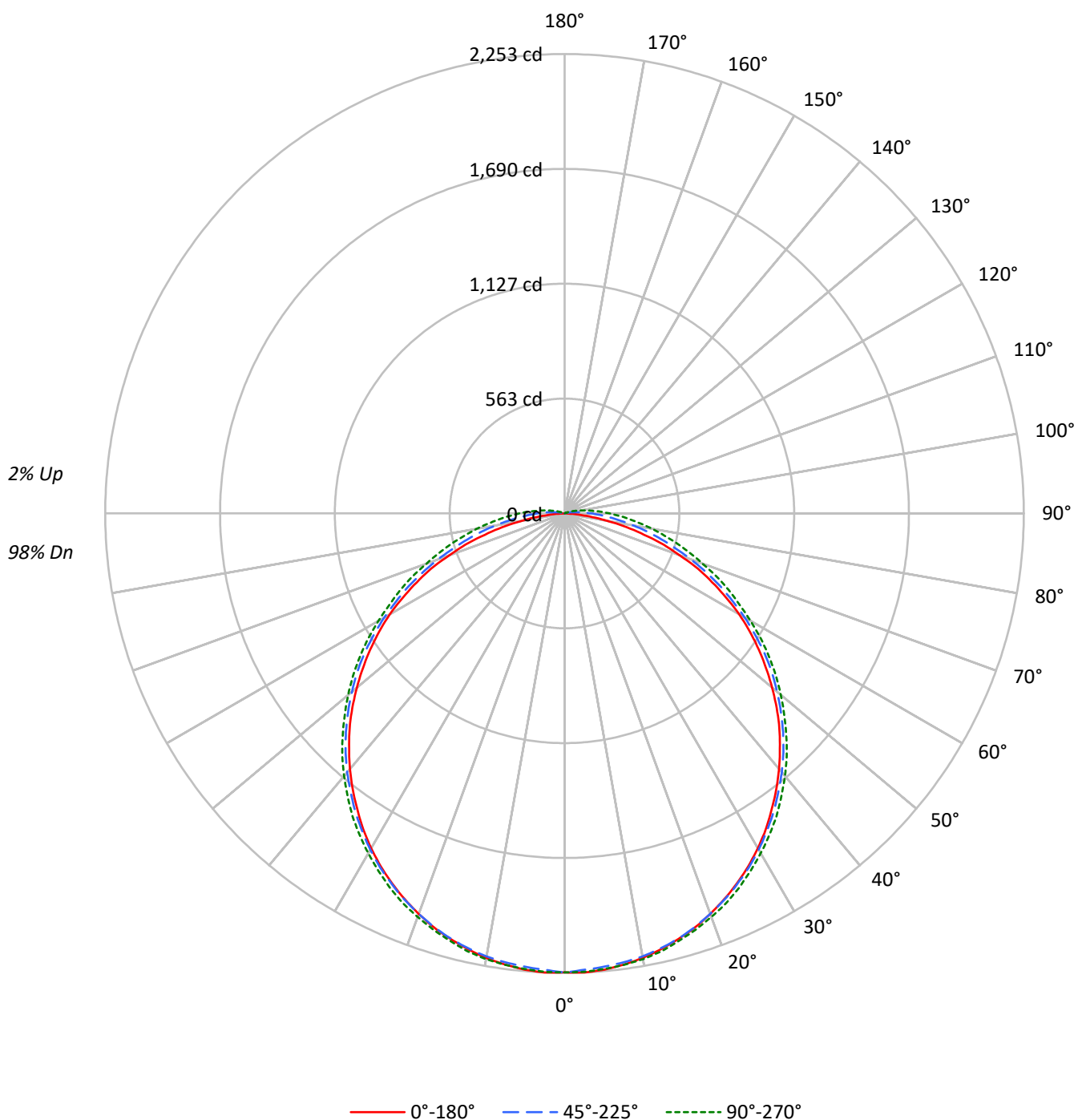
Input Watts (W): 86.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 9085 | 9085 | 9085 |
| 5°  | 9067 | 8882 | 8891 |
| 10° | 9006 | 8723 | 8713 |
| 15° | 8929 | 8547 | 8499 |
| 20° | 8846 | 8350 | 8291 |
| 25° | 8746 | 8149 | 8080 |
| 30° | 8631 | 7933 | 7840 |
| 35° | 8485 | 7696 | 7603 |
| 40° | 8333 | 7447 | 7325 |
| 45° | 8170 | 7176 | 7027 |
| 50° | 7957 | 6862 | 6705 |
| 55° | 7728 | 6518 | 6350 |
| 60° | 7454 | 6072 | 5936 |
| 65° | 7011 | 5572 | 5525 |
| 70° | 6372 | 4984 | 5048 |
| 75° | 5463 | 4339 | 4615 |
| 80° | 4110 | 3706 | 4218 |
| 85° | 2196 | 3066 | 3840 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 8170 cd/sqm

TEST NUMBER: P518065

CATALOG NUMBER: HVL8-4-LD4-2HI-35-UNV-O-EDD-90

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 213.0  | 3.1       |
| 10°-20°   | 610.9  | 9.0       |
| 20°-30°   | 927.0  | 13.6      |
| 30°-40°   | 1120.9 | 16.5      |
| 40°-50°   | 1169.6 | 17.2      |
| 50°-60°   | 1069.3 | 15.7      |
| 60°-70°   | 833.6  | 12.2      |
| 70°-80°   | 521.5  | 7.7       |
| 80°-90°   | 236.8  | 3.5       |
| 90°-100°  | 79.4   | 1.2       |
| 100°-110° | 19.9   | 0.3       |
| 110°-120° | 3.1    | 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°    | 1750.9 | 25.7      |
| 0°-40°    | 2871.8 | 42.2      |
| 0°-60°    | 5110.7 | 75.1      |
| 0°-90°    | 6702.6 | 98.5      |
| 90°-120°  | 102.4  | 1.5       |
| 90°-150°  | 102.4  | 1.5       |
| 90°-180°  | 102.0  | 1.5       |
| 0°-180°   | 6805.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2251 | 2251  | 2251 | 2251  | 2251 |      |
| 5°   | 2246 | 2242  | 2232 | 2242  | 2242 | 213  |
| 15°  | 2160 | 2164  | 2158 | 2171  | 2170 | 610  |
| 25°  | 2002 | 2003  | 2006 | 2022  | 2026 | 922  |
| 35°  | 1772 | 1780  | 1788 | 1806  | 1813 | 1109 |
| 45°  | 1491 | 1504  | 1516 | 1531  | 1539 | 1149 |
| 55°  | 1164 | 1177  | 1199 | 1217  | 1225 | 1039 |
| 65°  | 800  | 813   | 842  | 875   | 889  | 791  |
| 75°  | 405  | 430   | 492  | 551   | 572  | 432  |
| 85°  | 70   | 130   | 222  | 294   | 320  | 89   |
| 90°  | 0    | 48    | 131  | 197   | 221  | 3    |
| 95°  | 0    | 13    | 68   | 123   | 142  | 0    |
| 105° | 1    | 2     | 11   | 33    | 44   | 1    |
| 115° | 2    | 2     | 2    | 6     | 8    | 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    |

TEST NUMBER: P518065

CATALOG NUMBER: HVL8-4-LD4-2HI-35-UNV-O-EDD-90

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 2250.7 | 2250.7 | 2250.7 | 2250.7 | 2250.7 |
| 2.5°   | 2253.3 | 2250.2 | 2240.1 | 2250.2 | 2249.6 |
| 5°     | 2245.9 | 2241.7 | 2231.6 | 2242.2 | 2242.2 |
| 7.5°   | 2231.1 | 2229.5 | 2220.4 | 2232.6 | 2232.6 |
| 10°    | 2213.5 | 2213.0 | 2205.6 | 2218.8 | 2219.4 |
| 12.5°  | 2189.1 | 2191.3 | 2184.4 | 2197.1 | 2198.7 |
| 15°    | 2160.5 | 2164.2 | 2158.4 | 2170.6 | 2170.0 |
| 17.5°  | 2129.2 | 2131.3 | 2127.1 | 2140.9 | 2140.3 |
| 20°    | 2090.5 | 2093.1 | 2089.9 | 2104.2 | 2105.8 |
| 22.5°  | 2047.5 | 2051.2 | 2050.7 | 2065.5 | 2069.8 |
| 25°    | 2001.8 | 2003.4 | 2005.6 | 2022.5 | 2025.7 |
| 27.5°  | 1951.4 | 1954.1 | 1957.8 | 1973.2 | 1976.4 |
| 30°    | 1896.3 | 1900.5 | 1904.8 | 1920.7 | 1924.9 |
| 32.5°  | 1837.9 | 1842.1 | 1847.4 | 1868.1 | 1870.3 |
| 35°    | 1772.1 | 1780.1 | 1787.5 | 1805.5 | 1813.0 |
| 37.5°  | 1706.3 | 1716.4 | 1723.3 | 1742.4 | 1748.2 |
| 40°    | 1636.8 | 1646.9 | 1658.0 | 1678.2 | 1681.9 |
| 42.5°  | 1564.1 | 1575.8 | 1589.1 | 1607.1 | 1613.5 |
| 45°    | 1490.9 | 1504.2 | 1516.4 | 1531.2 | 1538.7 |
| 47.5°  | 1411.8 | 1425.1 | 1440.0 | 1456.9 | 1461.7 |
| 50°    | 1330.1 | 1345.5 | 1361.4 | 1377.4 | 1385.9 |
| 52.5°  | 1246.3 | 1264.9 | 1282.9 | 1299.9 | 1307.9 |
| 55°    | 1163.5 | 1177.3 | 1199.1 | 1216.6 | 1224.6 |
| 57.5°  | 1077.6 | 1089.3 | 1108.9 | 1137.5 | 1141.8 |
| 60°    | 990.0  | 1000.7 | 1020.8 | 1044.2 | 1053.7 |
| 62.5°  | 893.5  | 907.8  | 929.0  | 958.7  | 967.2  |
| 65°    | 799.6  | 813.4  | 841.5  | 874.9  | 888.7  |
| 67.5°  | 708.8  | 713.6  | 749.7  | 784.7  | 807.0  |
| 70°    | 601.7  | 619.7  | 661.6  | 704.6  | 721.6  |
| 72.5°  | 509.3  | 527.4  | 573.5  | 624.0  | 645.2  |
| 75°    | 404.8  | 429.8  | 492.4  | 551.3  | 572.0  |
| 77.5°  | 313.0  | 340.6  | 418.1  | 477.5  | 501.4  |
| 80°    | 218.6  | 261.6  | 345.9  | 412.8  | 438.8  |
| 82.5°  | 137.4  | 190.5  | 280.7  | 350.7  | 373.5  |
| 85°    | 70.0   | 129.5  | 222.3  | 293.9  | 319.9  |
| 87.5°  | 18.6   | 83.8   | 173.0  | 241.4  | 267.9  |
| 90°    | 0.5    | 48.3   | 131.1  | 196.8  | 220.7  |
| 92.5°  | 0.5    | 27.1   | 97.6   | 156.5  | 180.9  |
| 95°    | 0.5    | 12.7   | 67.9   | 123.1  | 142.2  |
| 97.5°  | 0.5    | 5.3    | 46.7   | 92.8   | 112.0  |
| 100°   | 0.5    | 2.7    | 29.7   | 67.4   | 83.8   |
| 102.5° | 1.1    | 1.6    | 18.6   | 48.3   | 61.5   |
| 105°   | 1.1    | 1.6    | 11.1   | 32.9   | 44.0   |
| 107.5° | 1.1    | 1.6    | 6.4    | 22.3   | 30.2   |
| 110°   | 1.6    | 1.6    | 3.7    | 13.8   | 20.2   |

TEST NUMBER: P518065

CATALOG NUMBER: HVL8-4-LD4-2HI-35-UNV-O-EDD-90

**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90°  |
|--------|-----|-------|-----|-------|------|
| 112.5° | 1.6 | 1.6   | 2.1 | 9.0   | 13.3 |
| 115°   | 1.6 | 1.6   | 2.1 | 5.8   | 8.5  |
| 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)