

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: P517168

Luminaire Tested: HVL12-1-LD4-1LO-35-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: P517168  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-1-LD4-1LO-35-UNV-C-EDD  
Description: 1 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

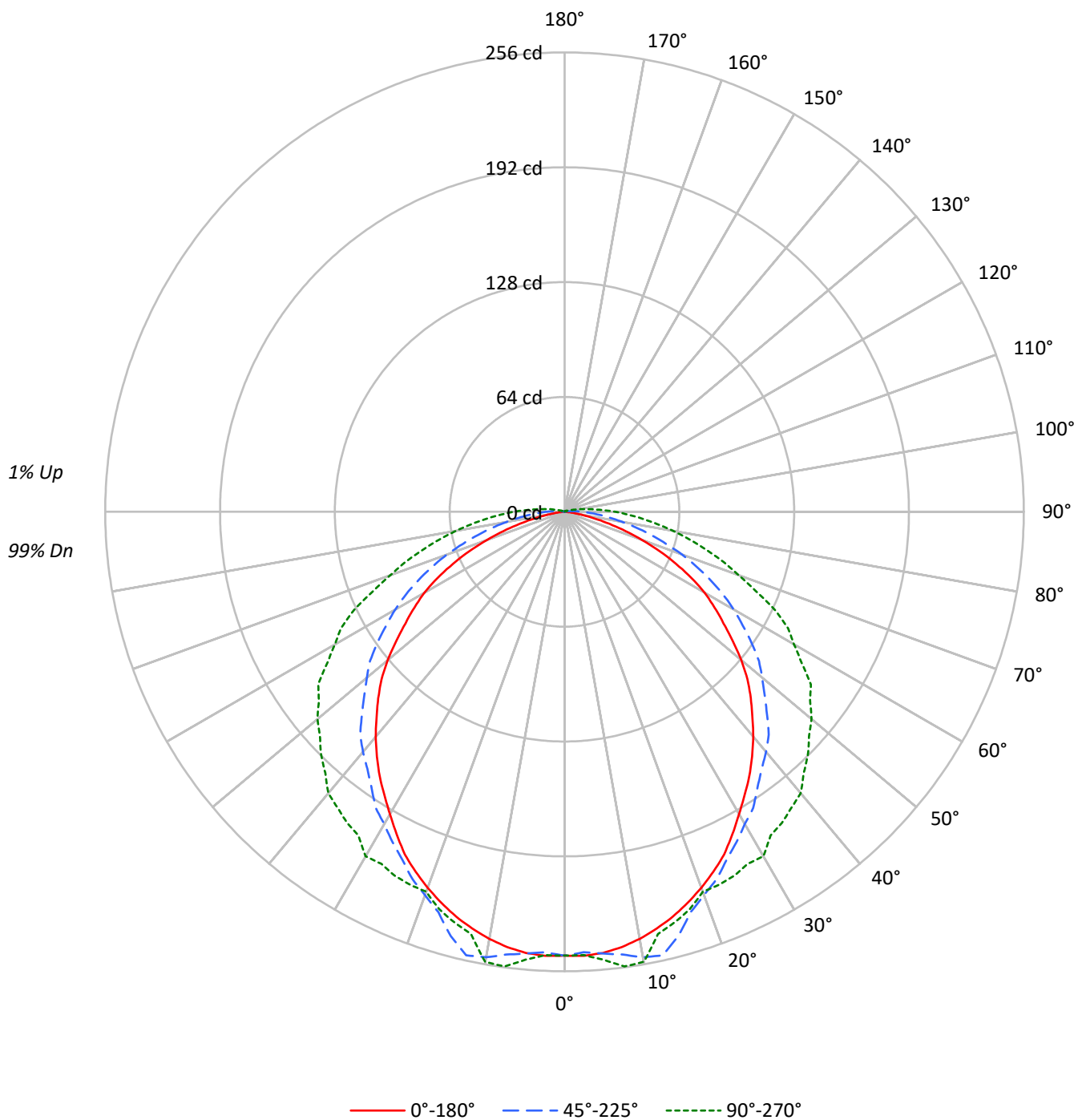
Lumens per Lamp: N/A  
Luminaire Lumens: 745.1 lumens  
Efficiency: N/A  
Efficacy: 126.3 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 1' x L: 1' x H: 0.17')  
CIE Type: Direct  
  
Input Watts (W): 5.9  
Input Voltage (V): NR  
Input Current (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 | 103 | 98  | 94  | 105 | 100 | 96  | 92  | 96  | 92  | 89  |  | 91  | 89  | 86  |  | 87  |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 78  | 73  |  | 80  | 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  | 51  |  | 62  | 56  | 51  |  | 60  |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 51  | 45  | 58  | 50  | 44  |  | 56  | 49  | 44  |  | 54  |
| 6   | 69  | 55  | 46  | 39  | 67  | 54  | 46  | 39  | 52  | 44  | 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°  | 2662 | 2662 | 2662 |
| 5°  | 2627 | 2615 | 2668 |
| 10° | 2565 | 2644 | 2703 |
| 15° | 2491 | 2566 | 2527 |
| 20° | 2407 | 2398 | 2433 |
| 25° | 2321 | 2288 | 2466 |
| 30° | 2205 | 2199 | 2512 |
| 35° | 2115 | 2115 | 2488 |
| 40° | 2018 | 2049 | 2525 |
| 45° | 1915 | 1966 | 2503 |
| 50° | 1798 | 1880 | 2510 |
| 55° | 1640 | 1789 | 2540 |
| 60° | 1507 | 1665 | 2467 |
| 65° | 1285 | 1517 | 2430 |
| 70° | 997  | 1331 | 2228 |
| 75° | 664  | 1106 | 2095 |
| 80° | 331  | 881  | 1963 |
| 85° | 98   | 652  | 1845 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 2540 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 23.8   | 3.2       |
| 10°-20°   | 67.7   | 9.1       |
| 20°-30°   | 100.7  | 13.5      |
| 30°-40°   | 121.1  | 16.2      |
| 40°-50°   | 127.4  | 17.1      |
| 50°-60°   | 118.2  | 15.9      |
| 60°-70°   | 93.5   | 12.5      |
| 70°-80°   | 57.1   | 7.7       |
| 80°-90°   | 24.9   | 3.3       |
| 90°-100°  | 7.8    | 1.0       |
| 100°-110° | 1.8    | 0.2       |
| 110°-120° | 0.7    | 0.1       |
| 120°-130° | 0.4    | 0.1       |
| 130°-140° | 0.1    | 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°    | 192.2  | 25.8      |
| 0°-40°    | 313.2  | 42.0      |
| 0°-60°    | 558.9  | 75.0      |
| 0°-90°    | 734.3  | 98.6      |
| 90°-120°  | 10.2   | 1.4       |
| 90°-150°  | 10.7   | 1.4       |
| 90°-180°  | 11.0   | 1.5       |
| 0°-180°   | 745.1  | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 247 | 247   | 247 | 247   | 247 |      |
| 5°   | 247 | 246   | 247 | 250   | 250 | 23   |
| 15°  | 234 | 242   | 245 | 237   | 237 | 66   |
| 25°  | 211 | 224   | 214 | 220   | 224 | 97   |
| 35°  | 180 | 185   | 188 | 204   | 211 | 112  |
| 45°  | 147 | 148   | 160 | 185   | 192 | 113  |
| 55°  | 108 | 110   | 127 | 155   | 168 | 97   |
| 65°  | 68  | 71    | 90  | 119   | 130 | 68   |
| 75°  | 26  | 34    | 50  | 77    | 82  | 28   |
| 85°  | 2   | 8     | 20  | 38    | 43  | 4    |
| 90°  | 0   | 2     | 10  | 24    | 28  | 0    |
| 95°  | 0   | 1     | 4   | 13    | 16  | 0    |
| 105° | 0   | 0     | 1   | 3     | 4   | 0    |
| 115° | 0   | 0     | 1   | 1     | 1   | 0    |
| 125° | 0   | 0     | 0   | 1     | 1   | 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°     | 247.3 | 247.3 | 247.3 | 247.3 | 247.3 |
| 2.5°   | 247.6 | 246.9 | 245.6 | 246.9 | 247.2 |
| 5°     | 246.7 | 246.2 | 247.0 | 249.8 | 250.5 |
| 7.5°   | 244.6 | 246.5 | 248.8 | 253.8 | 255.5 |
| 10°    | 241.6 | 245.2 | 252.0 | 256.3 | 254.6 |
| 12.5°  | 237.8 | 244.0 | 253.1 | 244.7 | 240.9 |
| 15°    | 233.5 | 242.5 | 244.8 | 236.7 | 236.9 |
| 17.5°  | 228.4 | 241.2 | 233.9 | 233.7 | 232.2 |
| 20°    | 222.9 | 237.0 | 227.3 | 226.9 | 225.3 |
| 22.5°  | 217.0 | 231.4 | 221.5 | 220.7 | 224.9 |
| 25°    | 210.6 | 224.1 | 213.8 | 220.2 | 223.8 |
| 27.5°  | 202.6 | 214.5 | 207.5 | 216.6 | 221.1 |
| 30°    | 194.5 | 204.6 | 201.0 | 213.6 | 221.6 |
| 32.5°  | 186.9 | 194.3 | 195.7 | 212.5 | 213.8 |
| 35°    | 179.7 | 184.7 | 187.5 | 204.5 | 211.4 |
| 37.5°  | 171.8 | 173.1 | 180.5 | 201.1 | 207.8 |
| 40°    | 163.7 | 162.9 | 174.7 | 195.6 | 204.8 |
| 42.5°  | 155.1 | 154.8 | 168.5 | 192.8 | 197.4 |
| 45°    | 146.8 | 147.5 | 159.6 | 184.9 | 191.8 |
| 47.5°  | 138.4 | 139.3 | 151.3 | 176.3 | 184.9 |
| 50°    | 128.7 | 129.8 | 143.8 | 168.7 | 179.7 |
| 52.5°  | 118.1 | 120.2 | 136.6 | 161.4 | 172.5 |
| 55°    | 108.2 | 109.9 | 127.4 | 155.2 | 167.6 |
| 57.5°  | 99.1  | 100.1 | 117.8 | 147.4 | 156.7 |
| 60°    | 90.2  | 90.4  | 108.9 | 138.7 | 147.7 |
| 62.5°  | 79.9  | 80.4  | 99.6  | 128.5 | 140.5 |
| 65°    | 68.5  | 70.6  | 89.7  | 118.7 | 129.5 |
| 67.5°  | 57.7  | 61.5  | 79.6  | 109.8 | 115.4 |
| 70°    | 46.2  | 52.6  | 69.7  | 99.2  | 103.2 |
| 72.5°  | 35.7  | 43.2  | 59.5  | 87.5  | 93.0  |
| 75°    | 25.9  | 34.3  | 50.0  | 76.9  | 81.7  |
| 77.5°  | 17.4  | 26.0  | 41.2  | 65.2  | 71.6  |
| 80°    | 10.4  | 19.0  | 33.2  | 54.4  | 61.6  |
| 82.5°  | 5.3   | 12.7  | 25.8  | 45.6  | 52.0  |
| 85°    | 2.3   | 8.1   | 19.5  | 37.8  | 43.4  |
| 87.5°  | 0.7   | 4.6   | 14.4  | 30.6  | 35.3  |
| 90°    | 0.1   | 2.4   | 10.2  | 24.0  | 28.3  |
| 92.5°  | 0.1   | 1.2   | 7.2   | 18.1  | 21.4  |
| 95°    | 0.1   | 0.6   | 4.5   | 13.1  | 16.1  |
| 97.5°  | 0.1   | 0.4   | 2.7   | 9.3   | 11.8  |
| 100°   | 0.1   | 0.3   | 1.6   | 6.2   | 8.4   |
| 102.5° | 0.1   | 0.4   | 1.1   | 3.9   | 5.5   |
| 105°   | 0.1   | 0.4   | 0.9   | 2.6   | 3.6   |
| 107.5° | 0.1   | 0.4   | 0.8   | 1.9   | 2.5   |
| 110°   | 0.1   | 0.3   | 0.9   | 1.5   | 2.0   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.1 | 0.3   | 0.8 | 1.2   | 1.5 |
| 115°   | 0.1 | 0.2   | 0.7 | 1.2   | 1.2 |
| 117.5° | 0.1 | 0.2   | 0.6 | 1.2   | 1.2 |
| 120°   | 0.1 | 0.1   | 0.5 | 1.1   | 1.3 |
| 122.5° | 0.1 | 0.1   | 0.4 | 1.0   | 1.2 |
| 125°   | 0.1 | 0.1   | 0.3 | 0.8   | 1.1 |
| 127.5° | 0.1 | 0.1   | 0.3 | 0.6   | 0.8 |
| 130°   | 0.1 | 0.1   | 0.2 | 0.5   | 0.6 |
| 132.5° | 0.1 | 0.1   | 0.2 | 0.4   | 0.5 |
| 135°   | 0.1 | 0.1   | 0.1 | 0.3   | 0.4 |
| 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)