

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: P517792

Luminaire Tested: HVL8-1-LD4-2LO-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: P517792  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-1-LD4-2LO-35-UNV-C-EDD  
Description: 1 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1355.0 lumens  
Efficiency: N/A  
Efficacy: 117.8 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

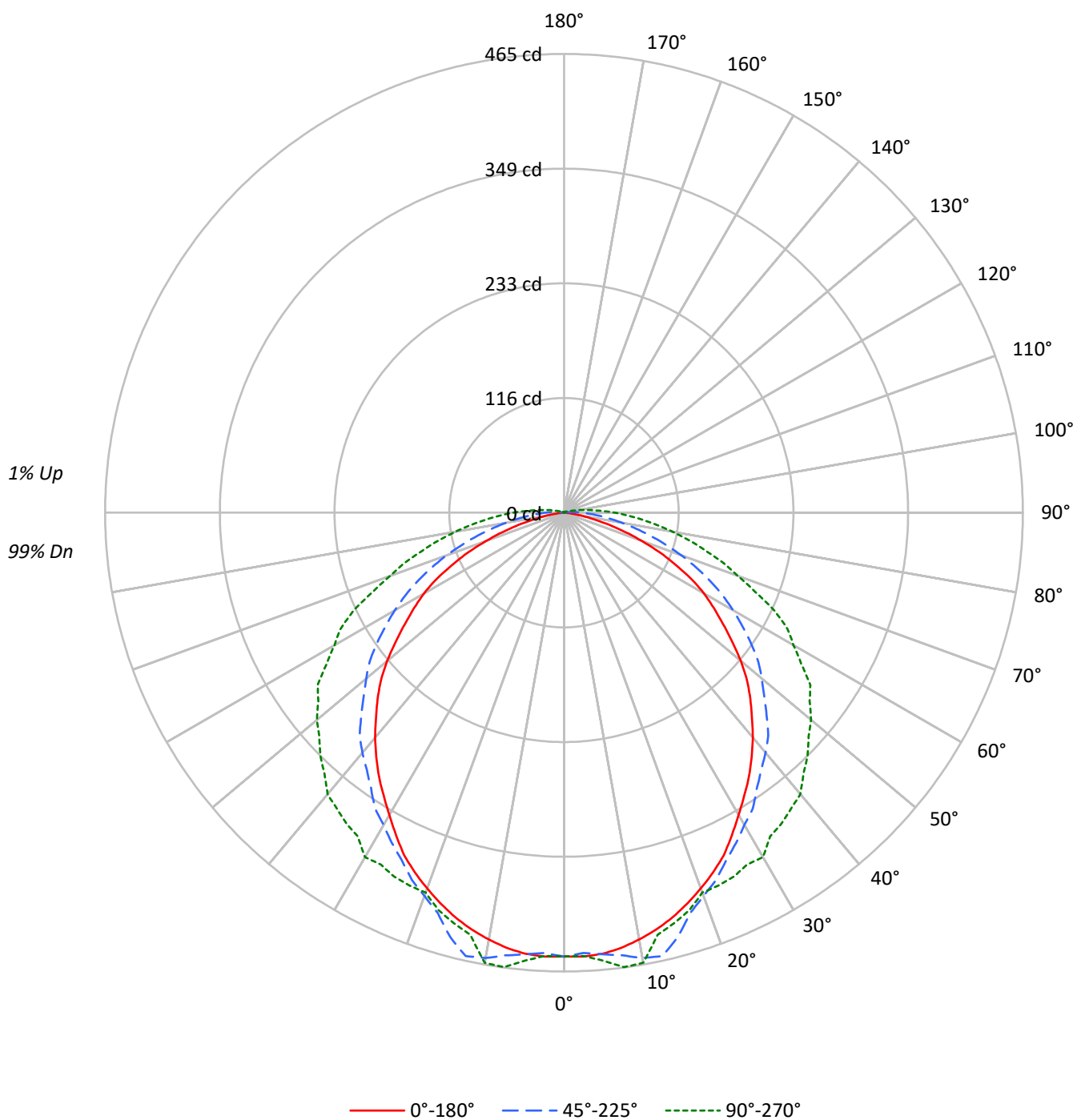
Input Watts (W): 11.5  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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  | 39  | 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°  | 7262 | 7262 | 7262 |
| 5°  | 7168 | 7099 | 7228 |
| 10° | 6997 | 7143 | 7272 |
| 15° | 6796 | 6899 | 6749 |
| 20° | 6567 | 6415 | 6454 |
| 25° | 6333 | 6091 | 6495 |
| 30° | 6017 | 5825 | 6567 |
| 35° | 5768 | 5570 | 6449 |
| 40° | 5506 | 5369 | 6490 |
| 45° | 5227 | 5122 | 6373 |
| 50° | 4904 | 4863 | 6324 |
| 55° | 4472 | 4588 | 6320 |
| 60° | 4109 | 4233 | 6052 |
| 65° | 3504 | 3821 | 5859 |
| 70° | 2723 | 3305 | 5252 |
| 75° | 1811 | 2704 | 4795 |
| 80° | 908  | 2106 | 4307 |
| 85° | 268  | 1506 | 3793 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 6373 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 43.2   | 3.2       |
| 10°-20°   | 123.1  | 9.1       |
| 20°-30°   | 183.2  | 13.5      |
| 30°-40°   | 220.2  | 16.2      |
| 40°-50°   | 231.7  | 17.1      |
| 50°-60°   | 215.0  | 15.9      |
| 60°-70°   | 170.0  | 12.5      |
| 70°-80°   | 103.9  | 7.7       |
| 80°-90°   | 45.2   | 3.3       |
| 90°-100°  | 14.1   | 1.0       |
| 100°-110° | 3.2    | 0.2       |
| 110°-120° | 1.3    | 0.1       |
| 120°-130° | 0.7    | 0.1       |
| 130°-140° | 0.2    | 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°    | 349.5  | 25.8      |
| 0°-40°    | 569.7  | 42.0      |
| 0°-60°    | 1016.4 | 75.0      |
| 0°-90°    | 1335.6 | 98.6      |
| 90°-120°  | 18.5   | 1.4       |
| 90°-150°  | 19.4   | 1.4       |
| 90°-180°  | 19.0   | 1.4       |
| 0°-180°   | 1355.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 450 | 450   | 450 | 450   | 450 |      |
| 5°   | 449 | 448   | 449 | 454   | 456 | 43   |
| 15°  | 425 | 441   | 445 | 430   | 431 | 120  |
| 25°  | 383 | 408   | 389 | 401   | 407 | 176  |
| 35°  | 327 | 336   | 341 | 372   | 384 | 204  |
| 45°  | 267 | 268   | 290 | 336   | 349 | 206  |
| 55°  | 197 | 200   | 232 | 282   | 305 | 177  |
| 65°  | 124 | 128   | 163 | 216   | 236 | 123  |
| 75°  | 47  | 62    | 91  | 140   | 149 | 51   |
| 85°  | 4   | 15    | 36  | 69    | 79  | 7    |
| 90°  | 0   | 4     | 19  | 44    | 51  | 0    |
| 95°  | 0   | 1     | 8   | 24    | 29  | 0    |
| 105° | 0   | 1     | 2   | 5     | 7   | 0    |
| 115° | 0   | 0     | 1   | 2     | 2   | 0    |
| 125° | 0   | 0     | 0   | 1     | 2   | 0    |
| 135° | 0   | 0     | 0   | 0     | 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°     | 449.8 | 449.8 | 449.8 | 449.8 | 449.8 |
| 2.5°   | 450.3 | 449.1 | 446.7 | 449.1 | 449.7 |
| 5°     | 448.7 | 447.8 | 449.3 | 454.4 | 455.7 |
| 7.5°   | 444.9 | 448.4 | 452.5 | 461.7 | 464.6 |
| 10°    | 439.3 | 445.9 | 458.3 | 466.1 | 463.1 |
| 12.5°  | 432.6 | 443.7 | 460.3 | 445.1 | 438.1 |
| 15°    | 424.7 | 441.0 | 445.3 | 430.5 | 430.8 |
| 17.5°  | 415.4 | 438.7 | 425.4 | 425.0 | 422.4 |
| 20°    | 405.4 | 431.0 | 413.4 | 412.7 | 409.8 |
| 22.5°  | 394.7 | 420.8 | 402.8 | 401.3 | 409.0 |
| 25°    | 383.1 | 407.5 | 388.9 | 400.6 | 407.1 |
| 27.5°  | 368.5 | 390.1 | 377.4 | 393.9 | 402.0 |
| 30°    | 353.8 | 372.2 | 365.6 | 388.6 | 403.1 |
| 32.5°  | 339.9 | 353.4 | 355.9 | 386.6 | 388.9 |
| 35°    | 326.8 | 335.9 | 340.9 | 371.9 | 384.5 |
| 37.5°  | 312.4 | 314.9 | 328.3 | 365.8 | 378.0 |
| 40°    | 297.8 | 296.2 | 317.7 | 355.7 | 372.5 |
| 42.5°  | 282.0 | 281.5 | 306.4 | 350.6 | 359.1 |
| 45°    | 267.1 | 268.3 | 290.4 | 336.4 | 348.9 |
| 47.5°  | 251.8 | 253.3 | 275.1 | 320.7 | 336.3 |
| 50°    | 234.0 | 236.0 | 261.6 | 306.8 | 326.8 |
| 52.5°  | 214.8 | 218.6 | 248.4 | 293.6 | 313.8 |
| 55°    | 196.7 | 199.9 | 231.6 | 282.3 | 304.7 |
| 57.5°  | 180.2 | 182.2 | 214.3 | 268.1 | 285.0 |
| 60°    | 164.0 | 164.5 | 198.0 | 252.3 | 268.6 |
| 62.5°  | 145.4 | 146.2 | 181.2 | 233.7 | 255.5 |
| 65°    | 124.5 | 128.5 | 163.2 | 216.0 | 235.6 |
| 67.5°  | 105.0 | 111.9 | 144.8 | 199.7 | 209.9 |
| 70°    | 84.1  | 95.7  | 126.7 | 180.5 | 187.7 |
| 72.5°  | 65.0  | 78.6  | 108.2 | 159.1 | 169.2 |
| 75°    | 47.1  | 62.4  | 91.0  | 139.8 | 148.6 |
| 77.5°  | 31.7  | 47.3  | 74.9  | 118.6 | 130.2 |
| 80°    | 19.0  | 34.5  | 60.5  | 98.9  | 112.0 |
| 82.5°  | 9.7   | 23.2  | 46.9  | 82.9  | 94.6  |
| 85°    | 4.2   | 14.7  | 35.5  | 68.8  | 79.0  |
| 87.5°  | 1.2   | 8.3   | 26.1  | 55.6  | 64.2  |
| 90°    | 0.1   | 4.4   | 18.6  | 43.6  | 51.4  |
| 92.5°  | 0.1   | 2.1   | 13.1  | 33.0  | 38.9  |
| 95°    | 0.1   | 1.1   | 8.2   | 23.9  | 29.2  |
| 97.5°  | 0.1   | 0.6   | 4.9   | 17.0  | 21.4  |
| 100°   | 0.1   | 0.5   | 2.9   | 11.3  | 15.3  |
| 102.5° | 0.1   | 0.6   | 2.0   | 7.1   | 10.0  |
| 105°   | 0.1   | 0.6   | 1.6   | 4.7   | 6.6   |
| 107.5° | 0.2   | 0.6   | 1.5   | 3.5   | 4.6   |
| 110°   | 0.1   | 0.5   | 1.6   | 2.7   | 3.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.2 | 0.5   | 1.5 | 2.2   | 2.7 |
| 115°   | 0.1 | 0.4   | 1.3 | 2.1   | 2.2 |
| 117.5° | 0.2 | 0.3   | 1.0 | 2.1   | 2.2 |
| 120°   | 0.2 | 0.2   | 0.8 | 2.0   | 2.3 |
| 122.5° | 0.2 | 0.2   | 0.6 | 1.8   | 2.2 |
| 125°   | 0.1 | 0.2   | 0.5 | 1.4   | 1.9 |
| 127.5° | 0.2 | 0.2   | 0.5 | 1.1   | 1.5 |
| 130°   | 0.2 | 0.2   | 0.4 | 0.8   | 1.1 |
| 132.5° | 0.2 | 0.2   | 0.3 | 0.6   | 0.8 |
| 135°   | 0.2 | 0.2   | 0.2 | 0.5   | 0.6 |
| 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)