

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: P517813

Luminaire Tested: HVL8-1-LD4-2STD-40-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: P517813  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-1-LD4-2STD-40-UNV-O-EDD-90  
Description: 1 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 1341.0 lumens  
Efficiency: N/A  
Efficacy: 82.3 lumens/watt  
Spacing Criteria (0/90/45): 1.25 / 1.27 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 1' x H: 0.17')  
CIE Type: Direct

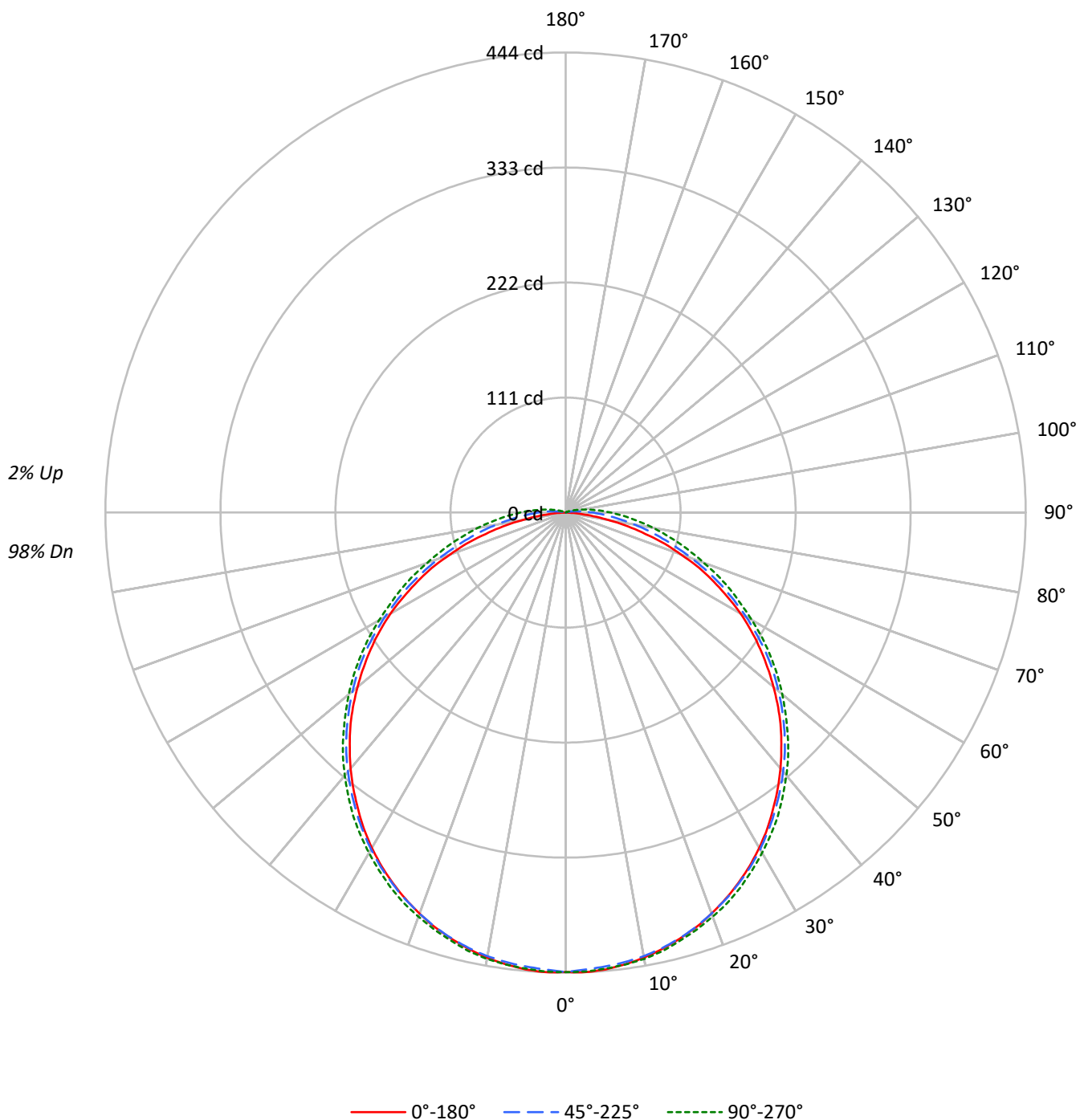
Input Watts (W): 16.3  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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°  | 7161 | 7161 | 7161 |
| 5°  | 7070 | 6949 | 7007 |
| 10° | 6947 | 6773 | 6868 |
| 15° | 6812 | 6589 | 6699 |
| 20° | 6672 | 6390 | 6536 |
| 25° | 6521 | 6190 | 6369 |
| 30° | 6355 | 5981 | 6179 |
| 35° | 6163 | 5755 | 5993 |
| 40° | 5965 | 5521 | 5774 |
| 45° | 5750 | 5270 | 5538 |
| 50° | 5492 | 4988 | 5285 |
| 55° | 5213 | 4681 | 5005 |
| 60° | 4889 | 4302 | 4678 |
| 65° | 4435 | 3881 | 4355 |
| 70° | 3840 | 3402 | 3979 |
| 75° | 3069 | 2882 | 3637 |
| 80° | 2060 | 2374 | 3326 |
| 85° | 880  | 1857 | 3025 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 5750 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 42.0   | 3.1       |
| 10°-20°   | 120.4  | 9.0       |
| 20°-30°   | 182.7  | 13.6      |
| 30°-40°   | 220.9  | 16.5      |
| 40°-50°   | 230.5  | 17.2      |
| 50°-60°   | 210.7  | 15.7      |
| 60°-70°   | 164.3  | 12.2      |
| 70°-80°   | 102.8  | 7.7       |
| 80°-90°   | 46.7   | 3.5       |
| 90°-100°  | 15.6   | 1.2       |
| 100°-110° | 3.9    | 0.3       |
| 110°-120° | 0.6    | 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       |
| 0°-30°    | 345.0  | 25.7      |
| 0°-40°    | 565.9  | 42.2      |
| 0°-60°    | 1007.1 | 75.1      |
| 0°-90°    | 1320.8 | 98.5      |
| 90°-120°  | 20.2   | 1.5       |
| 90°-150°  | 20.2   | 1.5       |
| 90°-180°  | 20.0   | 1.5       |
| 0°-180°   | 1341.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 444 | 444   | 444 | 444   | 444 |      |
| 5°   | 443 | 442   | 440 | 442   | 442 | 42   |
| 15°  | 426 | 426   | 425 | 428   | 428 | 120  |
| 25°  | 394 | 395   | 395 | 399   | 399 | 182  |
| 35°  | 349 | 351   | 352 | 356   | 357 | 219  |
| 45°  | 294 | 296   | 299 | 302   | 303 | 226  |
| 55°  | 229 | 232   | 236 | 240   | 241 | 205  |
| 65°  | 158 | 160   | 166 | 172   | 175 | 156  |
| 75°  | 80  | 85    | 97  | 109   | 113 | 85   |
| 85°  | 14  | 26    | 44  | 58    | 63  | 17   |
| 90°  | 0   | 10    | 26  | 39    | 44  | 1    |
| 95°  | 0   | 2     | 13  | 24    | 28  | 0    |
| 105° | 0   | 0     | 2   | 6     | 9   | 0    |
| 115° | 0   | 0     | 0   | 1     | 2   | 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°     | 443.5 | 443.5 | 443.5 | 443.5 | 443.5 |
| 2.5°   | 444.0 | 443.4 | 441.4 | 443.4 | 443.3 |
| 5°     | 442.6 | 441.7 | 439.8 | 441.8 | 441.8 |
| 7.5°   | 439.7 | 439.3 | 437.6 | 440.0 | 440.0 |
| 10°    | 436.2 | 436.1 | 434.6 | 437.2 | 437.4 |
| 12.5°  | 431.4 | 431.8 | 430.5 | 433.0 | 433.3 |
| 15°    | 425.7 | 426.5 | 425.3 | 427.7 | 427.6 |
| 17.5°  | 419.6 | 420.0 | 419.2 | 421.9 | 421.8 |
| 20°    | 411.9 | 412.5 | 411.8 | 414.7 | 415.0 |
| 22.5°  | 403.5 | 404.2 | 404.1 | 407.0 | 407.9 |
| 25°    | 394.5 | 394.8 | 395.2 | 398.6 | 399.2 |
| 27.5°  | 384.6 | 385.1 | 385.8 | 388.8 | 389.5 |
| 30°    | 373.7 | 374.5 | 375.4 | 378.5 | 379.3 |
| 32.5°  | 362.2 | 363.0 | 364.1 | 368.1 | 368.6 |
| 35°    | 349.2 | 350.8 | 352.2 | 355.8 | 357.3 |
| 37.5°  | 336.2 | 338.2 | 339.6 | 343.4 | 344.5 |
| 40°    | 322.6 | 324.5 | 326.7 | 330.7 | 331.4 |
| 42.5°  | 308.2 | 310.5 | 313.1 | 316.7 | 318.0 |
| 45°    | 293.8 | 296.4 | 298.8 | 301.7 | 303.2 |
| 47.5°  | 278.2 | 280.8 | 283.8 | 287.1 | 288.0 |
| 50°    | 262.1 | 265.2 | 268.3 | 271.4 | 273.1 |
| 52.5°  | 245.6 | 249.3 | 252.8 | 256.2 | 257.7 |
| 55°    | 229.3 | 232.0 | 236.3 | 239.7 | 241.3 |
| 57.5°  | 212.4 | 214.7 | 218.5 | 224.2 | 225.0 |
| 60°    | 195.1 | 197.2 | 201.2 | 205.8 | 207.6 |
| 62.5°  | 176.1 | 178.9 | 183.1 | 188.9 | 190.6 |
| 65°    | 157.6 | 160.3 | 165.8 | 172.4 | 175.1 |
| 67.5°  | 139.7 | 140.6 | 147.7 | 154.6 | 159.0 |
| 70°    | 118.6 | 122.1 | 130.4 | 138.8 | 142.2 |
| 72.5°  | 100.4 | 103.9 | 113.0 | 123.0 | 127.1 |
| 75°    | 79.8  | 84.7  | 97.0  | 108.6 | 112.7 |
| 77.5°  | 61.7  | 67.1  | 82.4  | 94.1  | 98.8  |
| 80°    | 43.1  | 51.5  | 68.2  | 81.3  | 86.5  |
| 82.5°  | 27.1  | 37.5  | 55.3  | 69.1  | 73.6  |
| 85°    | 13.8  | 25.5  | 43.8  | 57.9  | 63.0  |
| 87.5°  | 3.7   | 16.5  | 34.1  | 47.6  | 52.8  |
| 90°    | 0.1   | 9.5   | 25.8  | 38.8  | 43.5  |
| 92.5°  | 0.1   | 5.3   | 19.2  | 30.8  | 35.7  |
| 95°    | 0.1   | 2.5   | 13.4  | 24.3  | 28.0  |
| 97.5°  | 0.1   | 1.0   | 9.2   | 18.3  | 22.1  |
| 100°   | 0.1   | 0.5   | 5.9   | 13.3  | 16.5  |
| 102.5° | 0.2   | 0.3   | 3.7   | 9.5   | 12.1  |
| 105°   | 0.2   | 0.3   | 2.2   | 6.5   | 8.7   |
| 107.5° | 0.2   | 0.3   | 1.3   | 4.4   | 6.0   |
| 110°   | 0.3   | 0.3   | 0.7   | 2.7   | 4.0   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.3 | 0.3   | 0.4 | 1.8   | 2.6 |
| 115°   | 0.3 | 0.3   | 0.4 | 1.2   | 1.7 |
| 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)