

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: P518090

Luminaire Tested: HVL8-4-LD4-2LO-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: P518090  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-2LO-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: 4384.0 lumens  
Efficiency: N/A  
Efficacy: 95.1 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

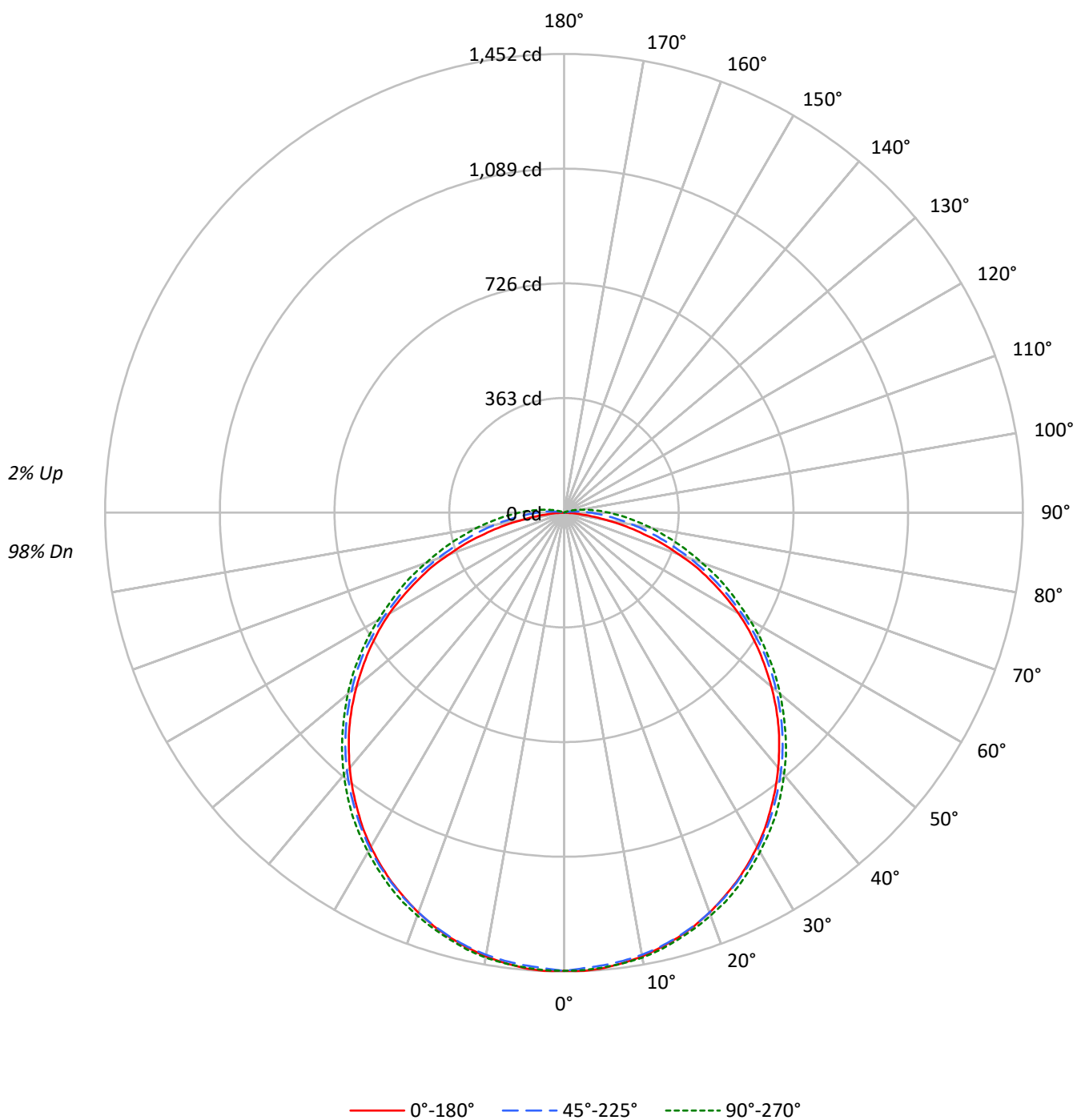
Input Watts (W): 46.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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°  | 5853 | 5853 | 5853 |
| 5°  | 5841 | 5722 | 5728 |
| 10° | 5802 | 5619 | 5613 |
| 15° | 5752 | 5506 | 5475 |
| 20° | 5698 | 5380 | 5341 |
| 25° | 5635 | 5249 | 5205 |
| 30° | 5560 | 5111 | 5051 |
| 35° | 5466 | 4958 | 4898 |
| 40° | 5369 | 4798 | 4719 |
| 45° | 5264 | 4623 | 4527 |
| 50° | 5126 | 4421 | 4319 |
| 55° | 4979 | 4199 | 4091 |
| 60° | 4802 | 3911 | 3824 |
| 65° | 4516 | 3590 | 3559 |
| 70° | 4104 | 3210 | 3252 |
| 75° | 3520 | 2795 | 2973 |
| 80° | 2647 | 2388 | 2718 |
| 85° | 1415 | 1975 | 2474 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 5264 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 137.2  | 3.1       |
| 10°-20°   | 393.6  | 9.0       |
| 20°-30°   | 597.2  | 13.6      |
| 30°-40°   | 722.1  | 16.5      |
| 40°-50°   | 753.5  | 17.2      |
| 50°-60°   | 688.9  | 15.7      |
| 60°-70°   | 537.0  | 12.2      |
| 70°-80°   | 335.9  | 7.7       |
| 80°-90°   | 152.6  | 3.5       |
| 90°-100°  | 51.1   | 1.2       |
| 100°-110° | 12.8   | 0.3       |
| 110°-120° | 2.0    | 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°    | 1128.0 | 25.7      |
| 0°-40°    | 1850.1 | 42.2      |
| 0°-60°    | 3292.5 | 75.1      |
| 0°-90°    | 4318.0 | 98.5      |
| 90°-120°  | 66.0   | 1.5       |
| 90°-150°  | 66.0   | 1.5       |
| 90°-180°  | 66.0   | 1.5       |
| 0°-180°   | 4384.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1450 | 1450  | 1450 | 1450  | 1450 |      |
| 5°   | 1447 | 1444  | 1438 | 1444  | 1444 | 137  |
| 15°  | 1392 | 1394  | 1390 | 1398  | 1398 | 393  |
| 25°  | 1290 | 1291  | 1292 | 1303  | 1305 | 594  |
| 35°  | 1142 | 1147  | 1152 | 1163  | 1168 | 715  |
| 45°  | 960  | 969   | 977  | 986   | 991  | 740  |
| 55°  | 750  | 758   | 772  | 784   | 789  | 670  |
| 65°  | 515  | 524   | 542  | 564   | 572  | 510  |
| 75°  | 261  | 277   | 317  | 355   | 368  | 278  |
| 85°  | 45   | 83    | 143  | 189   | 206  | 57   |
| 90°  | 0    | 31    | 84   | 127   | 142  | 2    |
| 95°  | 0    | 8     | 44   | 79    | 92   | 0    |
| 105° | 1    | 1     | 7    | 21    | 28   | 1    |
| 115° | 1    | 1     | 1    | 4     | 6    | 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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CATALOG NUMBER: HVL8-4-LD4-2LO-50-UNV-O-EDD

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1450.0 | 1450.0 | 1450.0 | 1450.0 | 1450.0 |
| 2.5°   | 1451.7 | 1449.6 | 1443.1 | 1449.6 | 1449.3 |
| 5°     | 1446.9 | 1444.2 | 1437.7 | 1444.5 | 1444.5 |
| 7.5°   | 1437.3 | 1436.3 | 1430.5 | 1438.3 | 1438.3 |
| 10°    | 1426.0 | 1425.7 | 1420.9 | 1429.5 | 1429.8 |
| 12.5°  | 1410.3 | 1411.7 | 1407.2 | 1415.4 | 1416.5 |
| 15°    | 1391.9 | 1394.2 | 1390.5 | 1398.3 | 1398.0 |
| 17.5°  | 1371.7 | 1373.1 | 1370.3 | 1379.2 | 1378.9 |
| 20°    | 1346.7 | 1348.4 | 1346.4 | 1355.6 | 1356.6 |
| 22.5°  | 1319.0 | 1321.4 | 1321.1 | 1330.7 | 1333.4 |
| 25°    | 1289.7 | 1290.7 | 1292.0 | 1303.0 | 1305.0 |
| 27.5°  | 1257.2 | 1258.9 | 1261.3 | 1271.2 | 1273.2 |
| 30°    | 1221.6 | 1224.4 | 1227.1 | 1237.4 | 1240.1 |
| 32.5°  | 1184.0 | 1186.8 | 1190.2 | 1203.5 | 1204.9 |
| 35°    | 1141.6 | 1146.8 | 1151.6 | 1163.2 | 1168.0 |
| 37.5°  | 1099.3 | 1105.8 | 1110.2 | 1122.5 | 1126.3 |
| 40°    | 1054.5 | 1061.0 | 1068.2 | 1081.1 | 1083.5 |
| 42.5°  | 1007.7 | 1015.2 | 1023.7 | 1035.3 | 1039.4 |
| 45°    | 960.5  | 969.0  | 976.9  | 986.5  | 991.3  |
| 47.5°  | 909.6  | 918.1  | 927.7  | 938.6  | 941.7  |
| 50°    | 856.9  | 866.8  | 877.1  | 887.3  | 892.8  |
| 52.5°  | 802.9  | 814.9  | 826.5  | 837.4  | 842.6  |
| 55°    | 749.6  | 758.5  | 772.5  | 783.8  | 788.9  |
| 57.5°  | 694.2  | 701.7  | 714.4  | 732.8  | 735.6  |
| 60°    | 637.8  | 644.7  | 657.6  | 672.7  | 678.8  |
| 62.5°  | 575.6  | 584.8  | 598.5  | 617.7  | 623.1  |
| 65°    | 515.1  | 524.0  | 542.1  | 563.6  | 572.5  |
| 67.5°  | 456.7  | 459.7  | 483.0  | 505.5  | 519.9  |
| 70°    | 387.6  | 399.2  | 426.2  | 453.9  | 464.9  |
| 72.5°  | 328.1  | 339.8  | 369.5  | 402.0  | 415.6  |
| 75°    | 260.8  | 276.9  | 317.2  | 355.1  | 368.5  |
| 77.5°  | 201.7  | 219.4  | 269.3  | 307.6  | 323.0  |
| 80°    | 140.8  | 168.5  | 222.9  | 265.9  | 282.7  |
| 82.5°  | 88.5   | 122.7  | 180.8  | 225.9  | 240.6  |
| 85°    | 45.1   | 83.4   | 143.2  | 189.4  | 206.1  |
| 87.5°  | 12.0   | 54.0   | 111.4  | 155.5  | 172.6  |
| 90°    | 0.3    | 31.1   | 84.4   | 126.8  | 142.2  |
| 92.5°  | 0.3    | 17.4   | 62.9   | 100.8  | 116.6  |
| 95°    | 0.3    | 8.2    | 43.8   | 79.3   | 91.6   |
| 97.5°  | 0.3    | 3.4    | 30.1   | 59.8   | 72.1   |
| 100°   | 0.3    | 1.7    | 19.1   | 43.4   | 54.0   |
| 102.5° | 0.7    | 1.0    | 12.0   | 31.1   | 39.7   |
| 105°   | 0.7    | 1.0    | 7.2    | 21.2   | 28.4   |
| 107.5° | 0.7    | 1.0    | 4.1    | 14.4   | 19.5   |
| 110°   | 1.0    | 1.0    | 2.4    | 8.9    | 13.0   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 1.0 | 1.0   | 1.4 | 5.8   | 8.5 |
| 115°   | 1.0 | 1.0   | 1.4 | 3.8   | 5.5 |
| 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)