

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: P518001

Luminaire Tested: HVL8-2-LD4-3STD-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: P518001  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-2-LD4-3STD-35-UNV-O-EDD-90  
Description: 2 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4983.0 lumens  
Efficiency: N/A  
Efficacy: 104.2 lumens/watt  
Spacing Criteria (0/90/45): 1.25 / 1.27 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 2' x H: 0.17')  
CIE Type: Direct

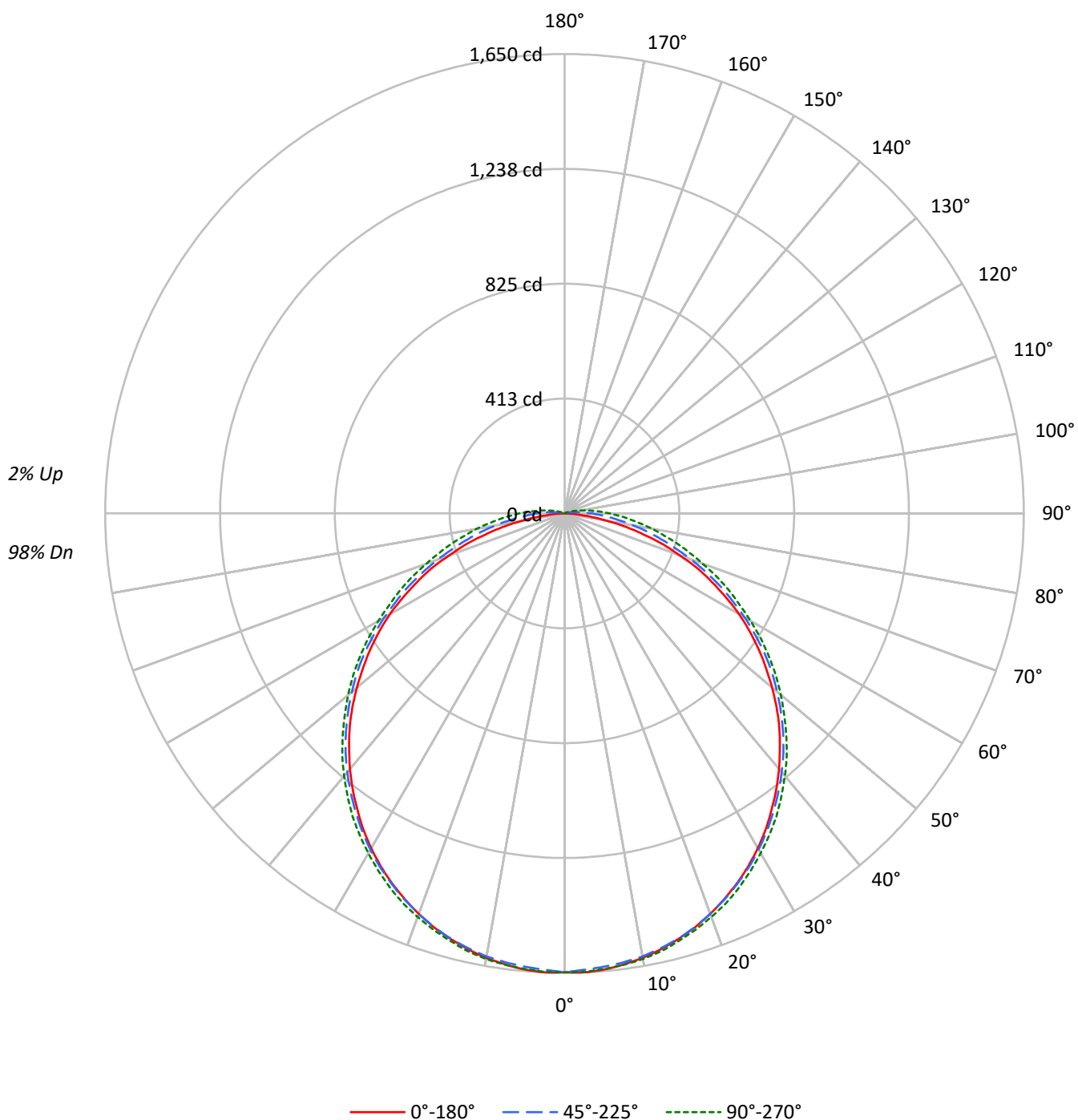
Input Watts (W): 47.8  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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°  | 13305 | 13305 | 13305 |
| 5°  | 13231 | 12975 | 13021 |
| 10° | 13095 | 12711 | 12760 |
| 15° | 12933 | 12425 | 12446 |
| 20° | 12763 | 12109 | 12142 |
| 25° | 12569 | 11786 | 11833 |
| 30° | 12349 | 11444 | 11482 |
| 35° | 12083 | 11072 | 11134 |
| 40° | 11806 | 10682 | 10728 |
| 45° | 11505 | 10259 | 10290 |
| 50° | 11127 | 9774  | 9819  |
| 55° | 10716 | 9245  | 9300  |
| 60° | 10229 | 8570  | 8693  |
| 65° | 9488  | 7818  | 8092  |
| 70° | 8462  | 6941  | 7393  |
| 75° | 7052  | 5982  | 6757  |
| 80° | 5054  | 5039  | 6177  |
| 85° | 2433  | 4081  | 5625  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 11505 cd/sqm

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CATALOG NUMBER: HVL8-2-LD4-3STD-35-UNV-O-EDD-90

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 156.0  | 3.1       |
| 10°-20°   | 447.4  | 9.0       |
| 20°-30°   | 678.8  | 13.6      |
| 30°-40°   | 820.8  | 16.5      |
| 40°-50°   | 856.4  | 17.2      |
| 50°-60°   | 783.0  | 15.7      |
| 60°-70°   | 610.4  | 12.2      |
| 70°-80°   | 381.8  | 7.7       |
| 80°-90°   | 173.4  | 3.5       |
| 90°-100°  | 58.1   | 1.2       |
| 100°-110° | 14.6   | 0.3       |
| 110°-120° | 2.3    | 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°    | 1282.1 | 25.7      |
| 0°-40°    | 2102.9 | 42.2      |
| 0°-60°    | 3742.3 | 75.1      |
| 0°-90°    | 4908.0 | 98.5      |
| 90°-120°  | 75.0   | 1.5       |
| 90°-150°  | 75.0   | 1.5       |
| 90°-180°  | 75.0   | 1.5       |
| 0°-180°   | 4983.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1648 | 1648  | 1648 | 1648  | 1648 |      |
| 5°   | 1645 | 1642  | 1634 | 1642  | 1642 | 156  |
| 15°  | 1582 | 1585  | 1580 | 1589  | 1589 | 447  |
| 25°  | 1466 | 1467  | 1469 | 1481  | 1483 | 675  |
| 35°  | 1298 | 1304  | 1309 | 1322  | 1328 | 812  |
| 45°  | 1092 | 1101  | 1110 | 1121  | 1127 | 841  |
| 55°  | 852  | 862   | 878  | 891   | 897  | 761  |
| 65°  | 586  | 596   | 616  | 641   | 651  | 579  |
| 75°  | 296  | 315   | 360  | 404   | 419  | 316  |
| 85°  | 51   | 95    | 163  | 215   | 234  | 65   |
| 90°  | 0    | 35    | 96   | 144   | 162  | 2    |
| 95°  | 0    | 9     | 50   | 90    | 104  | 0    |
| 105° | 1    | 1     | 8    | 24    | 32   | 1    |
| 115° | 1    | 1     | 2    | 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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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1648.1 | 1648.1 | 1648.1 | 1648.1 | 1648.1 |
| 2.5°   | 1650.0 | 1647.7 | 1640.3 | 1647.7 | 1647.3 |
| 5°     | 1644.6 | 1641.5 | 1634.1 | 1641.9 | 1641.9 |
| 7.5°   | 1633.7 | 1632.5 | 1625.9 | 1634.9 | 1634.9 |
| 10°    | 1620.9 | 1620.5 | 1615.1 | 1624.8 | 1625.2 |
| 12.5°  | 1603.0 | 1604.6 | 1599.5 | 1608.8 | 1610.0 |
| 15°    | 1582.0 | 1584.7 | 1580.5 | 1589.4 | 1589.0 |
| 17.5°  | 1559.1 | 1560.7 | 1557.6 | 1567.7 | 1567.3 |
| 20°    | 1530.7 | 1532.7 | 1530.4 | 1540.8 | 1542.0 |
| 22.5°  | 1499.3 | 1502.0 | 1501.6 | 1512.5 | 1515.6 |
| 25°    | 1465.9 | 1467.0 | 1468.6 | 1481.0 | 1483.3 |
| 27.5°  | 1429.0 | 1430.9 | 1433.6 | 1444.9 | 1447.2 |
| 30°    | 1388.5 | 1391.7 | 1394.8 | 1406.4 | 1409.5 |
| 32.5°  | 1345.8 | 1348.9 | 1352.8 | 1368.0 | 1369.5 |
| 35°    | 1297.6 | 1303.5 | 1308.9 | 1322.1 | 1327.6 |
| 37.5°  | 1249.5 | 1256.8 | 1261.9 | 1275.9 | 1280.2 |
| 40°    | 1198.6 | 1205.9 | 1214.1 | 1228.9 | 1231.6 |
| 42.5°  | 1145.3 | 1153.9 | 1163.6 | 1176.8 | 1181.5 |
| 45°    | 1091.7 | 1101.4 | 1110.4 | 1121.3 | 1126.7 |
| 47.5°  | 1033.8 | 1043.5 | 1054.4 | 1066.9 | 1070.4 |
| 50°    | 974.0  | 985.3  | 996.9  | 1008.6 | 1014.8 |
| 52.5°  | 912.6  | 926.2  | 939.4  | 951.9  | 957.7  |
| 55°    | 852.0  | 862.1  | 878.0  | 890.9  | 896.7  |
| 57.5°  | 789.1  | 797.6  | 812.0  | 833.0  | 836.1  |
| 60°    | 725.0  | 732.7  | 747.5  | 764.6  | 771.6  |
| 62.5°  | 654.3  | 664.7  | 680.3  | 702.0  | 708.3  |
| 65°    | 585.5  | 595.6  | 616.2  | 640.7  | 650.8  |
| 67.5°  | 519.1  | 522.6  | 549.0  | 574.6  | 590.9  |
| 70°    | 440.6  | 453.8  | 484.5  | 515.9  | 528.4  |
| 72.5°  | 373.0  | 386.2  | 420.0  | 456.9  | 472.4  |
| 75°    | 296.4  | 314.7  | 360.5  | 403.7  | 418.8  |
| 77.5°  | 229.2  | 249.4  | 306.1  | 349.7  | 367.1  |
| 80°    | 160.1  | 191.5  | 253.3  | 302.3  | 321.3  |
| 82.5°  | 100.6  | 139.5  | 205.5  | 256.8  | 273.5  |
| 85°    | 51.3   | 94.8   | 162.8  | 215.2  | 234.3  |
| 87.5°  | 13.6   | 61.4   | 126.7  | 176.8  | 196.2  |
| 90°    | 0.4    | 35.4   | 96.0   | 144.1  | 161.6  |
| 92.5°  | 0.4    | 19.8   | 71.5   | 114.6  | 132.5  |
| 95°    | 0.4    | 9.3    | 49.7   | 90.1   | 104.1  |
| 97.5°  | 0.4    | 3.9    | 34.2   | 68.0   | 82.0   |
| 100°   | 0.4    | 1.9    | 21.8   | 49.3   | 61.4   |
| 102.5° | 0.8    | 1.2    | 13.6   | 35.4   | 45.1   |
| 105°   | 0.8    | 1.2    | 8.2    | 24.1   | 32.2   |
| 107.5° | 0.8    | 1.2    | 4.7    | 16.3   | 22.1   |
| 110°   | 1.2    | 1.2    | 2.7    | 10.1   | 14.8   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 1.2 | 1.2   | 1.6 | 6.6   | 9.7 |
| 115°   | 1.2 | 1.2   | 1.6 | 4.3   | 6.2 |
| 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)