

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: P517443

Luminaire Tested: HVL12-4-LD4-1HI-40-UNV-C-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: P517443  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-4-LD4-1HI-40-UNV-C-EDD-90  
Description: 4 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4987.0 lumens  
Efficiency: N/A  
Efficacy: 113.1 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 1' x L: 4' x H: 0.17')  
CIE Type: Direct

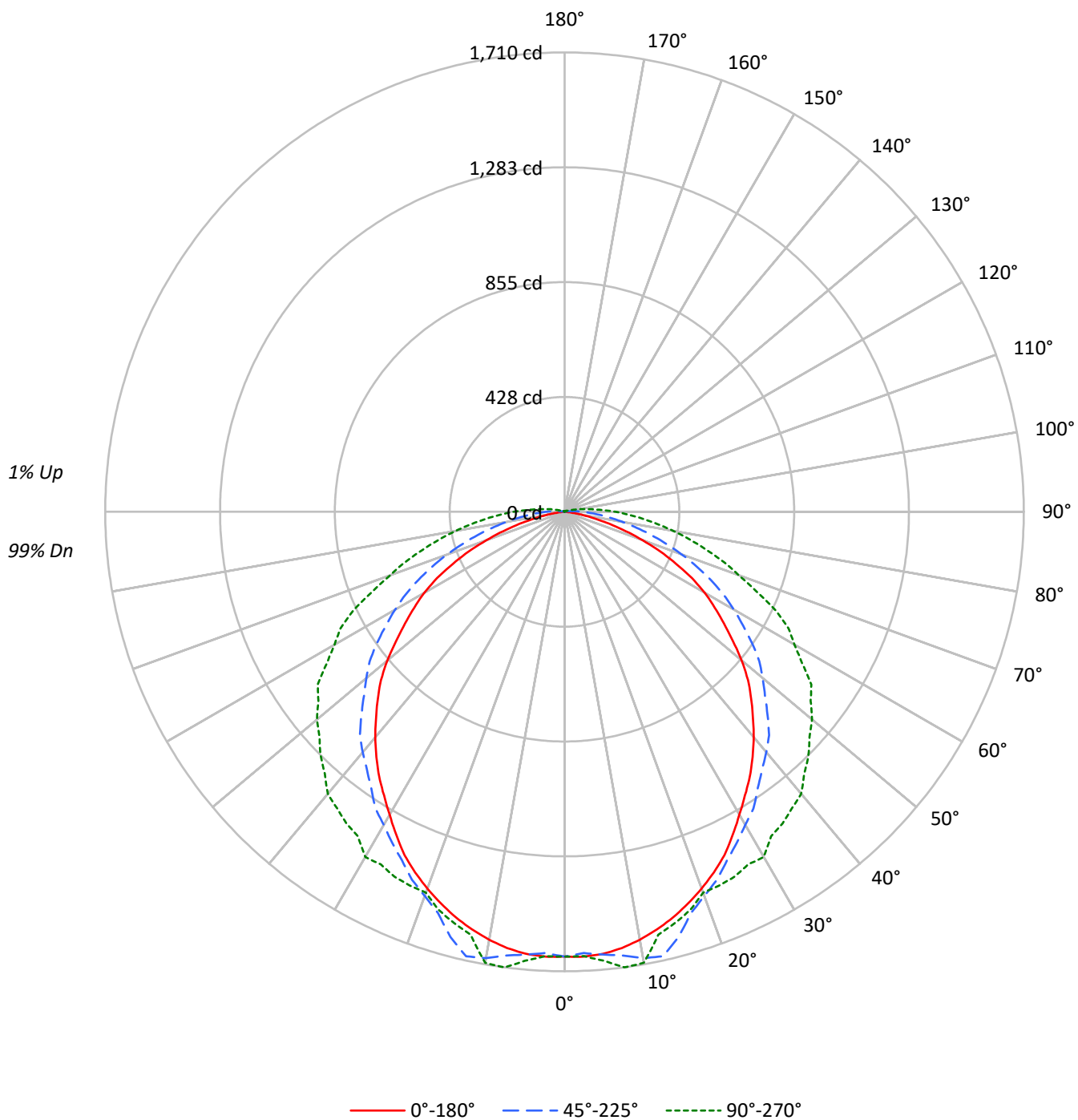
Input Watts (W): 44.1  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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  | 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°  | 4455 | 4455 | 4455 |
| 5°  | 4445 | 4410 | 4465 |
| 10° | 4386 | 4492 | 4524 |
| 15° | 4306 | 4392 | 4228 |
| 20° | 4209 | 4135 | 4072 |
| 25° | 4106 | 3977 | 4128 |
| 30° | 3951 | 3853 | 4205 |
| 35° | 3840 | 3737 | 4163 |
| 40° | 3720 | 3655 | 4225 |
| 45° | 3591 | 3545 | 4189 |
| 50° | 3435 | 3429 | 4201 |
| 55° | 3206 | 3304 | 4250 |
| 60° | 3030 | 3124 | 4128 |
| 65° | 2679 | 2906 | 4067 |
| 70° | 2186 | 2612 | 3729 |
| 75° | 1559 | 2247 | 3506 |
| 80° | 875  | 1879 | 3283 |
| 85° | 324  | 1501 | 3089 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 4250 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 159.1  | 3.2       |
| 10°-20°   | 453.1  | 9.1       |
| 20°-30°   | 674.1  | 13.5      |
| 30°-40°   | 810.3  | 16.2      |
| 40°-50°   | 852.9  | 17.1      |
| 50°-60°   | 791.4  | 15.9      |
| 60°-70°   | 625.7  | 12.5      |
| 70°-80°   | 382.2  | 7.7       |
| 80°-90°   | 166.5  | 3.3       |
| 90°-100°  | 51.8   | 1.0       |
| 100°-110° | 11.7   | 0.2       |
| 110°-120° | 4.7    | 0.1       |
| 120°-130° | 2.6    | 0.1       |
| 130°-140° | 0.7    | 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°    | 1286.3 | 25.8      |
| 0°-40°    | 2096.7 | 42.0      |
| 0°-60°    | 3741.0 | 75.0      |
| 0°-90°    | 4915.5 | 98.6      |
| 90°-120°  | 68.2   | 1.4       |
| 90°-150°  | 71.5   | 1.4       |
| 90°-180°  | 72.0   | 1.4       |
| 0°-180°   | 4987.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1655 | 1655  | 1655 | 1655  | 1655 |      |
| 5°   | 1651 | 1648  | 1654 | 1672  | 1677 | 157  |
| 15°  | 1563 | 1623  | 1639 | 1585  | 1586 | 440  |
| 25°  | 1410 | 1500  | 1432 | 1474  | 1498 | 647  |
| 35°  | 1203 | 1236  | 1255 | 1369  | 1415 | 752  |
| 45°  | 983  | 987   | 1069 | 1238  | 1284 | 758  |
| 55°  | 724  | 736   | 852  | 1039  | 1122 | 651  |
| 65°  | 458  | 473   | 601  | 795   | 867  | 454  |
| 75°  | 173  | 230   | 335  | 515   | 547  | 189  |
| 85°  | 16   | 54    | 130  | 253   | 291  | 24   |
| 90°  | 0    | 16    | 68   | 160   | 189  | 1    |
| 95°  | 0    | 4     | 30   | 88    | 108  | 0    |
| 105° | 0    | 2     | 6    | 17    | 24   | 0    |
| 115° | 0    | 1     | 5    | 8     | 8    | 1    |
| 125° | 0    | 1     | 2    | 5     | 7    | 1    |
| 135° | 1    | 1     | 1    | 2     | 2    | 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°     | 1655.4 | 1655.4 | 1655.4 | 1655.4 | 1655.4 |
| 2.5°   | 1657.4 | 1653.1 | 1643.9 | 1652.7 | 1655.1 |
| 5°     | 1651.4 | 1648.0 | 1653.7 | 1672.3 | 1677.0 |
| 7.5°   | 1637.5 | 1650.4 | 1665.5 | 1699.3 | 1710.0 |
| 10°    | 1617.0 | 1641.2 | 1686.8 | 1715.4 | 1704.3 |
| 12.5°  | 1592.0 | 1633.2 | 1694.2 | 1638.2 | 1612.2 |
| 15°    | 1563.0 | 1623.0 | 1638.9 | 1584.6 | 1585.6 |
| 17.5°  | 1529.0 | 1614.6 | 1565.7 | 1564.4 | 1554.6 |
| 20°    | 1492.2 | 1586.3 | 1521.5 | 1518.8 | 1508.4 |
| 22.5°  | 1452.7 | 1548.9 | 1482.4 | 1477.0 | 1505.3 |
| 25°    | 1409.9 | 1500.0 | 1431.5 | 1474.3 | 1498.3 |
| 27.5°  | 1356.3 | 1435.9 | 1389.0 | 1449.7 | 1479.7 |
| 30°    | 1302.0 | 1369.8 | 1345.5 | 1430.1 | 1483.4 |
| 32.5°  | 1251.1 | 1300.7 | 1309.8 | 1422.7 | 1431.5 |
| 35°    | 1202.9 | 1236.2 | 1254.8 | 1368.8 | 1415.3 |
| 37.5°  | 1149.9 | 1159.0 | 1208.3 | 1346.2 | 1391.0 |
| 40°    | 1096.0 | 1090.2 | 1169.1 | 1309.1 | 1371.1 |
| 42.5°  | 1038.0 | 1035.9 | 1127.7 | 1290.5 | 1321.6 |
| 45°    | 983.0  | 987.4  | 1068.7 | 1237.9 | 1284.1 |
| 47.5°  | 926.7  | 932.4  | 1012.7 | 1180.3 | 1237.6 |
| 50°    | 861.3  | 868.7  | 962.8  | 1129.0 | 1202.9 |
| 52.5°  | 790.4  | 804.6  | 914.2  | 1080.5 | 1155.0 |
| 55°    | 724.0  | 735.8  | 852.5  | 1039.0 | 1121.6 |
| 57.5°  | 663.3  | 670.4  | 788.8  | 986.7  | 1049.1 |
| 60°    | 603.6  | 605.3  | 728.7  | 928.7  | 988.4  |
| 62.5°  | 535.2  | 538.2  | 667.0  | 860.2  | 940.2  |
| 65°    | 458.3  | 472.8  | 600.6  | 794.8  | 867.0  |
| 67.5°  | 386.5  | 411.7  | 532.8  | 734.8  | 772.6  |
| 70°    | 309.6  | 352.4  | 466.4  | 664.3  | 691.0  |
| 72.5°  | 239.1  | 289.3  | 398.3  | 585.4  | 622.8  |
| 75°    | 173.3  | 229.6  | 334.9  | 514.6  | 547.0  |
| 77.5°  | 116.7  | 174.0  | 275.5  | 436.4  | 479.2  |
| 80°    | 69.8   | 127.1  | 222.6  | 363.9  | 412.1  |
| 82.5°  | 35.7   | 85.3   | 172.7  | 305.2  | 348.3  |
| 85°    | 15.5   | 54.0   | 130.5  | 253.3  | 290.7  |
| 87.5°  | 4.4    | 30.7   | 96.1   | 204.7  | 236.4  |
| 90°    | 0.3    | 16.2   | 68.5   | 160.5  | 189.2  |
| 92.5°  | 0.3    | 7.8    | 48.2   | 121.4  | 143.3  |
| 95°    | 0.3    | 4.0    | 30.0   | 88.0   | 107.6  |
| 97.5°  | 0.3    | 2.4    | 18.2   | 62.4   | 78.9   |
| 100°   | 0.3    | 2.0    | 10.8   | 41.5   | 56.3   |
| 102.5° | 0.3    | 2.4    | 7.4    | 26.3   | 36.8   |
| 105°   | 0.3    | 2.4    | 6.1    | 17.2   | 24.3   |
| 107.5° | 0.7    | 2.4    | 5.4    | 12.8   | 16.9   |
| 110°   | 0.3    | 2.0    | 5.7    | 9.8    | 13.2   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.7 | 1.7   | 5.4 | 8.1   | 9.8 |
| 115°   | 0.3 | 1.3   | 4.7 | 7.8   | 8.1 |
| 117.5° | 0.7 | 1.0   | 3.7 | 7.8   | 8.1 |
| 120°   | 0.7 | 0.7   | 3.0 | 7.4   | 8.4 |
| 122.5° | 0.7 | 0.7   | 2.4 | 6.7   | 8.1 |
| 125°   | 0.3 | 0.7   | 2.0 | 5.1   | 7.1 |
| 127.5° | 0.7 | 0.7   | 1.7 | 4.0   | 5.4 |
| 130°   | 0.7 | 0.7   | 1.3 | 3.0   | 4.0 |
| 132.5° | 0.7 | 0.7   | 1.0 | 2.4   | 3.0 |
| 135°   | 0.7 | 0.7   | 0.7 | 1.7   | 2.4 |
| 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)