

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: P518098

Luminaire Tested: HVL8-4-LD4-2STD-35-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: P518098  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-2STD-35-UNV-O-EDD  
Description: 4 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 5288.0 lumens  
Efficiency: N/A  
Efficacy: 80.9 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

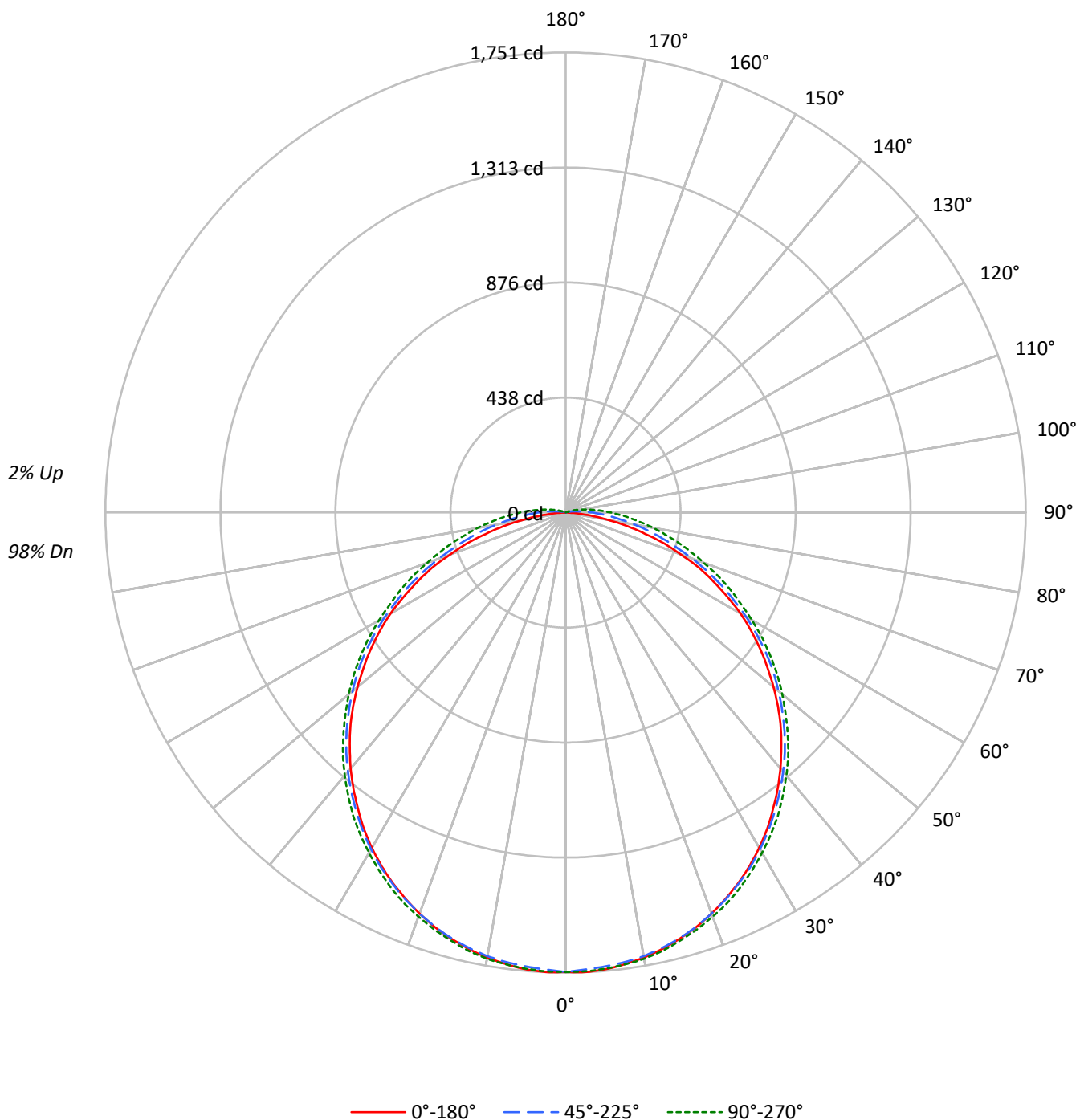
Input Watts (W): 65.4  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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  |     |     |  | 0  |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  |  | 50  | 30  | 10  |  | 0  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |    |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 110 | 110 | 110 |  | 105 | 105 | 105 |  | 98 |
| 1   | 108 | 102 | 98  | 94  | 105 | 100 | 96  | 92  | 95  | 92  | 89  |  | 91  | 88  | 86  |  | 81 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 77  | 73  |  | 79  | 75  | 71  |  | 67 |
| 3   | 89  | 78  | 69  | 63  | 86  | 76  | 68  | 62  | 73  | 66  | 61  |  | 70  | 64  | 59  |  | 56 |
| 4   | 81  | 69  | 60  | 53  | 79  | 67  | 59  | 52  | 65  | 57  | 52  |  | 62  | 56  | 51  |  | 47 |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 52  | 45  | 58  | 50  | 44  |  | 56  | 49  | 44  |  | 41 |
| 6   | 69  | 55  | 46  | 40  | 67  | 54  | 46  | 39  | 52  | 45  | 39  |  | 50  | 44  | 38  |  | 36 |
| 7   | 64  | 50  | 41  | 35  | 62  | 49  | 41  | 35  | 47  | 40  | 34  |  | 46  | 39  | 34  |  | 32 |
| 8   | 59  | 46  | 37  | 31  | 58  | 45  | 37  | 31  | 43  | 36  | 31  |  | 42  | 35  | 30  |  | 28 |
| 9   | 55  | 42  | 34  | 28  | 54  | 41  | 33  | 28  | 40  | 33  | 28  |  | 39  | 32  | 27  |  | 25 |
| 10  | 52  | 39  | 31  | 25  | 51  | 38  | 30  | 25  | 37  | 30  | 25  |  | 36  | 29  | 25  |  | 23 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 7060 | 7060 | 7060 |
| 5°  | 7046 | 6902 | 6909 |
| 10° | 6999 | 6778 | 6770 |
| 15° | 6938 | 6642 | 6604 |
| 20° | 6873 | 6489 | 6443 |
| 25° | 6796 | 6332 | 6279 |
| 30° | 6706 | 6164 | 6092 |
| 35° | 6593 | 5981 | 5908 |
| 40° | 6475 | 5787 | 5693 |
| 45° | 6349 | 5576 | 5460 |
| 50° | 6184 | 5332 | 5210 |
| 55° | 6006 | 5065 | 4935 |
| 60° | 5792 | 4718 | 4612 |
| 65° | 5447 | 4330 | 4294 |
| 70° | 4951 | 3873 | 3923 |
| 75° | 4246 | 3371 | 3586 |
| 80° | 3194 | 2880 | 3278 |
| 85° | 1707 | 2383 | 2984 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 6349 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 165.5  | 3.1       |
| 10°-20°   | 474.7  | 9.0       |
| 20°-30°   | 720.3  | 13.6      |
| 30°-40°   | 871.0  | 16.5      |
| 40°-50°   | 908.8  | 17.2      |
| 50°-60°   | 831.0  | 15.7      |
| 60°-70°   | 647.8  | 12.2      |
| 70°-80°   | 405.2  | 7.7       |
| 80°-90°   | 184.0  | 3.5       |
| 90°-100°  | 61.7   | 1.2       |
| 100°-110° | 15.5   | 0.3       |
| 110°-120° | 2.4    | 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°    | 1360.6 | 25.7      |
| 0°-40°    | 2231.6 | 42.2      |
| 0°-60°    | 3971.4 | 75.1      |
| 0°-90°    | 5208.4 | 98.5      |
| 90°-120°  | 79.6   | 1.5       |
| 90°-150°  | 79.6   | 1.5       |
| 90°-180°  | 80.0   | 1.5       |
| 0°-180°   | 5288.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1749 | 1749  | 1749 | 1749  | 1749 |      |
| 5°   | 1745 | 1742  | 1734 | 1742  | 1742 | 166  |
| 15°  | 1679 | 1682  | 1677 | 1687  | 1686 | 474  |
| 25°  | 1556 | 1557  | 1558 | 1572  | 1574 | 717  |
| 35°  | 1377 | 1383  | 1389 | 1403  | 1409 | 862  |
| 45°  | 1158 | 1169  | 1178 | 1190  | 1196 | 893  |
| 55°  | 904  | 915   | 932  | 945   | 952  | 808  |
| 65°  | 621  | 632   | 654  | 680   | 691  | 615  |
| 75°  | 315  | 334   | 383  | 428   | 444  | 335  |
| 85°  | 54   | 101   | 173  | 228   | 249  | 69   |
| 90°  | 0    | 38    | 102  | 153   | 172  | 2    |
| 95°  | 0    | 10    | 53   | 96    | 110  | 0    |
| 105° | 1    | 1     | 9    | 26    | 34   | 1    |
| 115° | 1    | 1     | 2    | 4     | 7    | 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°     | 1749.0 | 1749.0 | 1749.0 | 1749.0 | 1749.0 |
| 2.5°   | 1751.0 | 1748.5 | 1740.7 | 1748.5 | 1748.1 |
| 5°     | 1745.2 | 1741.9 | 1734.1 | 1742.4 | 1742.4 |
| 7.5°   | 1733.7 | 1732.5 | 1725.5 | 1734.9 | 1734.9 |
| 10°    | 1720.1 | 1719.7 | 1713.9 | 1724.2 | 1724.6 |
| 12.5°  | 1701.1 | 1702.8 | 1697.4 | 1707.3 | 1708.5 |
| 15°    | 1678.9 | 1681.7 | 1677.2 | 1686.7 | 1686.3 |
| 17.5°  | 1654.5 | 1656.2 | 1652.9 | 1663.6 | 1663.2 |
| 20°    | 1624.4 | 1626.5 | 1624.0 | 1635.2 | 1636.4 |
| 22.5°  | 1591.0 | 1593.9 | 1593.5 | 1605.1 | 1608.4 |
| 25°    | 1555.6 | 1556.8 | 1558.5 | 1571.7 | 1574.1 |
| 27.5°  | 1516.4 | 1518.5 | 1521.4 | 1533.3 | 1535.8 |
| 30°    | 1473.5 | 1476.8 | 1480.1 | 1492.5 | 1495.8 |
| 32.5°  | 1428.2 | 1431.5 | 1435.6 | 1451.7 | 1453.3 |
| 35°    | 1377.1 | 1383.2 | 1389.0 | 1403.0 | 1408.8 |
| 37.5°  | 1325.9 | 1333.8 | 1339.1 | 1354.0 | 1358.5 |
| 40°    | 1271.9 | 1279.8 | 1288.4 | 1304.1 | 1307.0 |
| 42.5°  | 1215.4 | 1224.5 | 1234.8 | 1248.8 | 1253.8 |
| 45°    | 1158.5 | 1168.9 | 1178.3 | 1189.9 | 1195.7 |
| 47.5°  | 1097.1 | 1107.4 | 1119.0 | 1132.2 | 1135.9 |
| 50°    | 1033.6 | 1045.6 | 1057.9 | 1070.3 | 1076.9 |
| 52.5°  | 968.5  | 982.9  | 996.9  | 1010.1 | 1016.3 |
| 55°    | 904.2  | 914.9  | 931.8  | 945.4  | 951.6  |
| 57.5°  | 837.4  | 846.4  | 861.7  | 884.0  | 887.3  |
| 60°    | 769.3  | 777.6  | 793.3  | 811.4  | 818.8  |
| 62.5°  | 694.3  | 705.4  | 721.9  | 745.0  | 751.6  |
| 65°    | 621.3  | 632.0  | 653.9  | 679.9  | 690.6  |
| 67.5°  | 550.8  | 554.5  | 582.6  | 609.8  | 627.1  |
| 70°    | 467.5  | 481.6  | 514.1  | 547.5  | 560.7  |
| 72.5°  | 395.8  | 409.8  | 445.7  | 484.9  | 501.3  |
| 75°    | 314.6  | 334.0  | 382.6  | 428.4  | 444.5  |
| 77.5°  | 243.3  | 264.7  | 324.9  | 371.1  | 389.6  |
| 80°    | 169.9  | 203.3  | 268.8  | 320.8  | 341.0  |
| 82.5°  | 106.8  | 148.0  | 218.1  | 272.5  | 290.3  |
| 85°    | 54.4   | 100.6  | 172.8  | 228.4  | 248.6  |
| 87.5°  | 14.4   | 65.1   | 134.4  | 187.6  | 208.2  |
| 90°    | 0.4    | 37.5   | 101.8  | 153.0  | 171.5  |
| 92.5°  | 0.4    | 21.0   | 75.9   | 121.6  | 140.6  |
| 95°    | 0.4    | 9.9    | 52.8   | 95.7   | 110.5  |
| 97.5°  | 0.4    | 4.1    | 36.3   | 72.2   | 87.0   |
| 100°   | 0.4    | 2.1    | 23.1   | 52.4   | 65.1   |
| 102.5° | 0.8    | 1.2    | 14.4   | 37.5   | 47.8   |
| 105°   | 0.8    | 1.2    | 8.7    | 25.6   | 34.2   |
| 107.5° | 0.8    | 1.2    | 4.9    | 17.3   | 23.5   |
| 110°   | 1.2    | 1.2    | 2.9    | 10.7   | 15.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90°  |
|--------|-----|-------|-----|-------|------|
| 112.5° | 1.2 | 1.2   | 1.6 | 7.0   | 10.3 |
| 115°   | 1.2 | 1.2   | 1.6 | 4.5   | 6.6  |
| 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)