

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: P518020

Luminaire Tested: HVL8-4-LD4-1HI-40-UNV-C-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: P518020  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-4-LD4-1HI-40-UNV-C-EDD  
Description: 4 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

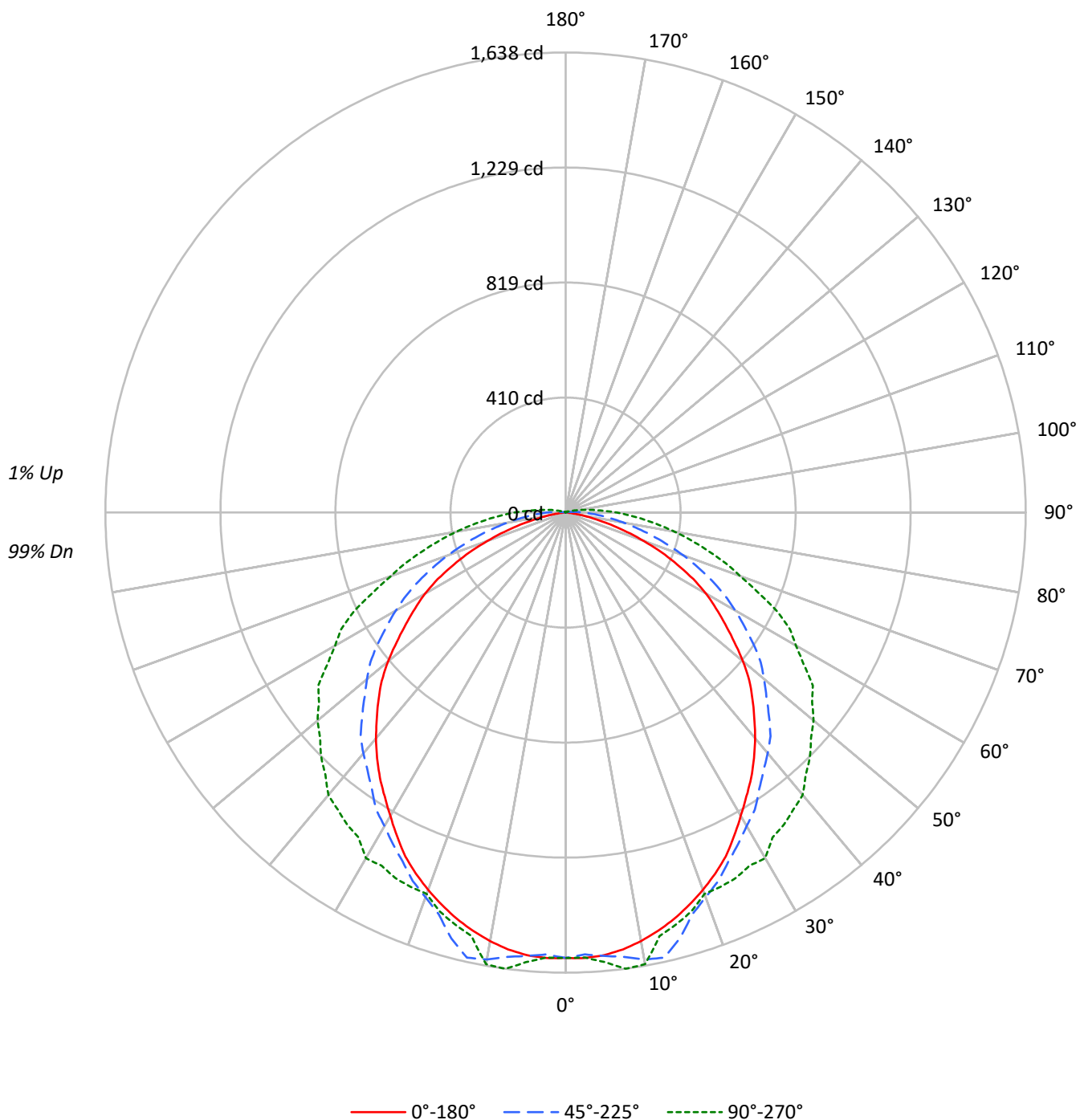
Lumens per Lamp: N/A  
Luminaire Lumens: 4777.0 lumens  
Efficiency: N/A  
Efficacy: 111.1 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 4' x H: 0.17')  
CIE Type: Direct

Input Watts (W): 43  
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°  | 6401 | 6401 | 6401 |
| 5°  | 6386 | 6305 | 6370 |
| 10° | 6302 | 6390 | 6409 |
| 15° | 6187 | 6217 | 5948 |
| 20° | 6048 | 5823 | 5689 |
| 25° | 5900 | 5571 | 5725 |
| 30° | 5677 | 5368 | 5788 |
| 35° | 5517 | 5175 | 5685 |
| 40° | 5345 | 5030 | 5720 |
| 45° | 5160 | 4844 | 5617 |
| 50° | 4936 | 4648 | 5574 |
| 55° | 4606 | 4439 | 5571 |
| 60° | 4354 | 4152 | 5334 |
| 65° | 3849 | 3810 | 5163 |
| 70° | 3140 | 3365 | 4630 |
| 75° | 2240 | 2827 | 4226 |
| 80° | 1258 | 2284 | 3794 |
| 85° | 467  | 1724 | 3342 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 5617 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 152.4  | 3.2       |
| 10°-20°   | 434.0  | 9.1       |
| 20°-30°   | 645.8  | 13.5      |
| 30°-40°   | 776.2  | 16.2      |
| 40°-50°   | 817.0  | 17.1      |
| 50°-60°   | 758.1  | 15.9      |
| 60°-70°   | 599.4  | 12.5      |
| 70°-80°   | 366.1  | 7.7       |
| 80°-90°   | 159.5  | 3.3       |
| 90°-100°  | 49.7   | 1.0       |
| 100°-110° | 11.2   | 0.2       |
| 110°-120° | 4.5    | 0.1       |
| 120°-130° | 2.5    | 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°    | 1232.2 | 25.8      |
| 0°-40°    | 2008.4 | 42.0      |
| 0°-60°    | 3583.4 | 75.0      |
| 0°-90°    | 4708.5 | 98.6      |
| 90°-120°  | 65.3   | 1.4       |
| 90°-150°  | 68.5   | 1.4       |
| 90°-180°  | 68.0   | 1.4       |
| 0°-180°   | 4777.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1586 | 1586  | 1586 | 1586  | 1586 |      |
| 5°   | 1582 | 1579  | 1584 | 1602  | 1606 | 150  |
| 15°  | 1497 | 1555  | 1570 | 1518  | 1519 | 422  |
| 25°  | 1350 | 1437  | 1371 | 1412  | 1435 | 620  |
| 35°  | 1152 | 1184  | 1202 | 1311  | 1356 | 720  |
| 45°  | 942  | 946   | 1024 | 1186  | 1230 | 726  |
| 55°  | 694  | 705   | 817  | 995   | 1074 | 623  |
| 65°  | 439  | 453   | 575  | 761   | 830  | 435  |
| 75°  | 166  | 220   | 321  | 493   | 524  | 181  |
| 85°  | 15   | 52    | 125  | 243   | 278  | 23   |
| 90°  | 0    | 16    | 66   | 154   | 181  | 1    |
| 95°  | 0    | 4     | 29   | 84    | 103  | 0    |
| 105° | 0    | 2     | 6    | 16    | 23   | 0    |
| 115° | 0    | 1     | 4    | 7     | 8    | 0    |
| 125° | 0    | 1     | 2    | 5     | 7    | 0    |
| 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°     | 1585.7 | 1585.7 | 1585.7 | 1585.7 | 1585.7 |
| 2.5°   | 1587.6 | 1583.4 | 1574.7 | 1583.1 | 1585.4 |
| 5°     | 1581.8 | 1578.6 | 1584.1 | 1601.9 | 1606.4 |
| 7.5°   | 1568.6 | 1580.9 | 1595.4 | 1627.7 | 1638.0 |
| 10°    | 1548.9 | 1572.1 | 1615.7 | 1643.2 | 1632.5 |
| 12.5°  | 1525.0 | 1564.4 | 1622.9 | 1569.2 | 1544.4 |
| 15°    | 1497.2 | 1554.7 | 1569.9 | 1517.9 | 1518.8 |
| 17.5°  | 1464.6 | 1546.6 | 1499.8 | 1498.5 | 1489.1 |
| 20°    | 1429.4 | 1519.5 | 1457.5 | 1454.9 | 1444.9 |
| 22.5°  | 1391.6 | 1483.6 | 1420.0 | 1414.8 | 1442.0 |
| 25°    | 1350.5 | 1436.8 | 1371.2 | 1412.2 | 1435.2 |
| 27.5°  | 1299.2 | 1375.4 | 1330.5 | 1388.7 | 1417.4 |
| 30°    | 1247.2 | 1312.1 | 1288.8 | 1369.9 | 1421.0 |
| 32.5°  | 1198.4 | 1245.9 | 1254.6 | 1362.8 | 1371.2 |
| 35°    | 1152.2 | 1184.2 | 1202.0 | 1311.1 | 1355.7 |
| 37.5°  | 1101.5 | 1110.2 | 1157.4 | 1289.5 | 1332.5 |
| 40°    | 1049.8 | 1044.3 | 1119.9 | 1254.0 | 1313.4 |
| 42.5°  | 994.3  | 992.3  | 1080.2 | 1236.2 | 1265.9 |
| 45°    | 941.6  | 945.8  | 1023.6 | 1185.8 | 1230.1 |
| 47.5°  | 887.7  | 893.1  | 970.0  | 1130.6 | 1185.5 |
| 50°    | 825.0  | 832.1  | 922.2  | 1081.5 | 1152.2 |
| 52.5°  | 757.2  | 770.7  | 875.7  | 1035.0 | 1106.3 |
| 55°    | 693.5  | 704.8  | 816.6  | 995.2  | 1074.4 |
| 57.5°  | 635.4  | 642.2  | 755.5  | 945.2  | 1004.9 |
| 60°    | 578.2  | 579.8  | 698.0  | 889.6  | 946.8  |
| 62.5°  | 512.6  | 515.5  | 638.9  | 824.0  | 900.6  |
| 65°    | 439.0  | 452.9  | 575.3  | 761.4  | 830.5  |
| 67.5°  | 370.2  | 394.4  | 510.4  | 703.9  | 740.0  |
| 70°    | 296.5  | 337.6  | 446.7  | 636.3  | 661.9  |
| 72.5°  | 229.0  | 277.2  | 381.5  | 560.8  | 596.6  |
| 75°    | 166.0  | 220.0  | 320.8  | 492.9  | 523.9  |
| 77.5°  | 111.8  | 166.7  | 263.9  | 418.0  | 459.0  |
| 80°    | 66.9   | 121.8  | 213.2  | 348.5  | 394.7  |
| 82.5°  | 34.2   | 81.7   | 165.4  | 292.3  | 333.7  |
| 85°    | 14.9   | 51.7   | 125.0  | 242.6  | 278.4  |
| 87.5°  | 4.2    | 29.4   | 92.1   | 196.1  | 226.4  |
| 90°    | 0.3    | 15.5   | 65.6   | 153.8  | 181.2  |
| 92.5°  | 0.3    | 7.4    | 46.2   | 116.3  | 137.3  |
| 95°    | 0.3    | 3.9    | 28.7   | 84.3   | 103.0  |
| 97.5°  | 0.3    | 2.3    | 17.4   | 59.8   | 75.6   |
| 100°   | 0.3    | 1.9    | 10.3   | 39.7   | 53.9   |
| 102.5° | 0.3    | 2.3    | 7.1    | 25.2   | 35.2   |
| 105°   | 0.3    | 2.3    | 5.8    | 16.5   | 23.3   |
| 107.5° | 0.6    | 2.3    | 5.2    | 12.3   | 16.2   |
| 110°   | 0.3    | 1.9    | 5.5    | 9.4    | 12.6   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.6 | 1.6   | 5.2 | 7.8   | 9.4 |
| 115°   | 0.3 | 1.3   | 4.5 | 7.4   | 7.8 |
| 117.5° | 0.6 | 1.0   | 3.6 | 7.4   | 7.8 |
| 120°   | 0.6 | 0.6   | 2.9 | 7.1   | 8.1 |
| 122.5° | 0.6 | 0.6   | 2.3 | 6.5   | 7.8 |
| 125°   | 0.3 | 0.6   | 1.9 | 4.8   | 6.8 |
| 127.5° | 0.6 | 0.6   | 1.6 | 3.9   | 5.2 |
| 130°   | 0.6 | 0.6   | 1.3 | 2.9   | 3.9 |
| 132.5° | 0.6 | 0.6   | 1.0 | 2.3   | 2.9 |
| 135°   | 0.6 | 0.6   | 0.6 | 1.6   | 2.3 |
| 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)