

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: P517551

Luminaire Tested: HVL12-4-LD4-3LO-35-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: P517551  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-4-LD4-3LO-35-UNV-C-EDD-90  
Description: 4 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

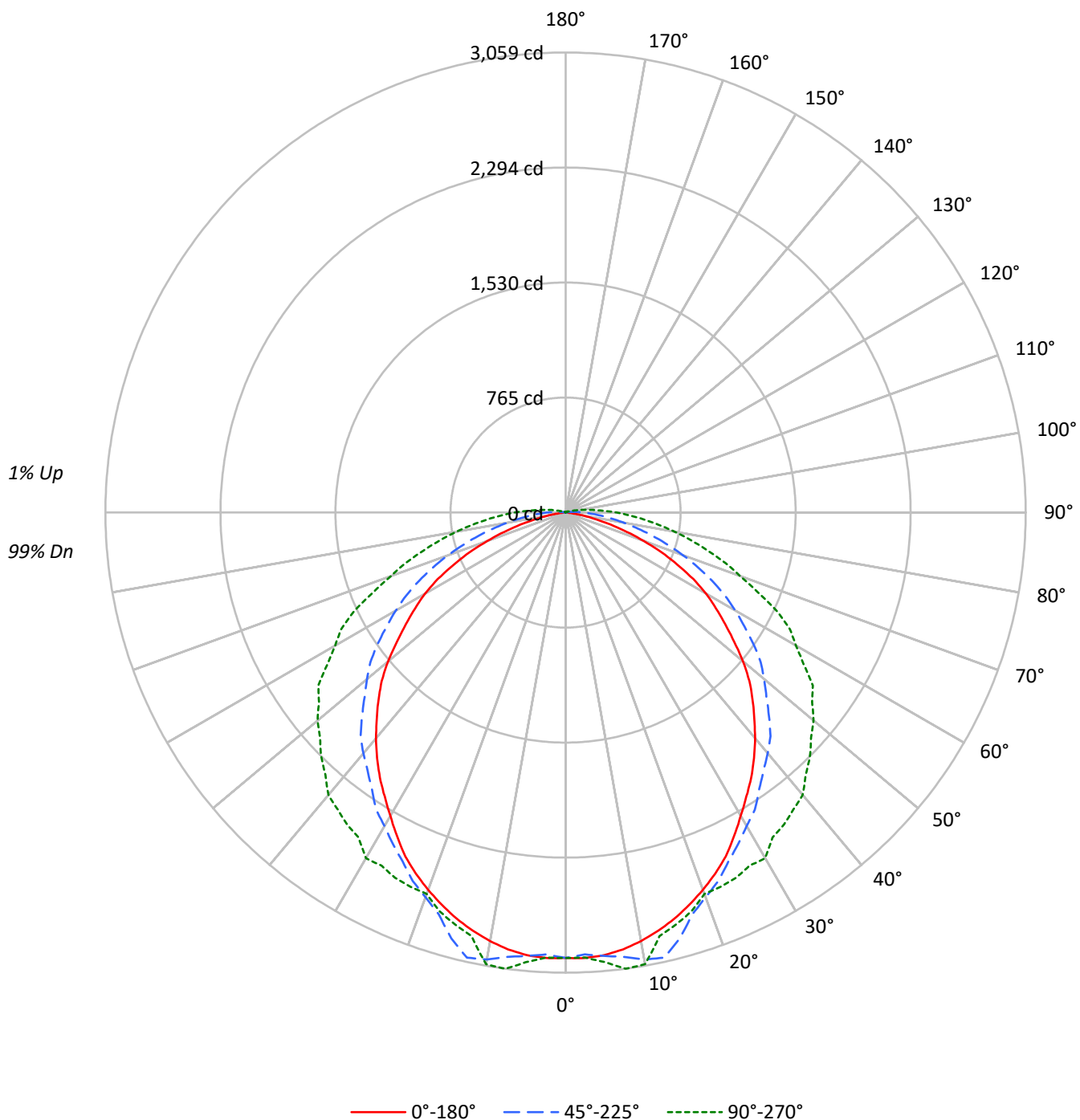
Lumens per Lamp: N/A  
Luminaire Lumens: 8921.0 lumens  
Efficiency: N/A  
Efficacy: 128.9 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 1' x L: 4' x H: 0.17')  
CIE Type: Direct  
  
Input Watts (W): 69.2  
Input Voltage (V): NR  
Input Current (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°  | 7969 | 7969 | 7969 |
| 5°  | 7951 | 7889 | 7987 |
| 10° | 7846 | 8036 | 8093 |
| 15° | 7703 | 7857 | 7564 |
| 20° | 7530 | 7398 | 7285 |
| 25° | 7346 | 7114 | 7384 |
| 30° | 7067 | 6893 | 7522 |
| 35° | 6868 | 6684 | 7448 |
| 40° | 6654 | 6538 | 7559 |
| 45° | 6424 | 6341 | 7493 |
| 50° | 6145 | 6133 | 7515 |
| 55° | 5735 | 5911 | 7603 |
| 60° | 5420 | 5589 | 7384 |
| 65° | 4792 | 5199 | 7275 |
| 70° | 3910 | 4673 | 6670 |
| 75° | 2790 | 4018 | 6271 |
| 80° | 1566 | 3361 | 5872 |
| 85° | 579  | 2686 | 5526 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 7603 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 284.6  | 3.2       |
| 10°-20°   | 810.5  | 9.1       |
| 20°-30°   | 1205.9 | 13.5      |
| 30°-40°   | 1449.5 | 16.2      |
| 40°-50°   | 1525.7 | 17.1      |
| 50°-60°   | 1415.7 | 15.9      |
| 60°-70°   | 1119.4 | 12.5      |
| 70°-80°   | 683.7  | 7.7       |
| 80°-90°   | 297.9  | 3.3       |
| 90°-100°  | 92.7   | 1.0       |
| 100°-110° | 20.8   | 0.2       |
| 110°-120° | 8.4    | 0.1       |
| 120°-130° | 4.7    | 0.1       |
| 130°-140° | 1.3    | 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°    | 2301.1 | 25.8      |
| 0°-40°    | 3750.6 | 42.0      |
| 0°-60°    | 6692.1 | 75.0      |
| 0°-90°    | 8793.1 | 98.6      |
| 90°-120°  | 122.0  | 1.4       |
| 90°-150°  | 127.9  | 1.4       |
| 90°-180°  | 128.0  | 1.4       |
| 0°-180°   | 8921.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 2961 | 2961  | 2961 | 2961  | 2961 |      |
| 5°   | 2954 | 2948  | 2958 | 2991  | 3000 | 280  |
| 15°  | 2796 | 2903  | 2932 | 2835  | 2836 | 788  |
| 25°  | 2522 | 2683  | 2561 | 2637  | 2680 | 1158 |
| 35°  | 2152 | 2212  | 2245 | 2448  | 2532 | 1345 |
| 45°  | 1758 | 1766  | 1912 | 2214  | 2297 | 1355 |
| 55°  | 1295 | 1316  | 1525 | 1859  | 2006 | 1164 |
| 65°  | 820  | 846   | 1074 | 1422  | 1551 | 812  |
| 75°  | 310  | 411   | 599  | 920   | 978  | 338  |
| 85°  | 28   | 96    | 234  | 453   | 520  | 43   |
| 90°  | 1    | 29    | 122  | 287   | 338  | 1    |
| 95°  | 1    | 7     | 54   | 157   | 192  | 0    |
| 105° | 1    | 4     | 11   | 31    | 43   | 1    |
| 115° | 1    | 2     | 8    | 14    | 14   | 1    |
| 125° | 1    | 1     | 4    | 9     | 13   | 1    |
| 135° | 1    | 1     | 1    | 3     | 4    | 1    |
| 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°     | 2961.3 | 2961.3 | 2961.3 | 2961.3 | 2961.3 |
| 2.5°   | 2964.9 | 2957.1 | 2940.8 | 2956.5 | 2960.7 |
| 5°     | 2954.0 | 2948.0 | 2958.3 | 2991.4 | 2999.9 |
| 7.5°   | 2929.3 | 2952.2 | 2979.4 | 3039.7 | 3059.0 |
| 10°    | 2892.5 | 2936.0 | 3017.4 | 3068.7 | 3048.8 |
| 12.5°  | 2847.9 | 2921.5 | 3030.7 | 2930.5 | 2884.1 |
| 15°    | 2796.0 | 2903.4 | 2931.7 | 2834.6 | 2836.4 |
| 17.5°  | 2735.1 | 2888.3 | 2800.8 | 2798.4 | 2780.9 |
| 20°    | 2669.3 | 2837.6 | 2721.8 | 2717.0 | 2698.3 |
| 22.5°  | 2598.7 | 2770.7 | 2651.8 | 2642.2 | 2692.8 |
| 25°    | 2522.1 | 2683.2 | 2560.7 | 2637.3 | 2680.2 |
| 27.5°  | 2426.2 | 2568.6 | 2484.7 | 2593.3 | 2647.0 |
| 30°    | 2329.1 | 2450.3 | 2406.9 | 2558.3 | 2653.6 |
| 32.5°  | 2238.0 | 2326.7 | 2343.0 | 2545.1 | 2560.7 |
| 35°    | 2151.7 | 2211.5 | 2244.6 | 2448.5 | 2531.8 |
| 37.5°  | 2057.0 | 2073.3 | 2161.4 | 2408.1 | 2488.3 |
| 40°    | 1960.5 | 1950.3 | 2091.4 | 2341.8 | 2452.8 |
| 42.5°  | 1856.8 | 1853.1 | 2017.2 | 2308.6 | 2364.1 |
| 45°    | 1758.4 | 1766.3 | 1911.7 | 2214.5 | 2297.1 |
| 47.5°  | 1657.7 | 1667.9 | 1811.5 | 2111.3 | 2213.9 |
| 50°    | 1540.7 | 1553.9 | 1722.2 | 2019.6 | 2151.7 |
| 52.5°  | 1414.0 | 1439.3 | 1635.4 | 1932.8 | 2066.1 |
| 55°    | 1295.1 | 1316.3 | 1525.0 | 1858.6 | 2006.4 |
| 57.5°  | 1186.6 | 1199.2 | 1411.0 | 1765.1 | 1876.7 |
| 60°    | 1079.8 | 1082.8 | 1303.6 | 1661.3 | 1768.1 |
| 62.5°  | 957.3  | 962.8  | 1193.2 | 1538.9 | 1681.8 |
| 65°    | 819.8  | 845.7  | 1074.4 | 1421.8 | 1550.9 |
| 67.5°  | 691.3  | 736.6  | 953.1  | 1314.5 | 1382.0 |
| 70°    | 553.8  | 630.4  | 834.3  | 1188.4 | 1236.0 |
| 72.5°  | 427.7  | 517.6  | 712.4  | 1047.2 | 1114.2 |
| 75°    | 310.1  | 410.8  | 599.0  | 920.5  | 978.4  |
| 77.5°  | 208.7  | 311.3  | 492.8  | 780.6  | 857.2  |
| 80°    | 124.9  | 227.4  | 398.1  | 650.9  | 737.2  |
| 82.5°  | 63.9   | 152.6  | 308.9  | 545.9  | 623.1  |
| 85°    | 27.7   | 96.5   | 233.5  | 453.0  | 520.0  |
| 87.5°  | 7.8    | 54.9   | 171.9  | 366.2  | 422.9  |
| 90°    | 0.6    | 29.0   | 122.5  | 287.1  | 338.4  |
| 92.5°  | 0.6    | 13.9   | 86.3   | 217.2  | 256.4  |
| 95°    | 0.6    | 7.2    | 53.7   | 157.4  | 192.4  |
| 97.5°  | 0.6    | 4.2    | 32.6   | 111.6  | 141.2  |
| 100°   | 0.6    | 3.6    | 19.3   | 74.2   | 100.7  |
| 102.5° | 0.6    | 4.2    | 13.3   | 47.1   | 65.8   |
| 105°   | 0.6    | 4.2    | 10.9   | 30.8   | 43.4   |
| 107.5° | 1.2    | 4.2    | 9.7    | 22.9   | 30.2   |
| 110°   | 0.6    | 3.6    | 10.3   | 17.5   | 23.5   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90°  |
|--------|-----|-------|-----|-------|------|
| 112.5° | 1.2 | 3.0   | 9.7 | 14.5  | 17.5 |
| 115°   | 0.6 | 2.4   | 8.4 | 13.9  | 14.5 |
| 117.5° | 1.2 | 1.8   | 6.6 | 13.9  | 14.5 |
| 120°   | 1.2 | 1.2   | 5.4 | 13.3  | 15.1 |
| 122.5° | 1.2 | 1.2   | 4.2 | 12.1  | 14.5 |
| 125°   | 0.6 | 1.2   | 3.6 | 9.0   | 12.7 |
| 127.5° | 1.2 | 1.2   | 3.0 | 7.2   | 9.7  |
| 130°   | 1.2 | 1.2   | 2.4 | 5.4   | 7.2  |
| 132.5° | 1.2 | 1.2   | 1.8 | 4.2   | 5.4  |
| 135°   | 1.2 | 1.2   | 1.2 | 3.0   | 4.2  |
| 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)