

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: P517488

Luminaire Tested: HVL12-4-LD4-2HI-35-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: P517488  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-4-LD4-2HI-35-UNV-C-EDD  
Description: 4 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

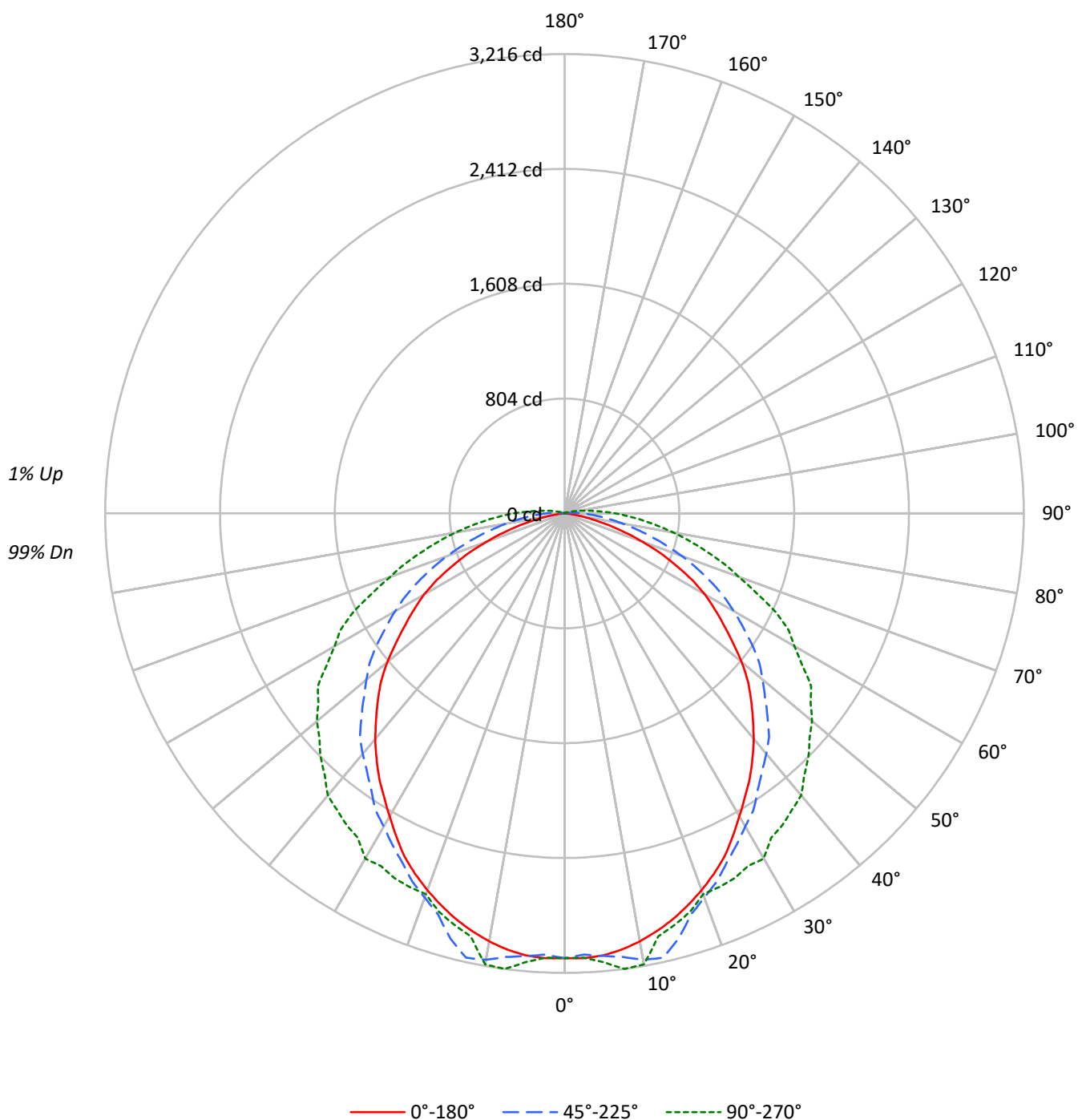
Lumens per Lamp: N/A  
Luminaire Lumens: 9378.0 lumens  
Efficiency: N/A  
Efficacy: 106.0 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 1' x L: 4' x H: 0.17')  
CIE Type: Direct  
  
Input Watts (W): 88.5  
Input Voltage (V): NR  
Input Current (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°  | 8377 | 8377 | 8377 |
| 5°  | 8358 | 8293 | 8396 |
| 10° | 8248 | 8448 | 8507 |
| 15° | 8098 | 8260 | 7952 |
| 20° | 7916 | 7777 | 7658 |
| 25° | 7722 | 7479 | 7762 |
| 30° | 7429 | 7246 | 7907 |
| 35° | 7220 | 7027 | 7829 |
| 40° | 6995 | 6873 | 7946 |
| 45° | 6753 | 6666 | 7877 |
| 50° | 6460 | 6447 | 7900 |
| 55° | 6029 | 6214 | 7992 |
| 60° | 5698 | 5876 | 7762 |
| 65° | 5037 | 5465 | 7648 |
| 70° | 4109 | 4912 | 7011 |
| 75° | 2932 | 4224 | 6593 |
| 80° | 1646 | 3533 | 6173 |
| 85° | 611  | 2823 | 5809 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 7992 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 299.2  | 3.2       |
| 10°-20°   | 852.0  | 9.1       |
| 20°-30°   | 1267.7 | 13.5      |
| 30°-40°   | 1523.8 | 16.2      |
| 40°-50°   | 1603.9 | 17.1      |
| 50°-60°   | 1488.2 | 15.9      |
| 60°-70°   | 1176.7 | 12.5      |
| 70°-80°   | 718.8  | 7.7       |
| 80°-90°   | 313.1  | 3.3       |
| 90°-100°  | 97.5   | 1.0       |
| 100°-110° | 21.9   | 0.2       |
| 110°-120° | 8.8    | 0.1       |
| 120°-130° | 5.0    | 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°    | 2418.9 | 25.8      |
| 0°-40°    | 3942.8 | 42.0      |
| 0°-60°    | 7034.9 | 75.0      |
| 0°-90°    | 9243.5 | 98.6      |
| 90°-120°  | 128.2  | 1.4       |
| 90°-150°  | 134.5  | 1.4       |
| 90°-180°  | 134.0  | 1.4       |
| 0°-180°   | 9378.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3113 | 3113  | 3113 | 3113  | 3113 |      |
| 5°   | 3105 | 3099  | 3110 | 3145  | 3154 | 294  |
| 15°  | 2939 | 3052  | 3082 | 2980  | 2982 | 828  |
| 25°  | 2651 | 2821  | 2692 | 2772  | 2818 | 1217 |
| 35°  | 2262 | 2325  | 2360 | 2574  | 2662 | 1414 |
| 45°  | 1848 | 1857  | 2010 | 2328  | 2415 | 1425 |
| 55°  | 1362 | 1384  | 1603 | 1954  | 2109 | 1223 |
| 65°  | 862  | 889   | 1129 | 1495  | 1630 | 853  |
| 75°  | 326  | 432   | 630  | 968   | 1029 | 356  |
| 85°  | 29   | 102   | 245  | 476   | 547  | 45   |
| 90°  | 1    | 30    | 129  | 302   | 356  | 1    |
| 95°  | 1    | 8     | 56   | 166   | 202  | 0    |
| 105° | 1    | 4     | 11   | 32    | 46   | 1    |
| 115° | 1    | 2     | 9    | 15    | 15   | 1    |
| 125° | 1    | 1     | 4    | 10    | 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°     | 3113.0 | 3113.0 | 3113.0 | 3113.0 | 3113.0 |
| 2.5°   | 3116.8 | 3108.5 | 3091.4 | 3107.9 | 3112.4 |
| 5°     | 3105.4 | 3099.0 | 3109.8 | 3144.7 | 3153.6 |
| 7.5°   | 3079.4 | 3103.5 | 3132.0 | 3195.4 | 3215.7 |
| 10°    | 3040.7 | 3086.4 | 3172.0 | 3225.9 | 3204.9 |
| 12.5°  | 2993.8 | 3071.1 | 3185.9 | 3080.6 | 3031.8 |
| 15°    | 2939.2 | 3052.1 | 3081.9 | 2979.8 | 2981.7 |
| 17.5°  | 2875.2 | 3036.3 | 2944.3 | 2941.8 | 2923.4 |
| 20°    | 2806.1 | 2983.0 | 2861.2 | 2856.2 | 2836.5 |
| 22.5°  | 2731.9 | 2912.6 | 2787.7 | 2777.5 | 2830.8 |
| 25°    | 2651.3 | 2820.6 | 2691.9 | 2772.5 | 2817.5 |
| 27.5°  | 2550.5 | 2700.2 | 2612.0 | 2726.2 | 2782.6 |
| 30°    | 2448.4 | 2575.9 | 2530.2 | 2689.4 | 2789.6 |
| 32.5°  | 2352.7 | 2445.9 | 2463.0 | 2675.4 | 2691.9 |
| 35°    | 2262.0 | 2324.8 | 2359.6 | 2574.0 | 2661.5 |
| 37.5°  | 2162.4 | 2179.5 | 2272.1 | 2531.5 | 2615.8 |
| 40°    | 2061.0 | 2050.2 | 2198.6 | 2461.7 | 2578.4 |
| 42.5°  | 1951.9 | 1948.1 | 2120.6 | 2426.8 | 2485.2 |
| 45°    | 1848.5 | 1856.8 | 2009.6 | 2327.9 | 2414.8 |
| 47.5°  | 1742.6 | 1753.4 | 1904.3 | 2219.5 | 2327.3 |
| 50°    | 1619.6 | 1633.5 | 1810.5 | 2123.1 | 2262.0 |
| 52.5°  | 1486.4 | 1513.1 | 1719.1 | 2031.8 | 2171.9 |
| 55°    | 1361.5 | 1383.7 | 1603.1 | 1953.8 | 2109.1 |
| 57.5°  | 1247.4 | 1260.7 | 1483.2 | 1855.5 | 1972.8 |
| 60°    | 1135.1 | 1138.3 | 1370.4 | 1746.4 | 1858.7 |
| 62.5°  | 1006.4 | 1012.1 | 1254.3 | 1617.7 | 1768.0 |
| 65°    | 861.8  | 889.1  | 1129.4 | 1494.7 | 1630.4 |
| 67.5°  | 726.7  | 774.3  | 1001.9 | 1381.8 | 1452.8 |
| 70°    | 582.1  | 662.7  | 877.0  | 1249.3 | 1299.3 |
| 72.5°  | 449.6  | 544.1  | 748.9  | 1100.9 | 1171.3 |
| 75°    | 325.9  | 431.8  | 629.7  | 967.7  | 1028.6 |
| 77.5°  | 219.4  | 327.2  | 518.1  | 820.6  | 901.1  |
| 80°    | 131.3  | 239.1  | 418.5  | 684.2  | 774.9  |
| 82.5°  | 67.2   | 160.4  | 324.7  | 573.9  | 655.1  |
| 85°    | 29.2   | 101.5  | 245.4  | 476.2  | 546.6  |
| 87.5°  | 8.2    | 57.7   | 180.7  | 384.9  | 444.5  |
| 90°    | 0.6    | 30.4   | 128.7  | 301.8  | 355.8  |
| 92.5°  | 0.6    | 14.6   | 90.7   | 228.3  | 269.5  |
| 95°    | 0.6    | 7.6    | 56.4   | 165.5  | 202.3  |
| 97.5°  | 0.6    | 4.4    | 34.2   | 117.3  | 148.4  |
| 100°   | 0.6    | 3.8    | 20.3   | 78.0   | 105.9  |
| 102.5° | 0.6    | 4.4    | 14.0   | 49.5   | 69.1   |
| 105°   | 0.6    | 4.4    | 11.4   | 32.3   | 45.7   |
| 107.5° | 1.3    | 4.4    | 10.1   | 24.1   | 31.7   |
| 110°   | 0.6    | 3.8    | 10.8   | 18.4   | 24.7   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45°  | 67.5° | 90°  |
|--------|-----|-------|------|-------|------|
| 112.5° | 1.3 | 3.2   | 10.1 | 15.2  | 18.4 |
| 115°   | 0.6 | 2.5   | 8.9  | 14.6  | 15.2 |
| 117.5° | 1.3 | 1.9   | 7.0  | 14.6  | 15.2 |
| 120°   | 1.3 | 1.3   | 5.7  | 14.0  | 15.9 |
| 122.5° | 1.3 | 1.3   | 4.4  | 12.7  | 15.2 |
| 125°   | 0.6 | 1.3   | 3.8  | 9.5   | 13.3 |
| 127.5° | 1.3 | 1.3   | 3.2  | 7.6   | 10.1 |
| 130°   | 1.3 | 1.3   | 2.5  | 5.7   | 7.6  |
| 132.5° | 1.3 | 1.3   | 1.9  | 4.4   | 5.7  |
| 135°   | 1.3 | 1.3   | 1.3  | 3.2   | 4.4  |
| 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)