

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: P517495

Luminaire Tested: HVL12-4-LD4-2HI-50-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: P517495  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-4-LD4-2HI-50-UNV-C-EDD-90  
Description: 4 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 5000K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 9632.0 lumens  
Efficiency: N/A  
Efficacy: 108.8 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

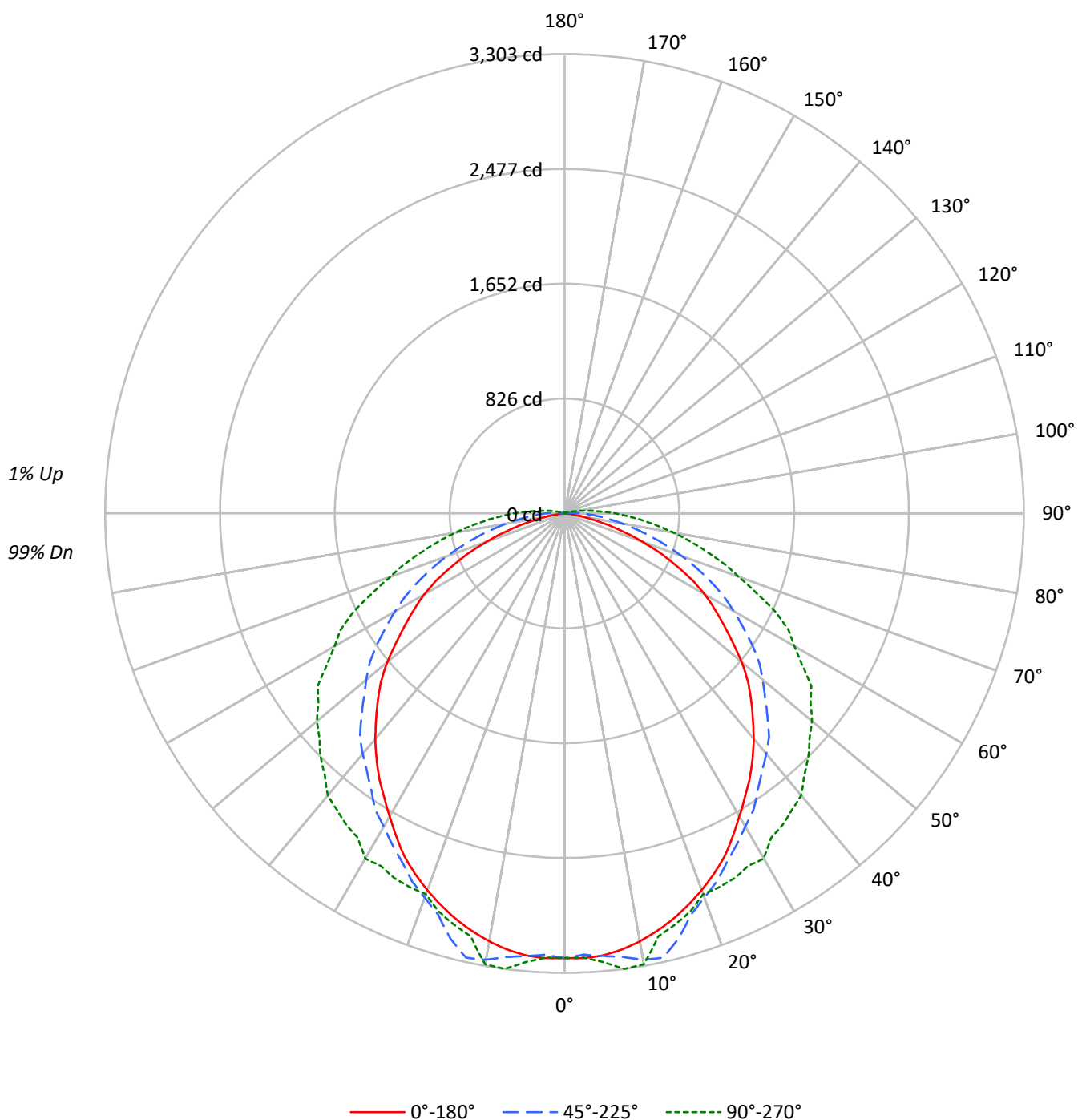
Input Watts (W): 88.5  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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°  | 8604 | 8604 | 8604 |
| 5°  | 8584 | 8518 | 8624 |
| 10° | 8472 | 8677 | 8738 |
| 15° | 8317 | 8484 | 8167 |
| 20° | 8130 | 7987 | 7866 |
| 25° | 7931 | 7681 | 7972 |
| 30° | 7630 | 7442 | 8121 |
| 35° | 7416 | 7217 | 8041 |
| 40° | 7185 | 7059 | 8161 |
| 45° | 6936 | 6846 | 8090 |
| 50° | 6635 | 6622 | 8114 |
| 55° | 6192 | 6382 | 8209 |
| 60° | 5852 | 6035 | 7972 |
| 65° | 5173 | 5613 | 7854 |
| 70° | 4221 | 5045 | 7201 |
| 75° | 3012 | 4339 | 6771 |
| 80° | 1690 | 3629 | 6340 |
| 85° | 627  | 2900 | 5966 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 8209 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 307.3  | 3.2       |
| 10°-20°   | 875.1  | 9.1       |
| 20°-30°   | 1302.1 | 13.5      |
| 30°-40°   | 1565.1 | 16.2      |
| 40°-50°   | 1647.3 | 17.1      |
| 50°-60°   | 1528.5 | 15.9      |
| 60°-70°   | 1208.6 | 12.5      |
| 70°-80°   | 738.2  | 7.7       |
| 80°-90°   | 321.6  | 3.3       |
| 90°-100°  | 100.1  | 1.0       |
| 100°-110° | 22.5   | 0.2       |
| 110°-120° | 9.1    | 0.1       |
| 120°-130° | 5.1    | 0.1       |
| 130°-140° | 1.4    | 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°    | 2484.5 | 25.8      |
| 0°-40°    | 4049.5 | 42.0      |
| 0°-60°    | 7225.4 | 75.0      |
| 0°-90°    | 9493.9 | 98.6      |
| 90°-120°  | 131.7  | 1.4       |
| 90°-150°  | 138.2  | 1.4       |
| 90°-180°  | 138.0  | 1.4       |
| 0°-180°   | 9632.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3197 | 3197  | 3197 | 3197  | 3197 |      |
| 5°   | 3190 | 3183  | 3194 | 3230  | 3239 | 302  |
| 15°  | 3019 | 3135  | 3165 | 3060  | 3062 | 850  |
| 25°  | 2723 | 2897  | 2765 | 2848  | 2894 | 1250 |
| 35°  | 2323 | 2388  | 2424 | 2644  | 2734 | 1452 |
| 45°  | 1899 | 1907  | 2064 | 2391  | 2480 | 1464 |
| 55°  | 1398 | 1421  | 1646 | 2007  | 2166 | 1256 |
| 65°  | 885  | 913   | 1160 | 1535  | 1674 | 877  |
| 75°  | 335  | 444   | 647  | 994   | 1056 | 365  |
| 85°  | 30   | 104   | 252  | 489   | 561  | 46   |
| 90°  | 1    | 31    | 132  | 310   | 365  | 1    |
| 95°  | 1    | 8     | 58   | 170   | 208  | 1    |
| 105° | 1    | 5     | 12   | 33    | 47   | 1    |
| 115° | 1    | 3     | 9    | 15    | 16   | 1    |
| 125° | 1    | 1     | 4    | 10    | 14   | 1    |
| 135° | 1    | 1     | 1    | 3     | 5    | 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°     | 3197.3 | 3197.3 | 3197.3 | 3197.3 | 3197.3 |
| 2.5°   | 3201.2 | 3192.7 | 3175.2 | 3192.1 | 3196.6 |
| 5°     | 3189.5 | 3183.0 | 3194.0 | 3229.9 | 3239.0 |
| 7.5°   | 3162.8 | 3187.5 | 3216.8 | 3282.0 | 3302.8 |
| 10°    | 3123.1 | 3169.9 | 3257.9 | 3313.2 | 3291.7 |
| 12.5°  | 3074.9 | 3154.3 | 3272.2 | 3164.1 | 3113.9 |
| 15°    | 3018.8 | 3134.8 | 3165.4 | 3060.5 | 3062.5 |
| 17.5°  | 2953.1 | 3118.5 | 3024.1 | 3021.4 | 3002.6 |
| 20°    | 2882.1 | 3063.8 | 2938.7 | 2933.5 | 2913.3 |
| 22.5°  | 2805.9 | 2991.5 | 2863.2 | 2852.8 | 2907.5 |
| 25°    | 2723.1 | 2897.0 | 2764.8 | 2847.5 | 2893.8 |
| 27.5°  | 2619.6 | 2773.3 | 2682.8 | 2800.0 | 2858.0 |
| 30°    | 2514.7 | 2645.6 | 2598.7 | 2762.2 | 2865.1 |
| 32.5°  | 2416.4 | 2512.1 | 2529.7 | 2747.9 | 2764.8 |
| 35°    | 2323.2 | 2387.7 | 2423.5 | 2643.7 | 2733.6 |
| 37.5°  | 2221.0 | 2238.6 | 2333.7 | 2600.0 | 2686.7 |
| 40°    | 2116.8 | 2105.7 | 2258.1 | 2528.4 | 2648.2 |
| 42.5°  | 2004.7 | 2000.8 | 2178.0 | 2492.6 | 2552.5 |
| 45°    | 1898.6 | 1907.0 | 2064.0 | 2391.0 | 2480.2 |
| 47.5°  | 1789.8 | 1800.9 | 1955.9 | 2279.6 | 2390.3 |
| 50°    | 1663.5 | 1677.8 | 1859.5 | 2180.6 | 2323.2 |
| 52.5°  | 1526.7 | 1554.0 | 1765.7 | 2086.8 | 2230.8 |
| 55°    | 1398.4 | 1421.2 | 1646.5 | 2006.7 | 2166.3 |
| 57.5°  | 1281.1 | 1294.8 | 1523.4 | 1905.7 | 2026.2 |
| 60°    | 1165.9 | 1169.1 | 1407.5 | 1793.7 | 1909.0 |
| 62.5°  | 1033.6 | 1039.5 | 1288.3 | 1661.5 | 1815.9 |
| 65°    | 885.1  | 913.1  | 1160.0 | 1535.1 | 1674.5 |
| 67.5°  | 746.4  | 795.3  | 1029.1 | 1419.2 | 1492.2 |
| 70°    | 597.9  | 680.6  | 900.8  | 1283.1 | 1334.5 |
| 72.5°  | 461.8  | 558.8  | 769.2  | 1130.7 | 1203.0 |
| 75°    | 334.8  | 443.5  | 646.8  | 993.9  | 1056.4 |
| 77.5°  | 225.4  | 336.1  | 532.1  | 842.8  | 925.5  |
| 80°    | 134.8  | 245.5  | 429.9  | 702.8  | 795.9  |
| 82.5°  | 69.0   | 164.8  | 333.5  | 589.4  | 672.8  |
| 85°    | 30.0   | 104.2  | 252.1  | 489.1  | 561.4  |
| 87.5°  | 8.5    | 59.3   | 185.6  | 395.3  | 456.6  |
| 90°    | 0.7    | 31.3   | 132.2  | 310.0  | 365.4  |
| 92.5°  | 0.7    | 15.0   | 93.1   | 234.5  | 276.8  |
| 95°    | 0.7    | 7.8    | 58.0   | 170.0  | 207.8  |
| 97.5°  | 0.7    | 4.6    | 35.2   | 120.5  | 152.4  |
| 100°   | 0.7    | 3.9    | 20.8   | 80.1   | 108.8  |
| 102.5° | 0.7    | 4.6    | 14.3   | 50.8   | 71.0   |
| 105°   | 0.7    | 4.6    | 11.7   | 33.2   | 46.9   |
| 107.5° | 1.3    | 4.6    | 10.4   | 24.7   | 32.6   |
| 110°   | 0.7    | 3.9    | 11.1   | 18.9   | 25.4   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45°  | 67.5° | 90°  |
|--------|-----|-------|------|-------|------|
| 112.5° | 1.3 | 3.3   | 10.4 | 15.6  | 18.9 |
| 115°   | 0.7 | 2.6   | 9.1  | 15.0  | 15.6 |
| 117.5° | 1.3 | 2.0   | 7.2  | 15.0  | 15.6 |
| 120°   | 1.3 | 1.3   | 5.9  | 14.3  | 16.3 |
| 122.5° | 1.3 | 1.3   | 4.6  | 13.0  | 15.6 |
| 125°   | 0.7 | 1.3   | 3.9  | 9.8   | 13.7 |
| 127.5° | 1.3 | 1.3   | 3.3  | 7.8   | 10.4 |
| 130°   | 1.3 | 1.3   | 2.6  | 5.9   | 7.8  |
| 132.5° | 1.3 | 1.3   | 2.0  | 4.6   | 5.9  |
| 135°   | 1.3 | 1.3   | 1.3  | 3.3   | 4.6  |
| 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)