

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: P517343

Luminaire Tested: HVL12-2-LD4-2HI-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: P517343  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-2-LD4-2HI-35-UNV-C-EDD-90  
Description: 2 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 90 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

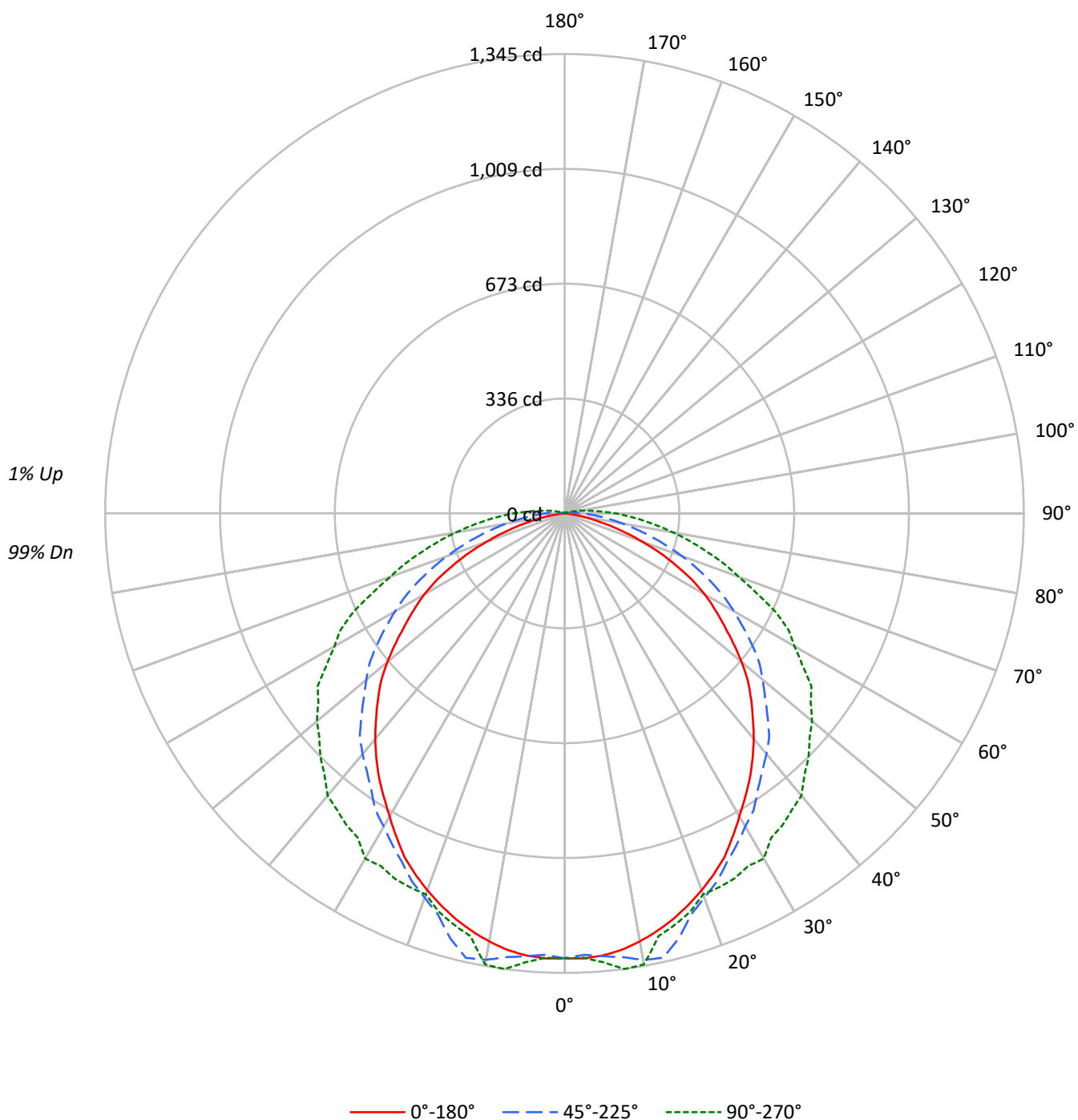
Lumens per Lamp: N/A  
Luminaire Lumens: 3923.0 lumens  
Efficiency: N/A  
Efficacy: 88.8 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 1' x L: 2' x H: 0.17')  
CIE Type: Direct  
  
Input Watts (W): 44.2  
Input Voltage (V): NR  
Input Current (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  |     |     |  | 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 |  | 99 |
| 1   | 108 | 103 | 98  | 94  | 105 | 100 | 96  | 92  | 96  | 92  | 89  |  | 91  | 89  | 86  |  | 81 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 78  | 73  |  | 80  | 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  | 51  |  | 62  | 56  | 51  |  | 47 |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 51  | 45  | 58  | 50  | 44  |  | 56  | 49  | 44  |  | 41 |
| 6   | 69  | 55  | 46  | 39  | 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°  | 7008 | 7008 | 7008 |
| 5°  | 6967 | 6921 | 7025 |
| 10° | 6851 | 7032 | 7118 |
| 15° | 6701 | 6858 | 6653 |
| 20° | 6525 | 6441 | 6407 |
| 25° | 6340 | 6178 | 6494 |
| 30° | 6073 | 5968 | 6615 |
| 35° | 5874 | 5771 | 6550 |
| 40° | 5661 | 5627 | 6648 |
| 45° | 5433 | 5437 | 6590 |
| 50° | 5160 | 5238 | 6609 |
| 55° | 4775 | 5024 | 6687 |
| 60° | 4466 | 4724 | 6494 |
| 65° | 3895 | 4363 | 6398 |
| 70° | 3118 | 3886 | 5866 |
| 75° | 2163 | 3300 | 5516 |
| 80° | 1155 | 2710 | 5165 |
| 85° | 386  | 2099 | 4861 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 6687 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 125.2  | 3.2       |
| 10°-20°   | 356.4  | 9.1       |
| 20°-30°   | 530.3  | 13.5      |
| 30°-40°   | 637.4  | 16.2      |
| 40°-50°   | 670.9  | 17.1      |
| 50°-60°   | 622.6  | 15.9      |
| 60°-70°   | 492.2  | 12.5      |
| 70°-80°   | 300.7  | 7.7       |
| 80°-90°   | 131.0  | 3.3       |
| 90°-100°  | 40.8   | 1.0       |
| 100°-110° | 9.2    | 0.2       |
| 110°-120° | 3.7    | 0.1       |
| 120°-130° | 2.1    | 0.1       |
| 130°-140° | 0.6    | 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°    | 1011.9 | 25.8      |
| 0°-40°    | 1649.3 | 42.0      |
| 0°-60°    | 2942.8 | 75.0      |
| 0°-90°    | 3866.7 | 98.6      |
| 90°-120°  | 53.6   | 1.4       |
| 90°-150°  | 56.3   | 1.4       |
| 90°-180°  | 56.0   | 1.4       |
| 0°-180°   | 3923.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1302 | 1302  | 1302 | 1302  | 1302 |      |
| 5°   | 1299 | 1296  | 1301 | 1316  | 1319 | 123  |
| 15°  | 1230 | 1277  | 1289 | 1246  | 1247 | 346  |
| 25°  | 1109 | 1180  | 1126 | 1160  | 1179 | 509  |
| 35°  | 946  | 972   | 987  | 1077  | 1113 | 591  |
| 45°  | 773  | 777   | 841  | 974   | 1010 | 596  |
| 55°  | 570  | 579   | 671  | 817   | 882  | 512  |
| 65°  | 360  | 372   | 472  | 625   | 682  | 357  |
| 75°  | 136  | 181   | 263  | 405   | 430  | 149  |
| 85°  | 12   | 42    | 103  | 199   | 229  | 19   |
| 90°  | 0    | 13    | 54   | 126   | 149  | 1    |
| 95°  | 0    | 3     | 24   | 69    | 85   | 0    |
| 105° | 0    | 2     | 5    | 14    | 19   | 0    |
| 115° | 0    | 1     | 4    | 6     | 6    | 0    |
| 125° | 0    | 0     | 2    | 4     | 6    | 0    |
| 135° | 0    | 0     | 0    | 1     | 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°     | 1302.2 | 1302.2 | 1302.2 | 1302.2 | 1302.2 |
| 2.5°   | 1303.8 | 1300.4 | 1293.2 | 1300.1 | 1302.0 |
| 5°     | 1299.0 | 1296.4 | 1300.9 | 1315.5 | 1319.2 |
| 7.5°   | 1288.2 | 1298.2 | 1310.2 | 1336.7 | 1345.2 |
| 10°    | 1272.0 | 1291.1 | 1326.9 | 1349.4 | 1340.7 |
| 12.5°  | 1252.4 | 1284.7 | 1332.7 | 1288.7 | 1268.3 |
| 15°    | 1229.5 | 1276.8 | 1289.2 | 1246.5 | 1247.3 |
| 17.5°  | 1202.7 | 1270.1 | 1231.7 | 1230.6 | 1222.9 |
| 20°    | 1173.8 | 1247.8 | 1196.9 | 1194.8 | 1186.6 |
| 22.5°  | 1142.8 | 1218.4 | 1166.1 | 1161.9 | 1184.2 |
| 25°    | 1109.1 | 1179.9 | 1126.1 | 1159.8 | 1178.6 |
| 27.5°  | 1066.9 | 1129.5 | 1092.7 | 1140.4 | 1164.0 |
| 30°    | 1024.2 | 1077.5 | 1058.4 | 1125.0 | 1166.9 |
| 32.5°  | 984.2  | 1023.2 | 1030.3 | 1119.2 | 1126.1 |
| 35°    | 946.2  | 972.5  | 987.1  | 1076.7 | 1113.3 |
| 37.5°  | 904.6  | 911.7  | 950.5  | 1059.0 | 1094.2 |
| 40°    | 862.1  | 857.6  | 919.7  | 1029.8 | 1078.6 |
| 42.5°  | 816.5  | 814.9  | 887.1  | 1015.2 | 1039.6 |
| 45°    | 773.3  | 776.7  | 840.6  | 973.8  | 1010.2 |
| 47.5°  | 729.0  | 733.5  | 796.6  | 928.5  | 973.6  |
| 50°    | 677.5  | 683.3  | 757.4  | 888.1  | 946.2  |
| 52.5°  | 621.8  | 632.9  | 719.2  | 849.9  | 908.6  |
| 55°    | 569.5  | 578.8  | 670.6  | 817.3  | 882.3  |
| 57.5°  | 521.8  | 527.4  | 620.5  | 776.2  | 825.3  |
| 60°    | 474.8  | 476.2  | 573.3  | 730.6  | 777.5  |
| 62.5°  | 421.0  | 423.4  | 524.7  | 676.7  | 739.6  |
| 65°    | 360.5  | 371.9  | 472.5  | 625.2  | 682.0  |
| 67.5°  | 304.0  | 323.9  | 419.1  | 578.0  | 607.7  |
| 70°    | 243.5  | 277.2  | 366.9  | 522.6  | 543.5  |
| 72.5°  | 188.1  | 227.6  | 313.3  | 460.5  | 490.0  |
| 75°    | 136.4  | 180.7  | 263.4  | 404.8  | 430.3  |
| 77.5°  | 91.8   | 136.9  | 216.7  | 343.3  | 377.0  |
| 80°    | 54.9   | 100.0  | 175.1  | 286.2  | 324.2  |
| 82.5°  | 28.1   | 67.1   | 135.8  | 240.1  | 274.0  |
| 85°    | 12.2   | 42.4   | 102.7  | 199.2  | 228.7  |
| 87.5°  | 3.4    | 24.1   | 75.6   | 161.0  | 186.0  |
| 90°    | 0.3    | 12.7   | 53.9   | 126.3  | 148.8  |
| 92.5°  | 0.3    | 6.1    | 37.9   | 95.5   | 112.7  |
| 95°    | 0.3    | 3.2    | 23.6   | 69.2   | 84.6   |
| 97.5°  | 0.3    | 1.9    | 14.3   | 49.1   | 62.1   |
| 100°   | 0.3    | 1.6    | 8.5    | 32.6   | 44.3   |
| 102.5° | 0.3    | 1.9    | 5.8    | 20.7   | 28.9   |
| 105°   | 0.3    | 1.9    | 4.8    | 13.5   | 19.1   |
| 107.5° | 0.5    | 1.9    | 4.2    | 10.1   | 13.3   |
| 110°   | 0.3    | 1.6    | 4.5    | 7.7    | 10.3   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.5 | 1.3   | 4.2 | 6.4   | 7.7 |
| 115°   | 0.3 | 1.1   | 3.7 | 6.1   | 6.4 |
| 117.5° | 0.5 | 0.8   | 2.9 | 6.1   | 6.4 |
| 120°   | 0.5 | 0.5   | 2.4 | 5.8   | 6.6 |
| 122.5° | 0.5 | 0.5   | 1.9 | 5.3   | 6.4 |
| 125°   | 0.3 | 0.5   | 1.6 | 4.0   | 5.6 |
| 127.5° | 0.5 | 0.5   | 1.3 | 3.2   | 4.2 |
| 130°   | 0.5 | 0.5   | 1.1 | 2.4   | 3.2 |
| 132.5° | 0.5 | 0.5   | 0.8 | 1.9   | 2.4 |
| 135°   | 0.5 | 0.5   | 0.5 | 1.3   | 1.9 |
| 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)