

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: P517988

Luminaire Tested: HVL8-2-LD4-3LO-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: P517988  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-2-LD4-3LO-40-UNV-C-EDD  
Description: 2 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4315.0 lumens  
Efficiency: N/A  
Efficacy: 128.0 lumens/watt  
Spacing Criteria (0/90/45): 1.18 / 1.32 / 1.37  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 2' x H: 0.17')  
CIE Type: Direct

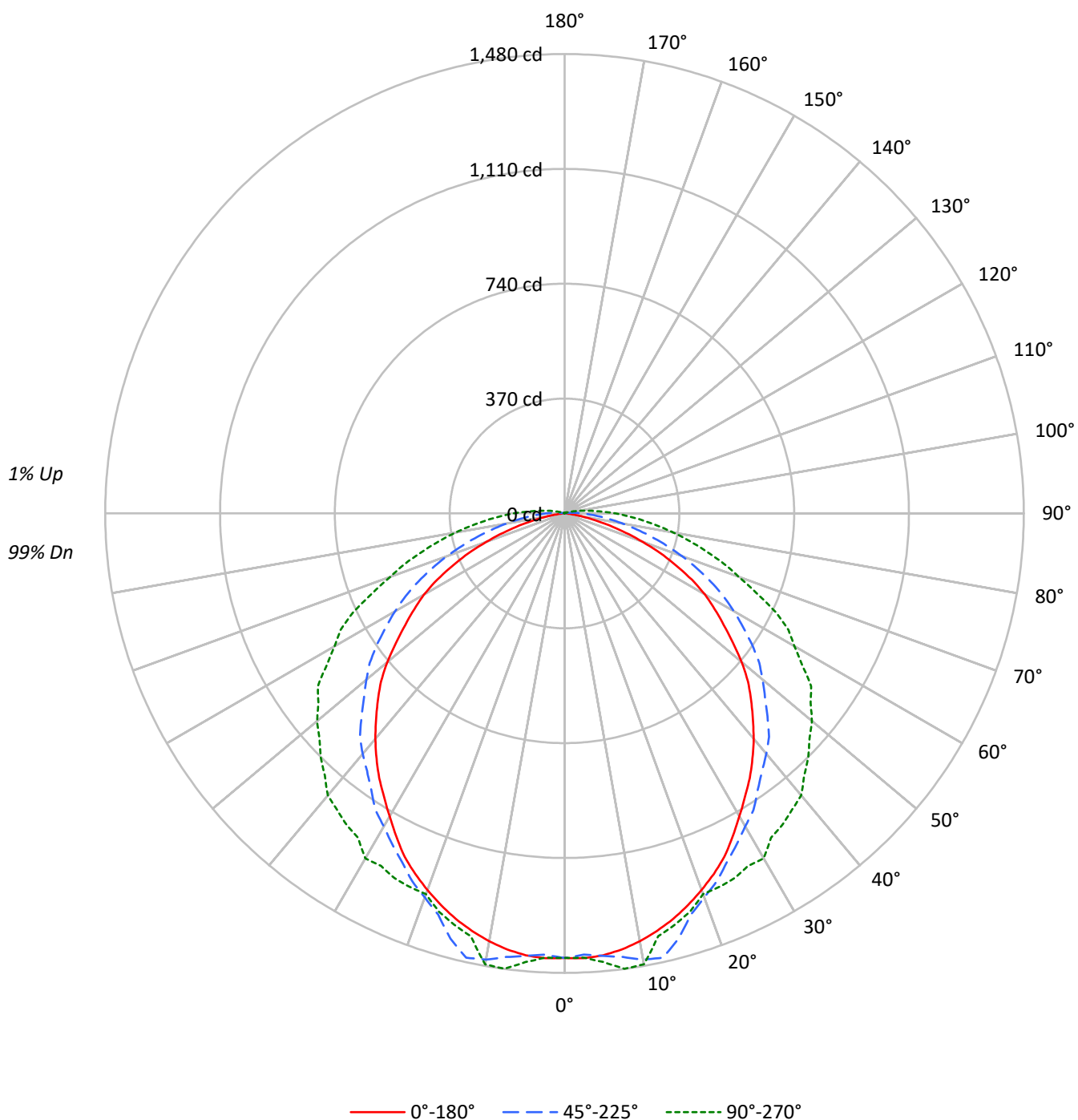
Input Watts (W): 33.7  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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  |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 110 | 110 | 110 |  | 105 | 105 | 105 |  | 101 |
| 1   | 108 | 103 | 98  | 94  | 105 | 100 | 96  | 92  | 96  | 92  | 89  |  | 91  | 89  | 86  |  | 87  |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 78  | 73  |  | 80  | 75  | 71  |  | 76  |
| 3   | 89  | 78  | 69  | 63  | 86  | 76  | 68  | 62  | 73  | 66  | 61  |  | 70  | 64  | 59  |  | 67  |
| 4   | 81  | 69  | 60  | 53  | 79  | 67  | 59  | 52  | 65  | 57  | 51  |  | 62  | 56  | 51  |  | 60  |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 51  | 45  | 58  | 50  | 44  |  | 56  | 49  | 44  |  | 54  |
| 6   | 69  | 55  | 46  | 39  | 67  | 54  | 46  | 39  | 52  | 45  | 39  |  | 50  | 44  | 38  |  | 49  |
| 7   | 64  | 50  | 41  | 35  | 62  | 49  | 41  | 35  | 47  | 40  | 34  |  | 46  | 39  | 34  |  | 44  |
| 8   | 59  | 46  | 37  | 31  | 58  | 45  | 37  | 31  | 43  | 36  | 31  |  | 42  | 35  | 30  |  | 41  |
| 9   | 55  | 42  | 34  | 28  | 54  | 41  | 33  | 28  | 40  | 33  | 28  |  | 39  | 32  | 27  |  | 38  |
| 10  | 52  | 39  | 31  | 25  | 51  | 38  | 30  | 25  | 37  | 30  | 25  |  | 36  | 29  | 25  |  | 35  |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°    | 45°   | 90°   |
|-----|-------|-------|-------|
| 0°  | 11563 | 11563 | 11563 |
| 5°  | 11495 | 11361 | 11507 |
| 10° | 11303 | 11487 | 11578 |
| 15° | 11056 | 11147 | 10746 |
| 20° | 10765 | 10416 | 10277 |
| 25° | 10460 | 9940  | 10342 |
| 30° | 10020 | 9552  | 10455 |
| 35° | 9692  | 9184  | 10270 |
| 40° | 9340  | 8900  | 10334 |
| 45° | 8963  | 8542  | 10148 |
| 50° | 8513  | 8167  | 10071 |
| 55° | 7880  | 7767  | 10065 |
| 60° | 7369  | 7228  | 9635  |
| 65° | 6425  | 6594  | 9328  |
| 70° | 5145  | 5780  | 8365  |
| 75° | 3569  | 4807  | 7637  |
| 80° | 1907  | 3831  | 6856  |
| 85° | 636   | 2830  | 6038  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 10148 cd/sqm

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CATALOG NUMBER: HVL8-2-LD4-3LO-40-UNV-C-EDD

**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 137.7  | 3.2       |
| 10°-20°   | 392.0  | 9.1       |
| 20°-30°   | 583.3  | 13.5      |
| 30°-40°   | 701.1  | 16.2      |
| 40°-50°   | 738.0  | 17.1      |
| 50°-60°   | 684.8  | 15.9      |
| 60°-70°   | 541.4  | 12.5      |
| 70°-80°   | 330.7  | 7.7       |
| 80°-90°   | 144.1  | 3.3       |
| 90°-100°  | 44.9   | 1.0       |
| 100°-110° | 10.1   | 0.2       |
| 110°-120° | 4.1    | 0.1       |
| 120°-130° | 2.3    | 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       |
| <hr/>     |        |           |
| 0°-30°    | 1113.0 | 25.8      |
| 0°-40°    | 1814.1 | 42.0      |
| 0°-60°    | 3236.9 | 75.0      |
| 0°-90°    | 4253.1 | 98.6      |
| 90°-120°  | 59.0   | 1.4       |
| 90°-150°  | 61.9   | 1.4       |
| 90°-180°  | 62.0   | 1.4       |
| 0°-180°   | 4315.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1432 | 1432  | 1432 | 1432  | 1432 |      |
| 5°   | 1429 | 1426  | 1431 | 1447  | 1451 | 135  |
| 15°  | 1352 | 1404  | 1418 | 1371  | 1372 | 381  |
| 25°  | 1220 | 1298  | 1239 | 1276  | 1296 | 560  |
| 35°  | 1041 | 1070  | 1086 | 1184  | 1225 | 650  |
| 45°  | 850  | 854   | 925  | 1071  | 1111 | 656  |
| 55°  | 626  | 637   | 738  | 899   | 970  | 563  |
| 65°  | 396  | 409   | 520  | 688   | 750  | 393  |
| 75°  | 150  | 199   | 290  | 445   | 473  | 164  |
| 85°  | 13   | 47    | 113  | 219   | 252  | 21   |
| 90°  | 0    | 14    | 59   | 139   | 164  | 1    |
| 95°  | 0    | 4     | 26   | 76    | 93   | 0    |
| 105° | 0    | 2     | 5    | 15    | 21   | 0    |
| 115° | 0    | 1     | 4    | 7     | 7    | 0    |
| 125° | 0    | 1     | 2    | 4     | 6    | 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    |

TEST NUMBER: P517988

CATALOG NUMBER: HVL8-2-LD4-3LO-40-UNV-C-EDD

**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 1432.3 | 1432.3 | 1432.3 | 1432.3 | 1432.3 |
| 2.5°   | 1434.1 | 1430.3 | 1422.4 | 1430.0 | 1432.1 |
| 5°     | 1428.8 | 1425.9 | 1430.9 | 1446.9 | 1451.0 |
| 7.5°   | 1416.9 | 1428.0 | 1441.1 | 1470.3 | 1479.6 |
| 10°    | 1399.1 | 1420.1 | 1459.5 | 1484.3 | 1474.7 |
| 12.5°  | 1377.5 | 1413.1 | 1465.9 | 1417.5 | 1395.0 |
| 15°    | 1352.4 | 1404.3 | 1418.0 | 1371.1 | 1371.9 |
| 17.5°  | 1322.9 | 1397.0 | 1354.7 | 1353.6 | 1345.1 |
| 20°    | 1291.1 | 1372.5 | 1316.5 | 1314.2 | 1305.1 |
| 22.5°  | 1257.0 | 1340.1 | 1282.7 | 1278.0 | 1302.5 |
| 25°    | 1219.9 | 1297.8 | 1238.6 | 1275.7 | 1296.4 |
| 27.5°  | 1173.5 | 1242.4 | 1201.8 | 1254.4 | 1280.3 |
| 30°    | 1126.6 | 1185.2 | 1164.2 | 1237.4 | 1283.5 |
| 32.5°  | 1082.5 | 1125.4 | 1133.3 | 1231.0 | 1238.6 |
| 35°    | 1040.8 | 1069.7 | 1085.7 | 1184.3 | 1224.6 |
| 37.5°  | 995.0  | 1002.8 | 1045.4 | 1164.8 | 1203.6 |
| 40°    | 948.3  | 943.3  | 1011.6 | 1132.7 | 1186.4 |
| 42.5°  | 898.1  | 896.3  | 975.7  | 1116.6 | 1143.5 |
| 45°    | 850.5  | 854.3  | 924.6  | 1071.1 | 1111.1 |
| 47.5°  | 801.8  | 806.8  | 876.2  | 1021.2 | 1070.8 |
| 50°    | 745.2  | 751.6  | 833.0  | 976.9  | 1040.8 |
| 52.5°  | 683.9  | 696.2  | 791.0  | 934.9  | 999.3  |
| 55°    | 626.5  | 636.7  | 737.6  | 899.0  | 970.5  |
| 57.5°  | 573.9  | 580.1  | 682.5  | 853.7  | 907.7  |
| 60°    | 522.3  | 523.7  | 630.5  | 803.6  | 855.2  |
| 62.5°  | 463.1  | 465.7  | 577.1  | 744.3  | 813.5  |
| 65°    | 396.5  | 409.1  | 519.7  | 687.7  | 750.2  |
| 67.5°  | 334.4  | 356.3  | 461.0  | 635.8  | 668.5  |
| 70°    | 267.9  | 304.9  | 403.5  | 574.8  | 597.9  |
| 72.5°  | 206.9  | 250.3  | 344.6  | 506.5  | 538.9  |
| 75°    | 150.0  | 198.7  | 289.7  | 445.3  | 473.3  |
| 77.5°  | 101.0  | 150.6  | 238.4  | 377.6  | 414.6  |
| 80°    | 60.4   | 110.0  | 192.6  | 314.8  | 356.6  |
| 82.5°  | 30.9   | 73.8   | 149.4  | 264.1  | 301.4  |
| 85°    | 13.4   | 46.7   | 112.9  | 219.1  | 251.5  |
| 87.5°  | 3.8    | 26.6   | 83.2   | 177.1  | 204.5  |
| 90°    | 0.3    | 14.0   | 59.2   | 138.9  | 163.7  |
| 92.5°  | 0.3    | 6.7    | 41.7   | 105.0  | 124.0  |
| 95°    | 0.3    | 3.5    | 26.0   | 76.2   | 93.1   |
| 97.5°  | 0.3    | 2.0    | 15.8   | 54.0   | 68.3   |
| 100°   | 0.3    | 1.8    | 9.3    | 35.9   | 48.7   |
| 102.5° | 0.3    | 2.0    | 6.4    | 22.8   | 31.8   |
| 105°   | 0.3    | 2.0    | 5.3    | 14.9   | 21.0   |
| 107.5° | 0.6    | 2.0    | 4.7    | 11.1   | 14.6   |
| 110°   | 0.3    | 1.8    | 5.0    | 8.5    | 11.4   |

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CATALOG NUMBER: HVL8-2-LD4-3LO-40-UNV-C-EDD

**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.6 | 1.5   | 4.7 | 7.0   | 8.5 |
| 115°   | 0.3 | 1.2   | 4.1 | 6.7   | 7.0 |
| 117.5° | 0.6 | 0.9   | 3.2 | 6.7   | 7.0 |
| 120°   | 0.6 | 0.6   | 2.6 | 6.4   | 7.3 |
| 122.5° | 0.6 | 0.6   | 2.0 | 5.8   | 7.0 |
| 125°   | 0.3 | 0.6   | 1.8 | 4.4   | 6.1 |
| 127.5° | 0.6 | 0.6   | 1.5 | 3.5   | 4.7 |
| 130°   | 0.6 | 0.6   | 1.2 | 2.6   | 3.5 |
| 132.5° | 0.6 | 0.6   | 0.9 | 2.0   | 2.6 |
| 135°   | 0.6 | 0.6   | 0.6 | 1.5   | 2.0 |
| 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)