

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: P517766

Luminaire Tested: HVL8-1-LD4-1STD-40-UNV-O-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: P517766  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-1-LD4-1STD-40-UNV-O-EDD  
Description: 1 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 840.0 lumens  
Efficiency: N/A  
Efficacy: 102.4 lumens/watt  
Spacing Criteria (0/90/45): 1.25 / 1.27 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 1' x H: 0.17')  
CIE Type: Direct

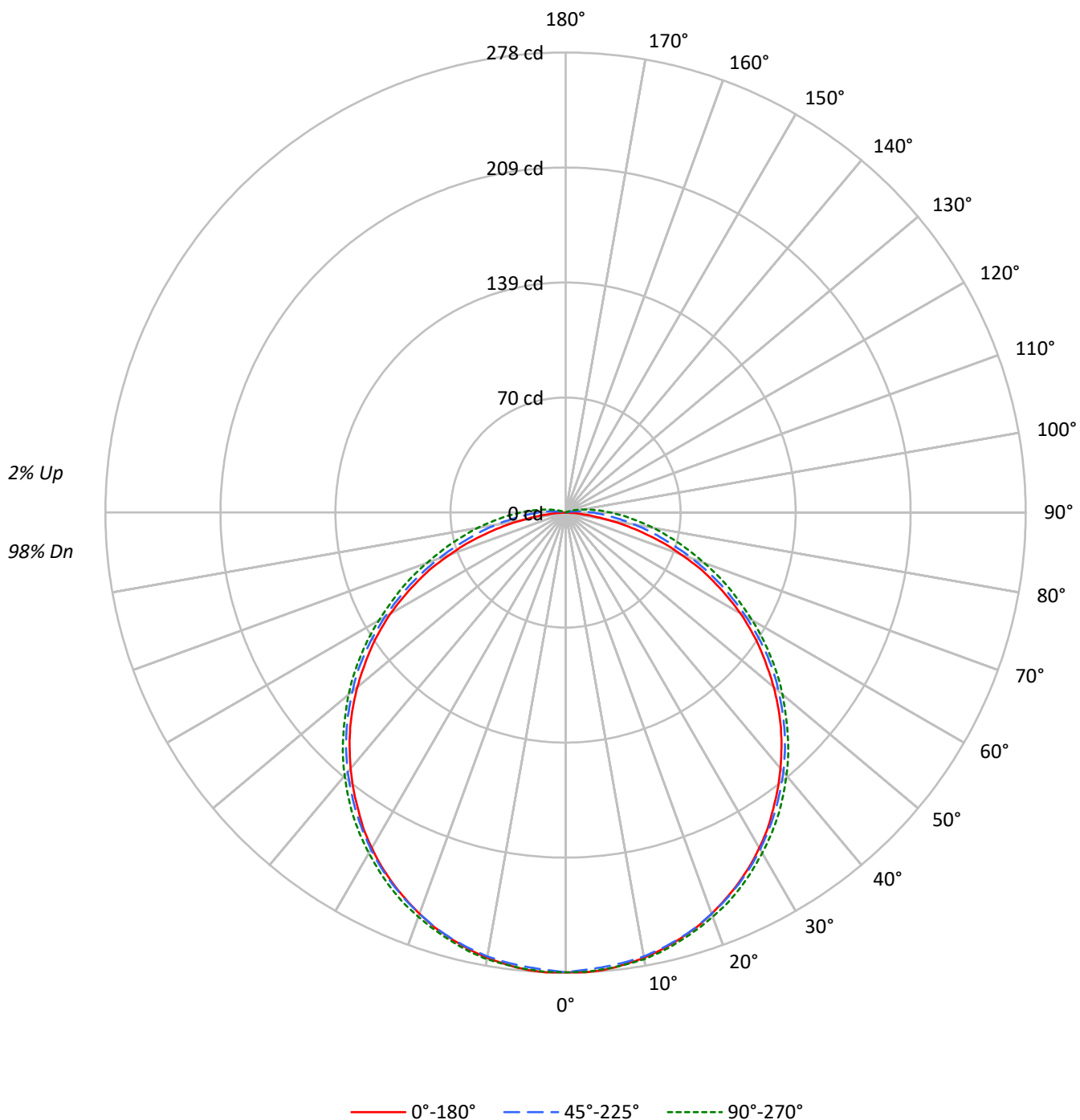
Input Watts (W): 8.2  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

| 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 |    |    | 98 |
| 1   | 108 | 102 | 98  | 94  | 105 | 100 | 96  | 92  | 95  | 92  | 89  | 91  | 88  | 86  | 87  | 85  | 83  |    |    | 81 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 77  | 73  | 79  | 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  | 52  | 62  | 56  | 51  | 60  | 54  | 50  |    |    | 47 |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 52  | 45  | 58  | 50  | 44  | 56  | 49  | 44  | 54  | 48  | 43  |    |    | 41 |
| 6   | 69  | 55  | 46  | 40  | 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°  | 4485 | 4485 | 4485 |
| 5°  | 4428 | 4353 | 4390 |
| 10° | 4351 | 4244 | 4303 |
| 15° | 4267 | 4127 | 4197 |
| 20° | 4179 | 4004 | 4093 |
| 25° | 4085 | 3878 | 3990 |
| 30° | 3981 | 3746 | 3871 |
| 35° | 3860 | 3604 | 3754 |
| 40° | 3735 | 3459 | 3617 |
| 45° | 3601 | 3302 | 3469 |
| 50° | 3441 | 3125 | 3311 |
| 55° | 3265 | 2932 | 3136 |
| 60° | 3062 | 2694 | 2932 |
| 65° | 2778 | 2432 | 2728 |
| 70° | 2406 | 2131 | 2493 |
| 75° | 1923 | 1806 | 2278 |
| 80° | 1290 | 1486 | 2084 |
| 85° | 548  | 1162 | 1897 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 3601 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 26.3   | 3.1       |
| 10°-20°   | 75.4   | 9.0       |
| 20°-30°   | 114.4  | 13.6      |
| 30°-40°   | 138.4  | 16.5      |
| 40°-50°   | 144.4  | 17.2      |
| 50°-60°   | 132.0  | 15.7      |
| 60°-70°   | 102.9  | 12.2      |
| 70°-80°   | 64.4   | 7.7       |
| 80°-90°   | 29.2   | 3.5       |
| 90°-100°  | 9.8    | 1.2       |
| 100°-110° | 2.5    | 0.3       |
| 110°-120° | 0.4    | 0.0       |
| 120°-130° | 0.0    | 0.0       |
| 130°-140° | 0.0    | 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°    | 216.1  | 25.7      |
| 0°-40°    | 354.5  | 42.2      |
| 0°-60°    | 630.9  | 75.1      |
| 0°-90°    | 827.4  | 98.5      |
| 90°-120°  | 12.7   | 1.5       |
| 90°-150°  | 12.7   | 1.5       |
| 90°-180°  | 13.0   | 1.5       |
| 0°-180°   | 840.0  | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|------|-----|-------|-----|-------|-----|------|
| 0°   | 278 | 278   | 278 | 278   | 278 |      |
| 5°   | 277 | 277   | 276 | 277   | 277 | 26   |
| 15°  | 267 | 267   | 266 | 268   | 268 | 75   |
| 25°  | 247 | 247   | 248 | 250   | 250 | 114  |
| 35°  | 219 | 220   | 221 | 223   | 224 | 137  |
| 45°  | 184 | 186   | 187 | 189   | 190 | 142  |
| 55°  | 144 | 145   | 148 | 150   | 151 | 128  |
| 65°  | 99  | 100   | 104 | 108   | 110 | 98   |
| 75°  | 50  | 53    | 61  | 68    | 71  | 53   |
| 85°  | 9   | 16    | 27  | 36    | 40  | 11   |
| 90°  | 0   | 6     | 16  | 24    | 27  | 0    |
| 95°  | 0   | 2     | 8   | 15    | 18  | 0    |
| 105° | 0   | 0     | 1   | 4     | 5   | 0    |
| 115° | 0   | 0     | 0   | 1     | 1   | 0    |
| 125° | 0   | 0     | 0   | 0     | 0   | 0    |
| 135° | 0   | 0     | 0   | 0     | 0   | 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°     | 277.8 | 277.8 | 277.8 | 277.8 | 277.8 |
| 2.5°   | 278.1 | 277.8 | 276.5 | 277.8 | 277.7 |
| 5°     | 277.2 | 276.7 | 275.5 | 276.8 | 276.8 |
| 7.5°   | 275.4 | 275.2 | 274.1 | 275.6 | 275.6 |
| 10°    | 273.2 | 273.2 | 272.3 | 273.9 | 274.0 |
| 12.5°  | 270.2 | 270.5 | 269.6 | 271.2 | 271.4 |
| 15°    | 266.7 | 267.1 | 266.4 | 267.9 | 267.9 |
| 17.5°  | 262.8 | 263.1 | 262.6 | 264.3 | 264.2 |
| 20°    | 258.0 | 258.4 | 258.0 | 259.7 | 259.9 |
| 22.5°  | 252.7 | 253.2 | 253.1 | 255.0 | 255.5 |
| 25°    | 247.1 | 247.3 | 247.6 | 249.7 | 250.1 |
| 27.5°  | 240.9 | 241.2 | 241.7 | 243.6 | 244.0 |
| 30°    | 234.1 | 234.6 | 235.1 | 237.1 | 237.6 |
| 32.5°  | 226.9 | 227.4 | 228.0 | 230.6 | 230.9 |
| 35°    | 218.7 | 219.7 | 220.6 | 222.9 | 223.8 |
| 37.5°  | 210.6 | 211.9 | 212.7 | 215.1 | 215.8 |
| 40°    | 202.0 | 203.3 | 204.7 | 207.2 | 207.6 |
| 42.5°  | 193.1 | 194.5 | 196.2 | 198.4 | 199.2 |
| 45°    | 184.0 | 185.7 | 187.2 | 189.0 | 189.9 |
| 47.5°  | 174.3 | 175.9 | 177.7 | 179.8 | 180.4 |
| 50°    | 164.2 | 166.1 | 168.1 | 170.0 | 171.1 |
| 52.5°  | 153.8 | 156.1 | 158.4 | 160.5 | 161.4 |
| 55°    | 143.6 | 145.3 | 148.0 | 150.2 | 151.2 |
| 57.5°  | 133.0 | 134.5 | 136.9 | 140.4 | 140.9 |
| 60°    | 122.2 | 123.5 | 126.0 | 128.9 | 130.1 |
| 62.5°  | 110.3 | 112.1 | 114.7 | 118.3 | 119.4 |
| 65°    | 98.7  | 100.4 | 103.9 | 108.0 | 109.7 |
| 67.5°  | 87.5  | 88.1  | 92.5  | 96.9  | 99.6  |
| 70°    | 74.3  | 76.5  | 81.7  | 87.0  | 89.1  |
| 72.5°  | 62.9  | 65.1  | 70.8  | 77.0  | 79.6  |
| 75°    | 50.0  | 53.0  | 60.8  | 68.0  | 70.6  |
| 77.5°  | 38.6  | 42.0  | 51.6  | 58.9  | 61.9  |
| 80°    | 27.0  | 32.3  | 42.7  | 51.0  | 54.2  |
| 82.5°  | 17.0  | 23.5  | 34.6  | 43.3  | 46.1  |
| 85°    | 8.6   | 16.0  | 27.4  | 36.3  | 39.5  |
| 87.5°  | 2.3   | 10.3  | 21.4  | 29.8  | 33.1  |
| 90°    | 0.1   | 6.0   | 16.2  | 24.3  | 27.2  |
| 92.5°  | 0.1   | 3.3   | 12.1  | 19.3  | 22.3  |
| 95°    | 0.1   | 1.6   | 8.4   | 15.2  | 17.6  |
| 97.5°  | 0.1   | 0.7   | 5.8   | 11.5  | 13.8  |
| 100°   | 0.1   | 0.3   | 3.7   | 8.3   | 10.3  |
| 102.5° | 0.1   | 0.2   | 2.3   | 6.0   | 7.6   |
| 105°   | 0.1   | 0.2   | 1.4   | 4.1   | 5.4   |
| 107.5° | 0.1   | 0.2   | 0.8   | 2.8   | 3.7   |
| 110°   | 0.2   | 0.2   | 0.5   | 1.7   | 2.5   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.2 | 0.2   | 0.3 | 1.1   | 1.6 |
| 115°   | 0.2 | 0.2   | 0.3 | 0.7   | 1.0 |
| 117.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 120°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 122.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 125°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 127.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 130°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 132.5° | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 135°   | 0.0 | 0.0   | 0.0 | 0.0   | 0.0 |
| 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)