

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: P517380

Luminaire Tested: HVL12-2-LD4-2STD-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: P517380  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL12-2-LD4-2STD-40-UNV-C-EDD  
Description: 2 FOOT, 12 INCH WIDE, HVL LED LUMINAIRE, WITH 4000K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

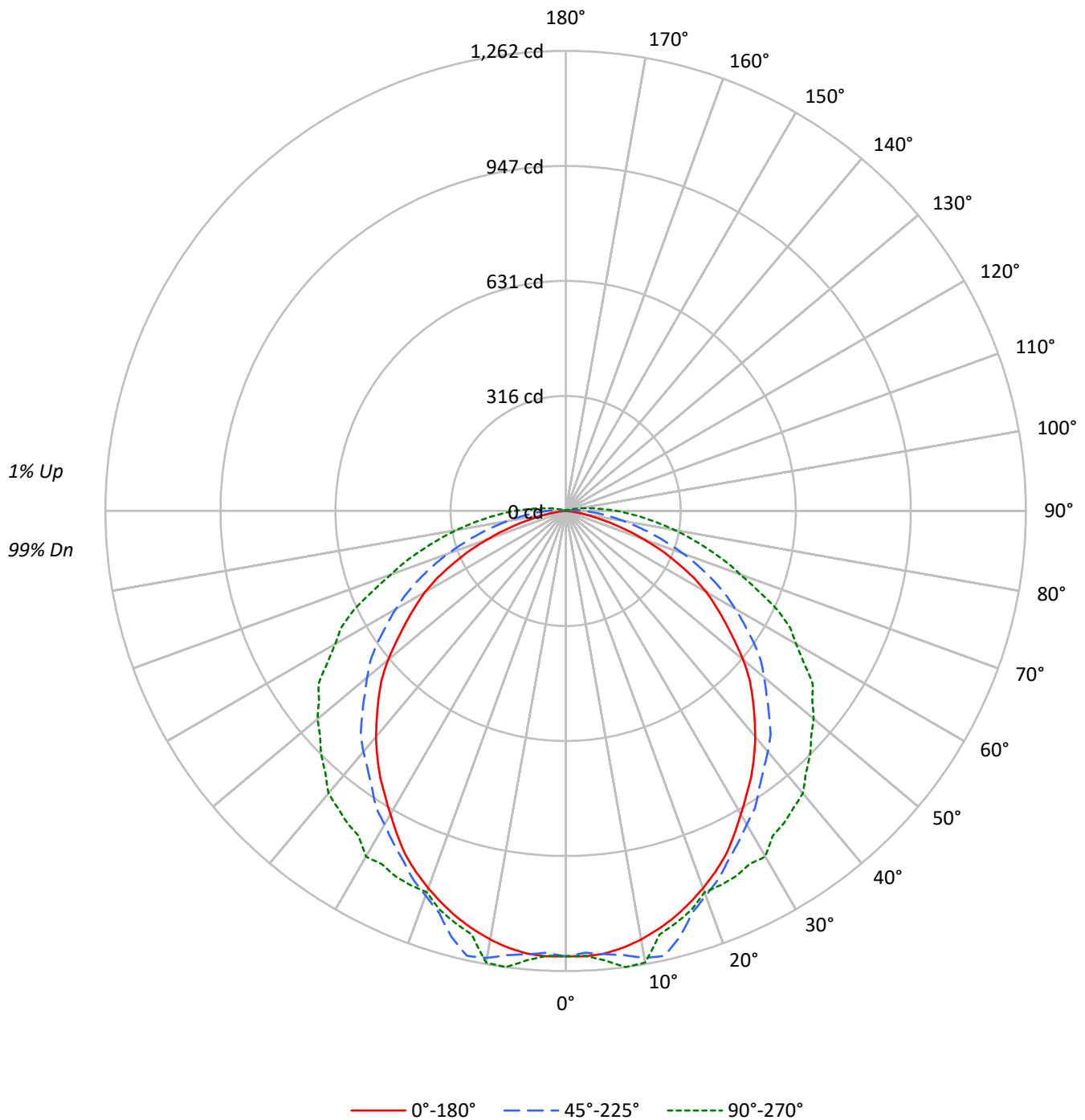
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 3679.9 lumens  
Efficiency: N/A  
Efficacy: 109.5 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): 33.6  
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  | 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°  | 6575 | 6575 | 6575 |
| 5°  | 6536 | 6492 | 6590 |
| 10° | 6426 | 6597 | 6677 |
| 15° | 6286 | 6434 | 6240 |
| 20° | 6121 | 6042 | 6010 |
| 25° | 5947 | 5795 | 6092 |
| 30° | 5697 | 5599 | 6206 |
| 35° | 5510 | 5413 | 6145 |
| 40° | 5310 | 5278 | 6236 |
| 45° | 5096 | 5100 | 6182 |
| 50° | 4840 | 4913 | 6200 |
| 55° | 4480 | 4713 | 6272 |
| 60° | 4189 | 4431 | 6092 |
| 65° | 3654 | 4092 | 6002 |
| 70° | 2924 | 3644 | 5503 |
| 75° | 2029 | 3096 | 5174 |
| 80° | 1084 | 2541 | 4845 |
| 85° | 361  | 1968 | 4559 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 55°

Luminance: 6272 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 117.4  | 3.2       |
| 10°-20°   | 334.3  | 9.1       |
| 20°-30°   | 497.5  | 13.5      |
| 30°-40°   | 598.0  | 16.2      |
| 40°-50°   | 629.4  | 17.1      |
| 50°-60°   | 584.0  | 15.9      |
| 60°-70°   | 461.8  | 12.5      |
| 70°-80°   | 282.0  | 7.7       |
| 80°-90°   | 122.9  | 3.3       |
| 90°-100°  | 38.2   | 1.0       |
| 100°-110° | 8.6    | 0.2       |
| 110°-120° | 3.4    | 0.1       |
| 120°-130° | 1.9    | 0.1       |
| 130°-140° | 0.5    | 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°    | 949.2  | 25.8      |
| 0°-40°    | 1547.2 | 42.0      |
| 0°-60°    | 2760.5 | 75.0      |
| 0°-90°    | 3627.2 | 98.6      |
| 90°-120°  | 50.3   | 1.4       |
| 90°-150°  | 52.7   | 1.4       |
| 90°-180°  | 53.0   | 1.4       |
| 0°-180°   | 3679.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 1222 | 1222  | 1222 | 1222  | 1222 |      |
| 5°   | 1219 | 1216  | 1220 | 1234  | 1238 | 115  |
| 15°  | 1153 | 1198  | 1209 | 1169  | 1170 | 325  |
| 25°  | 1040 | 1107  | 1056 | 1088  | 1106 | 478  |
| 35°  | 888  | 912   | 926  | 1010  | 1044 | 555  |
| 45°  | 725  | 729   | 789  | 914   | 948  | 559  |
| 55°  | 534  | 543   | 629  | 767   | 828  | 480  |
| 65°  | 338  | 349   | 443  | 586   | 640  | 335  |
| 75°  | 128  | 170   | 247  | 380   | 404  | 140  |
| 85°  | 11   | 40    | 96   | 187   | 214  | 18   |
| 90°  | 0    | 12    | 50   | 118   | 140  | 1    |
| 95°  | 0    | 3     | 22   | 65    | 79   | 0    |
| 105° | 0    | 2     | 4    | 13    | 18   | 0    |
| 115° | 0    | 1     | 4    | 6     | 6    | 0    |
| 125° | 0    | 0     | 2    | 4     | 5    | 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°     | 1221.6 | 1221.6 | 1221.6 | 1221.6 | 1221.6 |
| 2.5°   | 1223.1 | 1219.8 | 1213.1 | 1219.6 | 1221.3 |
| 5°     | 1218.6 | 1216.1 | 1220.3 | 1234.0 | 1237.5 |
| 7.5°   | 1208.4 | 1217.8 | 1229.0 | 1253.9 | 1261.9 |
| 10°    | 1193.2 | 1211.1 | 1244.7 | 1265.9 | 1257.6 |
| 12.5°  | 1174.8 | 1205.1 | 1250.2 | 1208.9 | 1189.7 |
| 15°    | 1153.4 | 1197.7 | 1209.4 | 1169.3 | 1170.0 |
| 17.5°  | 1128.2 | 1191.5 | 1155.4 | 1154.4 | 1147.2 |
| 20°    | 1101.1 | 1170.5 | 1122.8 | 1120.8 | 1113.1 |
| 22.5°  | 1072.0 | 1142.9 | 1093.9 | 1089.9 | 1110.8 |
| 25°    | 1040.4 | 1106.8 | 1056.3 | 1087.9 | 1105.6 |
| 27.5°  | 1000.8 | 1059.6 | 1025.0 | 1069.8 | 1091.9 |
| 30°    | 960.8  | 1010.8 | 992.9  | 1055.3 | 1094.7 |
| 32.5°  | 923.2  | 959.8  | 966.5  | 1049.9 | 1056.3 |
| 35°    | 887.6  | 912.3  | 925.9  | 1010.0 | 1044.4 |
| 37.5°  | 848.5  | 855.3  | 891.6  | 993.4  | 1026.5 |
| 40°    | 808.7  | 804.5  | 862.7  | 966.0  | 1011.8 |
| 42.5°  | 765.9  | 764.4  | 832.1  | 952.3  | 975.2  |
| 45°    | 725.4  | 728.6  | 788.6  | 913.5  | 947.6  |
| 47.5°  | 683.8  | 688.0  | 747.3  | 870.9  | 913.2  |
| 50°    | 635.5  | 641.0  | 710.4  | 833.1  | 887.6  |
| 52.5°  | 583.3  | 593.7  | 674.6  | 797.3  | 852.3  |
| 55°    | 534.3  | 543.0  | 629.1  | 766.7  | 827.6  |
| 57.5°  | 489.5  | 494.7  | 582.0  | 728.1  | 774.1  |
| 60°    | 445.4  | 446.7  | 537.7  | 685.3  | 729.4  |
| 62.5°  | 394.9  | 397.2  | 492.2  | 634.8  | 693.8  |
| 65°    | 338.2  | 348.9  | 443.2  | 586.5  | 639.8  |
| 67.5°  | 285.2  | 303.8  | 393.2  | 542.2  | 570.1  |
| 70°    | 228.4  | 260.0  | 344.1  | 490.2  | 509.9  |
| 72.5°  | 176.4  | 213.5  | 293.9  | 432.0  | 459.6  |
| 75°    | 127.9  | 169.5  | 247.1  | 379.7  | 403.6  |
| 77.5°  | 86.1   | 128.4  | 203.3  | 322.0  | 353.6  |
| 80°    | 51.5   | 93.8   | 164.2  | 268.5  | 304.1  |
| 82.5°  | 26.4   | 63.0   | 127.4  | 225.2  | 257.1  |
| 85°    | 11.4   | 39.8   | 96.3   | 186.9  | 214.5  |
| 87.5°  | 3.2    | 22.6   | 70.9   | 151.0  | 174.4  |
| 90°    | 0.2    | 11.9   | 50.5   | 118.4  | 139.6  |
| 92.5°  | 0.2    | 5.7    | 35.6   | 89.6   | 105.8  |
| 95°    | 0.2    | 3.0    | 22.1   | 64.9   | 79.4   |
| 97.5°  | 0.2    | 1.7    | 13.4   | 46.0   | 58.2   |
| 100°   | 0.2    | 1.5    | 8.0    | 30.6   | 41.6   |
| 102.5° | 0.2    | 1.7    | 5.5    | 19.4   | 27.1   |
| 105°   | 0.2    | 1.7    | 4.5    | 12.7   | 17.9   |
| 107.5° | 0.5    | 1.7    | 4.0    | 9.5    | 12.4   |
| 110°   | 0.2    | 1.5    | 4.2    | 7.2    | 9.7    |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 0.5 | 1.2   | 4.0 | 6.0   | 7.2 |
| 115°   | 0.2 | 1.0   | 3.5 | 5.7   | 6.0 |
| 117.5° | 0.5 | 0.7   | 2.7 | 5.7   | 6.0 |
| 120°   | 0.5 | 0.5   | 2.2 | 5.5   | 6.2 |
| 122.5° | 0.5 | 0.5   | 1.7 | 5.0   | 6.0 |
| 125°   | 0.2 | 0.5   | 1.5 | 3.7   | 5.2 |
| 127.5° | 0.5 | 0.5   | 1.2 | 3.0   | 4.0 |
| 130°   | 0.5 | 0.5   | 1.0 | 2.2   | 3.0 |
| 132.5° | 0.5 | 0.5   | 0.7 | 1.7   | 2.2 |
| 135°   | 0.5 | 0.5   | 0.5 | 1.2   | 1.7 |
| 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)