

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: P518210

Luminaire Tested: HVL8-8-LD4-2HI-35-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: P518210  
Test Lab: INNOVATION CENTER  
Issue Date: 4/27/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: HVL8-8-LD4-2HI-35-UNV-O-EDD  
Description: 8 FOOT, 8 INCH WIDE, HVL LED LUMINAIRE, WITH 3500K, 80 CRI LEDS  
Light Source: -  
Ballast/Driver: -

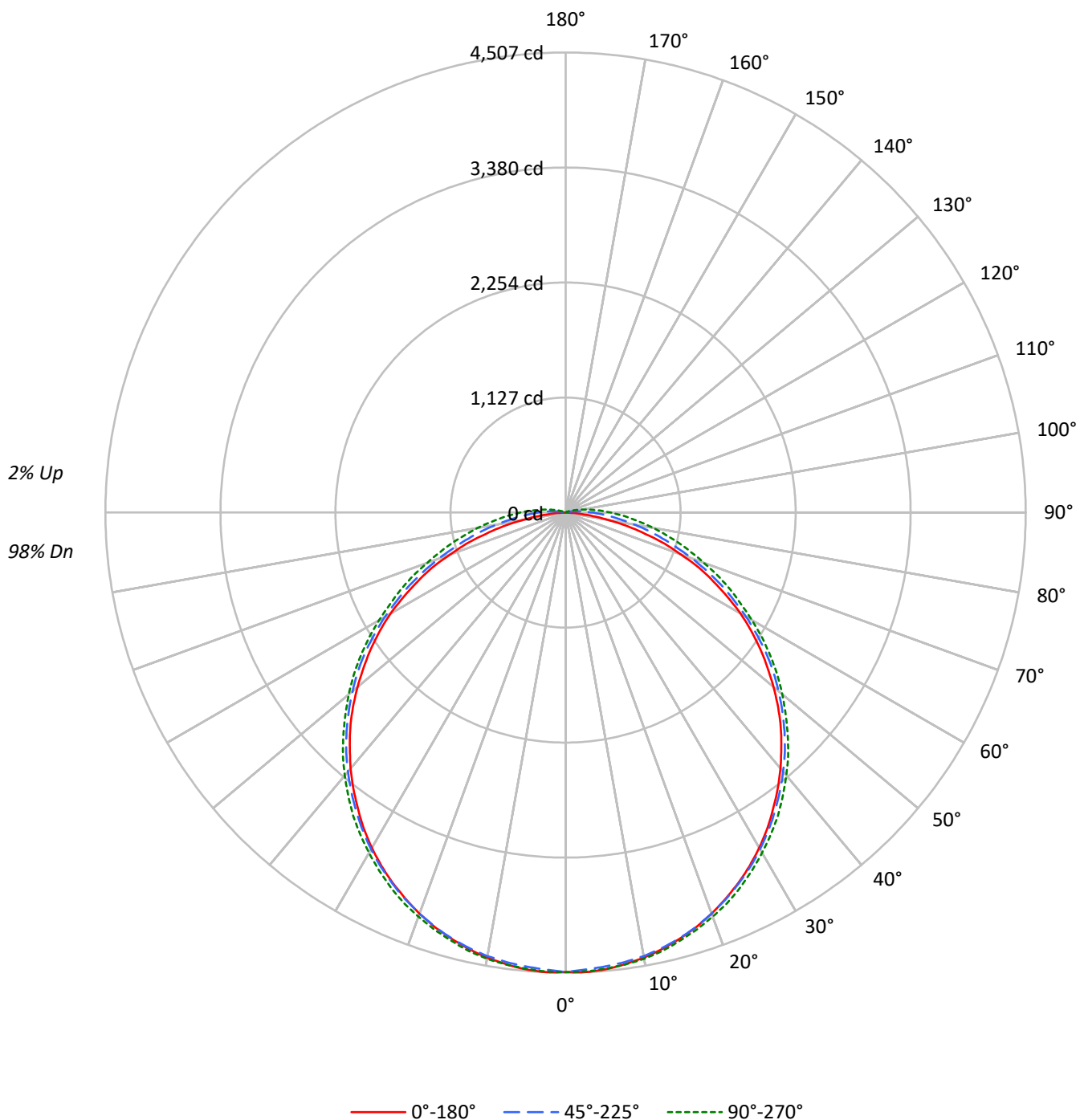
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 13611.0 lumens  
Efficiency: N/A  
Efficacy: 79.0 lumens/watt  
Spacing Criteria (0/90/45): 1.25 / 1.27 / 1.38  
Luminous Opening: Rectangular w/ Sides (W: 0.67' x L: 8' x H: 0.17')  
CIE Type: Direct  
  
Input Watts (W): 172.3  
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 |  | 98 |
| 1   | 108 | 102 | 98  | 94  | 105 | 100 | 96  | 92  | 95  | 92  | 89  |  | 91  | 88  | 86  |  | 81 |
| 2   | 98  | 89  | 82  | 76  | 95  | 87  | 80  | 75  | 83  | 77  | 73  |  | 79  | 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  | 52  |  | 62  | 56  | 51  |  | 47 |
| 5   | 75  | 61  | 52  | 45  | 72  | 60  | 52  | 45  | 58  | 50  | 44  |  | 56  | 49  | 44  |  | 41 |
| 6   | 69  | 55  | 46  | 40  | 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°  | 9085 | 9085 | 9085 |
| 5°  | 9084 | 8894 | 8891 |
| 10° | 9040 | 8745 | 8713 |
| 15° | 8979 | 8580 | 8499 |
| 20° | 8913 | 8393 | 8292 |
| 25° | 8831 | 8200 | 8080 |
| 30° | 8734 | 7994 | 7841 |
| 35° | 8607 | 7767 | 7603 |
| 40° | 8477 | 7527 | 7326 |
| 45° | 8338 | 7265 | 7027 |
| 50° | 8151 | 6961 | 6705 |
| 55° | 7952 | 6626 | 6350 |
| 60° | 7715 | 6189 | 5936 |
| 65° | 7311 | 5697 | 5526 |
| 70° | 6717 | 5116 | 5048 |
| 75° | 5858 | 4478 | 4615 |
| 80° | 4544 | 3854 | 4218 |
| 85° | 2620 | 3229 | 3841 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°

Vertical Angle: 45°

Luminance: 8338 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 426.0   | 3.1       |
| 10°-20°   | 1222.0  | 9.0       |
| 20°-30°   | 1854.1  | 13.6      |
| 30°-40°   | 2241.9  | 16.5      |
| 40°-50°   | 2339.3  | 17.2      |
| 50°-60°   | 2138.8  | 15.7      |
| 60°-70°   | 1667.3  | 12.2      |
| 70°-80°   | 1043.0  | 7.7       |
| 80°-90°   | 473.7   | 3.5       |
| 90°-100°  | 158.8   | 1.2       |
| 100°-110° | 39.9    | 0.3       |
| 110°-120° | 6.3     | 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°    | 3502.1  | 25.7      |
| 0°-40°    | 5744.0  | 42.2      |
| 0°-60°    | 10222.1 | 75.1      |
| 0°-90°    | 13406.1 | 98.5      |
| 90°-120°  | 204.9   | 1.5       |
| 90°-150°  | 204.9   | 1.5       |
| 90°-180°  | 205.0   | 1.5       |
| 0°-180°   | 13611.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 4502 | 4502  | 4502 | 4502  | 4502 |      |
| 5°   | 4492 | 4484  | 4464 | 4485  | 4485 | 427  |
| 15°  | 4321 | 4329  | 4317 | 4342  | 4340 | 1220 |
| 25°  | 4004 | 4007  | 4011 | 4045  | 4052 | 1845 |
| 35°  | 3544 | 3560  | 3575 | 3611  | 3626 | 2219 |
| 45°  | 2982 | 3009  | 3033 | 3063  | 3078 | 2298 |
| 55°  | 2327 | 2355  | 2398 | 2433  | 2449 | 2079 |
| 65°  | 1599 | 1627  | 1683 | 1750  | 1778 | 1582 |
| 75°  | 810  | 860   | 985  | 1103  | 1144 | 863  |
| 85°  | 140  | 259   | 445  | 588   | 640  | 177  |
| 90°  | 1    | 97    | 262  | 394   | 442  | 6    |
| 95°  | 1    | 26    | 136  | 246   | 284  | 1    |
| 105° | 2    | 3     | 22   | 66    | 88   | 2    |
| 115° | 3    | 3     | 4    | 12    | 17   | 2    |
| 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    |

TEST NUMBER: P518210

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 4501.7 | 4501.7 | 4501.7 | 4501.7 | 4501.7 |
| 2.5°   | 4507.0 | 4500.6 | 4480.5 | 4500.6 | 4499.6 |
| 5°     | 4492.1 | 4483.7 | 4463.5 | 4484.7 | 4484.7 |
| 7.5°   | 4462.4 | 4459.2 | 4441.2 | 4465.6 | 4465.6 |
| 10°    | 4427.4 | 4426.3 | 4411.5 | 4438.0 | 4439.1 |
| 12.5°  | 4378.6 | 4382.8 | 4369.0 | 4394.5 | 4397.7 |
| 15°    | 4321.3 | 4328.7 | 4317.0 | 4341.5 | 4340.4 |
| 17.5°  | 4258.7 | 4262.9 | 4254.4 | 4282.0 | 4281.0 |
| 20°    | 4181.2 | 4186.5 | 4180.1 | 4208.8 | 4212.0 |
| 22.5°  | 4095.2 | 4102.7 | 4101.6 | 4131.3 | 4139.8 |
| 25°    | 4004.0 | 4007.2 | 4011.4 | 4045.4 | 4051.7 |
| 27.5°  | 3903.2 | 3908.5 | 3915.9 | 3946.7 | 3953.0 |
| 30°    | 3792.8 | 3801.3 | 3809.8 | 3841.6 | 3850.1 |
| 32.5°  | 3676.1 | 3684.6 | 3695.2 | 3736.6 | 3740.8 |
| 35°    | 3544.5 | 3560.4 | 3575.3 | 3611.3 | 3626.2 |
| 37.5°  | 3412.9 | 3433.0 | 3446.8 | 3485.0 | 3496.7 |
| 40°    | 3273.9 | 3294.0 | 3316.3 | 3356.6 | 3364.1 |
| 42.5°  | 3128.5 | 3151.8 | 3178.4 | 3214.4 | 3227.2 |
| 45°    | 2982.0 | 3008.6 | 3033.0 | 3062.7 | 3077.5 |
| 47.5°  | 2823.9 | 2850.4 | 2880.2 | 2914.1 | 2923.7 |
| 50°    | 2660.5 | 2691.3 | 2723.1 | 2754.9 | 2771.9 |
| 52.5°  | 2492.8 | 2529.9 | 2566.0 | 2600.0 | 2615.9 |
| 55°    | 2327.3 | 2354.8 | 2398.4 | 2433.4 | 2449.3 |
| 57.5°  | 2155.3 | 2178.7 | 2218.0 | 2275.3 | 2283.7 |
| 60°    | 1980.2 | 2001.5 | 2041.8 | 2088.5 | 2107.6 |
| 62.5°  | 1787.1 | 1815.7 | 1858.2 | 1917.6 | 1934.6 |
| 65°    | 1599.3 | 1626.9 | 1683.1 | 1750.0 | 1777.5 |
| 67.5°  | 1417.8 | 1427.3 | 1499.5 | 1569.5 | 1614.1 |
| 70°    | 1203.4 | 1239.5 | 1323.3 | 1409.3 | 1443.3 |
| 72.5°  | 1018.8 | 1054.9 | 1147.2 | 1248.0 | 1290.4 |
| 75°    | 809.7  | 859.6  | 984.8  | 1102.6 | 1144.0 |
| 77.5°  | 626.1  | 681.3  | 836.2  | 955.1  | 1002.9 |
| 80°    | 437.2  | 523.2  | 691.9  | 825.6  | 877.6  |
| 82.5°  | 274.9  | 381.0  | 561.4  | 701.5  | 747.1  |
| 85°    | 140.1  | 258.9  | 444.7  | 587.9  | 639.9  |
| 87.5°  | 37.1   | 167.7  | 346.0  | 482.9  | 535.9  |
| 90°    | 1.1    | 96.6   | 262.1  | 393.7  | 441.5  |
| 92.5°  | 1.1    | 54.1   | 195.3  | 313.1  | 361.9  |
| 95°    | 1.1    | 25.5   | 135.8  | 246.2  | 284.4  |
| 97.5°  | 1.1    | 10.6   | 93.4   | 185.7  | 223.9  |
| 100°   | 1.1    | 5.3    | 59.4   | 134.8  | 167.7  |
| 102.5° | 2.1    | 3.2    | 37.1   | 96.6   | 123.1  |
| 105°   | 2.1    | 3.2    | 22.3   | 65.8   | 88.1   |
| 107.5° | 2.1    | 3.2    | 12.7   | 44.6   | 60.5   |
| 110°   | 3.2    | 3.2    | 7.4    | 27.6   | 40.3   |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90°  |
|--------|-----|-------|-----|-------|------|
| 112.5° | 3.2 | 3.2   | 4.2 | 18.0  | 26.5 |
| 115°   | 3.2 | 3.2   | 4.2 | 11.7  | 17.0 |
| 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)