

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: HALO

Report Number: P990906

Luminaire Tested: **ML4ALSFL9FS1E-TIR4D40FL-TL4RDMW-35°-1000LM-5000K**

Issue Date: 5/13/2025

Tested By:

Approved By:



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### Test Information

Test Method: LM-79-08  
 Report Number: P990906  
 Test Lab: Cooper Lighting Solutions  
 Issue Date: 5/13/2025  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML4ALSFL9FS1E-TIR4D40FL-TL4RDMW-35°-1000LM-5000K  
 Description: 4IN ROUND ML FLEX ADJUSTABLE, SELECTABLE CCT, WITH 40D TIR, MATTE WHITE TRIM 35° Tilt  
 Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 5000K CCT  
 Ballast/Driver: -

### Summary

Lumens per Lamp: N/A  
 Luminaire Lumens: 930.3 lumens  
 Efficiency: N/A  
 Efficacy: 71.6 lumens/watt  
 Spacing Criteria (0/90/45): 2.28 / 0.7 / 1.37  
 Luminous Opening: Circular (Dia: 0.33' x H: 0')  
 CIE Type: Direct

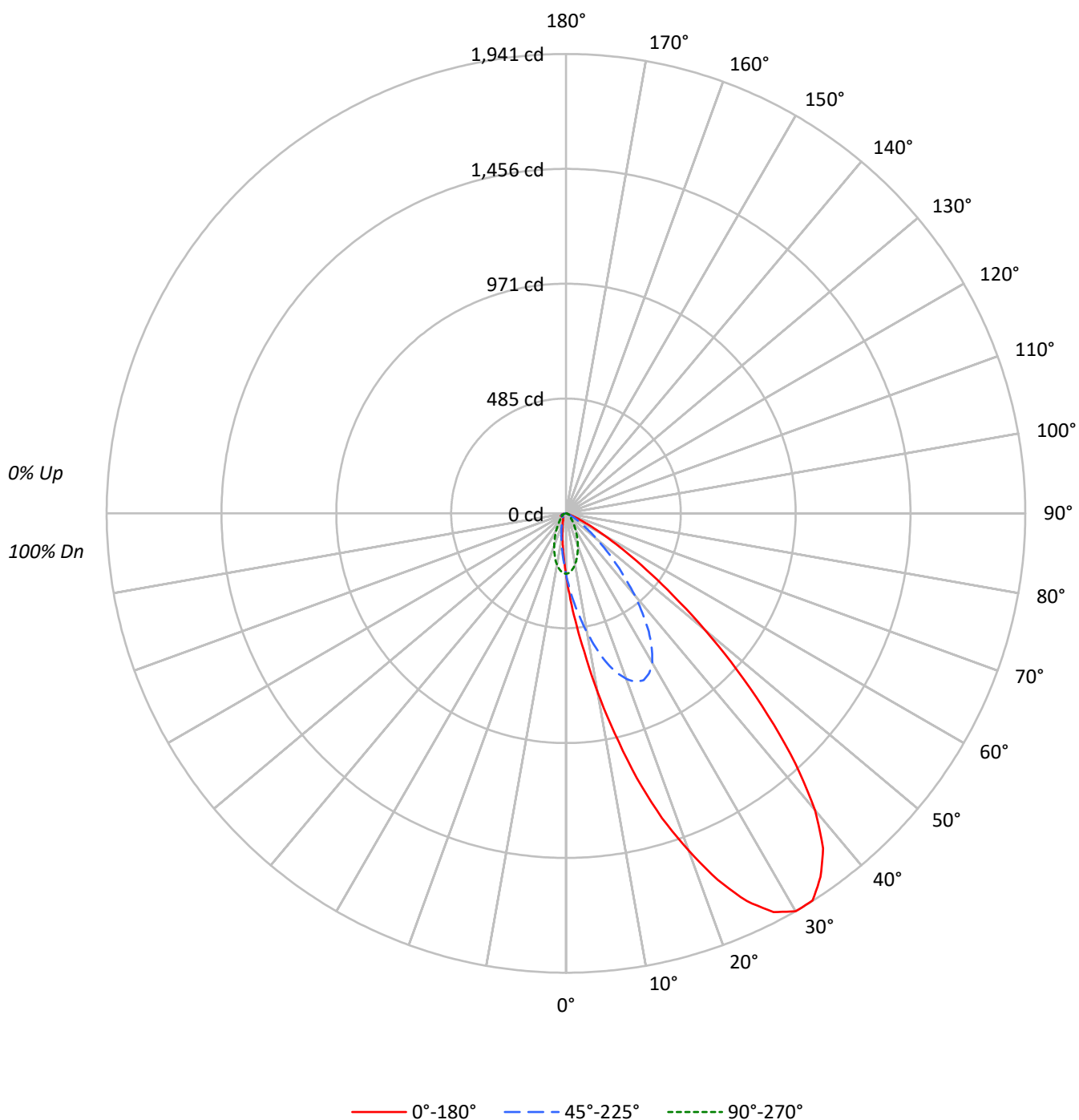
Input Watts (W): 13  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT

| Measurement and Test Equipment |                       |                  |                      |
|--------------------------------|-----------------------|------------------|----------------------|
| Instrument                     | Identification Number | Calibration Date | Calibration Due Date |
| Photometer                     | GONIO 1 IN0055        | 4/22/2021        | 10/22/2021           |
| Power Meter                    | XITRON 2801 IN0197    | 12/1/2020        | 12/1/2021            |
| AC Power Source                | CHROMA 61505 IN0196   | 12/1/2020        | 12/1/2021            |
| DC Power Supply                | AGILENT E3634A IN0198 | 11/30/2020       | 11/30/2021           |
| Room Thermometer               | ONSET IN0143          | 12/1/2020        | 12/1/2021            |

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### Luminous Intensity Polar Plot



TEST NUMBER: P990906

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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 | 111 | 111 | 111 |  | 106 | 106 | 106 |  | 102 |
| 1   | 112 | 108 | 105 | 102 | 109 | 106 | 103 | 100 | 102 | 99  | 97  |  | 98  | 96  | 94  |  | 94  |
| 2   | 104 | 97  | 92  | 88  | 101 | 96  | 91  | 87  | 92  | 88  | 85  |  | 89  | 86  | 83  |  | 86  |
| 3   | 96  | 88  | 81  | 76  | 94  | 86  | 80  | 75  | 84  | 78  | 74  |  | 81  | 77  | 73  |  | 79  |
| 4   | 89  | 79  | 72  | 67  | 87  | 78  | 71  | 66  | 76  | 70  | 65  |  | 74  | 69  | 64  |  | 72  |
| 5   | 83  | 72  | 64  | 59  | 81  | 71  | 64  | 58  | 69  | 63  | 58  |  | 67  | 62  | 57  |  | 65  |
| 6   | 77  | 65  | 58  | 52  | 75  | 65  | 57  | 52  | 63  | 56  | 51  |  | 61  | 55  | 51  |  | 60  |
| 7   | 72  | 60  | 52  | 47  | 70  | 59  | 52  | 46  | 58  | 51  | 46  |  | 56  | 50  | 46  |  | 55  |
| 8   | 67  | 55  | 47  | 42  | 65  | 54  | 47  | 42  | 53  | 46  | 41  |  | 52  | 46  | 41  |  | 51  |
| 9   | 63  | 50  | 43  | 38  | 61  | 50  | 43  | 38  | 49  | 42  | 37  |  | 48  | 42  | 37  |  | 47  |
| 10  | 59  | 46  | 39  | 34  | 57  | 46  | 39  | 34  | 45  | 38  | 34  |  | 44  | 38  | 34  |  | 43  |

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

|     | 0°     | 90°   | 180°  |
|-----|--------|-------|-------|
| 0°  | 31539  | 31539 | 31539 |
| 5°  | 56423  | 30310 | 17867 |
| 10° | 95677  | 27517 | 11084 |
| 15° | 147937 | 23445 | 7253  |
| 20° | 198966 | 19085 | 5159  |
| 25° | 246009 | 15025 | 3865  |
| 30° | 276451 | 11679 | 3276  |
| 35° | 282392 | 8884  | 2966  |
| 40° | 263777 | 6859  | 3172  |
| 45° | 210842 | 5530  | 3436  |
| 50° | 147219 | 4816  | 4202  |
| 55° | 88836  | 4710  | 4946  |
| 60° | 46649  | 4588  | 5921  |
| 65° | 21043  | 4787  | 6392  |
| 70° | 7898   | 3931  | 7105  |
| 75° | 1573   | 2621  | 7292  |
| 80° | 0      | 1563  | 5469  |
| 85° | 0      | 3114  | 4670  |

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 27.4   | 2.9       |
| 10°-20°   | 109.4  | 11.8      |
| 20°-30°   | 214.5  | 23.1      |
| 30°-40°   | 260.9  | 28.0      |
| 40°-50°   | 193.8  | 20.8      |
| 50°-60°   | 85.2   | 9.2       |
| 60°-70°   | 28.8   | 3.1       |
| 70°-80°   | 8.6    | 0.9       |
| 80°-90°   | 1.7    | 0.2       |
| 90°-100°  | 0.0    | 0.0       |
| 100°-110° | 0.0    | 0.0       |
| 110°-120° | 0.0    | 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°    | 351.3  | 37.8      |
| 0°-40°    | 612.2  | 65.8      |
| 0°-60°    | 891.1  | 95.8      |
| 0°-90°    | 930.3  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 930.3  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 45° | 90° | 135° | 180° | Flux |
|-----|------|-----|-----|------|------|------|
| 0°  | 256  | 256 | 256 | 256  | 256  |      |
| 5°  | 456  | 374 | 245 | 168  | 144  | 53   |
| 15° | 1158 | 648 | 184 | 75   | 57   | 337  |
| 25° | 1808 | 777 | 110 | 37   | 28   | 829  |
| 35° | 1875 | 610 | 59  | 22   | 20   | 1157 |
| 45° | 1209 | 295 | 32  | 20   | 20   | 926  |
| 55° | 413  | 92  | 22  | 22   | 23   | 387  |
| 65° | 72   | 24  | 16  | 21   | 22   | 84   |
| 75° | 3    | 3   | 6   | 12   | 15   | 6    |
| 85° | 0    | 1   | 2   | 2    | 3    | 0    |
| 90° | 0    | 0   | 0   | 0    | 0    |      |

TEST NUMBER: P990906

CATALOG NUMBER: ML4ALSFL9FS1E-TIR4D40FL-TL4RDMW-35°-1000LM-5000K

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 10°    | 15°    | 20°    | 22.5°  | 45°   | 67.5° | 90°   | 112.5° | 135°  |
|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------|-------|
| 0°    | 255.7  | 255.7  | 255.7  | 255.7  | 255.7  | 255.7  | 255.7 | 255.7 | 255.7 | 255.7  | 255.7 |
| 2.5°  | 342.1  | 342.1  | 343.2  | 341.0  | 339.9  | 334.4  | 311.5 | 282.0 | 252.5 | 225.1  | 206.6 |
| 5°    | 455.7  | 453.5  | 445.9  | 440.4  | 436.1  | 429.5  | 373.8 | 306.0 | 244.8 | 198.9  | 168.3 |
| 7.5°  | 588.0  | 591.3  | 588.0  | 568.3  | 554.1  | 546.4  | 439.3 | 325.7 | 233.9 | 173.8  | 136.6 |
| 10°   | 763.9  | 754.1  | 744.3  | 722.4  | 703.8  | 684.1  | 509.3 | 338.8 | 219.7 | 149.7  | 112.6 |
| 12.5° | 949.7  | 942.1  | 929.0  | 895.1  | 860.1  | 837.2  | 580.3 | 344.3 | 203.3 | 127.9  | 91.8  |
| 15°   | 1158.5 | 1141.0 | 1113.7 | 1082.0 | 1024.0 | 1002.2 | 648.1 | 346.4 | 183.6 | 108.2  | 75.4  |
| 17.5° | 1349.7 | 1344.3 | 1303.8 | 1252.5 | 1181.4 | 1154.1 | 703.8 | 338.8 | 165.0 | 91.8   | 62.3  |
| 20°   | 1515.8 | 1523.5 | 1486.3 | 1420.8 | 1336.6 | 1291.8 | 744.3 | 324.6 | 145.4 | 77.6   | 51.4  |
| 22.5° | 1676.5 | 1669.9 | 1629.5 | 1562.8 | 1462.3 | 1404.4 | 771.6 | 307.1 | 129.0 | 65.6   | 43.7  |
| 25°   | 1807.6 | 1790.2 | 1743.2 | 1663.4 | 1550.8 | 1495.1 | 777.0 | 283.1 | 110.4 | 55.7   | 37.2  |
| 27.5° | 1899.4 | 1877.6 | 1821.8 | 1733.3 | 1614.2 | 1547.5 | 761.7 | 255.7 | 95.1  | 48.1   | 31.7  |
| 30°   | 1941.0 | 1919.1 | 1864.5 | 1761.7 | 1633.9 | 1559.6 | 730.0 | 226.2 | 82.0  | 40.4   | 27.3  |
| 32.5° | 1939.9 | 1914.7 | 1853.5 | 1747.5 | 1613.1 | 1538.8 | 674.3 | 195.6 | 69.9  | 35.0   | 24.0  |
| 35°   | 1875.4 | 1853.5 | 1792.3 | 1690.7 | 1548.6 | 1467.7 | 609.8 | 167.2 | 59.0  | 30.6   | 21.9  |
| 37.5° | 1784.7 | 1756.3 | 1691.8 | 1584.7 | 1453.5 | 1372.7 | 531.1 | 141.0 | 50.3  | 27.3   | 20.8  |
| 40°   | 1638.2 | 1610.9 | 1542.1 | 1447.0 | 1315.8 | 1232.8 | 451.4 | 115.8 | 42.6  | 24.0   | 19.7  |
| 42.5° | 1436.1 | 1412.0 | 1362.8 | 1264.5 | 1139.9 | 1066.7 | 368.3 | 95.1  | 36.1  | 21.9   | 19.7  |
| 45°   | 1208.7 | 1195.6 | 1147.5 | 1063.4 | 954.1  | 887.4  | 295.1 | 76.5  | 31.7  | 20.8   | 19.7  |
| 47.5° | 982.5  | 981.4  | 932.2  | 852.5  | 768.3  | 707.1  | 226.2 | 62.3  | 28.4  | 20.8   | 19.7  |
| 50°   | 767.2  | 756.3  | 723.5  | 655.7  | 578.1  | 538.8  | 172.7 | 50.3  | 25.1  | 19.7   | 19.7  |
| 52.5° | 568.3  | 566.1  | 532.2  | 488.5  | 429.5  | 389.1  | 126.8 | 41.5  | 23.0  | 20.8   | 20.8  |
| 55°   | 413.1  | 405.5  | 385.8  | 346.4  | 302.7  | 277.6  | 91.8  | 33.9  | 21.9  | 20.8   | 21.9  |
| 57.5° | 286.3  | 283.1  | 265.6  | 236.1  | 207.6  | 191.3  | 65.6  | 28.4  | 20.8  | 19.7   | 21.9  |
| 60°   | 189.1  | 184.7  | 176.0  | 157.4  | 137.7  | 127.9  | 48.1  | 23.0  | 18.6  | 19.7   | 21.9  |
| 62.5° | 122.4  | 118.0  | 110.4  | 101.6  | 89.6   | 82.0   | 33.9  | 18.6  | 17.5  | 19.7   | 20.8  |
| 65°   | 72.1   | 72.1   | 68.9   | 62.3   | 55.7   | 51.4   | 24.0  | 15.3  | 16.4  | 18.6   | 20.8  |
| 67.5° | 42.6   | 41.5   | 40.4   | 37.2   | 32.8   | 30.6   | 16.4  | 12.0  | 14.2  | 17.5   | 19.7  |
| 70°   | 21.9   | 21.9   | 20.8   | 19.7   | 17.5   | 17.5   | 10.9  | 9.8   | 10.9  | 14.2   | 17.5  |
| 72.5° | 8.7    | 8.7    | 8.7    | 7.7    | 7.7    | 7.7    | 6.6   | 6.6   | 8.7   | 12.0   | 15.3  |
| 75°   | 3.3    | 3.3    | 3.3    | 3.3    | 3.3    | 3.3    | 3.3   | 4.4   | 5.5   | 8.7    | 12.0  |
| 77.5° | 1.1    | 0.0    | 1.1    | 1.1    | 0.0    | 1.1    | 1.1   | 2.2   | 3.3   | 5.5    | 8.7   |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.1   | 2.2   | 2.2   | 4.4    | 5.5   |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.1   | 1.1   | 2.2   | 2.2    | 3.3   |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.1   | 1.1   | 2.2   | 2.2    | 2.2   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.1   | 1.1   | 1.1   | 1.1    | 1.1   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0    | 0.0   |

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**CANDELA DISTRIBUTION (continued):**

|       | 157.5° | 180°  |
|-------|--------|-------|
| 0°    | 255.7  | 255.7 |
| 2.5°  | 192.3  | 190.2 |
| 5°    | 149.7  | 144.3 |
| 7.5°  | 119.1  | 112.6 |
| 10°   | 94.0   | 88.5  |
| 12.5° | 75.4   | 71.0  |
| 15°   | 61.2   | 56.8  |
| 17.5° | 50.3   | 47.0  |
| 20°   | 41.5   | 39.3  |
| 22.5° | 35.0   | 32.8  |
| 25°   | 30.6   | 28.4  |
| 27.5° | 26.2   | 25.1  |
| 30°   | 23.0   | 23.0  |
| 32.5° | 20.8   | 20.8  |
| 35°   | 19.7   | 19.7  |
| 37.5° | 19.7   | 19.7  |
| 40°   | 18.6   | 19.7  |
| 42.5° | 18.6   | 19.7  |
| 45°   | 19.7   | 19.7  |
| 47.5° | 20.8   | 20.8  |
| 50°   | 20.8   | 21.9  |
| 52.5° | 21.9   | 23.0  |
| 55°   | 23.0   | 23.0  |
| 57.5° | 23.0   | 23.0  |
| 60°   | 23.0   | 24.0  |
| 62.5° | 23.0   | 23.0  |
| 65°   | 21.9   | 21.9  |
| 67.5° | 20.8   | 21.9  |
| 70°   | 19.7   | 19.7  |
| 72.5° | 17.5   | 17.5  |
| 75°   | 15.3   | 15.3  |
| 77.5° | 10.9   | 12.0  |
| 80°   | 7.7    | 7.7   |
| 82.5° | 4.4    | 5.5   |
| 85°   | 3.3    | 3.3   |
| 87.5° | 1.1    | 1.1   |
| 90°   | 0.0    | 0.0   |

(END OF REPORT)