

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: P990902

Luminaire Tested: **ML4ALSFL9FS1E-TIR4D40FL-TL4RDMW-35°-1000LM-2700K**

Issue Date: 5/13/2025

Tested By:

Approved By:



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### Test Information

Test Method: LM-79-08  
 Report Number: P990902  
 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-2700K  
 Description: 4IN ROUND ML FLEX ADJUSTABLE, SELECTABLE CCT, WITH 40D TIR, MATTE WHITE TRIM 35° Tilt  
 Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 2700K CCT  
 Ballast/Driver: -

### Summary

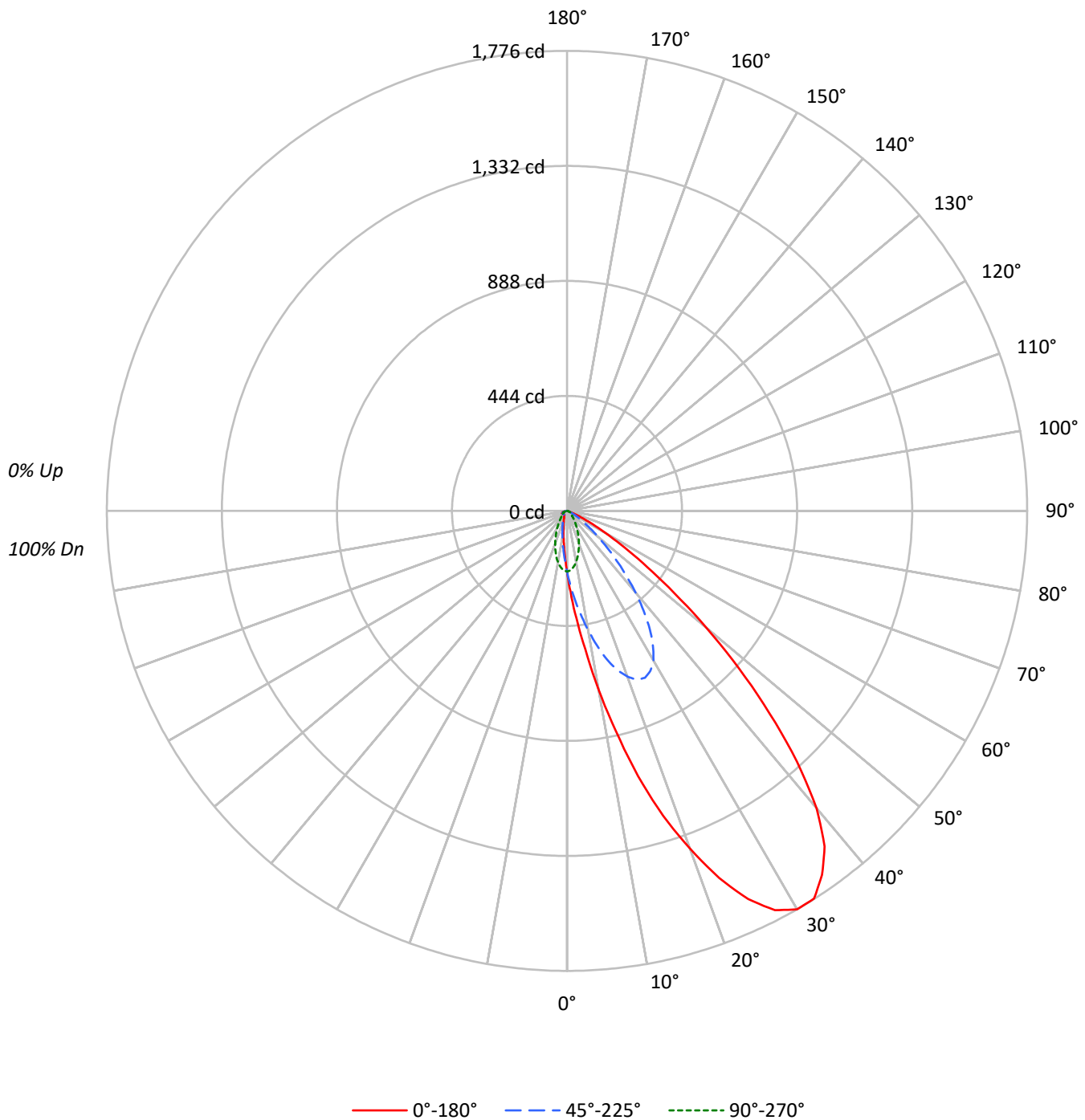
Lumens per Lamp: N/A  
 Luminaire Lumens: 851.1 lumens  
 Efficiency: N/A  
 Efficacy: 65.5 lumens/watt  
 Spacing Criteria (0/90/45): 2.28 / 0.7 / 1.37  
 Luminous Opening: Circular (Dia: 0.33' x H: 0')  
 CIE Type: Direct

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: P990902

CATALOG NUMBER: ML4ALSFL9FS1E-TIR4D40FL-TL4RDMW-35°-1000LM-2700K

**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°  | 28863  | 28863 | 28863 |
| 5°  | 51619  | 27735 | 16344 |
| 10° | 87536  | 25175 | 10145 |
| 15° | 135346 | 21453 | 6640  |
| 20° | 182034 | 17458 | 4725  |
| 25° | 225077 | 13746 | 3539  |
| 30° | 252922 | 10682 | 2991  |
| 35° | 258360 | 8131  | 2710  |
| 40° | 241331 | 6280  | 2898  |
| 45° | 192910 | 5059  | 3140  |
| 50° | 134689 | 4414  | 3838  |
| 55° | 81266  | 4301  | 4516  |
| 60° | 42678  | 4194  | 5427  |
| 65° | 19263  | 4378  | 5837  |
| 70° | 7213   | 3606  | 6491  |
| 75° | 1430   | 2383  | 6672  |
| 80° | 0      | 1421  | 4972  |
| 85° | 0      | 2830  | 4246  |

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 25.1   | 2.9       |
| 10°-20°   | 100.1  | 11.8      |
| 20°-30°   | 196.3  | 23.1      |
| 30°-40°   | 238.7  | 28.0      |
| 40°-50°   | 177.3  | 20.8      |
| 50°-60°   | 77.9   | 9.2       |
| 60°-70°   | 26.4   | 3.1       |
| 70°-80°   | 7.9    | 0.9       |
| 80°-90°   | 1.6    | 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°    | 321.4  | 37.8      |
| 0°-40°    | 560.1  | 65.8      |
| 0°-60°    | 815.3  | 95.8      |
| 0°-90°    | 851.1  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 851.1  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 45° | 90° | 135° | 180° | Flux |
|-----|------|-----|-----|------|------|------|
| 0°  | 234  | 234 | 234 | 234  | 234  |      |
| 5°  | 417  | 342 | 224 | 154  | 132  | 48   |
| 15° | 1060 | 593 | 168 | 69   | 52   | 308  |
| 25° | 1654 | 711 | 101 | 34   | 26   | 758  |
| 35° | 1716 | 558 | 54  | 20   | 18   | 1058 |
| 45° | 1106 | 270 | 29  | 18   | 18   | 847  |
| 55° | 378  | 84  | 20  | 20   | 21   | 354  |
| 65° | 66   | 22  | 15  | 19   | 20   | 77   |
| 75° | 3    | 3   | 5   | 11   | 14   | 6    |
| 85° | 0    | 1   | 2   | 2    | 3    | 0    |
| 90° | 0    | 0   | 0   | 0    | 0    |      |

TEST NUMBER: P990902

CATALOG NUMBER: ML4ALSFL9FS1E-TIR4D40FL-TL4RDMW-35°-1000LM-2700K

**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 5°     | 10°    | 15°    | 20°    | 22.5°  | 45°   | 67.5° | 90°   | 112.5° | 135°  |
|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------|-------|
| 0°    | 234.0  | 234.0  | 234.0  | 234.0  | 234.0  | 234.0  | 234.0 | 234.0 | 234.0 | 234.0  | 234.0 |
| 2.5°  | 313.0  | 313.0  | 314.0  | 312.0  | 311.0  | 306.0  | 285.0 | 258.0 | 231.0 | 206.0  | 189.0 |
| 5°    | 416.9  | 414.9  | 407.9  | 402.9  | 398.9  | 392.9  | 342.0 | 280.0 | 224.0 | 182.0  | 154.0 |
| 7.5°  | 537.9  | 540.9  | 537.9  | 519.9  | 506.9  | 499.9  | 401.9 | 298.0 | 214.0 | 159.0  | 125.0 |
| 10°   | 698.9  | 689.9  | 680.9  | 660.9  | 643.9  | 625.9  | 465.9 | 310.0 | 201.0 | 137.0  | 103.0 |
| 12.5° | 868.9  | 861.9  | 849.9  | 818.9  | 786.9  | 765.9  | 530.9 | 315.0 | 186.0 | 117.0  | 84.0  |
| 15°   | 1059.9 | 1043.9 | 1018.9 | 989.9  | 936.9  | 916.9  | 592.9 | 317.0 | 168.0 | 99.0   | 69.0  |
| 17.5° | 1234.8 | 1229.8 | 1192.8 | 1145.8 | 1080.9 | 1055.9 | 643.9 | 310.0 | 151.0 | 84.0   | 57.0  |
| 20°   | 1386.8 | 1393.8 | 1359.8 | 1299.8 | 1222.8 | 1181.8 | 680.9 | 297.0 | 133.0 | 71.0   | 47.0  |
| 22.5° | 1533.8 | 1527.8 | 1490.8 | 1429.8 | 1337.8 | 1284.8 | 705.9 | 281.0 | 118.0 | 60.0   | 40.0  |
| 25°   | 1653.8 | 1637.8 | 1594.8 | 1521.8 | 1418.8 | 1367.8 | 710.9 | 259.0 | 101.0 | 51.0   | 34.0  |
| 27.5° | 1737.8 | 1717.8 | 1666.8 | 1585.8 | 1476.8 | 1415.8 | 696.9 | 234.0 | 87.0  | 44.0   | 29.0  |
| 30°   | 1775.8 | 1755.8 | 1705.8 | 1611.8 | 1494.8 | 1426.8 | 667.9 | 207.0 | 75.0  | 37.0   | 25.0  |
| 32.5° | 1774.8 | 1751.8 | 1695.8 | 1598.8 | 1475.8 | 1407.8 | 616.9 | 179.0 | 64.0  | 32.0   | 22.0  |
| 35°   | 1715.8 | 1695.8 | 1639.8 | 1546.8 | 1416.8 | 1342.8 | 557.9 | 153.0 | 54.0  | 28.0   | 20.0  |
| 37.5° | 1632.8 | 1606.8 | 1547.8 | 1449.8 | 1329.8 | 1255.8 | 485.9 | 129.0 | 46.0  | 25.0   | 19.0  |
| 40°   | 1498.8 | 1473.8 | 1410.8 | 1323.8 | 1203.8 | 1127.8 | 412.9 | 106.0 | 39.0  | 22.0   | 18.0  |
| 42.5° | 1313.8 | 1291.8 | 1246.8 | 1156.8 | 1042.9 | 975.9  | 337.0 | 87.0  | 33.0  | 20.0   | 18.0  |
| 45°   | 1105.9 | 1093.9 | 1049.9 | 972.9  | 872.9  | 811.9  | 270.0 | 70.0  | 29.0  | 19.0   | 18.0  |
| 47.5° | 898.9  | 897.9  | 852.9  | 779.9  | 702.9  | 646.9  | 207.0 | 57.0  | 26.0  | 19.0   | 18.0  |
| 50°   | 701.9  | 691.9  | 661.9  | 599.9  | 528.9  | 492.9  | 158.0 | 46.0  | 23.0  | 18.0   | 18.0  |
| 52.5° | 519.9  | 517.9  | 486.9  | 446.9  | 392.9  | 356.0  | 116.0 | 38.0  | 21.0  | 19.0   | 19.0  |
| 55°   | 377.9  | 371.0  | 353.0  | 317.0  | 277.0  | 254.0  | 84.0  | 31.0  | 20.0  | 19.0   | 20.0  |
| 57.5° | 262.0  | 259.0  | 243.0  | 216.0  | 190.0  | 175.0  | 60.0  | 26.0  | 19.0  | 18.0   | 20.0  |
| 60°   | 173.0  | 169.0  | 161.0  | 144.0  | 126.0  | 117.0  | 44.0  | 21.0  | 17.0  | 18.0   | 20.0  |
| 62.5° | 112.0  | 108.0  | 101.0  | 93.0   | 82.0   | 75.0   | 31.0  | 17.0  | 16.0  | 18.0   | 19.0  |
| 65°   | 66.0   | 66.0   | 63.0   | 57.0   | 51.0   | 47.0   | 22.0  | 14.0  | 15.0  | 17.0   | 19.0  |
| 67.5° | 39.0   | 38.0   | 37.0   | 34.0   | 30.0   | 28.0   | 15.0  | 11.0  | 13.0  | 16.0   | 18.0  |
| 70°   | 20.0   | 20.0   | 19.0   | 18.0   | 16.0   | 16.0   | 10.0  | 9.0   | 10.0  | 13.0   | 16.0  |
| 72.5° | 8.0    | 8.0    | 8.0    | 7.0    | 7.0    | 7.0    | 6.0   | 6.0   | 8.0   | 11.0   | 14.0  |
| 75°   | 3.0    | 3.0    | 3.0    | 3.0    | 3.0    | 3.0    | 3.0   | 4.0   | 5.0   | 8.0    | 11.0  |
| 77.5° | 1.0    | 0.0    | 1.0    | 1.0    | 0.0    | 1.0    | 1.0   | 2.0   | 3.0   | 5.0    | 8.0   |
| 80°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.0   | 2.0   | 2.0   | 4.0    | 5.0   |
| 82.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.0   | 1.0   | 2.0   | 2.0    | 3.0   |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.0   | 1.0   | 2.0   | 2.0    | 2.0   |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.0   | 1.0   | 1.0   | 1.0    | 1.0   |
| 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°    | 234.0  | 234.0 |
| 2.5°  | 176.0  | 174.0 |
| 5°    | 137.0  | 132.0 |
| 7.5°  | 109.0  | 103.0 |
| 10°   | 86.0   | 81.0  |
| 12.5° | 69.0   | 65.0  |
| 15°   | 56.0   | 52.0  |
| 17.5° | 46.0   | 43.0  |
| 20°   | 38.0   | 36.0  |
| 22.5° | 32.0   | 30.0  |
| 25°   | 28.0   | 26.0  |
| 27.5° | 24.0   | 23.0  |
| 30°   | 21.0   | 21.0  |
| 32.5° | 19.0   | 19.0  |
| 35°   | 18.0   | 18.0  |
| 37.5° | 18.0   | 18.0  |
| 40°   | 17.0   | 18.0  |
| 42.5° | 17.0   | 18.0  |
| 45°   | 18.0   | 18.0  |
| 47.5° | 19.0   | 19.0  |
| 50°   | 19.0   | 20.0  |
| 52.5° | 20.0   | 21.0  |
| 55°   | 21.0   | 21.0  |
| 57.5° | 21.0   | 21.0  |
| 60°   | 21.0   | 22.0  |
| 62.5° | 21.0   | 21.0  |
| 65°   | 20.0   | 20.0  |
| 67.5° | 19.0   | 20.0  |
| 70°   | 18.0   | 18.0  |
| 72.5° | 16.0   | 16.0  |
| 75°   | 14.0   | 14.0  |
| 77.5° | 10.0   | 11.0  |
| 80°   | 7.0    | 7.0   |
| 82.5° | 4.0    | 5.0   |
| 85°   | 3.0    | 3.0   |
| 87.5° | 1.0    | 1.0   |
| 90°   | 0.0    | 0.0   |

(END OF REPORT)