

Scaled data based on original data using  
LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P589028

Luminaire Tested: **FMR-24-2-LD4-2HI-40-UNV-81-97-EDD**

Issue Date: 12/8/2021



**Test Information**

Test Method: LM-79-08  
Report Number: P589028  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2102-135-1)  
Test Lab: INNOVATION CENTER  
Issue Date: 12/8/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: FMR-24-2-LD4-2HI-40-UNV-81-97-EDD  
Description: 2X2 FMR TROFFER WITH .156 CLEAR PC FIXTURE SIDE AND .375 CLEAR  
TEMPERED GLASS ENVIRONMENTAL SIDE LENSES WITH, 80 CRI AND 4000K CCT LEDS  
Light Source: -  
Ballast/Driver: -

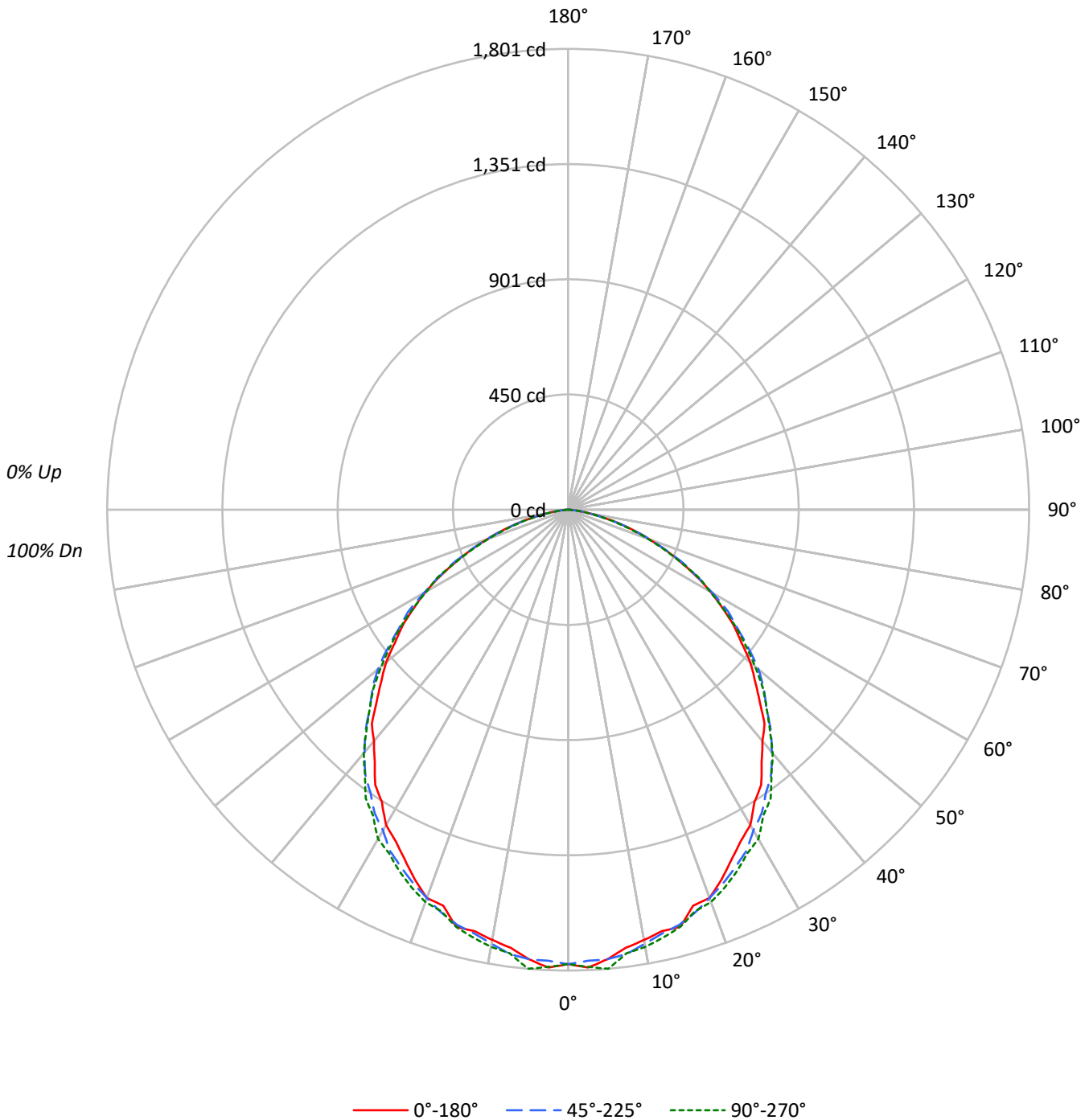
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4475.0 lumens  
Efficiency: N/A  
Efficacy: 103.6 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.23 / 1.33  
Luminous Opening: Rectangular (W 2' x L: 2' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 43.2  
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: 25 FT

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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  | 0   |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 0   |
| RCR |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1   | 110 | 105 | 101 | 98  | 107 | 103 | 100 | 96  | 99  | 96  | 93  | 95  | 93  | 90  | 91  | 90  | 88  | 86  |
| 2   | 100 | 93  | 86  | 81  | 98  | 91  | 85  | 80  | 87  | 82  | 78  | 84  | 80  | 76  | 81  | 78  | 75  | 73  |
| 3   | 92  | 82  | 74  | 68  | 89  | 80  | 73  | 67  | 77  | 71  | 66  | 75  | 69  | 65  | 72  | 68  | 64  | 62  |
| 4   | 84  | 73  | 64  | 58  | 82  | 71  | 64  | 58  | 69  | 62  | 57  | 67  | 61  | 56  | 65  | 59  | 55  | 53  |
| 5   | 78  | 65  | 57  | 50  | 76  | 64  | 56  | 50  | 62  | 55  | 49  | 60  | 54  | 49  | 58  | 53  | 48  | 46  |
| 6   | 72  | 59  | 50  | 44  | 70  | 58  | 50  | 44  | 56  | 49  | 43  | 54  | 48  | 43  | 53  | 47  | 43  | 41  |
| 7   | 67  | 53  | 45  | 39  | 65  | 53  | 45  | 39  | 51  | 44  | 39  | 50  | 43  | 38  | 48  | 42  | 38  | 36  |
| 8   | 62  | 49  | 41  | 35  | 61  | 48  | 40  | 35  | 47  | 40  | 34  | 46  | 39  | 34  | 44  | 39  | 34  | 32  |
| 9   | 58  | 45  | 37  | 31  | 57  | 44  | 37  | 31  | 43  | 36  | 31  | 42  | 36  | 31  | 41  | 35  | 31  | 29  |
| 10  | 54  | 41  | 34  | 29  | 53  | 41  | 33  | 28  | 40  | 33  | 28  | 39  | 33  | 28  | 38  | 32  | 28  | 26  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4778 | 4778 | 4778 |
| 5°  | 4762 | 4764 | 4864 |
| 10° | 4666 | 4706 | 4740 |
| 15° | 4703 | 4677 | 4703 |
| 20° | 4623 | 4623 | 4672 |
| 25° | 4481 | 4579 | 4630 |
| 30° | 4419 | 4497 | 4617 |
| 35° | 4315 | 4428 | 4528 |
| 40° | 4148 | 4347 | 4366 |
| 45° | 4022 | 4165 | 4171 |
| 50° | 3890 | 4065 | 3988 |
| 55° | 3706 | 3779 | 3751 |
| 60° | 3466 | 3500 | 3437 |
| 65° | 3090 | 3169 | 3068 |
| 70° | 2651 | 2660 | 2586 |
| 75° | 2100 | 2095 | 2014 |
| 80° | 1407 | 1368 | 1314 |
| 85° | 766  | 756  | 707  |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 167.0  | 3.7       |
| 10°-20°   | 473.3  | 10.6      |
| 20°-30°   | 709.2  | 15.8      |
| 30°-40°   | 840.5  | 18.8      |
| 40°-50°   | 842.1  | 18.8      |
| 50°-60°   | 714.8  | 16.0      |
| 60°-70°   | 481.9  | 10.8      |
| 70°-80°   | 211.8  | 4.7       |
| 80°-90°   | 34.4   | 0.8       |
| 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°    | 1349.5 | 30.2      |
| 0°-40°    | 2190.1 | 48.9      |
| 0°-60°    | 3746.9 | 83.7      |
| 0°-90°    | 4475.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 4475.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 1776 | 1776  | 1776 | 1776  | 1776 |      |
| 5°  | 1763 | 1759  | 1764 | 1758  | 1801 | 166  |
| 15° | 1688 | 1668  | 1679 | 1688  | 1688 | 470  |
| 25° | 1509 | 1517  | 1542 | 1562  | 1559 | 698  |
| 35° | 1314 | 1318  | 1348 | 1379  | 1378 | 816  |
| 45° | 1057 | 1077  | 1094 | 1123  | 1096 | 818  |
| 55° | 790  | 785   | 805  | 800   | 800  | 703  |
| 65° | 485  | 479   | 498  | 479   | 482  | 483  |
| 75° | 202  | 198   | 202  | 187   | 194  | 216  |
| 85° | 25   | 24    | 24   | 24    | 23   | 36   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 1775.6 | 1775.6 | 1775.6 | 1775.6 | 1775.6 |
| 2.5°  | 1790.9 | 1777.4 | 1764.8 | 1779.5 | 1788.4 |
| 5°    | 1763.0 | 1758.8 | 1763.6 | 1758.4 | 1800.8 |
| 7.5°  | 1726.7 | 1742.6 | 1751.7 | 1746.0 | 1748.5 |
| 10°   | 1707.5 | 1702.0 | 1722.4 | 1736.6 | 1734.5 |
| 12.5° | 1686.8 | 1695.1 | 1696.2 | 1711.6 | 1713.0 |
| 15°   | 1688.0 | 1668.5 | 1678.8 | 1687.5 | 1688.2 |
| 17.5° | 1622.4 | 1643.5 | 1650.6 | 1670.6 | 1645.8 |
| 20°   | 1614.4 | 1599.0 | 1614.4 | 1634.8 | 1631.6 |
| 22.5° | 1565.1 | 1547.9 | 1580.9 | 1599.0 | 1597.9 |
| 25°   | 1509.2 | 1517.4 | 1542.2 | 1562.4 | 1559.2 |
| 27.5° | 1460.1 | 1469.7 | 1505.0 | 1532.8 | 1514.9 |
| 30°   | 1422.3 | 1417.5 | 1447.3 | 1472.0 | 1485.8 |
| 32.5° | 1354.7 | 1372.1 | 1406.9 | 1431.5 | 1418.4 |
| 35°   | 1313.6 | 1317.5 | 1348.0 | 1379.2 | 1378.3 |
| 37.5° | 1241.9 | 1260.0 | 1302.8 | 1311.6 | 1303.5 |
| 40°   | 1180.7 | 1198.8 | 1237.5 | 1246.9 | 1243.0 |
| 42.5° | 1135.5 | 1138.7 | 1171.9 | 1182.7 | 1165.5 |
| 45°   | 1056.9 | 1076.6 | 1094.5 | 1122.7 | 1096.1 |
| 47.5° | 989.9  | 999.1  | 1037.6 | 1045.2 | 1031.2 |
| 50°   | 929.2  | 932.4  | 971.1  | 961.7  | 952.5  |
| 52.5° | 852.8  | 866.3  | 888.1  | 886.3  | 875.5  |
| 55°   | 790.0  | 784.7  | 805.4  | 799.9  | 799.6  |
| 57.5° | 714.6  | 723.8  | 740.7  | 732.0  | 718.0  |
| 60°   | 644.0  | 644.2  | 650.4  | 640.5  | 638.7  |
| 62.5° | 565.3  | 568.1  | 569.5  | 557.3  | 577.0  |
| 65°   | 485.3  | 478.9  | 497.7  | 478.7  | 481.9  |
| 67.5° | 411.7  | 414.9  | 413.1  | 401.2  | 405.8  |
| 70°   | 337.0  | 341.1  | 338.1  | 324.6  | 328.7  |
| 72.5° | 268.7  | 263.6  | 266.9  | 249.9  | 257.7  |
| 75°   | 202.0  | 197.8  | 201.5  | 187.3  | 193.7  |
| 77.5° | 137.6  | 140.8  | 138.5  | 130.9  | 135.3  |
| 80°   | 90.8   | 88.3   | 88.3   | 83.9   | 84.8   |
| 82.5° | 53.0   | 50.4   | 49.7   | 48.4   | 50.4   |
| 85°   | 24.8   | 24.1   | 24.5   | 23.8   | 22.9   |
| 87.5° | 8.9    | 9.2    | 9.2    | 8.7    | 8.3    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)