

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: P546800

Luminaire Tested: **FMR-24-4-LD4-2LO-35-UNV-93-85-EDD**

Issue Date: 6/15/2021

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.



**Test Information**

Test Method: LM-79-08  
Report Number: P546800  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2102-135-5)  
Test Lab: INNOVATION CENTER  
Issue Date: 6/15/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: FMR-24-4-LD4-2LO-35-UNV-93-85-EDD  
Description: 2X4 FMR TROFFER WITH .156 CLEAR TEMPERED GLASS FIXTURE SIDE AND .187 CLEAR PC ENVIRONMENTAL SIDE LENSES WITH, 90 CRI AND 3500K CCT LEDS  
Light Source: -  
Ballast/Driver: -

Luminaire Equipment: Sample No.   Condition   Description

**Summary**

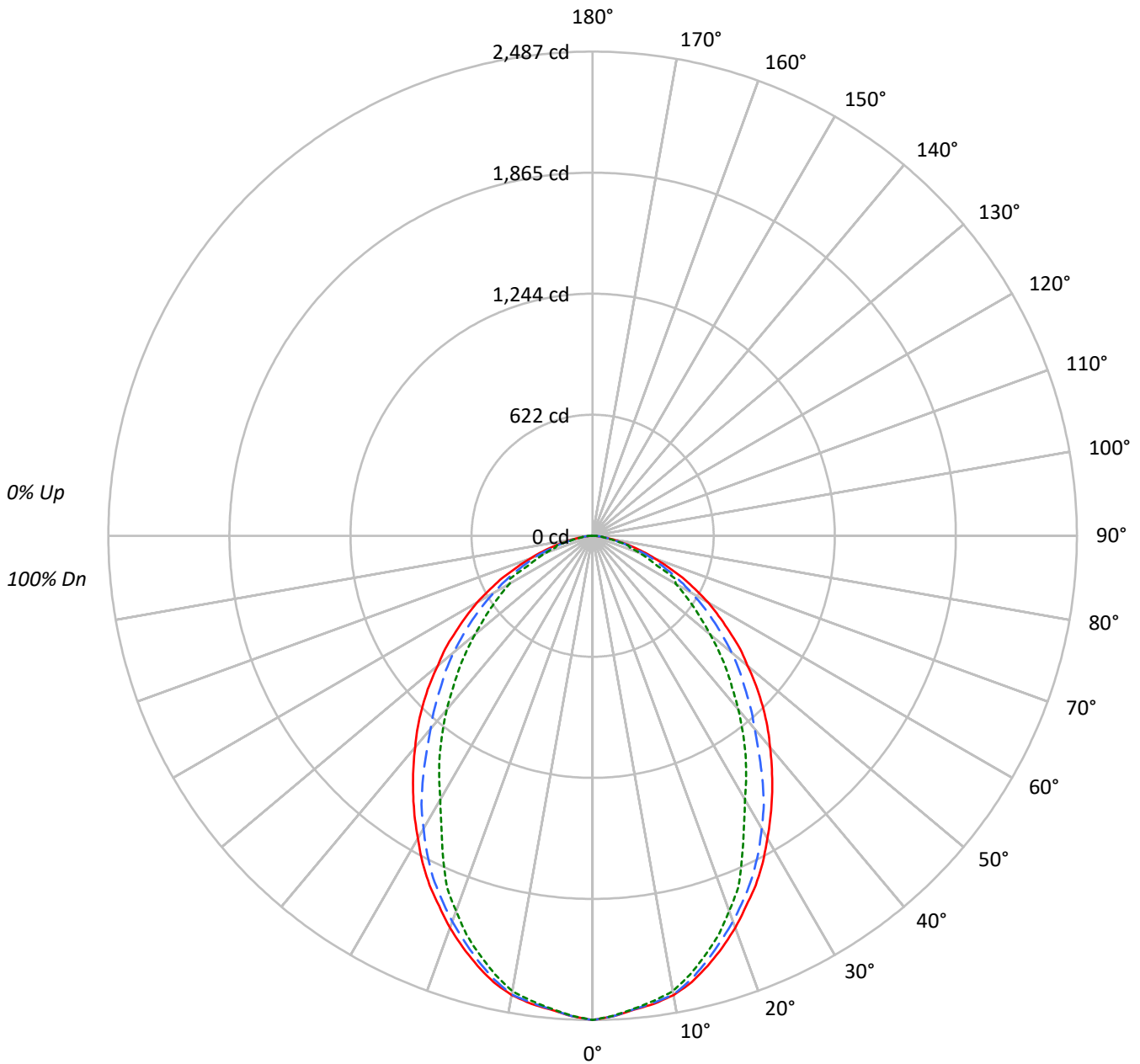
Lumens per Lamp: N/A  
Luminaire Lumens: 4883.0 lumens  
Efficiency: N/A  
Efficacy: 104.3 lumens/watt  
Spacing Criteria (0/90/45): 1.1 / 1 / 1.15  
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')  
CIE Type: Direct

Input Watts (W): 46.8  
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 |  |  |  |  |  |  |  |  |   |
| RC  | 80  |     |     |     |     |     |     |     |     | 50  |     |     |     |     |     |     |     |     | 30 |    |   |  |  |  |  |  |  | 10 |  |  |  |  |  |  |  |  | 0 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 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 | 106 | 102 | 99  | 108 | 104 | 100 | 97  | 100 | 97  | 94  | 96  | 94  | 91  | 92  | 90  | 89  | 87  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 2   | 101 | 94  | 88  | 83  | 99  | 92  | 87  | 82  | 89  | 84  | 80  | 86  | 82  | 78  | 83  | 79  | 77  | 75  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 3   | 93  | 84  | 77  | 71  | 91  | 82  | 76  | 70  | 79  | 74  | 69  | 77  | 72  | 68  | 74  | 70  | 67  | 65  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 4   | 86  | 75  | 67  | 61  | 84  | 74  | 66  | 61  | 72  | 65  | 60  | 69  | 64  | 59  | 67  | 62  | 58  | 56  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 5   | 80  | 68  | 60  | 54  | 78  | 67  | 59  | 53  | 65  | 58  | 53  | 63  | 57  | 52  | 61  | 56  | 52  | 50  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 6   | 74  | 62  | 53  | 48  | 72  | 61  | 53  | 47  | 59  | 52  | 47  | 57  | 51  | 47  | 56  | 50  | 46  | 44  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 7   | 69  | 56  | 48  | 43  | 67  | 56  | 48  | 42  | 54  | 47  | 42  | 53  | 46  | 42  | 51  | 46  | 42  | 40  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 8   | 65  | 52  | 44  | 38  | 63  | 51  | 44  | 38  | 50  | 43  | 38  | 49  | 42  | 38  | 48  | 42  | 38  | 36  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 9   | 61  | 48  | 40  | 35  | 59  | 47  | 40  | 35  | 46  | 39  | 35  | 45  | 39  | 34  | 44  | 38  | 34  | 33  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 10  | 57  | 44  | 37  | 32  | 56  | 44  | 37  | 32  | 43  | 36  | 32  | 42  | 36  | 32  | 41  | 36  | 32  | 30  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 3347 | 3347 | 3347 |
| 5°  | 3301 | 3297 | 3294 |
| 10° | 3273 | 3269 | 3245 |
| 15° | 3184 | 3152 | 3108 |
| 20° | 3067 | 3018 | 2936 |
| 25° | 2941 | 2877 | 2698 |
| 30° | 2788 | 2698 | 2430 |
| 35° | 2640 | 2494 | 2248 |
| 40° | 2490 | 2273 | 2046 |
| 45° | 2347 | 2101 | 1849 |
| 50° | 2173 | 1950 | 1649 |
| 55° | 2010 | 1767 | 1477 |
| 60° | 1842 | 1579 | 1323 |
| 65° | 1621 | 1382 | 1172 |
| 70° | 1335 | 1210 | 995  |
| 75° | 1062 | 927  | 972  |
| 80° | 713  | 669  | 624  |
| 85° | 445  | 533  | 622  |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 231.5  | 4.7       |
| 10°-20°   | 635.4  | 13.0      |
| 20°-30°   | 879.7  | 18.0      |
| 30°-40°   | 938.0  | 19.2      |
| 40°-50°   | 855.8  | 17.5      |
| 50°-60°   | 670.4  | 13.7      |
| 60°-70°   | 437.0  | 8.9       |
| 70°-80°   | 193.6  | 4.0       |
| 80°-90°   | 41.6   | 0.9       |
| 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°    | 1746.7 | 35.8      |
| 0°-40°    | 2684.7 | 55.0      |
| 0°-60°    | 4210.9 | 86.2      |
| 0°-90°    | 4883.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 4883.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 2487 | 2487  | 2487 | 2487  | 2487 |      |
| 5°  | 2444 | 2441  | 2441 | 2438  | 2438 | 232  |
| 15° | 2286 | 2286  | 2263 | 2240  | 2231 | 643  |
| 25° | 1981 | 1970  | 1938 | 1869  | 1817 | 910  |
| 35° | 1607 | 1596  | 1518 | 1403  | 1369 | 1005 |
| 45° | 1234 | 1208  | 1104 | 1012  | 972  | 950  |
| 55° | 857  | 831   | 753  | 664   | 630  | 769  |
| 65° | 509  | 480   | 434  | 443   | 368  | 502  |
| 75° | 204  | 190   | 178  | 170   | 187  | 219  |
| 85° | 29   | 32    | 34   | 37    | 40   | 40   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 2487.3 | 2487.3 | 2487.3 | 2487.3 | 2487.3 |
| 2.5°  | 2470.1 | 2470.1 | 2470.1 | 2467.2 | 2467.2 |
| 5°    | 2444.2 | 2441.3 | 2441.3 | 2438.5 | 2438.5 |
| 7.5°  | 2424.1 | 2421.2 | 2418.3 | 2415.4 | 2409.7 |
| 10°   | 2395.3 | 2395.3 | 2392.4 | 2378.1 | 2375.2 |
| 12.5° | 2349.3 | 2346.4 | 2334.9 | 2314.8 | 2309.1 |
| 15°   | 2286.0 | 2286.0 | 2263.0 | 2240.0 | 2231.4 |
| 17.5° | 2217.0 | 2214.2 | 2185.4 | 2162.4 | 2150.9 |
| 20°   | 2142.3 | 2136.5 | 2107.8 | 2070.4 | 2050.3 |
| 22.5° | 2058.9 | 2058.9 | 2024.4 | 1975.5 | 1955.4 |
| 25°   | 1981.2 | 1969.7 | 1938.1 | 1869.1 | 1817.3 |
| 27.5° | 1892.1 | 1874.8 | 1840.3 | 1742.6 | 1682.2 |
| 30°   | 1794.3 | 1785.7 | 1736.8 | 1610.3 | 1564.3 |
| 32.5° | 1702.3 | 1687.9 | 1636.2 | 1503.9 | 1466.5 |
| 35°   | 1607.4 | 1595.9 | 1518.3 | 1403.3 | 1368.8 |
| 37.5° | 1512.5 | 1498.2 | 1400.4 | 1308.4 | 1265.2 |
| 40°   | 1417.6 | 1400.4 | 1294.0 | 1210.6 | 1164.6 |
| 42.5° | 1328.5 | 1305.5 | 1202.0 | 1112.8 | 1061.1 |
| 45°   | 1233.6 | 1207.7 | 1104.2 | 1012.2 | 971.9  |
| 47.5° | 1138.7 | 1115.7 | 1020.8 | 925.9  | 879.9  |
| 50°   | 1038.1 | 1017.9 | 931.7  | 836.8  | 787.9  |
| 52.5° | 954.7  | 923.0  | 839.7  | 744.8  | 704.5  |
| 55°   | 856.9  | 831.0  | 753.4  | 664.2  | 629.7  |
| 57.5° | 767.8  | 741.9  | 670.0  | 586.6  | 557.9  |
| 60°   | 684.4  | 647.0  | 586.6  | 514.7  | 491.7  |
| 62.5° | 592.4  | 563.6  | 511.8  | 451.5  | 480.2  |
| 65°   | 509.0  | 480.2  | 434.2  | 442.8  | 368.1  |
| 67.5° | 417.0  | 402.6  | 362.3  | 322.1  | 310.6  |
| 70°   | 339.3  | 322.1  | 307.7  | 264.5  | 253.0  |
| 72.5° | 270.3  | 253.0  | 232.9  | 209.9  | 201.3  |
| 75°   | 204.2  | 189.8  | 178.3  | 169.7  | 186.9  |
| 77.5° | 140.9  | 135.1  | 126.5  | 117.9  | 115.0  |
| 80°   | 92.0   | 89.1   | 86.3   | 83.4   | 80.5   |
| 82.5° | 54.6   | 54.6   | 54.6   | 54.6   | 54.6   |
| 85°   | 28.8   | 31.6   | 34.5   | 37.4   | 40.3   |
| 87.5° | 17.3   | 17.3   | 20.1   | 23.0   | 25.9   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |



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— 0°-180°    - - 45°-225°    - - - - 90°-270°







(END OF REPORT)