

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: P589156

Luminaire Tested: **FMR-24-2-LD4-2LO-50-UNV-81-97-EDD**

Issue Date: 12/8/2021



**Test Information**

Test Method: LM-79-08  
Report Number: P589156  
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-LD4-2LO-50-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 5000K CCT LEDS  
Light Source: -  
Ballast/Driver: -

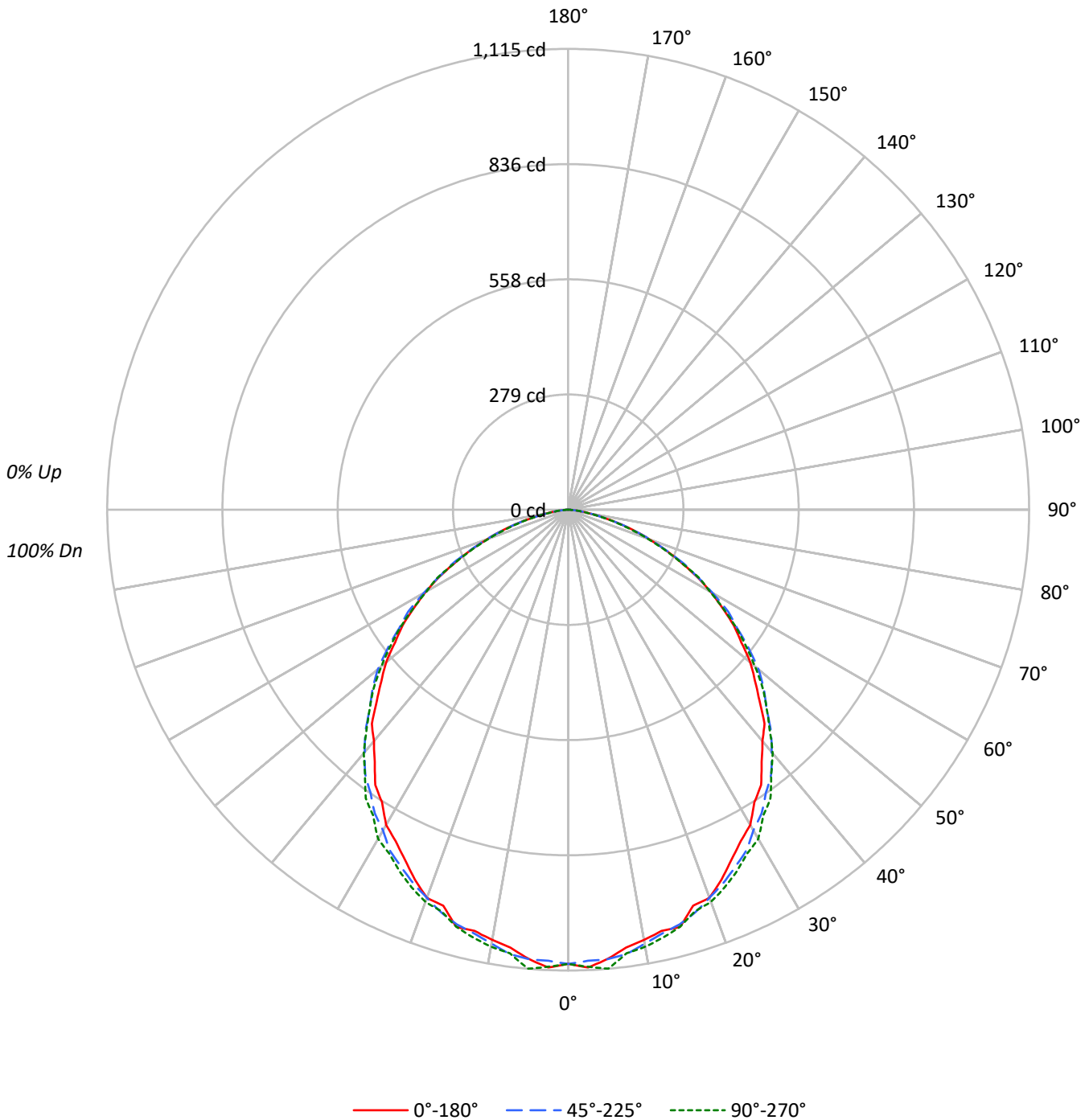
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 2770.0 lumens  
Efficiency: N/A  
Efficacy: 118.4 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): 23.4  
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  | 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 |    |    |    |    |    |    |    |    | 100 |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 1   | 110 | 105 | 101 | 98  | 107 | 103 | 100 | 96  | 99  | 96  | 93  | 95  | 93  | 90  | 91  | 90  | 88  | 86  |    |    |    |    |    |    |    |    | 86  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 2   | 100 | 93  | 86  | 81  | 98  | 91  | 85  | 80  | 87  | 82  | 78  | 84  | 80  | 76  | 81  | 78  | 75  | 73  |    |    |    |    |    |    |    |    | 73  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 3   | 92  | 82  | 74  | 68  | 89  | 80  | 73  | 67  | 77  | 71  | 66  | 75  | 69  | 65  | 72  | 68  | 64  | 62  |    |    |    |    |    |    |    |    | 62  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 4   | 84  | 73  | 64  | 58  | 82  | 71  | 64  | 58  | 69  | 62  | 57  | 67  | 61  | 56  | 65  | 59  | 55  | 53  |    |    |    |    |    |    |    |    | 53  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 5   | 78  | 65  | 57  | 50  | 76  | 64  | 56  | 50  | 62  | 55  | 49  | 60  | 54  | 49  | 58  | 53  | 48  | 46  |    |    |    |    |    |    |    |    | 46  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 6   | 72  | 59  | 50  | 44  | 70  | 58  | 50  | 44  | 56  | 49  | 43  | 54  | 48  | 43  | 53  | 47  | 43  | 41  |    |    |    |    |    |    |    |    | 41  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 7   | 67  | 53  | 45  | 39  | 65  | 53  | 45  | 39  | 51  | 44  | 39  | 50  | 43  | 38  | 48  | 42  | 38  | 36  |    |    |    |    |    |    |    |    | 36  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 8   | 62  | 49  | 41  | 35  | 61  | 48  | 40  | 35  | 47  | 40  | 34  | 46  | 39  | 34  | 44  | 39  | 34  | 32  |    |    |    |    |    |    |    |    | 32  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 9   | 58  | 45  | 37  | 31  | 57  | 44  | 37  | 31  | 43  | 36  | 31  | 42  | 36  | 31  | 41  | 35  | 31  | 29  |    |    |    |    |    |    |    |    | 29  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |
| 10  | 54  | 41  | 34  | 29  | 53  | 41  | 33  | 28  | 40  | 33  | 28  | 39  | 33  | 28  | 38  | 32  | 28  | 26  |    |    |    |    |    |    |    |    | 26  |    |    |   |  |  |  |  |  |  |    |  |  |  |  |  |  |  |  |   |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2958 | 2958 | 2958 |
| 5°  | 2948 | 2949 | 3011 |
| 10° | 2888 | 2913 | 2934 |
| 15° | 2911 | 2895 | 2911 |
| 20° | 2862 | 2862 | 2892 |
| 25° | 2774 | 2834 | 2866 |
| 30° | 2736 | 2784 | 2858 |
| 35° | 2671 | 2741 | 2803 |
| 40° | 2567 | 2691 | 2703 |
| 45° | 2490 | 2578 | 2582 |
| 50° | 2408 | 2516 | 2468 |
| 55° | 2294 | 2339 | 2322 |
| 60° | 2145 | 2167 | 2128 |
| 65° | 1913 | 1962 | 1899 |
| 70° | 1641 | 1647 | 1601 |
| 75° | 1300 | 1297 | 1247 |
| 80° | 871  | 846  | 814  |
| 85° | 472  | 469  | 438  |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 103.4  | 3.7       |
| 10°-20°   | 293.0  | 10.6      |
| 20°-30°   | 439.0  | 15.8      |
| 30°-40°   | 520.3  | 18.8      |
| 40°-50°   | 521.2  | 18.8      |
| 50°-60°   | 442.4  | 16.0      |
| 60°-70°   | 298.3  | 10.8      |
| 70°-80°   | 131.1  | 4.7       |
| 80°-90°   | 21.3   | 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°    | 835.4  | 30.2      |
| 0°-40°    | 1355.6 | 48.9      |
| 0°-60°    | 2319.3 | 83.7      |
| 0°-90°    | 2770.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 2770.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 1099 | 1099  | 1099 | 1099  | 1099 |      |
| 5°  | 1091 | 1089  | 1092 | 1088  | 1115 | 103  |
| 15° | 1045 | 1033  | 1039 | 1045  | 1045 | 291  |
| 25° | 934  | 939   | 955  | 967   | 965  | 432  |
| 35° | 813  | 816   | 834  | 854   | 853  | 505  |
| 45° | 654  | 666   | 678  | 695   | 678  | 506  |
| 55° | 489  | 486   | 498  | 495   | 495  | 435  |
| 65° | 300  | 296   | 308  | 296   | 298  | 299  |
| 75° | 125  | 122   | 125  | 116   | 120  | 134  |
| 85° | 15   | 15    | 15   | 15    | 14   | 22   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 1099.1 | 1099.1 | 1099.1 | 1099.1 | 1099.1 |
| 2.5°  | 1108.6 | 1100.2 | 1092.4 | 1101.5 | 1107.0 |
| 5°    | 1091.3 | 1088.7 | 1091.7 | 1088.4 | 1114.7 |
| 7.5°  | 1068.8 | 1078.6 | 1084.3 | 1080.8 | 1082.3 |
| 10°   | 1056.9 | 1053.5 | 1066.1 | 1074.9 | 1073.7 |
| 12.5° | 1044.1 | 1049.3 | 1050.0 | 1059.5 | 1060.3 |
| 15°   | 1044.9 | 1032.8 | 1039.2 | 1044.6 | 1045.0 |
| 17.5° | 1004.3 | 1017.3 | 1021.7 | 1034.1 | 1018.7 |
| 20°   | 999.3  | 989.8  | 999.3  | 1011.9 | 1009.9 |
| 22.5° | 968.8  | 958.2  | 978.6  | 989.8  | 989.1  |
| 25°   | 934.2  | 939.3  | 954.6  | 967.1  | 965.1  |
| 27.5° | 903.8  | 909.8  | 931.6  | 948.8  | 937.7  |
| 30°   | 880.4  | 877.4  | 895.9  | 911.2  | 919.7  |
| 32.5° | 838.5  | 849.3  | 870.9  | 886.1  | 878.0  |
| 35°   | 813.1  | 815.5  | 834.4  | 853.7  | 853.1  |
| 37.5° | 768.7  | 779.9  | 806.5  | 811.8  | 806.9  |
| 40°   | 730.8  | 742.0  | 766.0  | 771.8  | 769.4  |
| 42.5° | 702.9  | 704.8  | 725.4  | 732.1  | 721.5  |
| 45°   | 654.2  | 666.4  | 677.5  | 694.9  | 678.5  |
| 47.5° | 612.8  | 618.4  | 642.3  | 647.0  | 638.3  |
| 50°   | 575.1  | 577.1  | 601.1  | 595.3  | 589.6  |
| 52.5° | 527.9  | 536.3  | 549.7  | 548.6  | 541.9  |
| 55°   | 489.0  | 485.7  | 498.5  | 495.1  | 495.0  |
| 57.5° | 442.3  | 448.0  | 458.5  | 453.1  | 444.5  |
| 60°   | 398.6  | 398.8  | 402.6  | 396.5  | 395.4  |
| 62.5° | 349.9  | 351.6  | 352.5  | 345.0  | 357.2  |
| 65°   | 300.4  | 296.4  | 308.1  | 296.3  | 298.3  |
| 67.5° | 254.9  | 256.9  | 255.7  | 248.3  | 251.2  |
| 70°   | 208.6  | 211.2  | 209.3  | 200.9  | 203.5  |
| 72.5° | 166.3  | 163.2  | 165.2  | 154.7  | 159.5  |
| 75°   | 125.0  | 122.5  | 124.7  | 115.9  | 119.9  |
| 77.5° | 85.1   | 87.1   | 85.7   | 81.0   | 83.7   |
| 80°   | 56.2   | 54.6   | 54.6   | 51.9   | 52.5   |
| 82.5° | 32.8   | 31.2   | 30.8   | 29.9   | 31.2   |
| 85°   | 15.3   | 14.9   | 15.2   | 14.8   | 14.2   |
| 87.5° | 5.5    | 5.7    | 5.7    | 5.4    | 5.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)