

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: P311481

Luminaire Tested: **24FCZ2-45-UNV-L82765-S-CA08-W2A-U-3000K**

Issue Date: 3/3/2020

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: P311481  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1805-783-1)  
Test Lab: INNOVATION CENTER(G3)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: 24FCZ2-45-UNV-L82765-S-CA08-W2A-U-3000K  
Description: 2'X4' TROFFER LED MODULE, SMOOTH LENS, 0.08" ACRYLIC SHEET  
Light Source: (168) 3000K TUNABLE CCT, 80 CRI LEDS  
Ballast/Driver: ELECTRONIC DRIVER  
Luminaire Equipment: 

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u>        |
|-------------------|------------------|---------------------------|
| AS-5443-1         | Good             | WHITE TWIN R-EVOLVE FLOOD |
| AS-5443-2         | Good             | REFLECTOR                 |
| AS-5443-3         | Good             | DRIVER                    |
| AS-5443-4         | Good             | UPPER MODULE              |
| AS-5443-5         | Good             | LENS                      |
| AS-5443-6         | Good             | DRIVER 2                  |
| AS-5443-7         | Good             | TRIM RING                 |

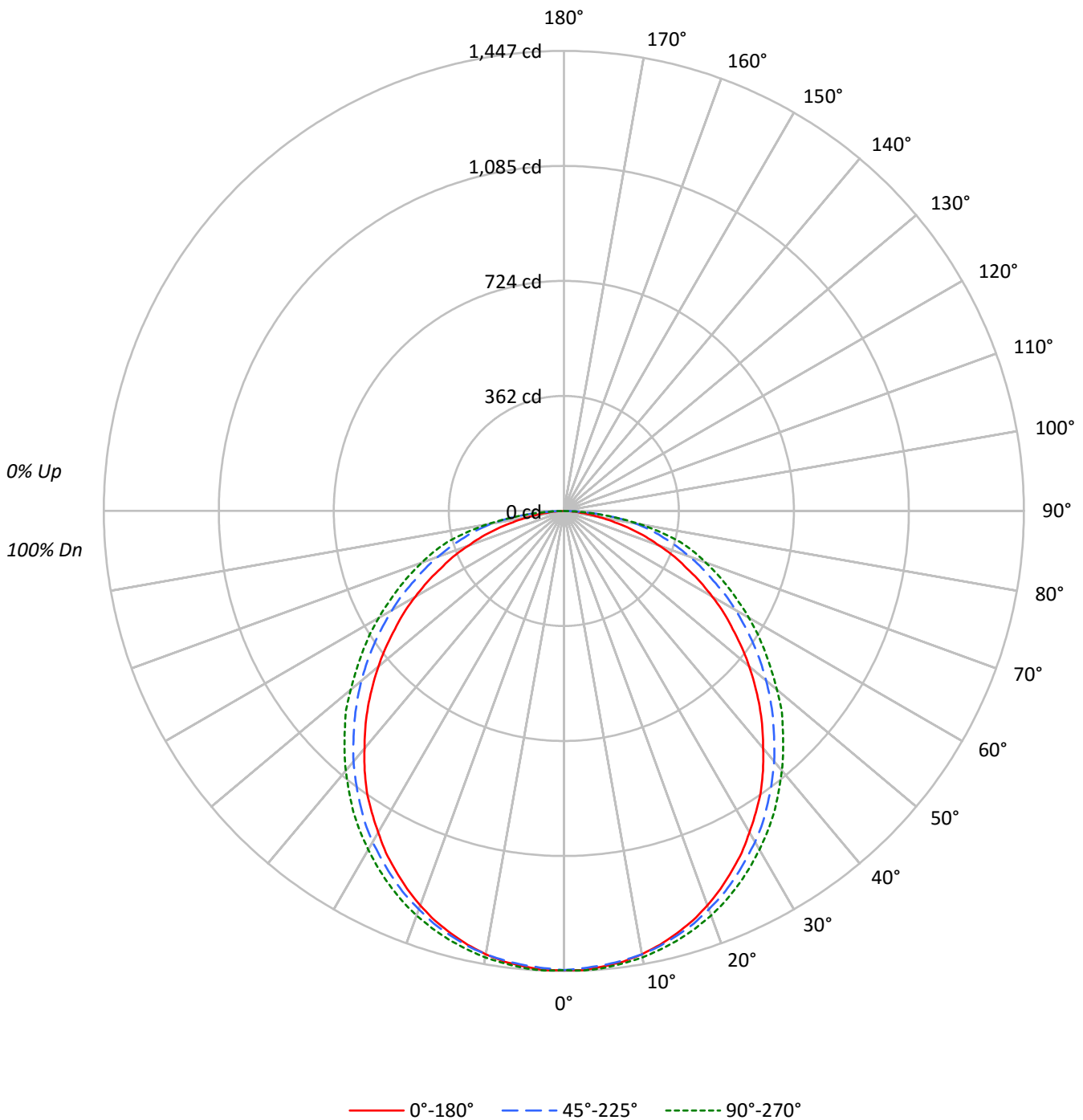
**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 4111.0 lumens  
Efficiency: N/A  
Efficacy: 110.2 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 1.26 / 1.35  
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 37.3  
Input Voltage (V): NR  
Input Current (A<sub>in</sub>): 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   | 108 | 103 | 99  | 95  | 106 | 101 | 97  | 93  | 97  | 93  | 90  | 93  | 90  | 88  | 89  | 87  | 85  | 83  |
| 2   | 98  | 90  | 83  | 77  | 96  | 88  | 81  | 76  | 84  | 79  | 74  | 81  | 76  | 72  | 78  | 74  | 71  | 69  |
| 3   | 89  | 79  | 70  | 64  | 87  | 77  | 69  | 63  | 74  | 67  | 62  | 71  | 66  | 61  | 69  | 64  | 60  | 58  |
| 4   | 82  | 70  | 61  | 54  | 80  | 68  | 60  | 54  | 66  | 59  | 53  | 63  | 57  | 52  | 61  | 56  | 51  | 49  |
| 5   | 75  | 62  | 53  | 46  | 73  | 61  | 53  | 46  | 59  | 51  | 46  | 57  | 50  | 45  | 55  | 49  | 45  | 42  |
| 6   | 70  | 56  | 47  | 40  | 68  | 55  | 47  | 40  | 53  | 46  | 40  | 52  | 45  | 40  | 50  | 44  | 39  | 37  |
| 7   | 64  | 51  | 42  | 36  | 63  | 50  | 42  | 36  | 48  | 41  | 35  | 47  | 40  | 35  | 46  | 39  | 35  | 33  |
| 8   | 60  | 46  | 38  | 32  | 58  | 46  | 37  | 32  | 44  | 37  | 32  | 43  | 36  | 31  | 42  | 36  | 31  | 29  |
| 9   | 56  | 43  | 34  | 29  | 55  | 42  | 34  | 29  | 41  | 34  | 28  | 40  | 33  | 28  | 39  | 33  | 28  | 26  |
| 10  | 53  | 39  | 31  | 26  | 51  | 39  | 31  | 26  | 38  | 31  | 26  | 37  | 30  | 26  | 36  | 30  | 26  | 24  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 1943 | 1943 | 1943 |
| 5°  | 1942 | 1937 | 1949 |
| 10° | 1934 | 1934 | 1948 |
| 15° | 1915 | 1924 | 1944 |
| 20° | 1890 | 1909 | 1939 |
| 25° | 1855 | 1890 | 1927 |
| 30° | 1814 | 1868 | 1911 |
| 35° | 1774 | 1838 | 1896 |
| 40° | 1713 | 1807 | 1874 |
| 45° | 1657 | 1772 | 1854 |
| 50° | 1594 | 1738 | 1831 |
| 55° | 1522 | 1706 | 1813 |
| 60° | 1451 | 1680 | 1810 |
| 65° | 1359 | 1650 | 1821 |
| 70° | 1258 | 1659 | 1870 |
| 75° | 1127 | 1690 | 1975 |
| 80° | 910  | 1791 | 1932 |
| 85° | 685  | 1573 | 1531 |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 136.7  | 3.3       |
| 10°-20°   | 390.7  | 9.5       |
| 20°-30°   | 587.3  | 14.3      |
| 30°-40°   | 699.5  | 17.0      |
| 40°-50°   | 715.9  | 17.4      |
| 50°-60°   | 644.6  | 15.7      |
| 60°-70°   | 506.2  | 12.3      |
| 70°-80°   | 328.5  | 8.0       |
| 80°-90°   | 101.6  | 2.5       |
| 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°    | 1114.7 | 27.1      |
| 0°-40°    | 1814.2 | 44.1      |
| 0°-60°    | 3174.7 | 77.2      |
| 0°-90°    | 4111.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 4111.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 1444 | 1444  | 1444 | 1444  | 1444 |      |
| 5°  | 1438 | 1440  | 1434 | 1442  | 1443 | 137  |
| 15° | 1375 | 1379  | 1382 | 1393  | 1396 | 388  |
| 25° | 1250 | 1260  | 1273 | 1294  | 1298 | 576  |
| 35° | 1080 | 1093  | 1119 | 1146  | 1154 | 674  |
| 45° | 871  | 892   | 931  | 966   | 974  | 671  |
| 55° | 649  | 678   | 727  | 765   | 773  | 582  |
| 65° | 427  | 460   | 518  | 562   | 572  | 425  |
| 75° | 217  | 258   | 325  | 370   | 380  | 229  |
| 85° | 44   | 82    | 102  | 99    | 99   | 54   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 1444.2 | 1444.2 | 1444.2 | 1444.2 | 1444.2 |
| 2.5°  | 1445.5 | 1445.5 | 1439.0 | 1445.5 | 1446.8 |
| 5°    | 1437.7 | 1440.3 | 1433.8 | 1441.6 | 1442.9 |
| 7.5°  | 1429.9 | 1429.9 | 1425.9 | 1433.8 | 1435.1 |
| 10°   | 1415.5 | 1416.8 | 1415.5 | 1424.6 | 1425.9 |
| 12.5° | 1397.2 | 1399.8 | 1401.1 | 1410.3 | 1411.6 |
| 15°   | 1375.0 | 1378.9 | 1381.5 | 1393.3 | 1395.9 |
| 17.5° | 1350.2 | 1354.1 | 1360.6 | 1373.7 | 1376.3 |
| 20°   | 1320.2 | 1325.4 | 1333.2 | 1350.2 | 1354.1 |
| 22.5° | 1287.5 | 1292.7 | 1305.8 | 1321.5 | 1328.0 |
| 25°   | 1249.7 | 1260.1 | 1273.2 | 1294.1 | 1298.0 |
| 27.5° | 1211.8 | 1220.9 | 1237.9 | 1260.1 | 1265.3 |
| 30°   | 1167.4 | 1181.8 | 1202.6 | 1224.8 | 1230.1 |
| 32.5° | 1124.3 | 1138.7 | 1163.5 | 1187.0 | 1193.5 |
| 35°   | 1079.9 | 1093.0 | 1119.1 | 1146.5 | 1154.3 |
| 37.5° | 1029.0 | 1046.0 | 1074.7 | 1102.1 | 1109.9 |
| 40°   | 975.4  | 996.3  | 1029.0 | 1057.7 | 1066.8 |
| 42.5° | 924.5  | 946.7  | 979.4  | 1010.7 | 1021.1 |
| 45°   | 871.0  | 891.9  | 931.0  | 966.3  | 974.1  |
| 47.5° | 816.1  | 839.6  | 881.4  | 916.7  | 929.7  |
| 50°   | 761.3  | 786.1  | 830.5  | 867.1  | 874.9  |
| 52.5° | 706.4  | 732.6  | 779.6  | 818.7  | 822.7  |
| 55°   | 649.0  | 677.7  | 727.3  | 765.2  | 773.0  |
| 57.5° | 596.8  | 621.6  | 675.1  | 714.3  | 723.4  |
| 60°   | 539.3  | 566.7  | 624.2  | 660.7  | 672.5  |
| 62.5° | 484.5  | 513.2  | 573.2  | 609.8  | 620.3  |
| 65°   | 427.0  | 459.6  | 518.4  | 561.5  | 571.9  |
| 67.5° | 377.4  | 408.7  | 471.4  | 513.2  | 523.6  |
| 70°   | 319.9  | 355.2  | 421.8  | 464.9  | 475.3  |
| 72.5° | 270.3  | 306.9  | 373.5  | 415.2  | 430.9  |
| 75°   | 216.8  | 258.5  | 325.1  | 369.5  | 380.0  |
| 77.5° | 164.5  | 212.8  | 280.7  | 314.7  | 314.7  |
| 80°   | 117.5  | 168.4  | 231.1  | 246.8  | 249.4  |
| 82.5° | 77.0   | 126.7  | 171.1  | 169.8  | 169.8  |
| 85°   | 44.4   | 82.3   | 101.9  | 99.2   | 99.2   |
| 87.5° | 17.0   | 34.0   | 36.6   | 36.6   | 35.3   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)