

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: FAIL-SAFE

Report Number: P590765

Luminaire Tested: FSR-24-2-LD4-4HI-40-UNV-93-84-EDD

Issue Date: 12/8/2021

**Test Information**

Test Method: LM-79-2019  
Report Number: P590765  
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  
Product Line: FAIL-SAFE  
Catalog Number: FSR-24-2-LD4-4HI-40-UNV-93-84-EDD  
Description: 2X2 FSR TROFFER WITH .156 CLEAR TEMPERED GLASS FIXTURE SIDE AND .125 CLEAR PC ENVIRONMENTAL SIDE LENSES WITH, 80 CRI AND 4000K CCT LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

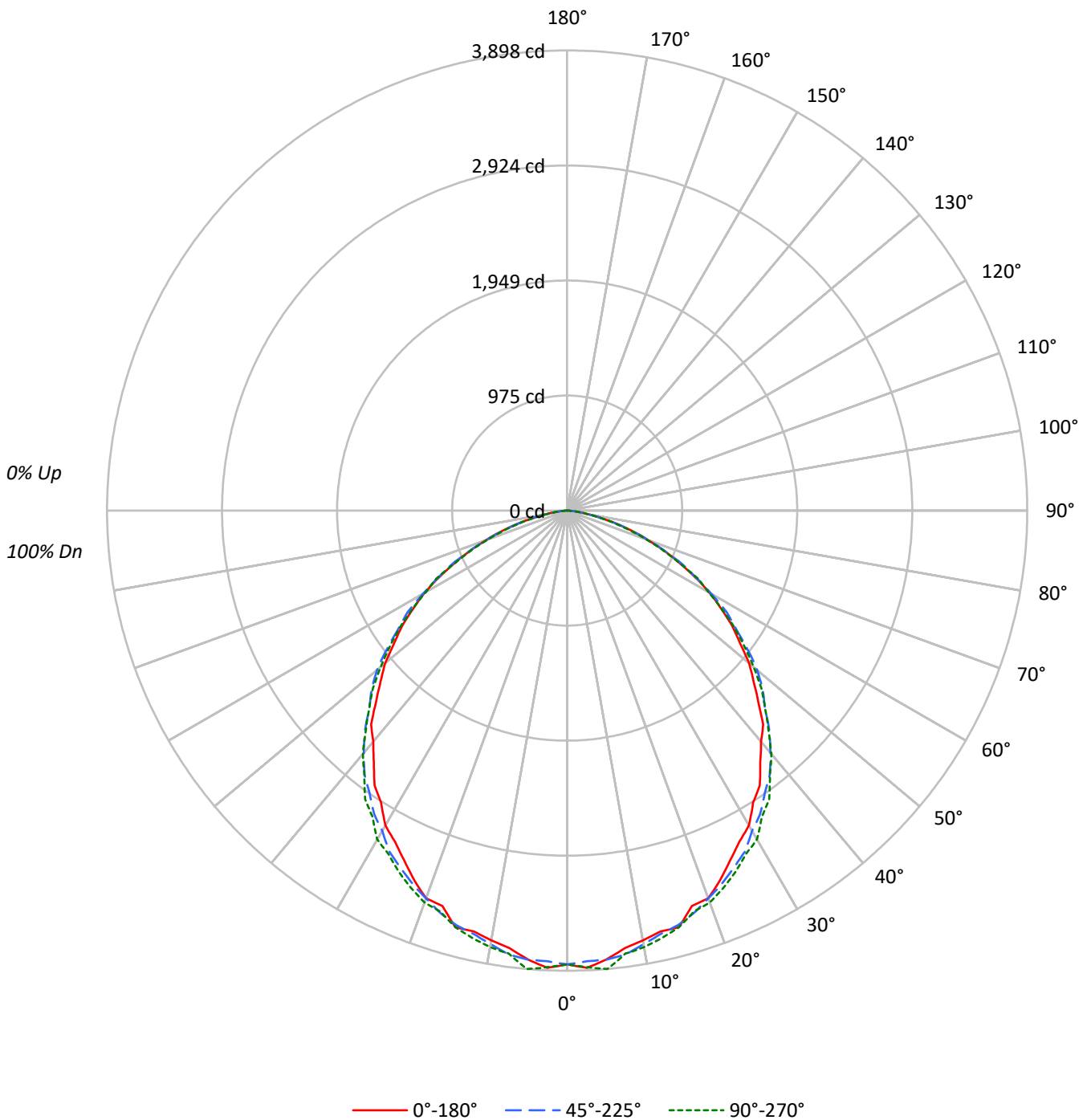
Lumens per Lamp: N/A  
Luminaire Lumens: 9688.0 lumens  
Efficiency: N/A  
Efficacy: 112.1 lumens/watt  
Spacing Criteria (0/90/45): 1.19 / 1.23 / 1.33  
Luminous Opening: Rectangular (W 2' x L: 2' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 86.4  
Input Voltage (V):  
Input Current (Ain): NR  
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: 24 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°  | 10344 | 10344 | 10344 |
| 5°  | 10310 | 10314 | 10531 |
| 10° | 10101 | 10189 | 10261 |
| 15° | 10181 | 10125 | 10182 |
| 20° | 10009 | 10009 | 10115 |
| 25° | 9701  | 9913  | 10022 |
| 30° | 9568  | 9736  | 9995  |
| 35° | 9342  | 9587  | 9802  |
| 40° | 8979  | 9411  | 9453  |
| 45° | 8707  | 9017  | 9030  |
| 50° | 8421  | 8802  | 8633  |
| 55° | 8024  | 8180  | 8122  |
| 60° | 7503  | 7578  | 7442  |
| 65° | 6690  | 6861  | 6643  |
| 70° | 5740  | 5760  | 5600  |
| 75° | 4547  | 4536  | 4361  |
| 80° | 3045  | 2961  | 2845  |
| 85° | 1655  | 1639  | 1531  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 67.5°  
 Vertical Angle: 45°  
 Luminance: 9250 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 361.6  | 3.7       |
| 10°-20°   | 1024.8 | 10.6      |
| 20°-30°   | 1535.3 | 15.8      |
| 30°-40°   | 1819.6 | 18.8      |
| 40°-50°   | 1823.0 | 18.8      |
| 50°-60°   | 1547.4 | 16.0      |
| 60°-70°   | 1043.3 | 10.8      |
| 70°-80°   | 458.4  | 4.7       |
| 80°-90°   | 74.5   | 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°    | 2921.7 | 30.2      |
| 0°-40°    | 4741.3 | 48.9      |
| 0°-60°    | 8111.8 | 83.7      |
| 0°-90°    | 9688.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 9688.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 3844 | 3844  | 3844 | 3844  | 3844 |      |
| 5°  | 3817 | 3808  | 3818 | 3807  | 3898 | 360  |
| 15° | 3654 | 3612  | 3634 | 3653  | 3655 | 1018 |
| 25° | 3267 | 3285  | 3339 | 3382  | 3375 | 1510 |
| 35° | 2844 | 2852  | 2918 | 2986  | 2984 | 1766 |
| 45° | 2288 | 2331  | 2369 | 2430  | 2373 | 1770 |
| 55° | 1710 | 1699  | 1744 | 1732  | 1731 | 1521 |
| 65° | 1051 | 1037  | 1078 | 1036  | 1043 | 1045 |
| 75° | 437  | 428   | 436  | 406   | 419  | 469  |
| 85° | 54   | 52    | 53   | 52    | 50   | 78   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 3844.0 | 3844.0 | 3844.0 | 3844.0 | 3844.0 |
| 2.5°  | 3877.2 | 3847.9 | 3820.6 | 3852.4 | 3871.7 |
| 5°    | 3816.7 | 3807.7 | 3818.1 | 3806.7 | 3898.5 |
| 7.5°  | 3738.2 | 3772.5 | 3792.3 | 3779.9 | 3785.4 |
| 10°   | 3696.5 | 3684.6 | 3728.8 | 3759.6 | 3755.1 |
| 12.5° | 3651.9 | 3669.7 | 3672.2 | 3705.5 | 3708.5 |
| 15°   | 3654.4 | 3612.2 | 3634.5 | 3653.4 | 3654.9 |
| 17.5° | 3512.4 | 3558.1 | 3573.5 | 3616.6 | 3563.0 |
| 20°   | 3495.0 | 3461.8 | 3495.0 | 3539.2 | 3532.3 |
| 22.5° | 3388.3 | 3351.1 | 3422.6 | 3461.8 | 3459.3 |
| 25°   | 3267.2 | 3285.1 | 3338.7 | 3382.4 | 3375.4 |
| 27.5° | 3161.0 | 3181.9 | 3258.3 | 3318.4 | 3279.6 |
| 30°   | 3079.1 | 3068.7 | 3133.2 | 3186.8 | 3216.6 |
| 32.5° | 2932.7 | 2970.4 | 3045.9 | 3099.0 | 3070.7 |
| 35°   | 2843.9 | 2852.3 | 2918.3 | 2985.8 | 2983.8 |
| 37.5° | 2688.5 | 2727.7 | 2820.6 | 2839.4 | 2822.0 |
| 40°   | 2556.0 | 2595.2 | 2679.1 | 2699.5 | 2691.0 |
| 42.5° | 2458.2 | 2465.2 | 2537.2 | 2560.5 | 2523.3 |
| 45°   | 2288.0 | 2330.7 | 2369.4 | 2430.5 | 2372.9 |
| 47.5° | 2143.1 | 2162.9 | 2246.3 | 2262.7 | 2232.4 |
| 50°   | 2011.6 | 2018.5 | 2102.4 | 2082.0 | 2062.2 |
| 52.5° | 1846.3 | 1875.6 | 1922.7 | 1918.8 | 1895.4 |
| 55°   | 1710.3 | 1698.9 | 1743.6 | 1731.6 | 1731.1 |
| 57.5° | 1547.0 | 1566.9 | 1603.6 | 1584.7 | 1554.5 |
| 60°   | 1394.1 | 1394.6 | 1408.0 | 1386.7 | 1382.7 |
| 62.5° | 1223.9 | 1229.9 | 1232.8 | 1206.5 | 1249.2 |
| 65°   | 1050.7 | 1036.8 | 1077.5 | 1036.3 | 1043.3 |
| 67.5° | 891.4  | 898.3  | 894.4  | 868.5  | 878.5  |
| 70°   | 729.6  | 738.5  | 732.1  | 702.8  | 711.7  |
| 72.5° | 581.7  | 570.8  | 577.7  | 541.0  | 557.9  |
| 75°   | 437.3  | 428.3  | 436.3  | 405.5  | 419.4  |
| 77.5° | 297.8  | 304.7  | 299.8  | 283.4  | 292.8  |
| 80°   | 196.5  | 191.1  | 191.1  | 181.7  | 183.6  |
| 82.5° | 114.6  | 109.2  | 107.7  | 104.7  | 109.2  |
| 85°   | 53.6   | 52.1   | 53.1   | 51.6   | 49.6   |
| 87.5° | 19.4   | 19.9   | 19.9   | 18.9   | 17.9   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)