

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: P563296

Luminaire Tested: FSR-24-4-LD4-3LO-35-UNV-93-84-EDD-90

Issue Date: 7/20/2021

**Test Information**

Test Method: LM-79-2019  
Report Number: P563296  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2102-135-5)  
Test Lab: INNOVATION CENTER  
Issue Date: 7/20/2021  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: FAIL-SAFE  
Catalog Number: FSR-24-4-LD4-3LO-35-UNV-93-84-EDD-90  
Description: 2X4 FSR TROFFER WITH .156 CLEAR TEMPERED GLASS FIXTURE SIDE AND .125 CLEAR PC ENVIRONMENTAL SIDE LENSES WITH, 90 CRI AND 3500K CCT LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

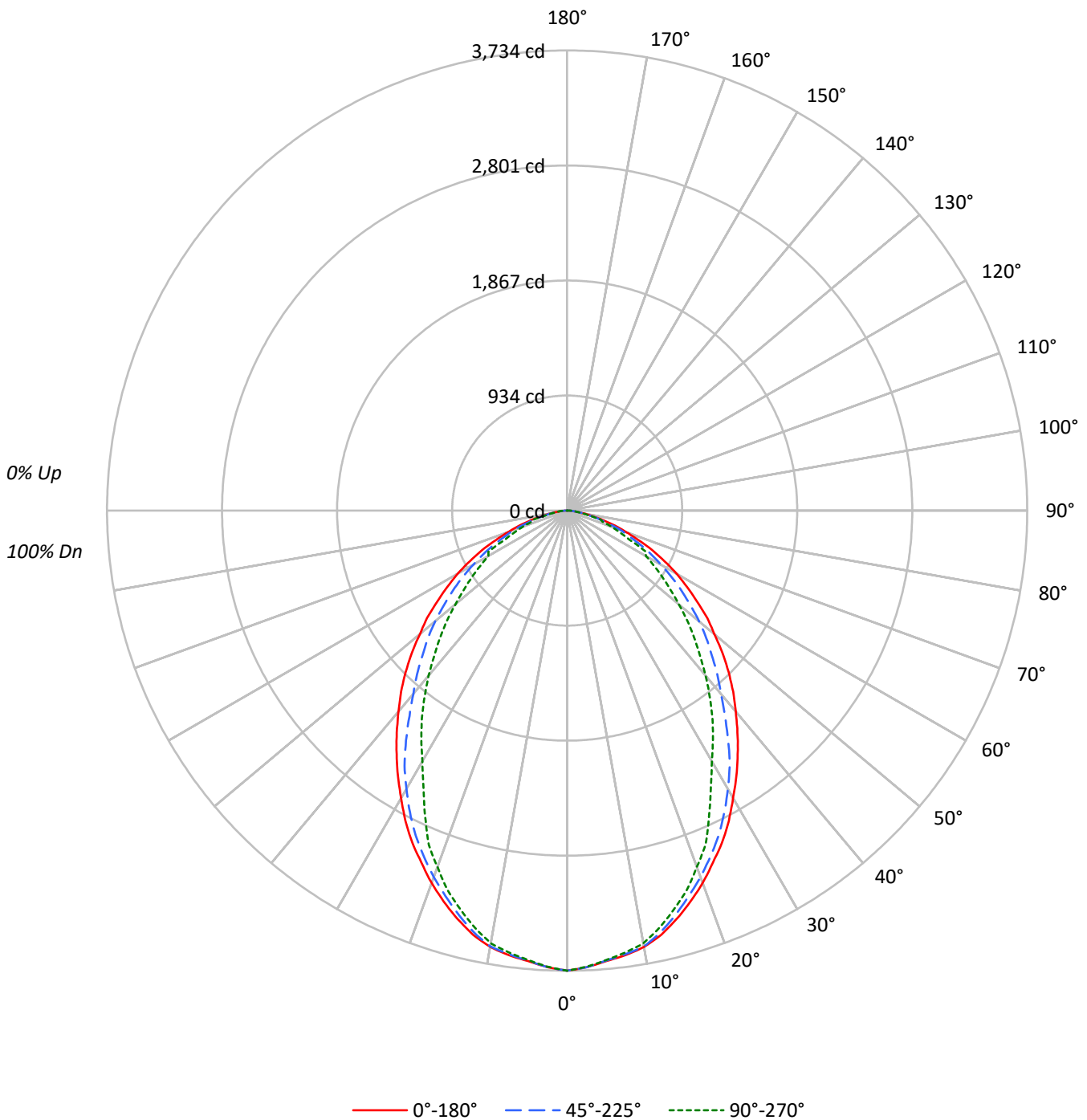
Lumens per Lamp: N/A  
Luminaire Lumens: 7330.0 lumens  
Efficiency: N/A  
Efficacy: 104.4 lumens/watt  
Spacing Criteria (0/90/45): 1.1 / 1 / 1.15  
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 70.2  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage 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  | 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°  | 5024 | 5024 | 5024 |
| 5°  | 4956 | 4950 | 4944 |
| 10° | 4913 | 4907 | 4871 |
| 15° | 4780 | 4732 | 4666 |
| 20° | 4605 | 4530 | 4407 |
| 25° | 4415 | 4319 | 4050 |
| 30° | 4185 | 4051 | 3648 |
| 35° | 3963 | 3744 | 3375 |
| 40° | 3738 | 3412 | 3071 |
| 45° | 3524 | 3154 | 2776 |
| 50° | 3262 | 2928 | 2476 |
| 55° | 3017 | 2653 | 2217 |
| 60° | 2764 | 2370 | 1986 |
| 65° | 2432 | 2075 | 1759 |
| 70° | 2004 | 1817 | 1495 |
| 75° | 1593 | 1391 | 1459 |
| 80° | 1070 | 1003 | 937  |
| 85° | 667  | 800  | 932  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 3524 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 347.6  | 4.7       |
| 10°-20°   | 953.9  | 13.0      |
| 20°-30°   | 1320.6 | 18.0      |
| 30°-40°   | 1408.1 | 19.2      |
| 40°-50°   | 1284.6 | 17.5      |
| 50°-60°   | 1006.4 | 13.7      |
| 60°-70°   | 655.9  | 8.9       |
| 70°-80°   | 290.6  | 4.0       |
| 80°-90°   | 62.4   | 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°    | 2622.0 | 35.8      |
| 0°-40°    | 4030.1 | 55.0      |
| 0°-60°    | 6321.1 | 86.2      |
| 0°-90°    | 7330.0 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 7330.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 3734 | 3734  | 3734 | 3734  | 3734 |      |
| 5°  | 3669 | 3665  | 3665 | 3660  | 3660 | 348  |
| 15° | 3432 | 3432  | 3397 | 3363  | 3350 | 965  |
| 25° | 2974 | 2957  | 2909 | 2806  | 2728 | 1365 |
| 35° | 2413 | 2396  | 2279 | 2106  | 2055 | 1509 |
| 45° | 1852 | 1813  | 1658 | 1519  | 1459 | 1426 |
| 55° | 1286 | 1248  | 1131 | 997   | 945  | 1154 |
| 65° | 764  | 721   | 652  | 665   | 552  | 753  |
| 75° | 306  | 285   | 268  | 255   | 281  | 328  |
| 85° | 43   | 48    | 52   | 56    | 60   | 60   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 3733.8 | 3733.8 | 3733.8 | 3733.8 | 3733.8 |
| 2.5°  | 3707.9 | 3707.9 | 3707.9 | 3703.6 | 3703.6 |
| 5°    | 3669.1 | 3664.7 | 3664.7 | 3660.4 | 3660.4 |
| 7.5°  | 3638.8 | 3634.5 | 3630.2 | 3625.9 | 3617.3 |
| 10°   | 3595.7 | 3595.7 | 3591.4 | 3569.8 | 3565.5 |
| 12.5° | 3526.6 | 3522.3 | 3505.0 | 3474.8 | 3466.2 |
| 15°   | 3431.6 | 3431.6 | 3397.1 | 3362.6 | 3349.6 |
| 17.5° | 3328.0 | 3323.7 | 3280.6 | 3246.0 | 3228.8 |
| 20°   | 3215.8 | 3207.2 | 3164.0 | 3107.9 | 3077.7 |
| 22.5° | 3090.6 | 3090.6 | 3038.8 | 2965.5 | 2935.2 |
| 25°   | 2974.1 | 2956.8 | 2909.3 | 2805.7 | 2728.1 |
| 27.5° | 2840.3 | 2814.4 | 2762.6 | 2615.8 | 2525.2 |
| 30°   | 2693.5 | 2680.6 | 2607.2 | 2417.3 | 2348.2 |
| 32.5° | 2555.4 | 2533.8 | 2456.1 | 2257.5 | 2201.4 |
| 35°   | 2412.9 | 2395.7 | 2279.1 | 2106.5 | 2054.7 |
| 37.5° | 2270.5 | 2248.9 | 2102.2 | 1964.0 | 1899.3 |
| 40°   | 2128.1 | 2102.2 | 1942.4 | 1817.3 | 1748.2 |
| 42.5° | 1994.2 | 1959.7 | 1804.3 | 1670.5 | 1592.8 |
| 45°   | 1851.8 | 1812.9 | 1657.6 | 1519.4 | 1459.0 |
| 47.5° | 1709.3 | 1674.8 | 1532.4 | 1389.9 | 1320.9 |
| 50°   | 1558.3 | 1528.1 | 1398.6 | 1256.1 | 1182.7 |
| 52.5° | 1433.1 | 1385.6 | 1260.4 | 1118.0 | 1057.6 |
| 55°   | 1286.3 | 1247.5 | 1130.9 | 997.1  | 945.3  |
| 57.5° | 1152.5 | 1113.7 | 1005.8 | 880.6  | 837.4  |
| 60°   | 1027.3 | 971.2  | 880.6  | 772.7  | 738.1  |
| 62.5° | 889.2  | 846.0  | 768.3  | 677.7  | 720.9  |
| 65°   | 764.0  | 720.9  | 651.8  | 664.7  | 552.5  |
| 67.5° | 625.9  | 604.3  | 543.9  | 483.5  | 466.2  |
| 70°   | 509.4  | 483.5  | 461.9  | 397.1  | 379.9  |
| 72.5° | 405.8  | 379.9  | 349.6  | 315.1  | 302.2  |
| 75°   | 306.5  | 284.9  | 267.6  | 254.7  | 280.6  |
| 77.5° | 211.5  | 202.9  | 189.9  | 177.0  | 172.7  |
| 80°   | 138.1  | 133.8  | 129.5  | 125.2  | 120.9  |
| 82.5° | 82.0   | 82.0   | 82.0   | 82.0   | 82.0   |
| 85°   | 43.2   | 47.5   | 51.8   | 56.1   | 60.4   |
| 87.5° | 25.9   | 25.9   | 30.2   | 34.5   | 38.8   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)