

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: P563106

Luminaire Tested: FSR-24-4-LD4-3HI-35-UNV-93-85-EDD-90

Issue Date: 7/20/2021

**Test Information**

Test Method: LM-79-2019  
Report Number: P563106  
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-LD4-3HI-35-UNV-93-85-EDD-90  
Description: 2X4 FSR 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: -

**Summary**

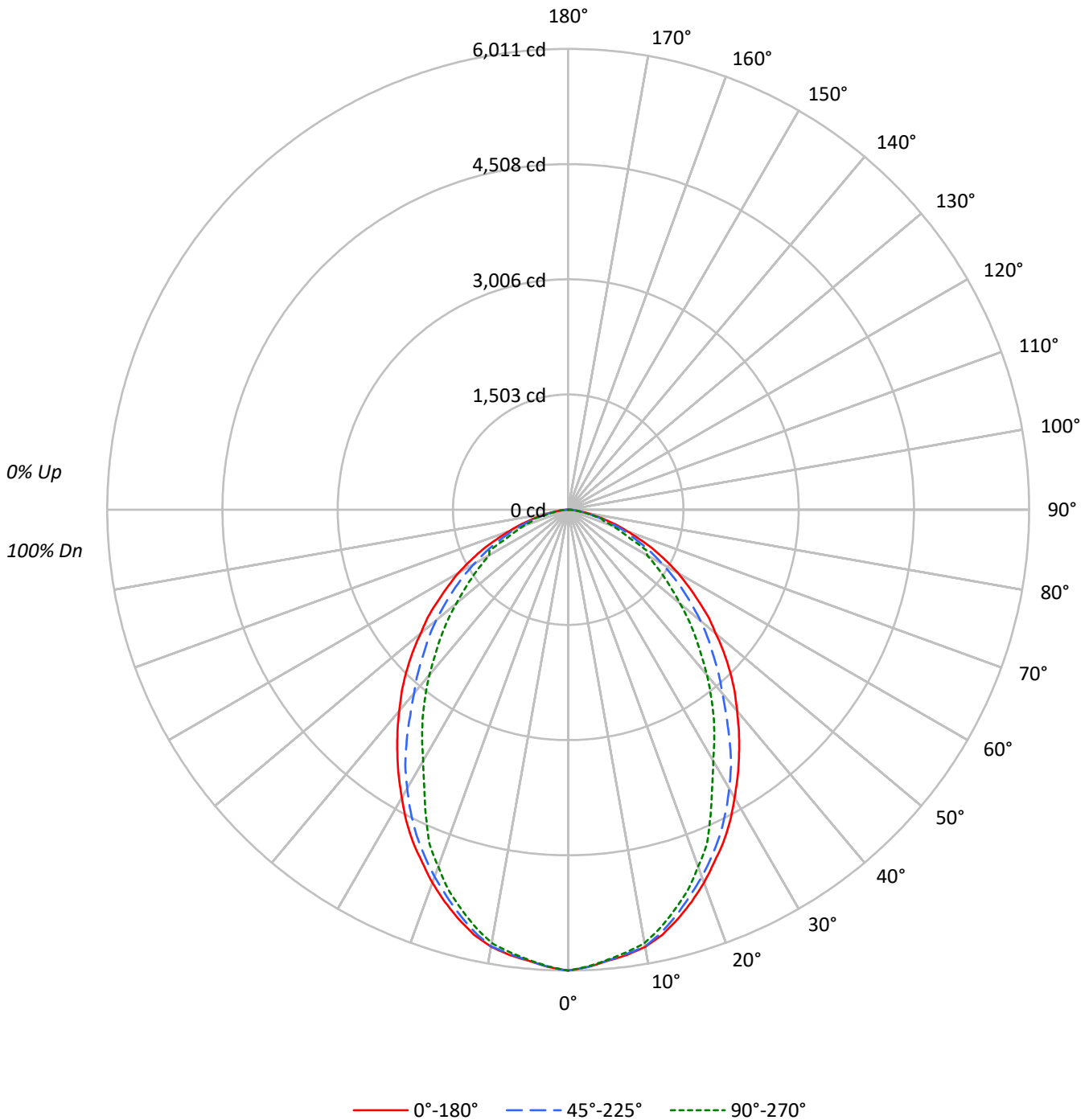
Lumens per Lamp: N/A  
Luminaire Lumens: 11801.0 lumens  
Efficiency: N/A  
Efficacy: 91.1 lumens/watt  
Spacing Criteria (0/90/45): 1.1 / 1 / 1.15  
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 129.6  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage 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°  | 8088 | 8088 | 8088 |
| 5°  | 7978 | 7969 | 7959 |
| 10° | 7909 | 7899 | 7843 |
| 15° | 7696 | 7618 | 7512 |
| 20° | 7413 | 7294 | 7095 |
| 25° | 7108 | 6954 | 6520 |
| 30° | 6737 | 6521 | 5874 |
| 35° | 6381 | 6027 | 5433 |
| 40° | 6018 | 5493 | 4943 |
| 45° | 5673 | 5078 | 4470 |
| 50° | 5251 | 4713 | 3986 |
| 55° | 4858 | 4271 | 3570 |
| 60° | 4451 | 3815 | 3198 |
| 65° | 3916 | 3341 | 2832 |
| 70° | 3226 | 2925 | 2406 |
| 75° | 2565 | 2240 | 2348 |
| 80° | 1723 | 1616 | 1508 |
| 85° | 1073 | 1288 | 1502 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 5673 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 559.6   | 4.7       |
| 10°-20°   | 1535.7  | 13.0      |
| 20°-30°   | 2126.1  | 18.0      |
| 30°-40°   | 2267.0  | 19.2      |
| 40°-50°   | 2068.2  | 17.5      |
| 50°-60°   | 1620.2  | 13.7      |
| 60°-70°   | 1056.0  | 8.9       |
| 70°-80°   | 467.8   | 4.0       |
| 80°-90°   | 100.4   | 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°    | 4221.3  | 35.8      |
| 0°-40°    | 6488.3  | 55.0      |
| 0°-60°    | 10176.7 | 86.2      |
| 0°-90°    | 11801.0 | 100.0     |
| 90°-120°  | 0.0     | 0.0       |
| 90°-150°  | 0.0     | 0.0       |
| 90°-180°  | 0.0     | 0.0       |
| 0°-180°   | 11801.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 6011 | 6011  | 6011 | 6011  | 6011 |      |
| 5°  | 5907 | 5900  | 5900 | 5893  | 5893 | 561  |
| 15° | 5525 | 5525  | 5469 | 5414  | 5393 | 1553 |
| 25° | 4788 | 4760  | 4684 | 4517  | 4392 | 2198 |
| 35° | 3885 | 3857  | 3669 | 3391  | 3308 | 2429 |
| 45° | 2981 | 2919  | 2669 | 2446  | 2349 | 2296 |
| 55° | 2071 | 2008  | 1821 | 1605  | 1522 | 1857 |
| 65° | 1230 | 1161  | 1049 | 1070  | 890  | 1212 |
| 75° | 493  | 459   | 431  | 410   | 452  | 529  |
| 85° | 70   | 76    | 83   | 90    | 97   | 96   |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 6011.3 | 6011.3 | 6011.3 | 6011.3 | 6011.3 |
| 2.5°  | 5969.6 | 5969.6 | 5969.6 | 5962.6 | 5962.6 |
| 5°    | 5907.0 | 5900.1 | 5900.1 | 5893.1 | 5893.1 |
| 7.5°  | 5858.4 | 5851.4 | 5844.5 | 5837.5 | 5823.6 |
| 10°   | 5788.9 | 5788.9 | 5781.9 | 5747.2 | 5740.2 |
| 12.5° | 5677.7 | 5670.7 | 5643.0 | 5594.3 | 5580.4 |
| 15°   | 5524.8 | 5524.8 | 5469.2 | 5413.6 | 5392.8 |
| 17.5° | 5358.0 | 5351.1 | 5281.6 | 5226.0 | 5198.2 |
| 20°   | 5177.3 | 5163.4 | 5093.9 | 5003.6 | 4955.0 |
| 22.5° | 4975.8 | 4975.8 | 4892.4 | 4774.3 | 4725.6 |
| 25°   | 4788.2 | 4760.4 | 4683.9 | 4517.1 | 4392.1 |
| 27.5° | 4572.7 | 4531.0 | 4447.6 | 4211.4 | 4065.4 |
| 30°   | 4336.5 | 4315.6 | 4197.5 | 3891.7 | 3780.5 |
| 32.5° | 4114.1 | 4079.3 | 3954.2 | 3634.6 | 3544.2 |
| 35°   | 3884.7 | 3856.9 | 3669.3 | 3391.3 | 3307.9 |
| 37.5° | 3655.4 | 3620.7 | 3384.4 | 3162.0 | 3057.8 |
| 40°   | 3426.1 | 3384.4 | 3127.3 | 2925.7 | 2814.5 |
| 42.5° | 3210.6 | 3155.0 | 2904.9 | 2689.4 | 2564.3 |
| 45°   | 2981.3 | 2918.8 | 2668.6 | 2446.2 | 2348.9 |
| 47.5° | 2752.0 | 2696.4 | 2467.1 | 2237.7 | 2126.5 |
| 50°   | 2508.8 | 2460.1 | 2251.6 | 2022.3 | 1904.1 |
| 52.5° | 2307.2 | 2230.8 | 2029.2 | 1799.9 | 1702.6 |
| 55°   | 2070.9 | 2008.4 | 1820.8 | 1605.3 | 1521.9 |
| 57.5° | 1855.5 | 1793.0 | 1619.2 | 1417.7 | 1348.2 |
| 60°   | 1654.0 | 1563.6 | 1417.7 | 1244.0 | 1188.4 |
| 62.5° | 1431.6 | 1362.1 | 1237.0 | 1091.1 | 1160.6 |
| 65°   | 1230.1 | 1160.6 | 1049.4 | 1070.2 | 889.5  |
| 67.5° | 1007.7 | 972.9  | 875.6  | 778.3  | 750.5  |
| 70°   | 820.0  | 778.3  | 743.6  | 639.3  | 611.6  |
| 72.5° | 653.2  | 611.6  | 562.9  | 507.3  | 486.5  |
| 75°   | 493.4  | 458.7  | 430.9  | 410.0  | 451.7  |
| 77.5° | 340.5  | 326.6  | 305.8  | 284.9  | 278.0  |
| 80°   | 222.4  | 215.4  | 208.5  | 201.5  | 194.6  |
| 82.5° | 132.0  | 132.0  | 132.0  | 132.0  | 132.0  |
| 85°   | 69.5   | 76.4   | 83.4   | 90.3   | 97.3   |
| 87.5° | 41.7   | 41.7   | 48.6   | 55.6   | 62.5   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)