

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: P563632

Luminaire Tested: FSR-24-4-LD4-4HI-35-UNV-80-84-EDD-90

Issue Date: 7/20/2021

**Test Information**

Test Method: LM-79-2019  
Report Number: P563632  
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-LD4-4HI-35-UNV-80-84-EDD-90  
Description: 2X4 FSR TROFFER WITH .125 PRISMATIC ACRYLIC FIXTURE SIDE AND .125 CLEAR PC ENVIRONM  
SIDE LENSES WITH, 90 CRI AND 3500K CCT LEDS  
Light Source: -  
Ballast/Driver: -

**Summary**

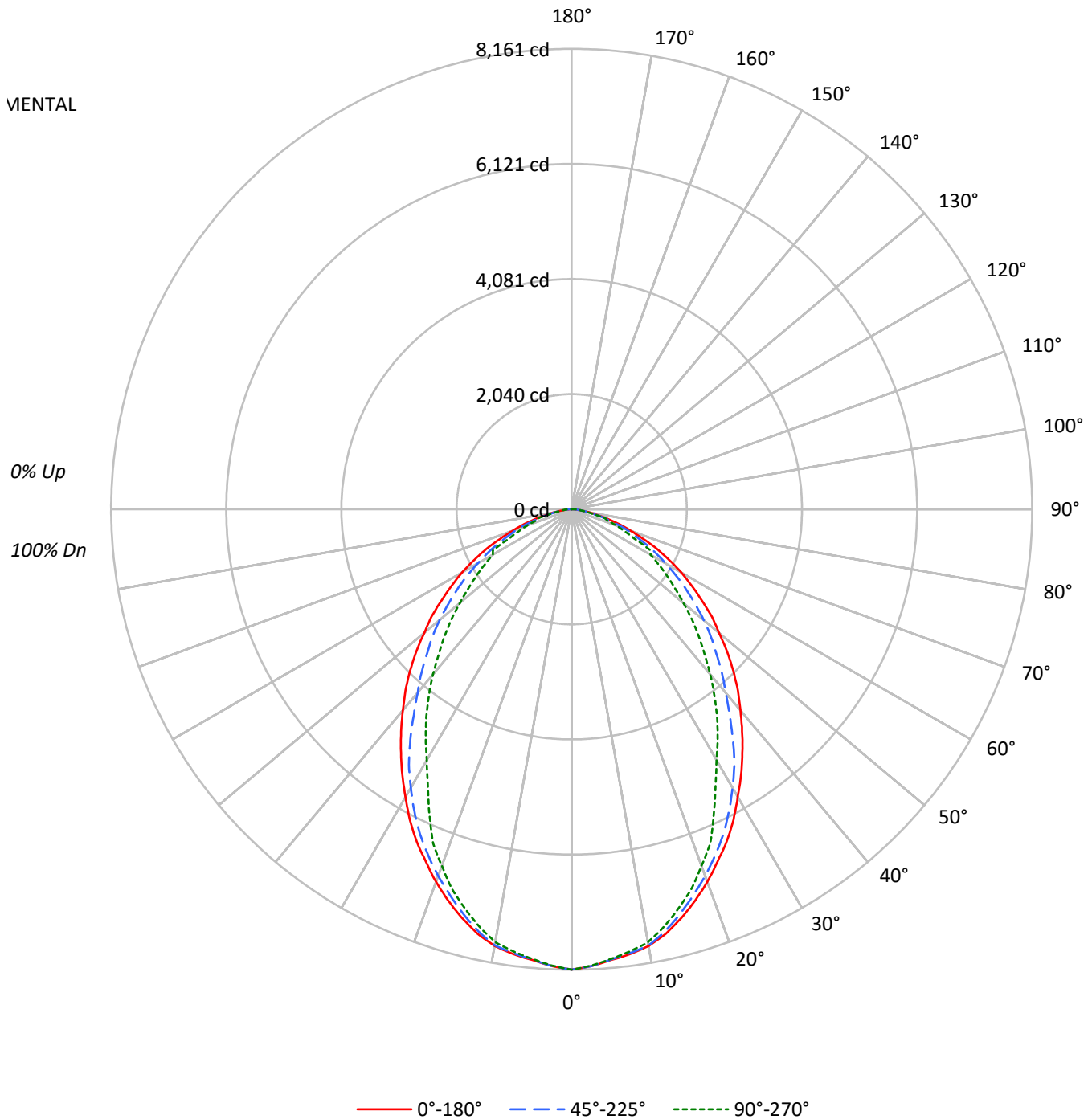
Lumens per Lamp: N/A  
Luminaire Lumens: 16021.0 lumens  
Efficiency: N/A  
Efficacy: 92.7 lumens/watt  
Spacing Criteria (0/90/45): 1.1 / 1 / 1.15  
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')  
CIE Type: Direct  
  
Input Watts (W): 172.8  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage 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°  | 10980 | 10980 | 10980 |
| 5°  | 10831 | 10818 | 10806 |
| 10° | 10737 | 10724 | 10647 |
| 15° | 10448 | 10343 | 10198 |
| 20° | 10064 | 9902  | 9632  |
| 25° | 9650  | 9440  | 8852  |
| 30° | 9147  | 8853  | 7974  |
| 35° | 8663  | 8182  | 7376  |
| 40° | 8169  | 7457  | 6711  |
| 45° | 7701  | 6894  | 6068  |
| 50° | 7129  | 6399  | 5411  |
| 55° | 6595  | 5799  | 4847  |
| 60° | 6042  | 5179  | 4341  |
| 65° | 5316  | 4535  | 3845  |
| 70° | 4380  | 3971  | 3266  |
| 75° | 3483  | 3041  | 3188  |
| 80° | 2339  | 2193  | 2047  |
| 85° | 1456  | 1748  | 2039  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 7701 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 759.7   | 4.7       |
| 10°-20°   | 2084.8  | 13.0      |
| 20°-30°   | 2886.3  | 18.0      |
| 30°-40°   | 3077.7  | 19.2      |
| 40°-50°   | 2807.7  | 17.5      |
| 50°-60°   | 2199.6  | 13.7      |
| 60°-70°   | 1433.6  | 8.9       |
| 70°-80°   | 635.1   | 4.0       |
| 80°-90°   | 136.4   | 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°    | 5730.8  | 35.8      |
| 0°-40°    | 8808.5  | 55.0      |
| 0°-60°    | 13815.9 | 86.2      |
| 0°-90°    | 16021.0 | 100.0     |
| 90°-120°  | 0.0     | 0.0       |
| 90°-150°  | 0.0     | 0.0       |
| 90°-180°  | 0.0     | 0.0       |
| 0°-180°   | 16021.0 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----|------|-------|------|-------|------|------|
| 0°  | 8161 | 8161  | 8161 | 8161  | 8161 |      |
| 5°  | 8019 | 8010  | 8010 | 8000  | 8000 | 761  |
| 15° | 7500 | 7500  | 7425 | 7350  | 7321 | 2109 |
| 25° | 6500 | 6463  | 6359 | 6132  | 5963 | 2984 |
| 35° | 5274 | 5236  | 4981 | 4604  | 4491 | 3297 |
| 45° | 4047 | 3962  | 3623 | 3321  | 3189 | 3118 |
| 55° | 2812 | 2727  | 2472 | 2179  | 2066 | 2522 |
| 65° | 1670 | 1576  | 1425 | 1453  | 1208 | 1646 |
| 75° | 670  | 623   | 585  | 557   | 613  | 718  |
| 85° | 94   | 104   | 113  | 123   | 132  | 131  |
| 90° | 0    | 0     | 0    | 0     | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|-------|--------|--------|--------|--------|--------|
| 0°    | 8160.9 | 8160.9 | 8160.9 | 8160.9 | 8160.9 |
| 2.5°  | 8104.3 | 8104.3 | 8104.3 | 8094.8 | 8094.8 |
| 5°    | 8019.4 | 8009.9 | 8009.9 | 8000.5 | 8000.5 |
| 7.5°  | 7953.3 | 7943.9 | 7934.5 | 7925.0 | 7906.2 |
| 10°   | 7859.0 | 7859.0 | 7849.5 | 7802.4 | 7792.9 |
| 12.5° | 7708.0 | 7698.6 | 7660.9 | 7594.8 | 7575.9 |
| 15°   | 7500.5 | 7500.5 | 7425.0 | 7349.5 | 7321.2 |
| 17.5° | 7274.0 | 7264.6 | 7170.3 | 7094.8 | 7057.0 |
| 20°   | 7028.7 | 7009.9 | 6915.5 | 6792.9 | 6726.8 |
| 22.5° | 6755.1 | 6755.1 | 6641.9 | 6481.5 | 6415.5 |
| 25°   | 6500.4 | 6462.7 | 6358.9 | 6132.5 | 5962.6 |
| 27.5° | 6207.9 | 6151.3 | 6038.1 | 5717.3 | 5519.2 |
| 30°   | 5887.2 | 5858.9 | 5698.5 | 5283.3 | 5132.4 |
| 32.5° | 5585.3 | 5538.1 | 5368.3 | 4934.3 | 4811.6 |
| 35°   | 5273.9 | 5236.2 | 4981.4 | 4604.1 | 4490.8 |
| 37.5° | 4962.6 | 4915.4 | 4594.6 | 4292.7 | 4151.2 |
| 40°   | 4651.2 | 4594.6 | 4245.5 | 3971.9 | 3821.0 |
| 42.5° | 4358.8 | 4283.3 | 3943.6 | 3651.2 | 3481.3 |
| 45°   | 4047.4 | 3962.5 | 3622.9 | 3321.0 | 3188.9 |
| 47.5° | 3736.1 | 3660.6 | 3349.3 | 3037.9 | 2887.0 |
| 50°   | 3405.9 | 3339.8 | 3056.8 | 2745.5 | 2585.1 |
| 52.5° | 3132.3 | 3028.5 | 2754.9 | 2443.5 | 2311.5 |
| 55°   | 2811.5 | 2726.6 | 2471.9 | 2179.4 | 2066.2 |
| 57.5° | 2519.0 | 2434.1 | 2198.2 | 1924.6 | 1830.3 |
| 60°   | 2245.4 | 2122.8 | 1924.6 | 1688.8 | 1613.3 |
| 62.5° | 1943.5 | 1849.2 | 1679.3 | 1481.2 | 1575.6 |
| 65°   | 1669.9 | 1575.6 | 1424.6 | 1452.9 | 1207.6 |
| 67.5° | 1368.0 | 1320.8 | 1188.8 | 1056.7 | 1018.9 |
| 70°   | 1113.3 | 1056.7 | 1009.5 | 868.0  | 830.2  |
| 72.5° | 886.8  | 830.2  | 764.2  | 688.7  | 660.4  |
| 75°   | 669.9  | 622.7  | 584.9  | 556.6  | 613.2  |
| 77.5° | 462.3  | 443.4  | 415.1  | 386.8  | 377.4  |
| 80°   | 301.9  | 292.5  | 283.0  | 273.6  | 264.2  |
| 82.5° | 179.3  | 179.3  | 179.3  | 179.3  | 179.3  |
| 85°   | 94.3   | 103.8  | 113.2  | 122.6  | 132.1  |
| 87.5° | 56.6   | 56.6   | 66.0   | 75.5   | 84.9   |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    |

(END OF REPORT)