

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: P30102

Luminaire Tested: **CRF-24-332-UNV-IK12**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: P30102  
Test Lab: METALUX RESEARCH LABS  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: CRF-24-332-UNV-IK12  
Description: FAILSAFE TRISEAL CRF SERIES 2x4 3L T8  
Light Source: (3) DOUBLE ENDED T8 4 FOOT LINEAR FLUORESCENT LAMPS  
F32W T8 32 WATTS  
Ballast/Driver: (1) UNIVERSAL ELECTRONIC BALLAST  
B332IUNV

**Summary**

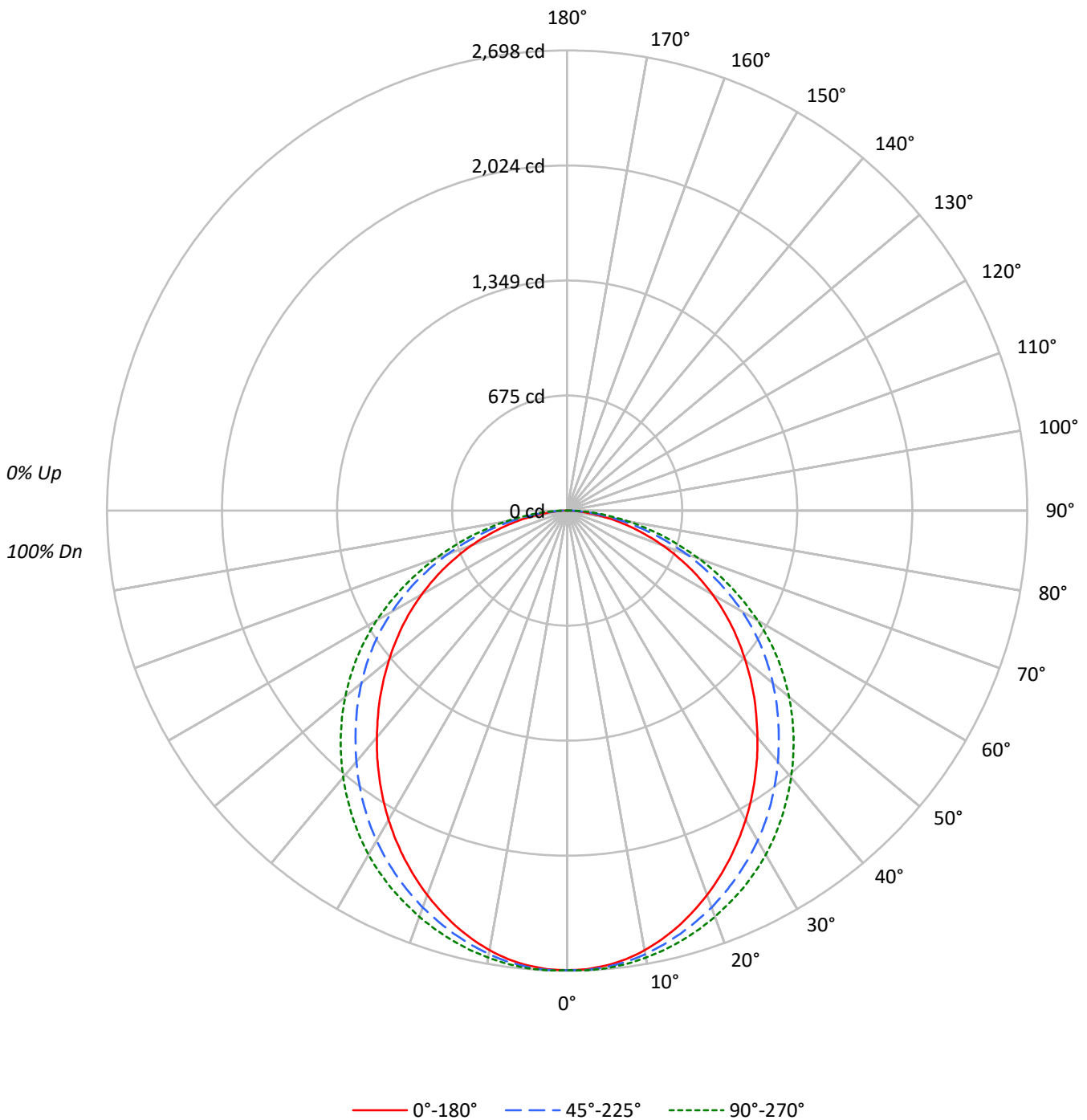
Lumens per Lamp: 3100 (3 lamps)  
Luminaire Lumens: 7549.5 lumens  
Efficiency: 81.2%  
Efficacy: 98.2 lumens/watt  
Spacing Criteria (0/90/45): 1.16 / 1.28 / 1.36  
Luminous Opening: Rectangular (W 1.75' x L: 3.75' x H: 0')  
CIE Type: Direct

Input Watts (W): 76.9  
Input Voltage (V): NR  
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: 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 | 50 | 30 | 10 | 0  |    |
| RCR |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 97 | 97 | 97 | 97 | 94 | 94 | 94 | 94 | 90 | 90 | 90 | 86 | 86 | 86 | 83 | 83 | 83 | 81 |    |    |    | 81 |
| 1   | 88 | 84 | 81 | 78 | 86 | 82 | 79 | 76 | 79 | 76 | 74 | 76 | 74 | 72 | 73 | 71 | 69 | 68 |    |    |    | 68 |
| 2   | 80 | 73 | 68 | 63 | 78 | 72 | 67 | 62 | 69 | 65 | 61 | 66 | 63 | 59 | 64 | 61 | 58 | 56 |    |    |    | 56 |
| 3   | 73 | 64 | 58 | 52 | 71 | 63 | 57 | 52 | 61 | 55 | 51 | 58 | 54 | 50 | 56 | 52 | 49 | 47 |    |    |    | 47 |
| 4   | 67 | 57 | 50 | 44 | 65 | 56 | 49 | 44 | 54 | 48 | 43 | 52 | 47 | 43 | 50 | 46 | 42 | 40 |    |    |    | 40 |
| 5   | 61 | 51 | 43 | 38 | 60 | 50 | 43 | 38 | 48 | 42 | 37 | 47 | 41 | 37 | 45 | 40 | 37 | 35 |    |    |    | 35 |
| 6   | 57 | 46 | 38 | 33 | 55 | 45 | 38 | 33 | 44 | 37 | 33 | 42 | 37 | 32 | 41 | 36 | 32 | 30 |    |    |    | 30 |
| 7   | 53 | 41 | 34 | 29 | 51 | 41 | 34 | 29 | 40 | 33 | 29 | 38 | 33 | 29 | 37 | 32 | 29 | 27 |    |    |    | 27 |
| 8   | 49 | 38 | 31 | 26 | 48 | 37 | 31 | 26 | 36 | 30 | 26 | 35 | 30 | 26 | 34 | 29 | 26 | 24 |    |    |    | 24 |
| 9   | 46 | 35 | 28 | 24 | 45 | 34 | 28 | 23 | 33 | 27 | 23 | 32 | 27 | 23 | 32 | 27 | 23 | 22 |    |    |    | 22 |
| 10  | 43 | 32 | 26 | 21 | 42 | 32 | 25 | 21 | 31 | 25 | 21 | 30 | 25 | 21 | 29 | 24 | 21 | 20 |    |    |    | 20 |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4420 | 4420 | 4420 |
| 5°  | 4408 | 4422 | 4434 |
| 10° | 4360 | 4399 | 4432 |
| 15° | 4283 | 4361 | 4429 |
| 20° | 4187 | 4322 | 4423 |
| 25° | 4081 | 4278 | 4419 |
| 30° | 3966 | 4233 | 4413 |
| 35° | 3842 | 4177 | 4393 |
| 40° | 3715 | 4115 | 4374 |
| 45° | 3598 | 4062 | 4354 |
| 50° | 3478 | 4019 | 4333 |
| 55° | 3366 | 3972 | 4304 |
| 60° | 3235 | 3894 | 4235 |
| 65° | 3066 | 3765 | 4110 |
| 70° | 2858 | 3563 | 3937 |
| 75° | 2560 | 3251 | 3707 |
| 80° | 2182 | 2853 | 3419 |
| 85° | 1637 | 2390 | 3180 |



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

| Zone      | Lumens | % Fixture | % Lamp |      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----------|--------|-----------|--------|------|------|-------|------|-------|------|------|
| 0°-10°    | 254.8  | 3.4       | 2.7    | 0°   | 2695 | 2695  | 2695 | 2695  | 2695 |      |
| 10°-20°   | 723.8  | 9.6       | 7.8    | 5°   | 2677 | 2680  | 2686 | 2689  | 2693 | 254  |
| 20°-30°   | 1085.5 | 14.4      | 11.7   | 15°  | 2522 | 2536  | 2568 | 2595  | 2608 | 710  |
| 30°-40°   | 1295.3 | 17.2      | 13.9   | 25°  | 2255 | 2291  | 2364 | 2421  | 2442 | 1038 |
| 40°-50°   | 1337.0 | 17.7      | 14.4   | 35°  | 1919 | 1971  | 2086 | 2169  | 2194 | 1200 |
| 50°-60°   | 1220.2 | 16.2      | 13.1   | 45°  | 1551 | 1615  | 1751 | 1850  | 1877 | 1196 |
| 60°-70°   | 939.4  | 12.4      | 10.1   | 55°  | 1177 | 1249  | 1389 | 1487  | 1505 | 1052 |
| 70°-80°   | 538.0  | 7.1       | 5.8    | 65°  | 790  | 855   | 970  | 1053  | 1059 | 782  |
| 80°-90°   | 152.9  | 2.0       | 1.6    | 75°  | 404  | 446   | 513  | 575   | 585  | 430  |
| 90°-100°  | 2.6    | 0.0       | 0.0    | 85°  | 87   | 103   | 127  | 158   | 169  | 102  |
| 100°-110° | 0.0    | 0.0       | 0.0    | 90°  | 7    | 10    | 17   | 29    | 34   | 7    |
| 110°-120° | 0.0    | 0.0       | 0.0    | 95°  | 0    | 0     | 0    | 0     | 0    | 0    |
| 120°-130° | 0.0    | 0.0       | 0.0    | 105° | 0    | 0     | 0    | 0     | 0    | 0    |
| 130°-140° | 0.0    | 0.0       | 0.0    | 115° | 0    | 0     | 0    | 0     | 0    | 0    |
| 140°-150° | 0.0    | 0.0       | 0.0    | 125° | 0    | 0     | 0    | 0     | 0    | 0    |
| 150°-160° | 0.0    | 0.0       | 0.0    | 135° | 0    | 0     | 0    | 0     | 0    | 0    |
| 160°-170° | 0.0    | 0.0       | 0.0    | 145° | 0    | 0     | 0    | 0     | 0    | 0    |
| 170°-180° | 0.0    | 0.0       | 0.0    | 155° | 0    | 0     | 0    | 0     | 0    | 0    |
| 0°-30°    | 2064.1 | 27.3      | 22.2   | 165° | 0    | 0     | 0    | 0     | 0    | 0    |
| 0°-40°    | 3359.4 | 44.5      | 36.1   | 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 0°-60°    | 5916.6 | 78.4      | 63.6   | 180° | 0    | 0     | 0    | 0     | 0    | 0    |
| 0°-90°    | 7546.9 | 100.0     | 81.1   |      |      |       |      |       |      |      |
| 90°-120°  | 2.6    | 0.0       | 0.0    |      |      |       |      |       |      |      |
| 90°-150°  | 2.6    | 0.0       | 0.0    |      |      |       |      |       |      |      |
| 90°-180°  | 3.0    | 0.0       | 0.0    |      |      |       |      |       |      |      |
| 0°-180°   | 7549.5 | 100.0     | 81.2   |      |      |       |      |       |      |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 0°     | 2695 | 2695  | 2695 | 2695  | 2695 |
| 2.5°   | 2691 | 2693  | 2696 | 2696  | 2698 |
| 5°     | 2677 | 2680  | 2686 | 2689  | 2693 |
| 7.5°   | 2653 | 2657  | 2668 | 2675  | 2681 |
| 10°    | 2618 | 2625  | 2641 | 2653  | 2661 |
| 12.5°  | 2574 | 2584  | 2607 | 2627  | 2638 |
| 15°    | 2522 | 2536  | 2568 | 2595  | 2608 |
| 17.5°  | 2463 | 2482  | 2524 | 2558  | 2574 |
| 20°    | 2399 | 2423  | 2476 | 2517  | 2534 |
| 22.5°  | 2329 | 2359  | 2422 | 2471  | 2489 |
| 25°    | 2255 | 2291  | 2364 | 2421  | 2442 |
| 27.5°  | 2176 | 2216  | 2301 | 2367  | 2388 |
| 30°    | 2094 | 2137  | 2235 | 2307  | 2330 |
| 32.5°  | 2008 | 2055  | 2163 | 2240  | 2264 |
| 35°    | 1919 | 1971  | 2086 | 2169  | 2194 |
| 37.5°  | 1829 | 1883  | 2006 | 2094  | 2120 |
| 40°    | 1735 | 1794  | 1922 | 2015  | 2043 |
| 42.5°  | 1643 | 1704  | 1837 | 1934  | 1962 |
| 45°    | 1551 | 1615  | 1751 | 1850  | 1877 |
| 47.5°  | 1457 | 1524  | 1664 | 1764  | 1790 |
| 50°    | 1363 | 1433  | 1575 | 1675  | 1698 |
| 52.5°  | 1270 | 1342  | 1483 | 1584  | 1604 |
| 55°    | 1177 | 1249  | 1389 | 1487  | 1505 |
| 57.5°  | 1082 | 1154  | 1290 | 1385  | 1400 |
| 60°    | 986  | 1057  | 1187 | 1279  | 1291 |
| 62.5°  | 888  | 957   | 1080 | 1168  | 1176 |
| 65°    | 790  | 855   | 970  | 1053  | 1059 |
| 67.5°  | 692  | 753   | 856  | 934   | 940  |
| 70°    | 596  | 650   | 743  | 814   | 821  |
| 72.5°  | 499  | 547   | 627  | 693   | 701  |
| 75°    | 404  | 446   | 513  | 575   | 585  |
| 77.5°  | 315  | 348   | 404  | 461   | 470  |
| 80°    | 231  | 257   | 302  | 350   | 362  |
| 82.5°  | 154  | 174   | 208  | 249   | 261  |
| 85°    | 87   | 103   | 127  | 158   | 169  |
| 87.5°  | 36   | 47    | 61   | 82    | 90   |
| 90°    | 7    | 10    | 17   | 29    | 34   |
| 92.5°  | 0    | 0     | 0    | 0     | 0    |
| 95°    | 0    | 0     | 0    | 0     | 0    |
| 97.5°  | 0    | 0     | 0    | 0     | 0    |
| 100°   | 0    | 0     | 0    | 0     | 0    |
| 102.5° | 0    | 0     | 0    | 0     | 0    |
| 105°   | 0    | 0     | 0    | 0     | 0    |
| 107.5° | 0    | 0     | 0    | 0     | 0    |
| 110°   | 0    | 0     | 0    | 0     | 0    |



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**CANDELA DISTRIBUTION (continued):**

|        | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|----|-------|-----|-------|-----|
| 112.5° | 0  | 0     | 0   | 0     | 0   |
| 115°   | 0  | 0     | 0   | 0     | 0   |
| 117.5° | 0  | 0     | 0   | 0     | 0   |
| 120°   | 0  | 0     | 0   | 0     | 0   |
| 122.5° | 0  | 0     | 0   | 0     | 0   |
| 125°   | 0  | 0     | 0   | 0     | 0   |
| 127.5° | 0  | 0     | 0   | 0     | 0   |
| 130°   | 0  | 0     | 0   | 0     | 0   |
| 132.5° | 0  | 0     | 0   | 0     | 0   |
| 135°   | 0  | 0     | 0   | 0     | 0   |
| 137.5° | 0  | 0     | 0   | 0     | 0   |
| 140°   | 0  | 0     | 0   | 0     | 0   |
| 142.5° | 0  | 0     | 0   | 0     | 0   |
| 145°   | 0  | 0     | 0   | 0     | 0   |
| 147.5° | 0  | 0     | 0   | 0     | 0   |
| 150°   | 0  | 0     | 0   | 0     | 0   |
| 152.5° | 0  | 0     | 0   | 0     | 0   |
| 155°   | 0  | 0     | 0   | 0     | 0   |
| 157.5° | 0  | 0     | 0   | 0     | 0   |
| 160°   | 0  | 0     | 0   | 0     | 0   |
| 162.5° | 0  | 0     | 0   | 0     | 0   |
| 165°   | 0  | 0     | 0   | 0     | 0   |
| 167.5° | 0  | 0     | 0   | 0     | 0   |
| 170°   | 0  | 0     | 0   | 0     | 0   |
| 172.5° | 0  | 0     | 0   | 0     | 0   |
| 175°   | 0  | 0     | 0   | 0     | 0   |
| 177.5° | 0  | 0     | 0   | 0     | 0   |
| 180°   | 0  | 0     | 0   | 0     | 0   |

(END OF REPORT)