

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: P30104

Luminaire Tested: **CRF-24-232-UNV-IK12**

Issue Date: 3/3/2020



Test Information

Test Method: LM-79-08
Report Number: P30104
Test Lab: METALUX RESEARCH LABS
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: CRF-24-232-UNV-IK12
Description: FAILSAFE TRISEAL CRF SERIES 2x4 2L T8
Light Source: (2) DOUBLE ENDED T8 4 FOOT LINEAR FLUORESCENT LAMPS
F32W T8 32 WATTS
Ballast/Driver: ADVANCE CENTIUM
ICN-2P32-N

Summary

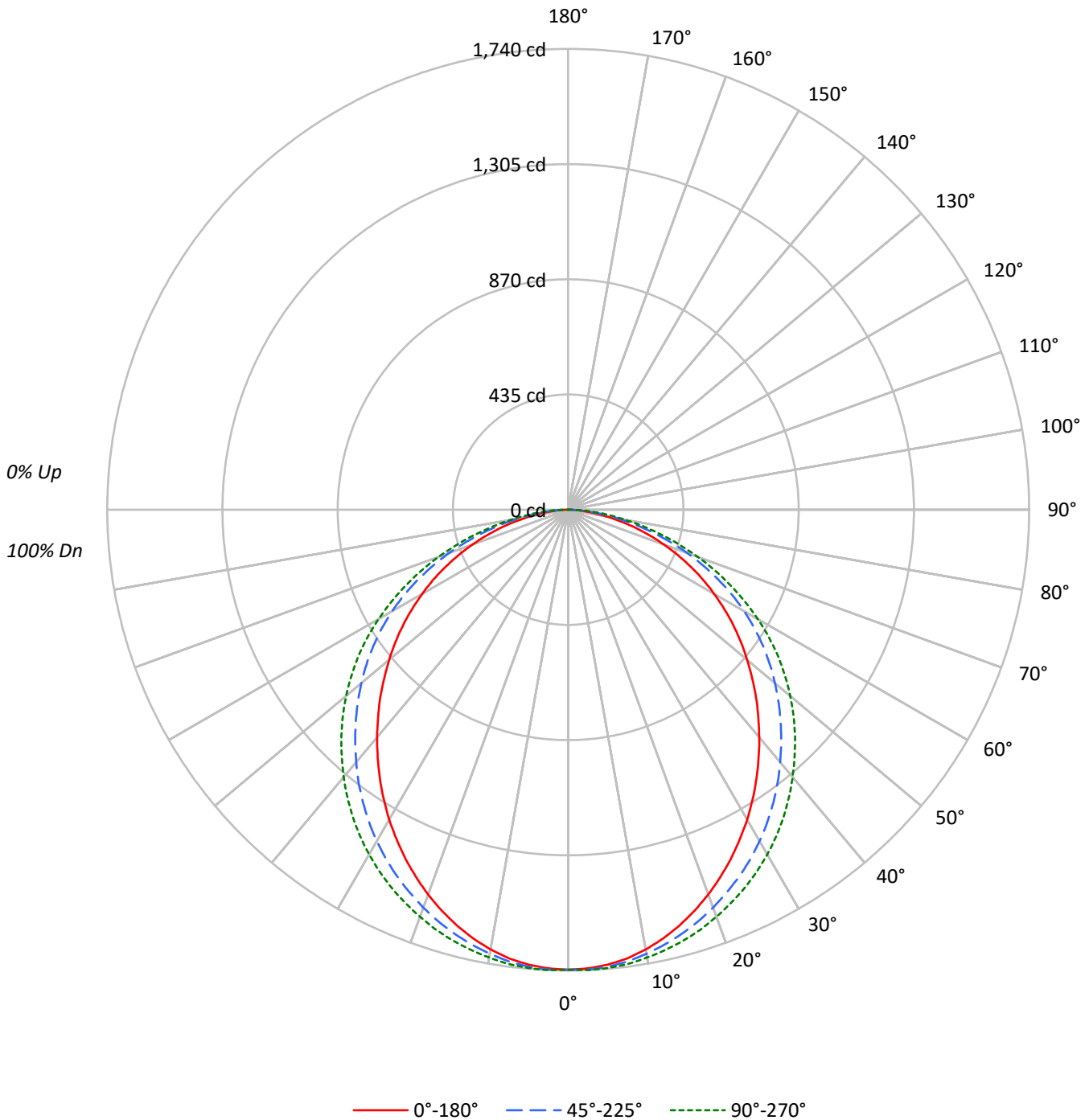
Lumens per Lamp: 3100 (2 lamps)
Luminaire Lumens: 4862.0 lumens
Efficiency: 78.4%
Efficacy: 83.8 lumens/watt
Spacing Criteria (0/90/45): 1.16 / 1.28 / 1.36
Luminous Opening: Rectangular (W 1.75' x L: 3.75' x H: 0')
CIE Type: Direct

Input Watts (W): 58
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





TEST NUMBER: P30104

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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|----|--|--|--|--|--|--|--|--|---|
| RF | 20 | | | | | | | | | 20 | | | | | | | | | 20 | | | | | | | | | 20 | | | | | | | | | |
| RC | 80 | | | | | | | | | 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 | 0 | | | | | | | | | | | | | |
| RCR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 93 | 93 | 93 | 93 | 91 | 91 | 91 | 91 | 87 | 87 | 87 | 83 | 83 | 83 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 78 | | | | | | | | | | | | | |
| 1 | 85 | 81 | 78 | 75 | 83 | 80 | 77 | 74 | 76 | 74 | 71 | 73 | 71 | 69 | 70 | 69 | 67 | 70 | 69 | 67 | 70 | 69 | 67 | 66 | | | | | | | | | | | | | |
| 2 | 77 | 71 | 66 | 61 | 75 | 69 | 64 | 60 | 67 | 62 | 59 | 64 | 61 | 57 | 62 | 59 | 56 | 62 | 59 | 56 | 62 | 59 | 56 | 54 | | | | | | | | | | | | | |
| 3 | 71 | 62 | 56 | 51 | 69 | 61 | 55 | 50 | 59 | 53 | 49 | 56 | 52 | 48 | 54 | 51 | 48 | 54 | 51 | 48 | 54 | 51 | 48 | 46 | | | | | | | | | | | | | |
| 4 | 65 | 55 | 48 | 43 | 63 | 54 | 48 | 43 | 52 | 46 | 42 | 50 | 45 | 41 | 48 | 44 | 41 | 48 | 44 | 41 | 48 | 44 | 41 | 39 | | | | | | | | | | | | | |
| 5 | 59 | 49 | 42 | 37 | 58 | 48 | 42 | 37 | 47 | 41 | 36 | 45 | 40 | 36 | 44 | 39 | 35 | 44 | 39 | 35 | 44 | 39 | 35 | 34 | | | | | | | | | | | | | |
| 6 | 55 | 44 | 37 | 32 | 53 | 44 | 37 | 32 | 42 | 36 | 32 | 41 | 35 | 31 | 40 | 35 | 31 | 40 | 35 | 31 | 40 | 35 | 31 | 30 | | | | | | | | | | | | | |
| 7 | 51 | 40 | 33 | 28 | 49 | 39 | 33 | 28 | 38 | 32 | 28 | 37 | 32 | 28 | 36 | 31 | 28 | 36 | 31 | 28 | 36 | 31 | 28 | 26 | | | | | | | | | | | | | |
| 8 | 47 | 37 | 30 | 25 | 46 | 36 | 30 | 25 | 35 | 29 | 25 | 34 | 29 | 25 | 33 | 28 | 25 | 33 | 28 | 25 | 33 | 28 | 25 | 23 | | | | | | | | | | | | | |
| 9 | 44 | 34 | 27 | 23 | 43 | 33 | 27 | 23 | 32 | 27 | 23 | 31 | 26 | 22 | 31 | 26 | 22 | 31 | 26 | 22 | 31 | 26 | 22 | 21 | | | | | | | | | | | | | |
| 10 | 41 | 31 | 25 | 21 | 40 | 31 | 25 | 21 | 30 | 24 | 21 | 29 | 24 | 20 | 28 | 24 | 20 | 28 | 24 | 20 | 28 | 24 | 20 | 19 | | | | | | | | | | | | | |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2849 | 2849 | 2849 |
| 5° | 2839 | 2852 | 2860 |
| 10° | 2808 | 2836 | 2860 |
| 15° | 2759 | 2815 | 2860 |
| 20° | 2699 | 2791 | 2856 |
| 25° | 2631 | 2765 | 2852 |
| 30° | 2559 | 2737 | 2847 |
| 35° | 2481 | 2703 | 2837 |
| 40° | 2402 | 2666 | 2822 |
| 45° | 2327 | 2630 | 2809 |
| 50° | 2251 | 2600 | 2792 |
| 55° | 2176 | 2568 | 2768 |
| 60° | 2090 | 2519 | 2713 |
| 65° | 1983 | 2430 | 2624 |
| 70° | 1842 | 2292 | 2494 |
| 75° | 1654 | 2085 | 2307 |
| 80° | 1379 | 1795 | 2059 |
| 85° | 1035 | 1468 | 1844 |



TEST NUMBER: P30104

CATALOG NUMBER: CRF-24-232-UNV-IK12

ZONAL LUMENS:

CANDELA DISTRIBUTION:

| Zone | Lumens | % Fixture | % Lamp | | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----------------|---------------|--------------|-------------|------|------|-------|------|-------|------|------|
| 0°-10° | 164.3 | 3.4 | 2.6 | 0° | 1737 | 1737 | 1737 | 1737 | 1737 | |
| 10°-20° | 466.9 | 9.6 | 7.5 | 5° | 1724 | 1727 | 1732 | 1732 | 1737 | 163 |
| 20°-30° | 700.8 | 14.4 | 11.3 | 15° | 1625 | 1635 | 1658 | 1675 | 1684 | 458 |
| 30°-40° | 837.3 | 17.2 | 13.5 | 25° | 1454 | 1478 | 1528 | 1564 | 1576 | 669 |
| 40°-50° | 864.5 | 17.8 | 13.9 | 35° | 1239 | 1273 | 1350 | 1403 | 1417 | 775 |
| 50°-60° | 787.9 | 16.2 | 12.7 | 45° | 1003 | 1044 | 1134 | 1196 | 1211 | 774 |
| 60°-70° | 604.3 | 12.4 | 9.7 | 55° | 761 | 808 | 898 | 960 | 968 | 680 |
| 70°-80° | 341.4 | 7.0 | 5.5 | 65° | 511 | 552 | 626 | 675 | 676 | 505 |
| 80°-90° | 93.2 | 1.9 | 1.5 | 75° | 261 | 286 | 329 | 362 | 364 | 277 |
| 90°-100° | 1.4 | 0.0 | 0.0 | 85° | 55 | 64 | 78 | 93 | 98 | 64 |
| 100°-110° | 0.0 | 0.0 | 0.0 | 90° | 3 | 6 | 9 | 15 | 18 | 4 |
| 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° | 1332.0 | 27.4 | 21.5 | 165° | 0 | 0 | 0 | 0 | 0 | 0 |
| 0°-40° | 2169.3 | 44.6 | 35.0 | 175° | 0 | 0 | 0 | 0 | 0 | 0 |
| 0°-60° | 3821.7 | 78.6 | 61.6 | 180° | 0 | 0 | 0 | 0 | 0 | 0 |
| 0°-90° | 4860.6 | 100.0 | 78.4 | | | | | | | |
| 90°-120° | 1.4 | 0.0 | 0.0 | | | | | | | |
| 90°-150° | 1.4 | 0.0 | 0.0 | | | | | | | |
| 90°-180° | 1.0 | 0.0 | 0.0 | | | | | | | |
| 0°-180° | 4862.0 | 100.0 | 78.4 | | | | | | | |



TEST NUMBER: P30104

CATALOG NUMBER: CRF-24-232-UNV-IK12

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|--------|------|-------|------|-------|------|
| 0° | 1737 | 1737 | 1737 | 1737 | 1737 |
| 2.5° | 1733 | 1736 | 1738 | 1737 | 1740 |
| 5° | 1724 | 1727 | 1732 | 1732 | 1737 |
| 7.5° | 1709 | 1713 | 1720 | 1724 | 1730 |
| 10° | 1686 | 1692 | 1703 | 1711 | 1717 |
| 12.5° | 1658 | 1666 | 1682 | 1694 | 1702 |
| 15° | 1625 | 1635 | 1658 | 1675 | 1684 |
| 17.5° | 1587 | 1600 | 1630 | 1651 | 1662 |
| 20° | 1546 | 1562 | 1599 | 1625 | 1636 |
| 22.5° | 1501 | 1521 | 1564 | 1596 | 1607 |
| 25° | 1454 | 1478 | 1528 | 1564 | 1576 |
| 27.5° | 1403 | 1430 | 1488 | 1529 | 1541 |
| 30° | 1351 | 1380 | 1445 | 1490 | 1503 |
| 32.5° | 1296 | 1327 | 1399 | 1449 | 1462 |
| 35° | 1239 | 1273 | 1350 | 1403 | 1417 |
| 37.5° | 1181 | 1217 | 1299 | 1355 | 1369 |
| 40° | 1122 | 1160 | 1245 | 1303 | 1318 |
| 42.5° | 1062 | 1102 | 1190 | 1250 | 1265 |
| 45° | 1003 | 1044 | 1134 | 1196 | 1211 |
| 47.5° | 942 | 986 | 1077 | 1140 | 1154 |
| 50° | 882 | 927 | 1019 | 1082 | 1094 |
| 52.5° | 822 | 868 | 960 | 1022 | 1032 |
| 55° | 761 | 808 | 898 | 960 | 968 |
| 57.5° | 699 | 746 | 834 | 893 | 899 |
| 60° | 637 | 683 | 768 | 823 | 827 |
| 62.5° | 575 | 618 | 698 | 750 | 752 |
| 65° | 511 | 552 | 626 | 675 | 676 |
| 67.5° | 447 | 486 | 552 | 597 | 599 |
| 70° | 384 | 418 | 478 | 518 | 520 |
| 72.5° | 322 | 351 | 402 | 439 | 442 |
| 75° | 261 | 286 | 329 | 362 | 364 |
| 77.5° | 201 | 222 | 257 | 285 | 289 |
| 80° | 146 | 163 | 190 | 214 | 218 |
| 82.5° | 97 | 110 | 130 | 149 | 155 |
| 85° | 55 | 64 | 78 | 93 | 98 |
| 87.5° | 22 | 28 | 37 | 47 | 52 |
| 90° | 3 | 6 | 9 | 15 | 18 |
| 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 |



TEST NUMBER: P30104

CATALOG NUMBER: CRF-24-232-UNV-IK12

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)