

Scaled data based on original data using
LM-31-95 IESNA Approved Method for Photometric Testing of Roadway Luminaires
Using Incandescent Filament and High Intensity Discharge Lamps

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: FAIL-SAFE

Report Number: P309813

Luminaire Tested: **24FCZ2-75HE-UNV-L82765-S-CP250-W2A-U-5700K**

Issue Date: 3/3/2020

This test was performed under the Supervised Manufacturer's Testing Program. The results of this test have not been influenced by sources from within Cooper Lighting Solutions or from external interests.

Test Information

Test Method: LM-31-95
Report Number: P309813
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-1808-918-20)
Test Lab: INNOVATION CENTER(G3)
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: FAIL-SAFE
Catalog Number: 24FCZ2-75HE-UNV-L82765-S-CP250-W2A-U-5700K
Description: 2'X4' TROFFER LED MODULE, HIGH EFFICIENCY RND PERF. LENS, 0.250"
POLYCARB SHEET
Light Source: (336) 5700K TUNABLE CCT, 80 CRI LEDS
Ballast/Driver: ELECTRONIC DRIVER
Luminaire Equipment:

| <u>Sample No.</u> | <u>Condition</u> | <u>Description</u> |
|-------------------|------------------|---------------------------|
| AS-5443-1 | Good | WHITE TWIN R-EVOLVE FLOOD |
| AS-5443-2 | Good | REFLECTOR |
| AS-5443-3 | Good | DRIVER |
| AS-5443-4 | Good | UPPER MODULE |
| AS-5443-5 | Good | LENS |
| AS-5443-6 | Good | DRIVER 2 |
| AS-5443-7 | Good | TRIM RING |

Summary

Lumens per Lamp: N/A
Luminaire Lumens: 5059.0 lumens
Efficiency: N/A
Efficacy: 78.3 lumens/watt
Spacing Criteria (0/90/45): 1.24 / 1.3 / 1.4
Luminous Opening: Rectangular (W 2' x L: 4' x H: 0')
CIE Type: Direct

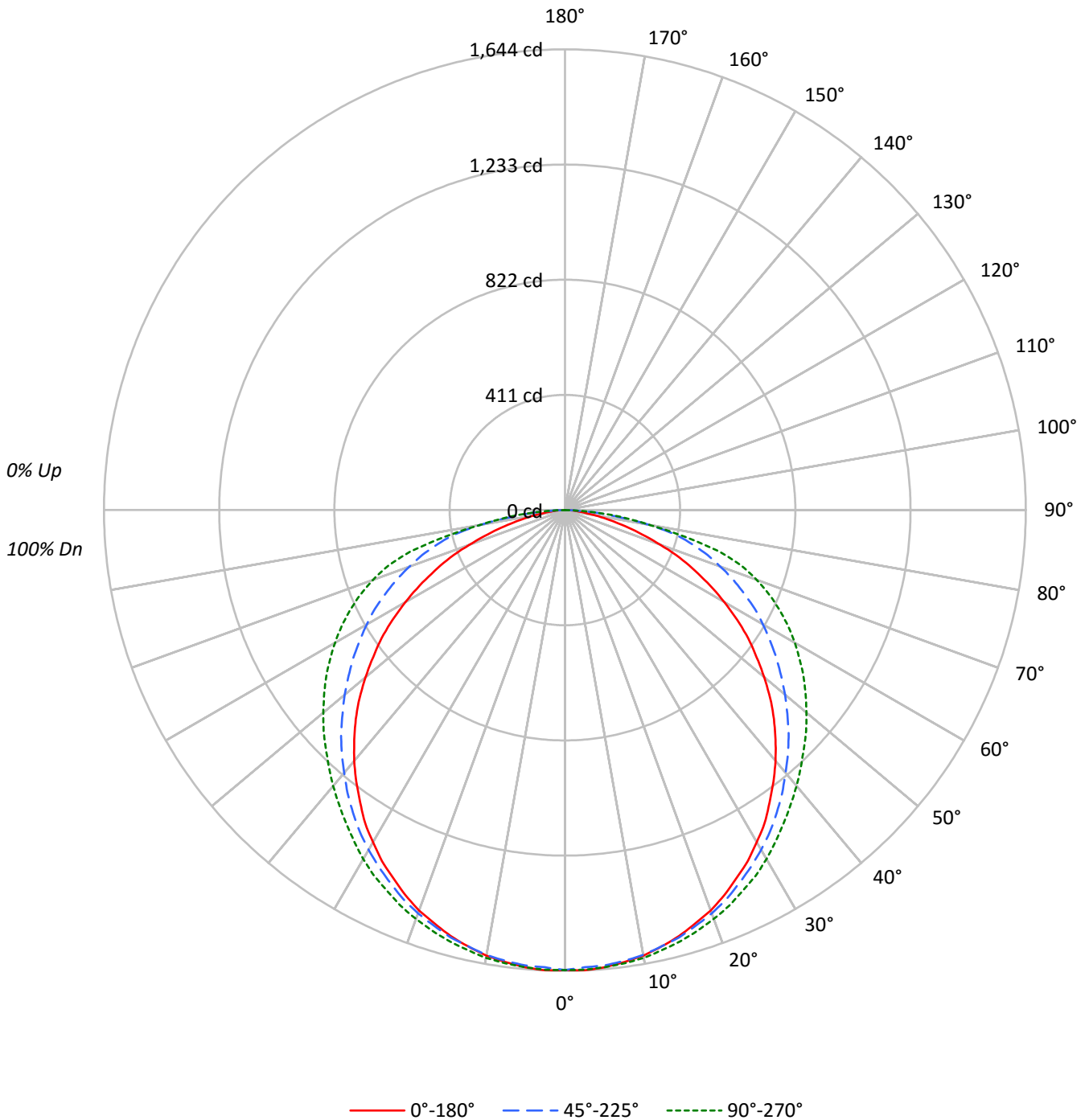
Input Watts (W): 64.6
Input Voltage (V): NR
Input Current (A_{in}): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT



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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 | 0 |
| RCR | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1 | 108 | 103 | 98 | 94 | 105 | 101 | 96 | 93 | 96 | 93 | 90 | 92 | 90 | 87 | 89 | 86 | 84 | 82 |
| 2 | 98 | 89 | 82 | 76 | 95 | 87 | 80 | 75 | 83 | 78 | 73 | 80 | 75 | 71 | 77 | 73 | 70 | 67 |
| 3 | 89 | 78 | 69 | 62 | 86 | 76 | 68 | 62 | 73 | 66 | 61 | 70 | 64 | 59 | 68 | 63 | 58 | 56 |
| 4 | 81 | 68 | 59 | 52 | 79 | 67 | 59 | 52 | 65 | 57 | 51 | 62 | 56 | 50 | 60 | 54 | 50 | 48 |
| 5 | 74 | 61 | 52 | 45 | 72 | 60 | 51 | 45 | 58 | 50 | 44 | 56 | 49 | 44 | 54 | 48 | 43 | 41 |
| 6 | 69 | 55 | 46 | 39 | 67 | 54 | 45 | 39 | 52 | 44 | 38 | 50 | 43 | 38 | 49 | 42 | 38 | 36 |
| 7 | 63 | 50 | 41 | 34 | 62 | 49 | 40 | 34 | 47 | 39 | 34 | 46 | 39 | 34 | 44 | 38 | 33 | 31 |
| 8 | 59 | 45 | 36 | 30 | 57 | 44 | 36 | 30 | 43 | 36 | 30 | 42 | 35 | 30 | 41 | 34 | 30 | 28 |
| 9 | 55 | 41 | 33 | 27 | 54 | 41 | 33 | 27 | 40 | 32 | 27 | 39 | 32 | 27 | 38 | 31 | 27 | 25 |
| 10 | 52 | 38 | 30 | 25 | 50 | 38 | 30 | 25 | 37 | 30 | 25 | 36 | 29 | 24 | 35 | 29 | 24 | 23 |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° |
|-----|------|------|------|
| 0° | 2208 | 2208 | 2208 |
| 5° | 2211 | 2203 | 2211 |
| 10° | 2205 | 2202 | 2216 |
| 15° | 2192 | 2198 | 2219 |
| 20° | 2177 | 2193 | 2223 |
| 25° | 2151 | 2182 | 2226 |
| 30° | 2126 | 2175 | 2234 |
| 35° | 2091 | 2164 | 2237 |
| 40° | 2053 | 2150 | 2258 |
| 45° | 2007 | 2148 | 2293 |
| 50° | 1942 | 2146 | 2354 |
| 55° | 1873 | 2161 | 2439 |
| 60° | 1767 | 2194 | 2548 |
| 65° | 1632 | 2245 | 2691 |
| 70° | 1425 | 2325 | 2866 |
| 75° | 1156 | 2444 | 2962 |
| 80° | 853 | 2396 | 2396 |
| 85° | 655 | 1766 | 1995 |



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 155.5 | 3.1 |
| 10°-20° | 446.5 | 8.8 |
| 20°-30° | 679.8 | 13.4 |
| 30°-40° | 825.4 | 16.3 |
| 40°-50° | 872.0 | 17.2 |
| 50°-60° | 822.8 | 16.3 |
| 60°-70° | 684.2 | 13.5 |
| 70°-80° | 450.1 | 8.9 |
| 80°-90° | 122.7 | 2.4 |
| 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° | 1281.8 | 25.3 |
| 0°-40° | 2107.2 | 41.7 |
| 0°-60° | 3802.0 | 75.2 |
| 0°-90° | 5059.0 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 5059.0 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|------|-------|------|-------|------|------|
| 0° | 1641 | 1641 | 1641 | 1641 | 1641 | |
| 5° | 1637 | 1637 | 1631 | 1637 | 1637 | 156 |
| 15° | 1574 | 1576 | 1578 | 1593 | 1593 | 444 |
| 25° | 1449 | 1457 | 1470 | 1495 | 1500 | 668 |
| 35° | 1273 | 1288 | 1317 | 1351 | 1362 | 797 |
| 45° | 1055 | 1076 | 1129 | 1184 | 1205 | 812 |
| 55° | 798 | 832 | 921 | 1008 | 1040 | 711 |
| 65° | 512 | 572 | 705 | 809 | 845 | 507 |
| 75° | 222 | 324 | 470 | 557 | 570 | 240 |
| 85° | 42 | 93 | 114 | 127 | 129 | 52 |
| 90° | 0 | 0 | 0 | 0 | 0 | |



TEST NUMBER: P309813

CATALOG NUMBER: 24FC22-75HE-UNV-L82765-S-CP250-W2A-U-5700K

CANDELA DISTRIBUTION (FULL):

| | 0° | 22.5° | 45° | 67.5° | 90° |
|-------|--------|--------|--------|--------|--------|
| 0° | 1641.4 | 1641.4 | 1641.4 | 1641.4 | 1641.4 |
| 2.5° | 1643.5 | 1641.4 | 1632.9 | 1641.4 | 1641.4 |
| 5° | 1637.2 | 1637.2 | 1630.8 | 1637.2 | 1637.2 |
| 7.5° | 1626.6 | 1626.6 | 1622.3 | 1630.8 | 1630.8 |
| 10° | 1613.9 | 1613.9 | 1611.7 | 1622.3 | 1622.3 |
| 12.5° | 1594.8 | 1596.9 | 1594.8 | 1607.5 | 1607.5 |
| 15° | 1573.6 | 1575.7 | 1577.9 | 1592.7 | 1592.7 |
| 17.5° | 1546.1 | 1550.3 | 1554.6 | 1571.5 | 1573.6 |
| 20° | 1520.7 | 1522.8 | 1531.3 | 1550.3 | 1552.4 |
| 22.5° | 1486.8 | 1493.1 | 1503.7 | 1522.8 | 1529.1 |
| 25° | 1448.7 | 1457.1 | 1469.8 | 1495.3 | 1499.5 |
| 27.5° | 1412.7 | 1419.0 | 1436.0 | 1463.5 | 1472.0 |
| 30° | 1368.2 | 1378.8 | 1400.0 | 1427.5 | 1438.1 |
| 32.5° | 1325.8 | 1336.4 | 1361.8 | 1391.5 | 1400.0 |
| 35° | 1272.9 | 1287.7 | 1317.4 | 1351.2 | 1361.8 |
| 37.5° | 1222.0 | 1236.9 | 1272.9 | 1311.0 | 1323.7 |
| 40° | 1169.1 | 1186.0 | 1224.2 | 1268.6 | 1285.6 |
| 42.5° | 1111.9 | 1135.2 | 1177.6 | 1226.3 | 1245.3 |
| 45° | 1054.7 | 1075.9 | 1128.9 | 1183.9 | 1205.1 |
| 47.5° | 993.3 | 1018.7 | 1075.9 | 1141.6 | 1167.0 |
| 50° | 927.7 | 959.4 | 1025.1 | 1097.1 | 1124.6 |
| 52.5° | 862.0 | 898.0 | 972.1 | 1052.6 | 1082.3 |
| 55° | 798.5 | 832.3 | 921.3 | 1008.1 | 1039.9 |
| 57.5° | 728.6 | 770.9 | 868.4 | 961.5 | 993.3 |
| 60° | 656.6 | 703.2 | 815.4 | 912.8 | 946.7 |
| 62.5° | 584.5 | 637.5 | 764.6 | 862.0 | 898.0 |
| 65° | 512.5 | 571.8 | 705.3 | 809.0 | 845.1 |
| 67.5° | 442.6 | 508.3 | 650.2 | 754.0 | 790.0 |
| 70° | 362.2 | 444.8 | 590.9 | 692.6 | 728.6 |
| 72.5° | 288.0 | 383.3 | 533.7 | 629.0 | 660.8 |
| 75° | 222.4 | 324.0 | 470.2 | 557.0 | 569.7 |
| 77.5° | 163.1 | 264.7 | 404.5 | 434.2 | 436.3 |
| 80° | 110.1 | 211.8 | 309.2 | 305.0 | 309.2 |
| 82.5° | 72.0 | 158.8 | 194.8 | 218.1 | 220.3 |
| 85° | 42.4 | 93.2 | 114.4 | 127.1 | 129.2 |
| 87.5° | 21.2 | 31.8 | 40.2 | 42.4 | 46.6 |
| 90° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

(END OF REPORT)