

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: 766700

Luminaire Tested: **MHHW-175xxxx**

Issue Date: 3/3/2020



**Test Information**

Test Method: LM-79-08  
Report Number: 766700  
Test Lab:  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: FAIL-SAFE  
Catalog Number: MHHW-175xxxx  
Description: FAIL-SAFE WHITE 12 x 12  
Light Source: #021 - 175W MH CL HOR MED 14000 LUMENS  
Ballast/Driver: -

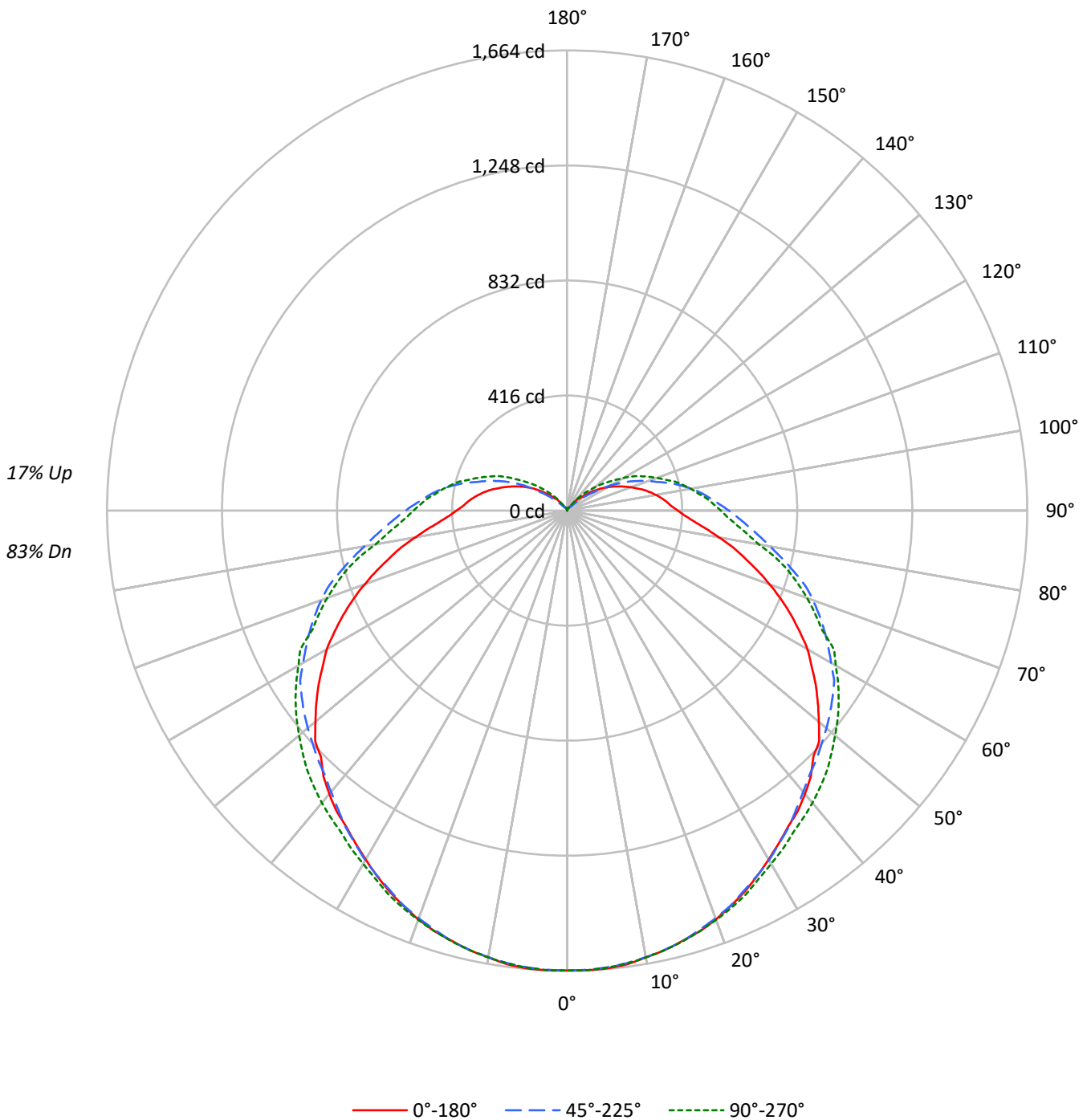
**Summary**

Lumens per Lamp: 14000 (1 lamp)  
Luminaire Lumens: 8053.2 lumens  
Efficiency: 57.5%  
Efficacy: 46.0 lumens/watt  
Spacing Criteria (0/90/45): 1.31 / 1.33 / 1.48  
Luminous Opening: Point Source (0' x 0' x 0')  
CIE Type: Semi-Direct

Input Watts (W): 175  
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 |    |    |    |
| RW  | 70 | 50 | 30 | 10 | 70 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 0   | 66 | 66 | 66 | 66 | 64 | 64 | 64 | 64 | 59 | 59 | 59 | 54 | 54 | 54 | 50 | 50 | 50 | 48 |    |    |
| 1   | 58 | 55 | 52 | 49 | 56 | 52 | 50 | 47 | 48 | 46 | 44 | 44 | 42 | 41 | 41 | 39 | 38 | 36 |    |    |
| 2   | 52 | 47 | 42 | 38 | 50 | 45 | 40 | 37 | 41 | 37 | 34 | 38 | 35 | 32 | 34 | 32 | 30 | 28 |    |    |
| 3   | 47 | 40 | 35 | 31 | 45 | 39 | 34 | 30 | 35 | 31 | 28 | 33 | 29 | 26 | 30 | 27 | 25 | 23 |    |    |
| 4   | 43 | 35 | 30 | 25 | 41 | 34 | 29 | 25 | 31 | 27 | 23 | 29 | 25 | 22 | 26 | 23 | 21 | 19 |    |    |
| 5   | 39 | 31 | 26 | 21 | 37 | 30 | 25 | 21 | 28 | 23 | 20 | 25 | 22 | 19 | 23 | 20 | 18 | 16 |    |    |
| 6   | 36 | 28 | 22 | 18 | 34 | 27 | 22 | 18 | 25 | 20 | 17 | 23 | 19 | 16 | 21 | 18 | 15 | 14 |    |    |
| 7   | 33 | 25 | 20 | 16 | 32 | 24 | 19 | 16 | 22 | 18 | 15 | 21 | 17 | 14 | 19 | 16 | 13 | 12 |    |    |
| 8   | 31 | 23 | 18 | 14 | 29 | 22 | 17 | 14 | 20 | 16 | 13 | 19 | 15 | 13 | 18 | 14 | 12 | 11 |    |    |
| 9   | 29 | 21 | 16 | 13 | 28 | 20 | 16 | 12 | 19 | 15 | 12 | 17 | 14 | 11 | 16 | 13 | 11 | 10 |    |    |
| 10  | 27 | 19 | 14 | 11 | 26 | 19 | 14 | 11 | 17 | 13 | 11 | 16 | 13 | 10 | 15 | 12 | 10 | 9  |    |    |

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

|     | 0°   | 45° | 90° |
|-----|--|-----|-----|
| 0°  | Luminaire represents a point source (luminous area is zero). |     |     |
| 5°  | No luminance values can be calculated.                       |     |     |
| 10° |  |     |     |
| 15° |  |     |     |
| 20° |  |     |     |
| 25° |  |     |     |
| 30° |  |     |     |
| 35° |  |     |     |
| 40° |  |     |     |
| 45° |  |     |     |
| 50° |  |     |     |
| 55° |  |     |     |
| 60° |  |     |     |
| 65° |  |     |     |
| 70° |  |     |     |
| 75° |  |     |     |
| 80° |  |     |     |
| 85° |  |     |     |



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**ZONAL LUMENS:**

**CANDELA DISTRIBUTION:**

| Zone      | Lumens | % Fixture | % Lamp |      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|-----------|--------|-----------|--------|------|------|-------|------|-------|------|------|
| 0°-10°    | 157.8  | 2.0       | 1.1    | 0°   | 1663 | 1663  | 1663 | 1663  | 1663 |      |
| 10°-20°   | 455.2  | 5.7       | 3.3    | 5°   | 1662 | 1658  | 1658 | 1659  | 1659 | 158  |
| 20°-30°   | 701.5  | 8.7       | 5.0    | 15°  | 1611 | 1613  | 1612 | 1612  | 1613 | 455  |
| 30°-40°   | 879.5  | 10.9      | 6.3    | 25°  | 1520 | 1516  | 1515 | 1523  | 1531 | 701  |
| 40°-50°   | 993.1  | 12.3      | 7.1    | 35°  | 1394 | 1392  | 1397 | 1411  | 1423 | 876  |
| 50°-60°   | 1034.1 | 12.8      | 7.4    | 45°  | 1259 | 1261  | 1274 | 1308  | 1329 | 979  |
| 60°-70°   | 984.8  | 12.2      | 7.0    | 55°  | 1097 | 1118  | 1172 | 1191  | 1199 | 982  |
| 70°-80°   | 848.5  | 10.5      | 6.1    | 65°  | 893  | 954   | 1026 | 1041  | 1015 | 884  |
| 80°-90°   | 668.1  | 8.3       | 4.8    | 75°  | 665  | 761   | 848  | 863   | 825  | 705  |
| 90°-100°  | 523.2  | 6.5       | 3.7    | 85°  | 462  | 572   | 658  | 665   | 617  | 398  |
| 100°-110° | 381.0  | 4.7       | 2.7    | 90°  | 400  | 495   | 585  | 593   | 556  | 220  |
| 110°-120° | 239.6  | 3.0       | 1.7    | 95°  | 361  | 439   | 518  | 530   | 506  | 288  |
| 120°-130° | 124.1  | 1.5       | 0.9    | 105° | 288  | 316   | 384  | 396   | 404  | 303  |
| 130°-140° | 44.8   | 0.6       | 0.3    | 115° | 207  | 196   | 248  | 264   | 294  | 206  |
| 140°-150° | 11.4   | 0.1       | 0.1    | 125° | 131  | 117   | 114  | 159   | 180  | 118  |
| 150°-160° | 5.0    | 0.1       | 0.0    | 135° | 61   | 47    | 32   | 65    | 88   | 51   |
| 160°-170° | 1.6    | 0.0       | 0.0    | 145° | 16   | 14    | 14   | 16    | 21   | 12   |
| 170°-180° | 0.0    | 0.0       | 0.0    | 155° | 10   | 10    | 11   | 11    | 11   | 5    |
| 0°-30°    | 1314.5 | 16.3      | 9.4    | 165° | 8    | 7     | 7    | 7     | 8    | 2    |
| 0°-40°    | 2194.0 | 27.2      | 15.7   | 175° | 0    | 0     | 0    | 0     | 0    | 0    |
| 0°-60°    | 4221.2 | 52.4      | 30.2   | 180° | 0    | 0     | 0    | 0     | 0    |      |
| 0°-90°    | 6722.6 | 83.5      | 48.0   |      |      |       |      |       |      |      |
| 90°-120°  | 1143.7 | 14.2      | 8.2    |      |      |       |      |       |      |      |
| 90°-150°  | 1324.0 | 16.4      | 9.5    |      |      |       |      |       |      |      |
| 90°-180°  | 1331.0 | 16.5      | 9.5    |      |      |       |      |       |      |      |
| 0°-180°   | 8053.2 | 100.0     | 57.5   |      |      |       |      |       |      |      |



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**CANDELA DISTRIBUTION (FULL):**

|        | 0°   | 22.5° | 45°  | 67.5° | 90°  |
|--------|------|-------|------|-------|------|
| 0°     | 1663 | 1663  | 1663 | 1663  | 1663 |
| 2.5°   | 1664 | 1661  | 1662 | 1662  | 1664 |
| 5°     | 1662 | 1658  | 1658 | 1659  | 1659 |
| 7.5°   | 1655 | 1651  | 1651 | 1651  | 1652 |
| 10°    | 1641 | 1641  | 1640 | 1642  | 1641 |
| 12.5°  | 1628 | 1628  | 1627 | 1627  | 1628 |
| 15°    | 1611 | 1613  | 1612 | 1612  | 1613 |
| 17.5°  | 1595 | 1591  | 1590 | 1593  | 1595 |
| 20°    | 1573 | 1569  | 1569 | 1574  | 1575 |
| 22.5°  | 1547 | 1542  | 1546 | 1549  | 1554 |
| 25°    | 1520 | 1516  | 1515 | 1523  | 1531 |
| 27.5°  | 1489 | 1485  | 1488 | 1497  | 1501 |
| 30°    | 1457 | 1456  | 1460 | 1468  | 1475 |
| 32.5°  | 1425 | 1424  | 1427 | 1440  | 1451 |
| 35°    | 1394 | 1392  | 1397 | 1411  | 1423 |
| 37.5°  | 1370 | 1354  | 1361 | 1388  | 1402 |
| 40°    | 1338 | 1324  | 1328 | 1362  | 1380 |
| 42.5°  | 1304 | 1294  | 1297 | 1334  | 1355 |
| 45°    | 1259 | 1261  | 1274 | 1308  | 1329 |
| 47.5°  | 1236 | 1224  | 1248 | 1281  | 1297 |
| 50°    | 1188 | 1189  | 1224 | 1251  | 1265 |
| 52.5°  | 1143 | 1157  | 1199 | 1221  | 1234 |
| 55°    | 1097 | 1118  | 1172 | 1191  | 1199 |
| 57.5°  | 1048 | 1070  | 1145 | 1149  | 1162 |
| 60°    | 1004 | 1032  | 1102 | 1115  | 1122 |
| 62.5°  | 948  | 994   | 1064 | 1079  | 1088 |
| 65°    | 893  | 954   | 1026 | 1041  | 1015 |
| 67.5°  | 837  | 911   | 987  | 1001  | 970  |
| 70°    | 779  | 863   | 946  | 948   | 923  |
| 72.5°  | 722  | 819   | 903  | 905   | 874  |
| 75°    | 665  | 761   | 848  | 863   | 825  |
| 77.5°  | 614  | 713   | 795  | 802   | 768  |
| 80°    | 557  | 666   | 744  | 757   | 703  |
| 82.5°  | 507  | 620   | 700  | 712   | 658  |
| 85°    | 462  | 572   | 658  | 665   | 617  |
| 87.5°  | 426  | 529   | 620  | 624   | 582  |
| 90°    | 400  | 495   | 585  | 593   | 556  |
| 92.5°  | 377  | 467   | 549  | 563   | 530  |
| 95°    | 361  | 439   | 518  | 530   | 506  |
| 97.5°  | 344  | 407   | 489  | 493   | 477  |
| 100°   | 326  | 375   | 457  | 462   | 454  |
| 102.5° | 307  | 345   | 421  | 431   | 429  |
| 105°   | 288  | 316   | 384  | 396   | 404  |
| 107.5° | 265  | 284   | 344  | 365   | 371  |
| 110°   | 246  | 256   | 312  | 326   | 345  |



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**CANDELA DISTRIBUTION (continued):**

|        | 0°  | 22.5° | 45° | 67.5° | 90° |
|--------|-----|-------|-----|-------|-----|
| 112.5° | 226 | 225   | 280 | 292   | 319 |
| 115°   | 207 | 196   | 248 | 264   | 294 |
| 117.5° | 188 | 173   | 214 | 237   | 268 |
| 120°   | 169 | 155   | 183 | 211   | 236 |
| 122.5° | 150 | 136   | 145 | 183   | 205 |
| 125°   | 131 | 117   | 114 | 159   | 180 |
| 127.5° | 110 | 98    | 89  | 133   | 155 |
| 130°   | 92  | 78    | 66  | 111   | 132 |
| 132.5° | 76  | 62    | 47  | 84    | 109 |
| 135°   | 61  | 47    | 32  | 65    | 88  |
| 137.5° | 60  | 35    | 20  | 48    | 68  |
| 140°   | 32  | 25    | 17  | 34    | 50  |
| 142.5° | 23  | 18    | 15  | 23    | 32  |
| 145°   | 16  | 14    | 14  | 16    | 21  |
| 147.5° | 12  | 13    | 14  | 14    | 15  |
| 150°   | 12  | 12    | 13  | 13    | 13  |
| 152.5° | 11  | 11    | 12  | 12    | 12  |
| 155°   | 10  | 10    | 11  | 11    | 11  |
| 157.5° | 9   | 9     | 10  | 10    | 10  |
| 160°   | 9   | 8     | 9   | 9     | 9   |
| 162.5° | 8   | 8     | 8   | 8     | 8   |
| 165°   | 8   | 7     | 7   | 7     | 8   |
| 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)