

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: HALO

Report Number: P300518

Luminaire Tested: **ML4D09\_27D2WE - TIR45FL40 - TL41RBCU - TL42SBCU**

Issue Date: 3/3/2020

**Test Information**

Test Method: LM-41-14  
Report Number: P300518  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G1-1902-156-30)  
Test Lab: INNOVATION CENTER(G1)  
Issue Date: 3/3/2020  
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
Product Line: HALO  
Catalog Number: ML4D09\_27D2WE - TIR45FL40 - TL41RBCU - TL42SBCU  
Description: ML4 2700K, 900LM DIM-TO-WARM, 40 DEG FL OPTIC, WITH ROUND/SQUARE PINHOLE BRUSHED COPPER FLANGE  
Light Source: (1) HIGH LUMEN LED 90CRI / 2700K CCT  
Ballast/Driver: ELECTRONIC DRIVER

**Summary**

Lumens per Lamp: N/A  
Luminaire Lumens: 540.0 lumens  
Efficiency: N/A  
Efficacy: 48.2 lumens/watt  
Spacing Criteria (0/90/45): 0.58 / 0.58 / 0.56  
Luminous Opening: Circular (Dia: 0.19' x H: 0')  
CIE Type: Direct

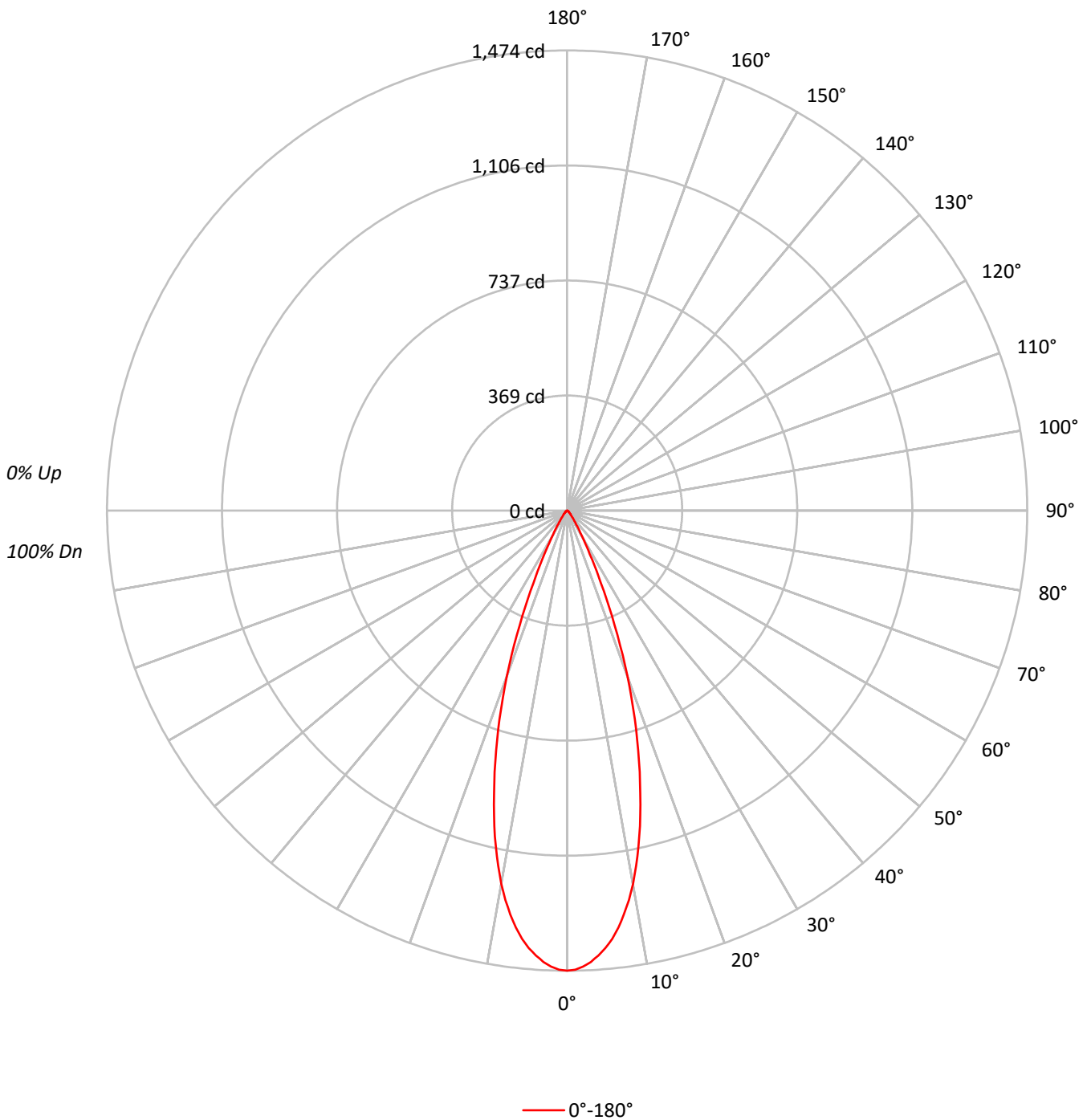
Input Watts (W): 11.2  
Input Voltage (V): NR  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: NR  
Total Harmonic Distortion (THDi): NR  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 25 FT



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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  | 0   |
| RCR |     |     |     |     |     |     |     |     |     |     |     |  |     |     |     |  |     |     |     |     |
| 0   | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 |  | 106 | 106 | 106 |  | 102 | 102 | 102 | 100 |
| 1   | 115 | 112 | 110 | 108 | 112 | 110 | 108 | 107 | 106 | 105 | 103 |  | 102 | 101 | 100 |  | 99  | 98  | 97  | 96  |
| 2   | 110 | 106 | 103 | 100 | 108 | 105 | 102 | 99  | 102 | 99  | 97  |  | 99  | 97  | 95  |  | 96  | 94  | 93  | 92  |
| 3   | 106 | 101 | 97  | 94  | 104 | 100 | 96  | 93  | 97  | 94  | 92  |  | 95  | 92  | 90  |  | 93  | 91  | 89  | 88  |
| 4   | 102 | 96  | 92  | 89  | 101 | 95  | 91  | 88  | 93  | 90  | 87  |  | 91  | 89  | 86  |  | 90  | 87  | 85  | 84  |
| 5   | 99  | 92  | 88  | 84  | 97  | 91  | 87  | 84  | 90  | 86  | 83  |  | 88  | 85  | 82  |  | 87  | 84  | 82  | 80  |
| 6   | 95  | 88  | 84  | 80  | 94  | 88  | 83  | 80  | 86  | 82  | 79  |  | 85  | 82  | 79  |  | 84  | 81  | 78  | 77  |
| 7   | 92  | 85  | 80  | 77  | 91  | 84  | 80  | 77  | 83  | 79  | 76  |  | 82  | 78  | 76  |  | 81  | 78  | 75  | 74  |
| 8   | 89  | 82  | 77  | 74  | 88  | 81  | 77  | 74  | 80  | 76  | 73  |  | 79  | 76  | 73  |  | 78  | 75  | 73  | 72  |
| 9   | 86  | 79  | 74  | 71  | 85  | 78  | 74  | 71  | 77  | 73  | 70  |  | 76  | 73  | 70  |  | 76  | 72  | 70  | 69  |
| 10  | 83  | 76  | 71  | 68  | 82  | 75  | 71  | 68  | 75  | 71  | 68  |  | 74  | 70  | 68  |  | 73  | 70  | 68  | 67  |

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

|     |        |
|-----|--------|
|     | 0°     |
| 0°  | 574496 |
| 5°  | 550511 |
| 10° | 480518 |
| 15° | 364114 |
| 20° | 233768 |
| 25° | 110458 |
| 30° | 43168  |
| 35° | 19036  |
| 40° | 10178  |
| 45° | 6064   |
| 50° | 4245   |
| 55° | 2719   |
| 60° | 1559   |
| 65° | 922    |
| 70° | 0      |
| 75° | 0      |
| 80° | 0      |
| 85° | 0      |



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 128.2  | 23.7      |
| 10°-20°   | 244.9  | 45.3      |
| 20°-30°   | 125.0  | 23.1      |
| 30°-40°   | 28.3   | 5.2       |
| 40°-50°   | 9.3    | 1.7       |
| 50°-60°   | 3.4    | 0.6       |
| 60°-70°   | 1.0    | 0.2       |
| 70°-80°   | 0.0    | 0.0       |
| 80°-90°   | 0.0    | 0.0       |
| 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°    | 498.0  | 92.2      |
| 0°-40°    | 526.3  | 97.5      |
| 0°-60°    | 539.0  | 99.8      |
| 0°-90°    | 540.0  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 540.0  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | Flux |
|-----|------|------|
| 0°  | 1474 |      |
| 5°  | 1407 | 128  |
| 15° | 902  | 245  |
| 25° | 257  | 125  |
| 35° | 40   | 28   |
| 45° | 11   | 9    |
| 55° | 4    | 3    |
| 65° | 1    | 1    |
| 75° | 0    | 0    |
| 85° | 0    | 0    |
| 90° | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

| 0°    |        |
|-------|--------|
| 0°    | 1473.7 |
| 1°    | 1470.7 |
| 2°    | 1461.7 |
| 3°    | 1447.7 |
| 4°    | 1428.7 |
| 5°    | 1406.8 |
| 6°    | 1379.8 |
| 7°    | 1345.8 |
| 8°    | 1306.8 |
| 9°    | 1262.9 |
| 10°   | 1213.9 |
| 11°   | 1159.0 |
| 12°   | 1100.0 |
| 13°   | 1037.1 |
| 14°   | 970.1  |
| 15°   | 902.2  |
| 16°   | 835.3  |
| 17°   | 768.3  |
| 18°   | 702.4  |
| 19°   | 630.4  |
| 20°   | 563.5  |
| 21°   | 496.6  |
| 22°   | 428.6  |
| 23°   | 366.7  |
| 24°   | 307.7  |
| 25°   | 256.8  |
| 27.5° | 156.9  |
| 30°   | 95.9   |
| 32.5° | 59.9   |
| 35°   | 40.0   |
| 37.5° | 28.0   |
| 40°   | 20.0   |
| 42.5° | 15.0   |
| 45°   | 11.0   |
| 47.5° | 9.0    |
| 50°   | 7.0    |
| 52.5° | 5.0    |
| 55°   | 4.0    |
| 57.5° | 2.0    |
| 60°   | 2.0    |
| 62.5° | 1.0    |
| 65°   | 1.0    |
| 67.5° | 1.0    |
| 70°   | 0.0    |
| 72.5° | 0.0    |



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**CANDELA DISTRIBUTION (continued):**

|       | 0°  |
|-------|-----|
| 75°   | 0.0 |
| 77.5° | 0.0 |
| 80°   | 0.0 |
| 82.5° | 0.0 |
| 85°   | 0.0 |
| 87.5° | 0.0 |
| 90°   | 0.0 |

(END OF REPORT)