

LM-79-08 Approved Method: Electrical and Photometric Measurements of Solid-State  
Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions  
(formerly Eaton)

Brand: HALO

Report Number: P601289

Luminaire Tested: **ML410LSFL9FS1E - TIR4D40FL - TL41R\_ TL42S\_ 2700K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P601289  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML410LSFL9FS1E - TIR4D40FL - TL41R\_ TL42S\_ 2700K  
 Description: RETROFIT, 40D OPTIC, OPEN TRIM  
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 2700K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 1144.8 lumens  
 Efficiency: N/A  
 Efficacy: 95.4 lumens/watt  
 Spacing Criteria (0/90/45): 0.67 / 0.67 / 0.63  
 Luminous Opening: Circular (Dia: 0.21' x H: 0')  
 CIE Type: Direct

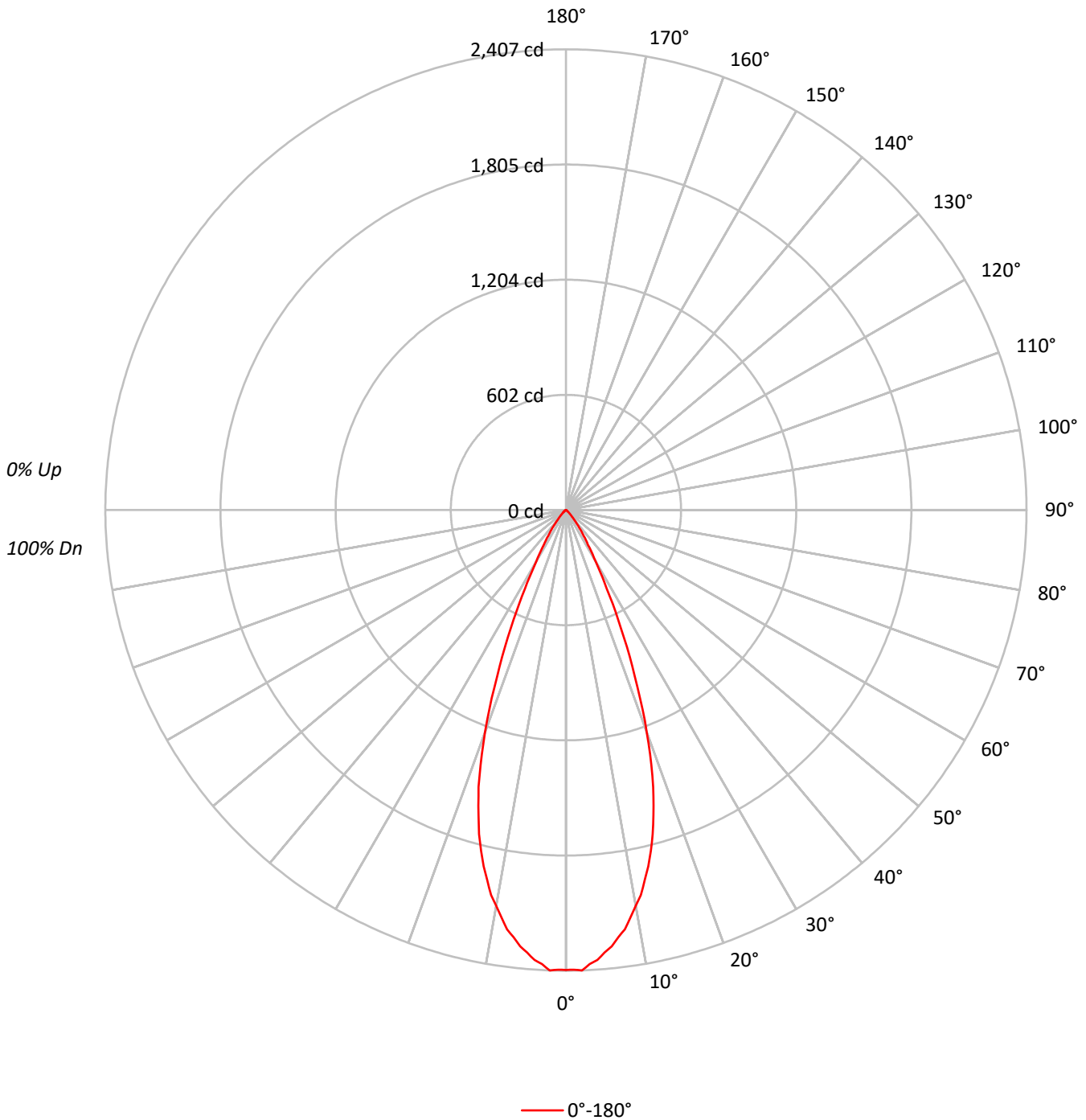
Input Watts (W): 12  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



| Meas             |                       | Calibration Due Date |            |
|------------------|-----------------------|----------------------|------------|
| Instrument       | Identificatio         |                      |            |
| Photometer       | GONIO 1 11111111      | 4/22/2021            | 10/22/2021 |
| Power Meter      | XITRON 2801 IN0197    | 12/1/2020            | 12/1/2021  |
| AC Power Source  | CHROMA 61505 IN0196   | 12/1/2020            | 12/1/2021  |
| DC Power Supply  | AGILENT E3634A IN0198 | 11/30/2020           | 11/30/2021 |
| Room Thermometer | ONSET IN0143          | 12/1/2020            | 12/1/2021  |

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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   | 114 | 112 | 110 | 108 | 112 | 110 | 108 | 106 | 106 | 104 | 103 | 102 | 101 | 100 | 99  | 98  | 97  | 95  |
| 2   | 110 | 106 | 102 | 99  | 108 | 104 | 101 | 98  | 101 | 98  | 96  | 98  | 96  | 94  | 95  | 93  | 92  | 90  |
| 3   | 105 | 100 | 96  | 92  | 103 | 98  | 95  | 91  | 96  | 93  | 90  | 94  | 91  | 89  | 91  | 89  | 87  | 86  |
| 4   | 101 | 95  | 90  | 86  | 99  | 94  | 89  | 86  | 92  | 88  | 85  | 90  | 87  | 84  | 88  | 85  | 83  | 82  |
| 5   | 97  | 90  | 85  | 81  | 96  | 89  | 85  | 81  | 87  | 83  | 80  | 86  | 82  | 80  | 84  | 81  | 79  | 78  |
| 6   | 93  | 86  | 81  | 77  | 92  | 85  | 80  | 77  | 84  | 79  | 76  | 82  | 79  | 76  | 81  | 78  | 75  | 74  |
| 7   | 90  | 82  | 77  | 73  | 89  | 81  | 77  | 73  | 80  | 76  | 73  | 79  | 75  | 72  | 78  | 75  | 72  | 71  |
| 8   | 86  | 78  | 73  | 70  | 85  | 78  | 73  | 70  | 77  | 73  | 69  | 76  | 72  | 69  | 75  | 72  | 69  | 68  |
| 9   | 83  | 75  | 70  | 67  | 82  | 75  | 70  | 67  | 74  | 69  | 66  | 73  | 69  | 66  | 72  | 69  | 66  | 65  |
| 10  | 80  | 72  | 67  | 64  | 79  | 72  | 67  | 64  | 71  | 67  | 64  | 70  | 66  | 63  | 70  | 66  | 63  | 62  |

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

|     |        |
|-----|--------|
|     | 0°     |
| 0°  | 758847 |
| 5°  | 735659 |
| 10° | 673304 |
| 15° | 572965 |
| 20° | 415535 |
| 25° | 236709 |
| 30° | 112593 |
| 35° | 58708  |
| 40° | 29431  |
| 45° | 14111  |
| 50° | 8106   |
| 55° | 3799   |
| 60° | 884    |
| 65° | 1046   |
| 70° | 0      |
| 75° | 0      |
| 80° | 0      |
| 85° | 0      |

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 214.9  | 18.8      |
| 10°-20°   | 475.7  | 41.6      |
| 20°-30°   | 317.3  | 27.7      |
| 30°-40°   | 101.6  | 8.9       |
| 40°-50°   | 27.6   | 2.4       |
| 50°-60°   | 6.8    | 0.6       |
| 60°-70°   | 0.9    | 0.1       |
| 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°    | 1007.8 | 88.0      |
| 0°-40°    | 1109.5 | 96.9      |
| 0°-60°    | 1143.9 | 99.9      |
| 0°-90°    | 1144.8 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 1144.8 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | Flux |
|-----|------|------|
| 0°  | 2403 |      |
| 5°  | 2321 | 215  |
| 15° | 1753 | 476  |
| 25° | 679  | 317  |
| 35° | 152  | 102  |
| 45° | 32   | 28   |
| 55° | 7    | 7    |
| 65° | 1    | 1    |
| 75° | 0    | 0    |
| 85° | 0    | 0    |
| 90° | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

| 0°    |        |
|-------|--------|
| 0°    | 2403.2 |
| 1°    | 2401.9 |
| 2°    | 2407.4 |
| 3°    | 2375.8 |
| 4°    | 2356.6 |
| 5°    | 2320.9 |
| 6°    | 2292.1 |
| 7°    | 2248.2 |
| 8°    | 2212.5 |
| 9°    | 2154.8 |
| 10°   | 2099.9 |
| 11°   | 2050.5 |
| 12°   | 1977.8 |
| 13°   | 1910.5 |
| 14°   | 1835.0 |
| 15°   | 1752.7 |
| 17.5° | 1518.0 |
| 20°   | 1236.6 |
| 22.5° | 938.8  |
| 25°   | 679.4  |
| 27.5° | 461.2  |
| 30°   | 308.8  |
| 32.5° | 214.1  |
| 35°   | 152.3  |
| 37.5° | 108.4  |
| 40°   | 71.4   |
| 42.5° | 46.7   |
| 45°   | 31.6   |
| 47.5° | 23.3   |
| 50°   | 16.5   |
| 52.5° | 11.0   |
| 55°   | 6.9    |
| 57.5° | 4.1    |
| 60°   | 1.4    |
| 62.5° | 1.4    |
| 65°   | 1.4    |
| 67.5° | 0.0    |
| 70°   | 0.0    |
| 72.5° | 0.0    |
| 75°   | 0.0    |
| 77.5° | 0.0    |
| 80°   | 0.0    |
| 82.5° | 0.0    |
| 85°   | 0.0    |
| 87.5° | 0.0    |

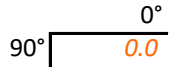
Signify Classified - Internal  
Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269

  
NVLAP Lab Code: 200050-0



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CANDELA DISTRIBUTION (continued):



(END OF REPORT)