

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: P601209

Luminaire Tested: **ML406NFL9FS1E - TIR4D25NFL - TL43R2G\_ TL44S2G\_ 4000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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**Test Information**

Test Method: LM-79-08  
 Report Number: P601209  
 Test Lab: COOPER LIGHTING SOLUTIONS  
 Issue Date: 7/29/2022  
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)  
 Product Line: HALO  
 Catalog Number: ML406NFL9FS1E - TIR4D25NFL - TL43R2G\_ TL44S2G\_ 4000K  
 Description: RETROFIT, 25D OPTIC, DIFFUSE CLEAR LENS TRIM  
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 4000K CCT  
 Ballast/Driver: -

**Summary**

Lumens per Lamp: N/A  
 Luminaire Lumens: 835.6 lumens  
 Efficiency: N/A  
 Efficacy: 100.7 lumens/watt  
 Spacing Criteria (0/90/45): 0.44 / 0.44 / 0.47  
 Luminous Opening: Circular (Dia: 0.21' x H: 0')  
 CIE Type: Direct

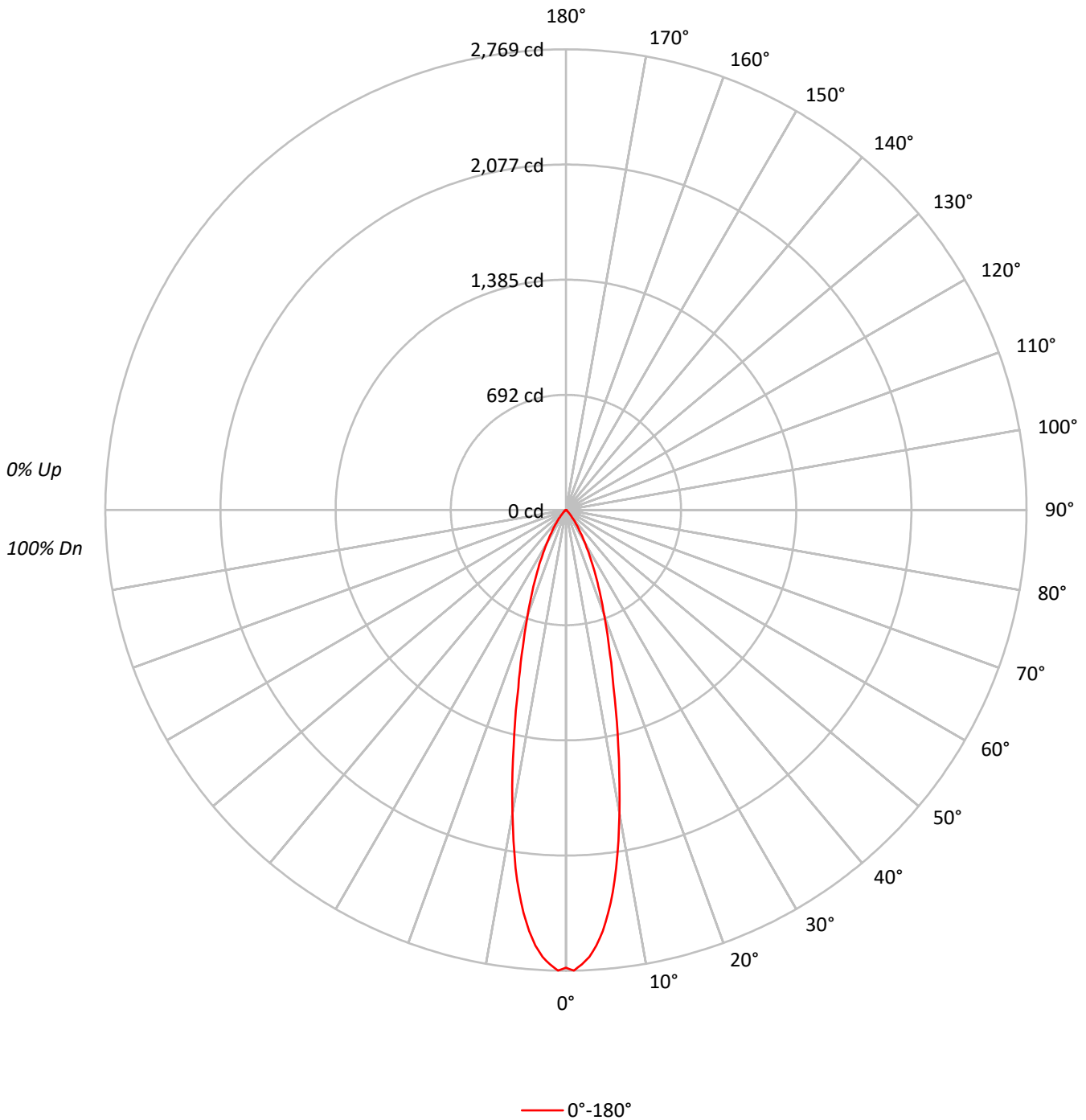
Input Watts (W): 8.3  
 Input Voltage (V): NR  
 Input Current (Ain): NR  
 Voltage Rise (V): NR  
 Power Factor: NR  
 Total Harmonic Distortion (THDi): NR  
 Frequency (hertz): 60  
 Stabilization Time: NR  
 Operation Time: NR  
 Ambient Temperature (°C): NR  
 Test Distance: 25 FT



| Meas             |                       |            |                      |
|------------------|-----------------------|------------|----------------------|
| Instrument       | Identificatio         |            | Calibration Due Date |
| 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 | 103 | 100 | 108 | 104 | 101 | 99  | 101 | 99  | 96  | 98  | 96  | 94  | 95  | 94  | 92  | 91  |
| 3   | 106 | 100 | 96  | 93  | 104 | 99  | 95  | 92  | 97  | 93  | 91  | 94  | 92  | 89  | 92  | 90  | 88  | 87  |
| 4   | 102 | 96  | 91  | 88  | 100 | 94  | 90  | 87  | 92  | 89  | 86  | 90  | 87  | 85  | 89  | 86  | 84  | 83  |
| 5   | 98  | 91  | 86  | 83  | 96  | 90  | 86  | 83  | 89  | 85  | 82  | 87  | 84  | 81  | 86  | 83  | 80  | 79  |
| 6   | 94  | 87  | 82  | 79  | 93  | 86  | 82  | 79  | 85  | 81  | 78  | 84  | 80  | 78  | 83  | 79  | 77  | 76  |
| 7   | 91  | 84  | 79  | 75  | 90  | 83  | 78  | 75  | 82  | 78  | 75  | 81  | 77  | 74  | 80  | 76  | 74  | 73  |
| 8   | 88  | 80  | 75  | 72  | 87  | 80  | 75  | 72  | 79  | 75  | 72  | 78  | 74  | 71  | 77  | 74  | 71  | 70  |
| 9   | 85  | 77  | 72  | 69  | 84  | 77  | 72  | 69  | 76  | 72  | 69  | 75  | 71  | 69  | 74  | 71  | 68  | 67  |
| 10  | 82  | 74  | 70  | 67  | 81  | 74  | 70  | 67  | 73  | 69  | 66  | 73  | 69  | 66  | 72  | 69  | 66  | 65  |

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

|     |        |
|-----|--------|
|     | 0°     |
| 0°  | 868607 |
| 5°  | 805583 |
| 10° | 593209 |
| 15° | 361491 |
| 20° | 225947 |
| 25° | 141071 |
| 30° | 82111  |
| 35° | 46450  |
| 40° | 24402  |
| 45° | 12727  |
| 50° | 7270   |
| 55° | 4074   |
| 60° | 2021   |
| 65° | 1569   |
| 70° | 1016   |
| 75° | 1342   |
| 80° | 0      |
| 85° | 0      |

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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 220.2  | 26.3      |
| 10°-20°   | 314.2  | 37.6      |
| 20°-30°   | 188.7  | 22.6      |
| 30°-40°   | 78.6   | 9.4       |
| 40°-50°   | 24.1   | 2.9       |
| 50°-60°   | 7.4    | 0.9       |
| 60°-70°   | 1.8    | 0.2       |
| 70°-80°   | 0.7    | 0.1       |
| 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°    | 723.0  | 86.5      |
| 0°-40°    | 801.6  | 95.9      |
| 0°-60°    | 833.1  | 99.7      |
| 0°-90°    | 835.6  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 835.6  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | Flux |
|-----|------|------|
| 0°  | 2751 |      |
| 5°  | 2542 | 220  |
| 15° | 1106 | 314  |
| 25° | 405  | 189  |
| 35° | 120  | 79   |
| 45° | 28   | 24   |
| 55° | 7    | 7    |
| 65° | 2    | 2    |
| 75° | 1    | 1    |
| 85° | 0    | 0    |
| 90° | 0    |      |

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**CANDELA DISTRIBUTION (FULL):**

| 0°    |        |
|-------|--------|
| 0°    | 2750.8 |
| 1°    | 2768.8 |
| 2°    | 2732.8 |
| 3°    | 2689.5 |
| 4°    | 2625.0 |
| 5°    | 2541.5 |
| 6°    | 2434.7 |
| 7°    | 2314.2 |
| 8°    | 2173.6 |
| 9°    | 2013.9 |
| 10°   | 1850.1 |
| 12.5° | 1449.4 |
| 15°   | 1105.8 |
| 17.5° | 857.4  |
| 20°   | 672.4  |
| 22.5° | 524.4  |
| 25°   | 404.9  |
| 27.5° | 304.5  |
| 30°   | 225.2  |
| 32.5° | 164.9  |
| 35°   | 120.5  |
| 37.5° | 85.6   |
| 40°   | 59.2   |
| 42.5° | 41.2   |
| 45°   | 28.5   |
| 47.5° | 20.1   |
| 50°   | 14.8   |
| 52.5° | 11.6   |
| 55°   | 7.4    |
| 57.5° | 5.3    |
| 60°   | 3.2    |
| 62.5° | 2.1    |
| 65°   | 2.1    |
| 67.5° | 1.1    |
| 70°   | 1.1    |
| 72.5° | 1.1    |
| 75°   | 1.1    |
| 77.5° | 0.0    |
| 80°   | 0.0    |
| 82.5° | 0.0    |
| 85°   | 0.0    |
| 87.5° | 0.0    |
| 90°   | 0.0    |

(END OF REPORT)