

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: P601291

Luminaire Tested: **ML410LSFL9FS1E - TIR4D40FL - TL41R_ TL42S_ 3500K**

Issue Date: 7/29/2022

Tested By:

Approved By:



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Test Information

Test Method: LM-79-08
 Report Number: P601291
 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_ 3500K
 Description: RETROFIT, 40D OPTIC, OPEN TRIM
 Light Source: (1) SELECTABLE LUMEN LED 90CRI / 3500K CCT
 Ballast/Driver: -

Summary

Lumens per Lamp: N/A
 Luminaire Lumens: 1215.1 lumens
 Efficiency: N/A
 Efficacy: 101.3 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

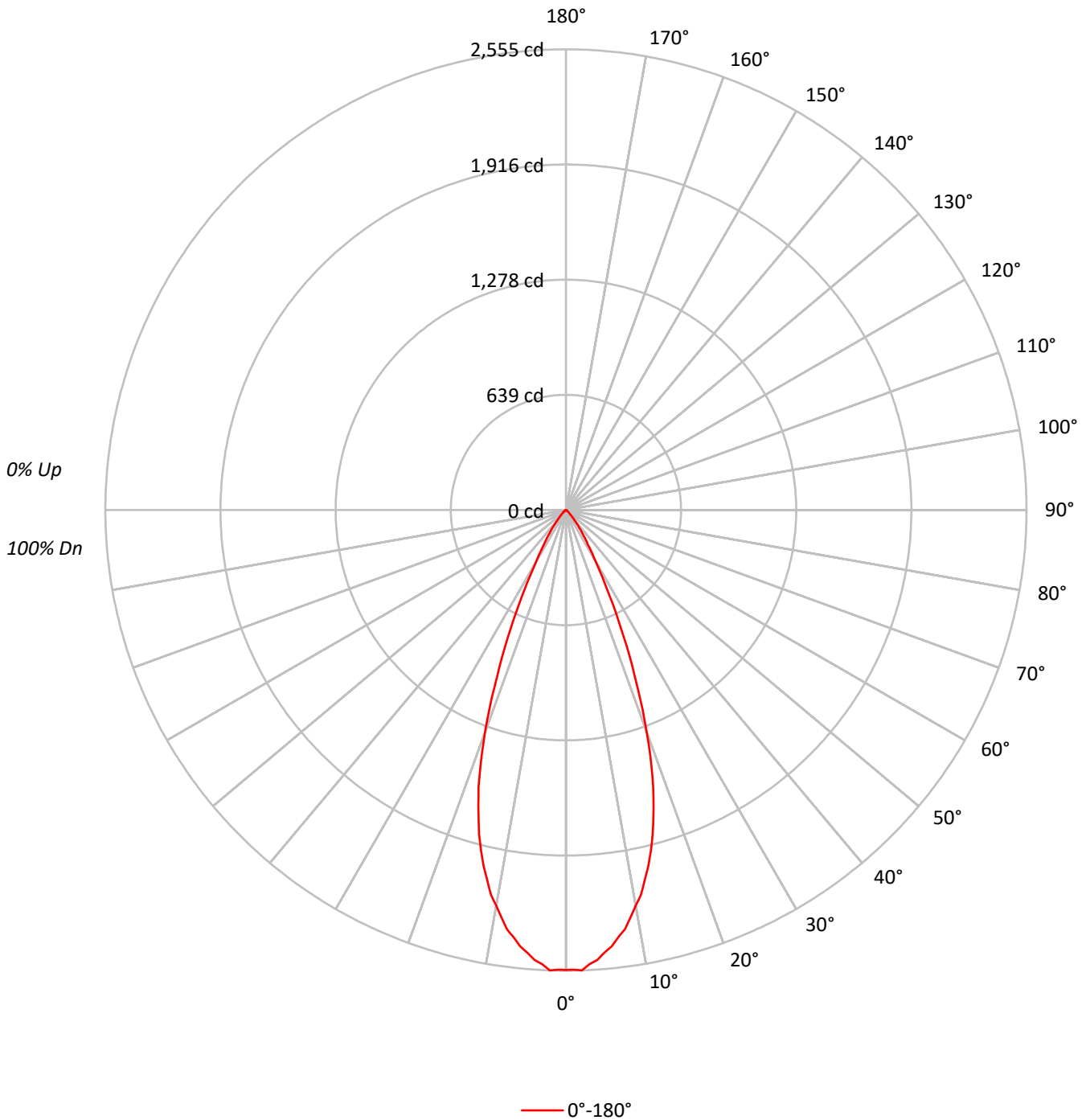
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



| 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° | 805454 |
| 5° | 780827 |
| 10° | 714666 |
| 15° | 608140 |
| 20° | 441073 |
| 25° | 251237 |
| 30° | 119521 |
| 35° | 62332 |
| 40° | 31245 |
| 45° | 14960 |
| 50° | 8597 |
| 55° | 4019 |
| 60° | 947 |
| 65° | 1121 |
| 70° | 0 |
| 75° | 0 |
| 80° | 0 |
| 85° | 0 |

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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 228.0 | 18.8 |
| 10°-20° | 504.9 | 41.5 |
| 20°-30° | 336.8 | 27.7 |
| 30°-40° | 107.9 | 8.9 |
| 40°-50° | 29.3 | 2.4 |
| 50°-60° | 7.2 | 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° | 1069.7 | 88.0 |
| 0°-40° | 1177.6 | 96.9 |
| 0°-60° | 1214.2 | 99.9 |
| 0°-90° | 1215.1 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1215.1 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | Flux |
|-----|------|------|
| 0° | 2551 | |
| 5° | 2463 | 228 |
| 15° | 1860 | 505 |
| 25° | 721 | 337 |
| 35° | 162 | 108 |
| 45° | 34 | 29 |
| 55° | 7 | 7 |
| 65° | 2 | 1 |
| 75° | 0 | 0 |
| 85° | 0 | 0 |
| 90° | 0 | |

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CANDELA DISTRIBUTION (FULL):

| 0° | |
|-------|--------|
| 0° | 2550.8 |
| 1° | 2549.4 |
| 2° | 2555.2 |
| 3° | 2521.7 |
| 4° | 2501.3 |
| 5° | 2463.4 |
| 6° | 2432.8 |
| 7° | 2386.2 |
| 8° | 2348.3 |
| 9° | 2287.1 |
| 10° | 2228.9 |
| 11° | 2176.4 |
| 12° | 2099.2 |
| 13° | 2027.8 |
| 14° | 1947.7 |
| 15° | 1860.3 |
| 17.5° | 1611.2 |
| 20° | 1312.6 |
| 22.5° | 996.4 |
| 25° | 721.1 |
| 27.5° | 489.5 |
| 30° | 327.8 |
| 32.5° | 227.3 |
| 35° | 161.7 |
| 37.5° | 115.1 |
| 40° | 75.8 |
| 42.5° | 49.5 |
| 45° | 33.5 |
| 47.5° | 24.8 |
| 50° | 17.5 |
| 52.5° | 11.7 |
| 55° | 7.3 |
| 57.5° | 4.4 |
| 60° | 1.5 |
| 62.5° | 1.5 |
| 65° | 1.5 |
| 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 |

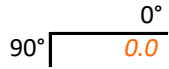
Signify Classified - Internal
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269


NVLAP Lab Code: 200050-0



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CANDELA DISTRIBUTION (continued):



(END OF REPORT)