

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: P601307

Luminaire Tested: **ML410LSNFL9FS1E - TIR4D25NFL - TL43R2G_ TL44S2G_ 4000K**

Issue Date: 7/29/2022

Tested By:

Approved By:



Cooper Lighting Solutions laboratories have been accredited by National Voluntary Laboratory Accreditation Program (NVLAP) that it adheres to the requirements of ISO/IEC 17025:2005 and appropriate IESNA test methods. This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the Federal Government. Results contained in this report are valid for luminaire sample tested, as supplied by requestor. Information related to the luminaire tested has been supplied by requestor and can affect the validity of the test results. Report shall not be reproduced except in full without approval of Cooper Lighting Solutions Lighting Laboratory. Test performed at address noted above.

Test Information

Test Method: LM-79-08
 Report Number: P601307
 Test Lab: COOPER LIGHTING SOLUTIONS
 Issue Date: 7/29/2022
 Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
 Product Line: HALO
 Catalog Number: ML410LSNFL9FS1E - 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: 1145.5 lumens
 Efficiency: N/A
 Efficacy: 95.5 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

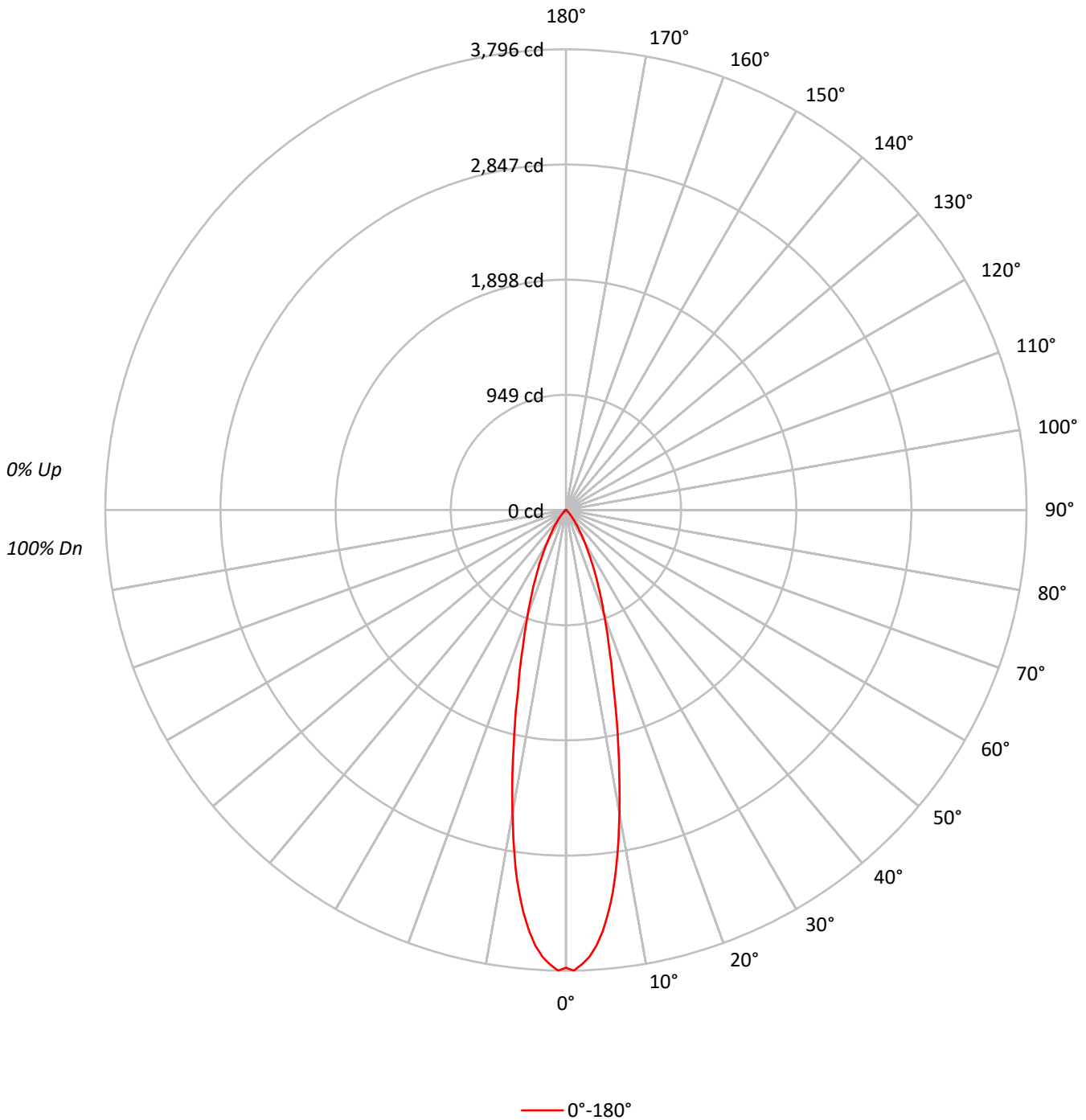
Input Watts (W): 12
 Input Voltage (V): NR
 Input Current (Ain): NR
 Voltage Rise (V): NR
 Power Factor: NR
 Total Harmonic Distortion (THDi): NR
 Frequency (hertz): 60
 Stabilization Time: NR
 Operation Time: NR
 Ambient Temperature (°C): NR
 Test Distance: 25 FT



| 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 |

TEST NUMBER: P601307
CATALOG NUMBER: ML410LSNFL9FS1E - TIR4D25NFL - TL43R2G_ TL44S2G_ 4000K

Luminous Intensity Polar Plot



TEST NUMBER: P601307
 CATALOG NUMBER: ML410LSNFL9FS1E - TIR4D25NFL - TL43R2G_ TL44S2G_ 4000K

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 | 50 | 30 | 10 | 0 |
| RCR | | | | | | | | | | | | | | | | | | | | | |
| 0 | 119 | 119 | 119 | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 | 100 | 100 | 100 |
| 1 | 114 | 112 | 110 | 108 | 112 | 110 | 108 | 106 | 106 | 104 | 103 | 102 | 101 | 100 | 99 | 98 | 97 | 95 | 95 | 95 | 95 |
| 2 | 110 | 106 | 103 | 100 | 108 | 104 | 101 | 99 | 101 | 99 | 96 | 98 | 96 | 94 | 95 | 94 | 92 | 91 | 91 | 91 | 91 |
| 3 | 106 | 100 | 96 | 93 | 104 | 99 | 95 | 92 | 97 | 93 | 91 | 94 | 92 | 89 | 92 | 90 | 88 | 87 | 87 | 87 | 87 |
| 4 | 102 | 96 | 91 | 88 | 100 | 94 | 90 | 87 | 92 | 89 | 86 | 91 | 87 | 85 | 89 | 86 | 84 | 83 | 83 | 83 | 83 |
| 5 | 98 | 91 | 86 | 83 | 96 | 90 | 86 | 83 | 89 | 85 | 82 | 87 | 84 | 81 | 86 | 83 | 80 | 79 | 79 | 79 | 79 |
| 6 | 94 | 87 | 82 | 79 | 93 | 86 | 82 | 79 | 85 | 81 | 78 | 84 | 80 | 78 | 83 | 79 | 77 | 76 | 76 | 76 | 76 |
| 7 | 91 | 84 | 79 | 75 | 90 | 83 | 78 | 75 | 82 | 78 | 75 | 81 | 77 | 74 | 80 | 76 | 74 | 73 | 73 | 73 | 73 |
| 8 | 88 | 80 | 75 | 72 | 87 | 80 | 75 | 72 | 79 | 75 | 72 | 78 | 74 | 71 | 77 | 74 | 71 | 70 | 70 | 70 | 70 |
| 9 | 85 | 77 | 72 | 69 | 84 | 77 | 72 | 69 | 76 | 72 | 69 | 75 | 71 | 69 | 74 | 71 | 68 | 67 | 67 | 67 | 67 |
| 10 | 82 | 74 | 70 | 67 | 81 | 74 | 70 | 67 | 73 | 69 | 66 | 73 | 69 | 66 | 72 | 69 | 66 | 65 | 65 | 65 | 65 |

AVERAGE LUMINANCE (cd/sqm):

| | |
|-----|---------|
| | 0° |
| 0° | 1190782 |
| 5° | 1104392 |
| 10° | 813230 |
| 15° | 495587 |
| 20° | 309753 |
| 25° | 193401 |
| 30° | 112556 |
| 35° | 63681 |
| 40° | 33471 |
| 45° | 17460 |
| 50° | 9972 |
| 55° | 5560 |
| 60° | 2716 |
| 65° | 2167 |
| 70° | 1293 |
| 75° | 1708 |
| 80° | 0 |
| 85° | 0 |

TEST NUMBER: P601307
 CATALOG NUMBER: ML410LSNFL9FS1E - TIR4D25NFL - TL43R2G_ TL44S2G_ 4000K

ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 301.8 | 26.4 |
| 10°-20° | 430.7 | 37.6 |
| 20°-30° | 258.7 | 22.6 |
| 30°-40° | 107.8 | 9.4 |
| 40°-50° | 33.0 | 2.9 |
| 50°-60° | 10.1 | 0.9 |
| 60°-70° | 2.5 | 0.2 |
| 70°-80° | 0.9 | 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° | 991.2 | 86.5 |
| 0°-40° | 1099.0 | 95.9 |
| 0°-60° | 1142.1 | 99.7 |
| 0°-90° | 1145.5 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1145.5 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | Flux |
|-----|------|------|
| 0° | 3771 | |
| 5° | 3484 | 302 |
| 15° | 1516 | 431 |
| 25° | 555 | 259 |
| 35° | 165 | 108 |
| 45° | 39 | 33 |
| 55° | 10 | 10 |
| 65° | 3 | 2 |
| 75° | 1 | 1 |
| 85° | 0 | 0 |
| 90° | 0 | |

TEST NUMBER: P601307
CATALOG NUMBER: ML410LSNFL9FS1E - TIR4D25NFL - TL43R2G_ TL44S2G_ 4000K

CANDELA DISTRIBUTION (FULL):

| 0° | |
|-------|--------|
| 0° | 3771.1 |
| 1° | 3795.8 |
| 2° | 3746.5 |
| 3° | 3687.1 |
| 4° | 3598.7 |
| 5° | 3484.2 |
| 6° | 3337.8 |
| 7° | 3172.6 |
| 8° | 2979.8 |
| 9° | 2760.9 |
| 10° | 2536.3 |
| 12.5° | 1987.0 |
| 15° | 1516.0 |
| 17.5° | 1175.4 |
| 20° | 921.8 |
| 22.5° | 718.9 |
| 25° | 555.1 |
| 27.5° | 417.4 |
| 30° | 308.7 |
| 32.5° | 226.1 |
| 35° | 165.2 |
| 37.5° | 117.4 |
| 40° | 81.2 |
| 42.5° | 56.5 |
| 45° | 39.1 |
| 47.5° | 27.5 |
| 50° | 20.3 |
| 52.5° | 15.9 |
| 55° | 10.1 |
| 57.5° | 7.2 |
| 60° | 4.3 |
| 62.5° | 2.9 |
| 65° | 2.9 |
| 67.5° | 1.4 |
| 70° | 1.4 |
| 72.5° | 1.4 |
| 75° | 1.4 |
| 77.5° | 0.0 |
| 80° | 0.0 |
| 82.5° | 0.0 |
| 85° | 0.0 |
| 87.5° | 0.0 |
| 90° | 0.0 |

(END OF REPORT)