

Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: HALO

Report Number: P626451

Luminaire Tested: HLBC4LS9FSD2WE010MWR-4000K-900lm

Issue Date: 11/17/2022

**Test Information**

Test Method: LM-79-2019  
Report Number: P626451  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA ( A2209543A001)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 11/17/2022  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: HLBC4LS9FSD2WE010MWR-4000K-900lm  
Description: 4IN CANLESS LED DOWNLIGHT WITH SELECTABLE CCT AND SELECTABLE LUMEN OUTPUT  
Light Source: (1) 4000K CCT, 90 CRI LEDS  
Ballast/Driver: -

**Summary**

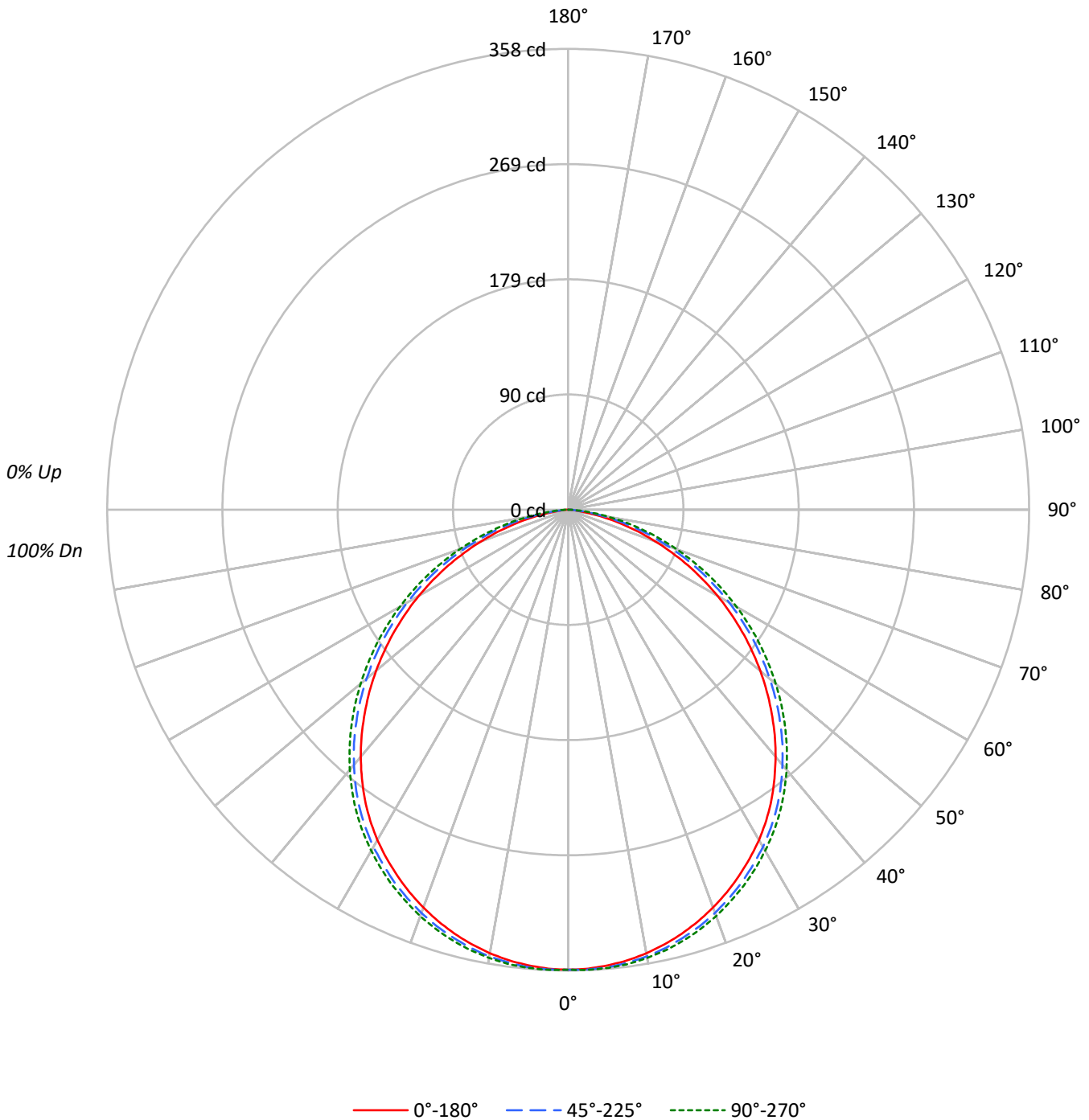
Lumens per Lamp: N/A  
Luminaire Lumens: 965.0 lumens  
Efficiency: N/A  
Efficacy: 74.2 lumens/watt  
Spacing Criteria (0/90/45): 1.23 / 1.27 / 1.36  
Luminous Opening: Circular (Dia: 0.33m x H: 0m)  
CIE Type: Direct

Input Watts (W): 13  
Input Voltage (V): 120  
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   | 109 | 105 | 101 | 97  | 107 | 103 | 99  | 95  | 98  | 95  | 92  |  | 94  | 92  | 90  |  | 91  | 89  | 87  | 85  |
| 2   | 100 | 92  | 85  | 80  | 97  | 90  | 84  | 79  | 86  | 81  | 77  |  | 83  | 79  | 75  |  | 80  | 77  | 73  | 71  |
| 3   | 91  | 81  | 73  | 66  | 89  | 79  | 72  | 66  | 76  | 70  | 65  |  | 73  | 68  | 64  |  | 71  | 66  | 63  | 60  |
| 4   | 83  | 72  | 63  | 57  | 81  | 70  | 62  | 56  | 68  | 61  | 55  |  | 66  | 59  | 55  |  | 63  | 58  | 54  | 52  |
| 5   | 77  | 64  | 55  | 49  | 75  | 63  | 55  | 48  | 61  | 54  | 48  |  | 59  | 52  | 47  |  | 57  | 51  | 47  | 45  |
| 6   | 71  | 58  | 49  | 43  | 69  | 57  | 49  | 42  | 55  | 48  | 42  |  | 53  | 47  | 42  |  | 52  | 46  | 41  | 39  |
| 7   | 66  | 52  | 44  | 38  | 64  | 52  | 43  | 38  | 50  | 43  | 37  |  | 49  | 42  | 37  |  | 47  | 41  | 37  | 35  |
| 8   | 61  | 48  | 39  | 34  | 60  | 47  | 39  | 34  | 46  | 39  | 33  |  | 45  | 38  | 33  |  | 43  | 37  | 33  | 31  |
| 9   | 57  | 44  | 36  | 30  | 56  | 43  | 36  | 30  | 42  | 35  | 30  |  | 41  | 35  | 30  |  | 40  | 34  | 30  | 28  |
| 10  | 54  | 41  | 33  | 27  | 52  | 40  | 33  | 27  | 39  | 32  | 27  |  | 38  | 32  | 27  |  | 37  | 31  | 27  | 25  |

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

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 4104 | 4104 | 4104 |
| 5°  | 4095 | 4112 | 4118 |
| 10° | 4080 | 4109 | 4123 |
| 15° | 4054 | 4093 | 4119 |
| 20° | 4019 | 4073 | 4106 |
| 25° | 3976 | 4045 | 4085 |
| 30° | 3928 | 4011 | 4056 |
| 35° | 3857 | 3961 | 4019 |
| 40° | 3756 | 3881 | 3954 |
| 45° | 3629 | 3777 | 3868 |
| 50° | 3478 | 3649 | 3758 |
| 55° | 3297 | 3503 | 3629 |
| 60° | 3077 | 3316 | 3470 |
| 65° | 2793 | 3081 | 3268 |
| 70° | 2424 | 2770 | 3001 |
| 75° | 1925 | 2356 | 2644 |
| 80° | 1203 | 1759 | 2109 |
| 85° | 540  | 804  | 1304 |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 90°

Vertical Angle: 45°

Luminance: 3868 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 33.9   | 3.5       |
| 10°-20°   | 97.1   | 10.1      |
| 20°-30°   | 146.8  | 15.2      |
| 30°-40°   | 176.0  | 18.2      |
| 40°-50°   | 178.6  | 18.5      |
| 50°-60°   | 155.4  | 16.1      |
| 60°-70°   | 111.3  | 11.5      |
| 70°-80°   | 55.7   | 5.8       |
| 80°-90°   | 10.1   | 1.0       |
| 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°    | 277.8  | 28.8      |
| 0°-40°    | 453.8  | 47.0      |
| 0°-60°    | 787.9  | 81.6      |
| 0°-90°    | 965.0  | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 965.0  | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°  | 22.5° | 45° | 67.5° | 90° | Flux |
|-----|-----|-------|-----|-------|-----|------|
| 0°  | 357 | 357   | 357 | 357   | 357 |      |
| 5°  | 355 | 356   | 357 | 357   | 357 | 34   |
| 15° | 341 | 343   | 344 | 345   | 346 | 96   |
| 25° | 314 | 317   | 319 | 321   | 322 | 145  |
| 35° | 275 | 279   | 283 | 284   | 287 | 172  |
| 45° | 224 | 228   | 233 | 235   | 238 | 172  |
| 55° | 165 | 170   | 175 | 178   | 181 | 147  |
| 65° | 103 | 108   | 113 | 117   | 120 | 102  |
| 75° | 43  | 48    | 53  | 56    | 60  | 46   |
| 85° | 4   | 5     | 6   | 7     | 10  | 6    |
| 90° | 0   | 0     | 1   | 1     | 2   |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°    | 22.5° | 45°   | 67.5° | 90°   |
|-------|-------|-------|-------|-------|-------|
| 0°    | 357.4 | 357.4 | 357.4 | 357.4 | 357.4 |
| 2.5°  | 356.9 | 357.1 | 357.5 | 357.5 | 357.8 |
| 5°    | 355.3 | 355.9 | 356.8 | 356.8 | 357.3 |
| 7.5°  | 353.1 | 353.9 | 354.8 | 355.4 | 356.0 |
| 10°   | 349.9 | 351.0 | 352.4 | 352.8 | 353.6 |
| 12.5° | 345.8 | 347.3 | 348.8 | 349.6 | 350.5 |
| 15°   | 341.0 | 342.7 | 344.3 | 345.3 | 346.5 |
| 17.5° | 335.3 | 337.3 | 339.4 | 340.2 | 341.6 |
| 20°   | 328.9 | 331.3 | 333.3 | 334.6 | 336.0 |
| 22.5° | 321.8 | 324.3 | 326.6 | 327.8 | 329.4 |
| 25°   | 313.8 | 316.6 | 319.3 | 320.6 | 322.4 |
| 27.5° | 305.4 | 308.4 | 311.0 | 312.7 | 314.5 |
| 30°   | 296.3 | 299.4 | 302.5 | 303.9 | 305.9 |
| 32.5° | 286.2 | 289.9 | 292.9 | 294.8 | 296.8 |
| 35°   | 275.2 | 279.0 | 282.6 | 284.5 | 286.7 |
| 37.5° | 263.2 | 267.3 | 271.2 | 273.2 | 275.7 |
| 40°   | 250.6 | 254.9 | 258.9 | 261.3 | 263.8 |
| 42.5° | 237.3 | 241.8 | 246.2 | 248.6 | 251.3 |
| 45°   | 223.5 | 228.3 | 232.6 | 235.3 | 238.2 |
| 47.5° | 209.3 | 214.2 | 218.8 | 221.5 | 224.5 |
| 50°   | 194.7 | 199.7 | 204.3 | 207.4 | 210.4 |
| 52.5° | 179.8 | 185.1 | 189.9 | 192.9 | 196.0 |
| 55°   | 164.7 | 170.0 | 175.0 | 178.1 | 181.3 |
| 57.5° | 149.4 | 154.6 | 159.7 | 163.0 | 166.3 |
| 60°   | 134.0 | 139.2 | 144.4 | 147.8 | 151.1 |
| 62.5° | 118.3 | 123.7 | 128.9 | 132.3 | 135.8 |
| 65°   | 102.8 | 108.2 | 113.4 | 116.8 | 120.3 |
| 67.5° | 87.2  | 92.8  | 97.8  | 101.3 | 104.7 |
| 70°   | 72.2  | 77.5  | 82.5  | 86.0  | 89.4  |
| 72.5° | 57.5  | 62.7  | 67.5  | 70.9  | 74.4  |
| 75°   | 43.4  | 48.4  | 53.1  | 56.3  | 59.6  |
| 77.5° | 30.3  | 34.9  | 39.3  | 42.4  | 45.5  |
| 80°   | 18.2  | 22.4  | 26.6  | 29.4  | 31.9  |
| 82.5° | 8.1   | 11.4  | 14.9  | 17.3  | 19.6  |
| 85°   | 4.1   | 5.1   | 6.1   | 7.3   | 9.9   |
| 87.5° | 1.5   | 2.4   | 3.3   | 3.9   | 4.4   |
| 90°   | 0.1   | 0.1   | 0.7   | 1.2   | 1.8   |

(END OF REPORT)