

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: P886973

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-4000K

Issue Date: 7/10/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P886973  
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-57)  
Test Lab: COOPER LIGHTING SOLUTIONS  
Issue Date: 7/10/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: HALO  
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-4000K  
Description: 4IN SQUARE ML FLEX, SELECTABLE CCT, WITH WW TIR, MATTE WHITE TRIM  
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 4000K CCT  
Ballast/Driver: -

**Summary**

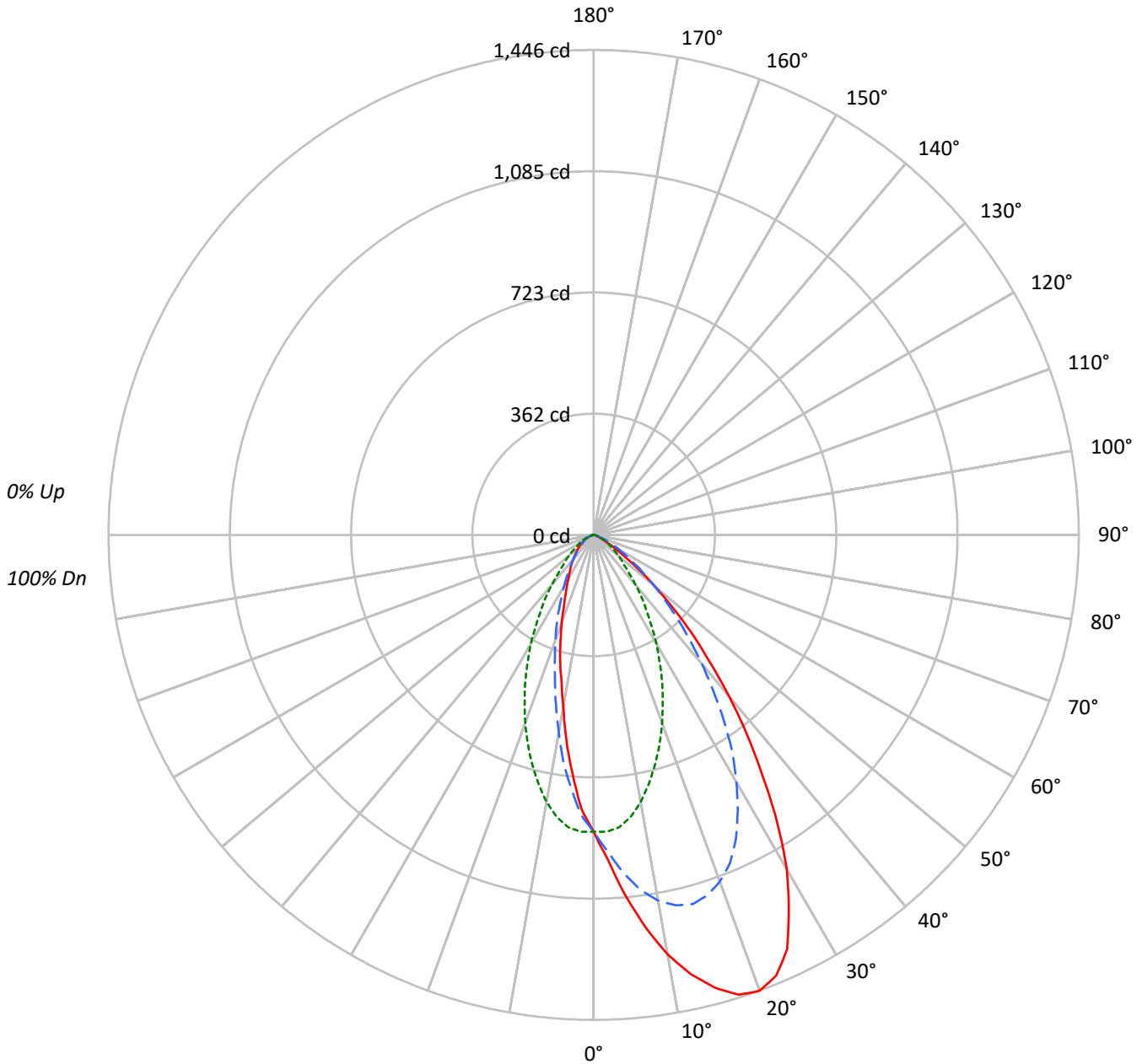
Lumens per Lamp: N/A  
Luminaire Lumens: 1113.9 lumens  
Efficiency: N/A  
Efficacy: 63.3 lumens/watt  
Spacing Criteria (0/90/45): 1.12 / 0.8 / 0.99  
Luminous Opening: Rectangular (W 0.33' x L: 0.33' x H: 0')  
CIE Type: Direct

Input Watts (W): 17.6  
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: 24 FT



TEST NUMBER: P886973  
CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-4000K

### Luminous Intensity Polar Plot





TEST NUMBER: P886973

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4SWMW-1200LM-4000K

**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |    |    |    |    |   |  |   |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|---|--|---|
| RF  | 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 | 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   | 112 | 109 | 106 | 104 | 110 | 107 | 104 | 102 | 103 | 101 | 99  | 99  | 97  | 96  | 96  | 94  | 93  | 91  |    |    |    |    |    |   |  |   |
| 2   | 105 | 100 | 95  | 91  | 103 | 98  | 93  | 90  | 95  | 91  | 88  | 91  | 88  | 86  | 89  | 86  | 84  | 82  |    |    |    |    |    |   |  |   |
| 3   | 99  | 91  | 85  | 81  | 97  | 90  | 84  | 80  | 87  | 82  | 79  | 84  | 81  | 77  | 82  | 79  | 76  | 74  |    |    |    |    |    |   |  |   |
| 4   | 93  | 84  | 77  | 72  | 91  | 82  | 76  | 72  | 80  | 75  | 71  | 78  | 74  | 70  | 76  | 72  | 69  | 67  |    |    |    |    |    |   |  |   |
| 5   | 87  | 77  | 70  | 65  | 85  | 76  | 70  | 65  | 74  | 69  | 64  | 72  | 68  | 64  | 71  | 66  | 63  | 61  |    |    |    |    |    |   |  |   |
| 6   | 82  | 71  | 64  | 59  | 80  | 70  | 64  | 59  | 69  | 63  | 59  | 67  | 62  | 58  | 66  | 61  | 58  | 56  |    |    |    |    |    |   |  |   |
| 7   | 77  | 66  | 59  | 54  | 75  | 65  | 59  | 54  | 64  | 58  | 54  | 63  | 57  | 53  | 62  | 57  | 53  | 52  |    |    |    |    |    |   |  |   |
| 8   | 73  | 62  | 55  | 50  | 71  | 61  | 54  | 50  | 60  | 54  | 50  | 59  | 53  | 49  | 58  | 53  | 49  | 48  |    |    |    |    |    |   |  |   |
| 9   | 69  | 57  | 51  | 46  | 67  | 57  | 50  | 46  | 56  | 50  | 46  | 55  | 50  | 46  | 54  | 49  | 46  | 44  |    |    |    |    |    |   |  |   |
| 10  | 65  | 54  | 47  | 43  | 64  | 53  | 47  | 43  | 53  | 47  | 43  | 52  | 46  | 43  | 51  | 46  | 42  | 41  |    |    |    |    |    |   |  |   |

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

|     | 0°     | 45°    | 90°   | 135°  | 180°  |
|-----|--------|--------|-------|-------|-------|
| 0°  | 85706  | 85706  | 85706 | 85706 | 85706 |
| 5°  | 104743 | 98296  | 85070 | 73984 | 69686 |
| 10° | 124890 | 108895 | 79522 | 58746 | 51133 |
| 15° | 140189 | 114294 | 70987 | 44590 | 38713 |
| 20° | 149124 | 113381 | 61454 | 34206 | 28619 |
| 25° | 145745 | 107216 | 51542 | 26006 | 21282 |
| 30° | 128776 | 95195  | 41814 | 19665 | 16824 |
| 35° | 103977 | 80040  | 32309 | 15043 | 14121 |
| 40° | 79431  | 63351  | 24470 | 11748 | 11887 |
| 45° | 56363  | 48334  | 17879 | 9248  | 10152 |
| 50° | 35673  | 35417  | 14333 | 7340  | 8500  |
| 55° | 19423  | 24836  | 11401 | 6536  | 7279  |
| 60° | 8990   | 17147  | 9223  | 6006  | 6219  |
| 65° | 4814   | 11289  | 7106  | 5066  | 4814  |
| 70° | 3144   | 6415   | 5325  | 4702  | 3456  |
| 75° | 2059   | 3518   | 3743  | 2882  | 1647  |
| 80° | 614    | 1841   | 1227  | 1841  | 1227  |
| 85° | 0      | 1223   | 1223  | 1223  | 1223  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
 Vertical Angle: 45°  
 Luminance: 56363 cd/sqm



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**ZONAL LUMENS:**

| Zone      | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10°    | 83.6   | 7.5       |
| 10°-20°   | 223.6  | 20.1      |
| 20°-30°   | 286.3  | 25.7      |
| 30°-40°   | 247.1  | 22.2      |
| 40°-50°   | 155.0  | 13.9      |
| 50°-60°   | 76.8   | 6.9       |
| 60°-70°   | 31.1   | 2.8       |
| 70°-80°   | 9.3    | 0.8       |
| 80°-90°   | 1.2    | 0.1       |
| 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°    | 593.5  | 53.3      |
| 0°-40°    | 840.5  | 75.5      |
| 0°-60°    | 1072.3 | 96.3      |
| 0°-90°    | 1113.9 | 100.0     |
| 90°-120°  | 0.0    | 0.0       |
| 90°-150°  | 0.0    | 0.0       |
| 90°-180°  | 0.0    | 0.0       |
| 0°-180°   | 1113.9 | 100.0     |

**CANDELA DISTRIBUTION:**

|     | 0°   | 45°  | 90° | 135° | 180° | Flux |
|-----|------|------|-----|------|------|------|
| 0°  | 885  | 885  | 885 | 885  | 885  |      |
| 5°  | 1077 | 1011 | 875 | 761  | 717  | 109  |
| 15° | 1398 | 1140 | 708 | 445  | 386  | 395  |
| 25° | 1364 | 1003 | 482 | 243  | 199  | 614  |
| 35° | 879  | 677  | 273 | 127  | 119  | 549  |
| 45° | 411  | 353  | 130 | 68   | 74   | 319  |
| 55° | 115  | 147  | 68  | 39   | 43   | 110  |
| 65° | 21   | 49   | 31  | 22   | 21   | 23   |
| 75° | 6    | 9    | 10  | 8    | 4    | 6    |
| 85° | 0    | 1    | 1   | 1    | 1    | 0    |
| 90° | 0    | 0    | 0   | 0    | 0    |      |



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**CANDELA DISTRIBUTION (FULL):**

|       | 0°     | 10°    | 20°    | 30°    | 40°    | 50°    | 60°    | 70°   | 80°   | 90°   | 112.5° |
|-------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|--------|
| 0°    | 884.7  | 884.7  | 884.7  | 884.7  | 884.7  | 884.7  | 884.7  | 884.7 | 884.7 | 884.7 | 884.7  |
| 2.5°  | 968.8  | 974.3  | 959.9  | 959.9  | 948.8  | 938.9  | 928.9  | 913.5 | 900.2 | 885.8 | 858.2  |
| 5°    | 1077.1 | 1072.7 | 1059.4 | 1048.4 | 1026.3 | 995.3  | 969.9  | 937.8 | 903.5 | 874.8 | 810.6  |
| 7.5°  | 1178.9 | 1173.3 | 1150.1 | 1126.9 | 1090.4 | 1042.8 | 995.3  | 943.3 | 891.3 | 847.1 | 753.1  |
| 10°   | 1269.6 | 1260.7 | 1233.1 | 1189.9 | 1139.1 | 1074.9 | 1007.5 | 934.5 | 868.1 | 808.4 | 690.1  |
| 12.5° | 1341.4 | 1329.3 | 1297.2 | 1240.8 | 1172.2 | 1090.4 | 1006.4 | 916.8 | 833.8 | 759.7 | 622.6  |
| 15°   | 1397.8 | 1386.8 | 1341.4 | 1275.1 | 1187.7 | 1091.5 | 988.7  | 889.1 | 791.8 | 707.8 | 557.4  |
| 17.5° | 1437.6 | 1422.2 | 1365.8 | 1285.0 | 1182.2 | 1070.5 | 958.8  | 847.1 | 744.3 | 652.5 | 495.4  |
| 20°   | 1446.5 | 1426.6 | 1365.8 | 1276.2 | 1161.2 | 1038.4 | 919.0  | 797.3 | 690.1 | 596.1 | 433.5  |
| 22.5° | 1422.2 | 1401.1 | 1339.2 | 1243.0 | 1126.9 | 993.1  | 865.9  | 739.8 | 631.5 | 537.5 | 376.0  |
| 25°   | 1363.5 | 1340.3 | 1281.7 | 1188.8 | 1070.5 | 935.6  | 801.8  | 686.8 | 578.4 | 482.2 | 321.8  |
| 27.5° | 1259.6 | 1248.5 | 1195.5 | 1108.1 | 995.3  | 864.8  | 733.2  | 621.5 | 513.1 | 424.7 | 276.5  |
| 30°   | 1151.2 | 1140.2 | 1094.8 | 1018.5 | 912.4  | 789.6  | 669.1  | 556.3 | 454.5 | 373.8 | 235.6  |
| 32.5° | 1019.6 | 1006.4 | 974.3  | 907.9  | 822.8  | 715.5  | 595.0  | 491.0 | 399.2 | 319.6 | 202.4  |
| 35°   | 879.2  | 879.2  | 851.5  | 799.6  | 725.5  | 628.1  | 524.2  | 428.0 | 343.9 | 273.2 | 168.1  |
| 37.5° | 749.8  | 753.1  | 729.9  | 682.3  | 622.6  | 546.3  | 451.2  | 364.9 | 292.0 | 234.4 | 141.6  |
| 40°   | 628.1  | 620.4  | 608.2  | 580.6  | 531.9  | 470.0  | 386.0  | 311.9 | 246.6 | 193.5 | 118.3  |
| 42.5° | 507.6  | 513.1  | 498.8  | 483.3  | 449.0  | 397.0  | 329.6  | 263.2 | 202.4 | 158.1 | 97.3   |
| 45°   | 411.4  | 409.2  | 404.8  | 393.7  | 376.0  | 329.6  | 273.2  | 212.3 | 165.9 | 130.5 | 80.7   |
| 47.5° | 316.3  | 319.6  | 318.5  | 318.5  | 306.3  | 273.2  | 223.4  | 171.4 | 139.3 | 113.9 | 69.7   |
| 50°   | 236.7  | 245.5  | 251.0  | 255.5  | 247.7  | 222.3  | 173.6  | 141.6 | 118.3 | 95.1  | 59.7   |
| 52.5° | 170.3  | 174.7  | 190.2  | 207.9  | 200.2  | 174.7  | 142.7  | 118.3 | 97.3  | 79.6  | 50.9   |
| 55°   | 115.0  | 123.9  | 140.4  | 158.1  | 157.0  | 137.1  | 116.1  | 96.2  | 81.8  | 67.5  | 43.1   |
| 57.5° | 73.0   | 77.4   | 97.3   | 118.3  | 118.3  | 108.4  | 92.9   | 80.7  | 64.1  | 54.2  | 36.5   |
| 60°   | 46.4   | 49.8   | 64.1   | 84.0   | 90.7   | 86.3   | 75.2   | 60.8  | 54.2  | 47.6  | 33.2   |
| 62.5° | 31.0   | 32.1   | 43.1   | 57.5   | 66.4   | 66.4   | 56.4   | 49.8  | 44.2  | 38.7  | 28.8   |
| 65°   | 21.0   | 22.1   | 28.8   | 38.7   | 48.7   | 49.8   | 43.1   | 38.7  | 35.4  | 31.0  | 24.3   |
| 67.5° | 14.4   | 15.5   | 19.9   | 26.5   | 32.1   | 34.3   | 33.2   | 31.0  | 27.6  | 23.2  | 18.8   |
| 70°   | 11.1   | 11.1   | 13.3   | 17.7   | 22.1   | 23.2   | 23.2   | 23.2  | 21.0  | 18.8  | 15.5   |
| 72.5° | 7.7    | 8.8    | 8.8    | 12.2   | 14.4   | 15.5   | 16.6   | 16.6  | 15.5  | 14.4  | 12.2   |
| 75°   | 5.5    | 5.5    | 6.6    | 7.7    | 8.8    | 10.0   | 11.1   | 11.1  | 11.1  | 10.0  | 8.8    |
| 77.5° | 3.3    | 3.3    | 4.4    | 4.4    | 5.5    | 6.6    | 6.6    | 6.6   | 5.5   | 5.5   | 5.5    |
| 80°   | 1.1    | 1.1    | 2.2    | 2.2    | 3.3    | 3.3    | 3.3    | 3.3   | 2.2   | 2.2   | 3.3    |
| 82.5° | 0.0    | 0.0    | 1.1    | 1.1    | 1.1    | 1.1    | 1.1    | 1.1   | 1.1   | 1.1   | 2.2    |
| 85°   | 0.0    | 0.0    | 0.0    | 0.0    | 1.1    | 1.1    | 1.1    | 1.1   | 1.1   | 1.1   | 1.1    |
| 87.5° | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 1.1    | 1.1    | 1.1   | 1.1   | 1.1   | 1.1    |
| 90°   | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0    | 0.0   | 0.0   | 0.0   | 0.0    |



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**CANDELA DISTRIBUTION (continued):**

|       | 135°  | 157.5° | 180°  |
|-------|-------|--------|-------|
| 0°    | 884.7 | 884.7  | 884.7 |
| 2.5°  | 837.2 | 821.7  | 819.5 |
| 5°    | 760.8 | 735.4  | 716.6 |
| 7.5°  | 685.6 | 635.9  | 620.4 |
| 10°   | 597.2 | 544.1  | 519.8 |
| 12.5° | 518.7 | 462.3  | 443.5 |
| 15°   | 444.6 | 395.9  | 386.0 |
| 17.5° | 384.8 | 340.6  | 326.2 |
| 20°   | 331.8 | 289.7  | 277.6 |
| 22.5° | 287.5 | 245.5  | 232.2 |
| 25°   | 243.3 | 209.0  | 199.1 |
| 27.5° | 206.8 | 178.0  | 172.5 |
| 30°   | 175.8 | 152.6  | 150.4 |
| 32.5° | 150.4 | 132.7  | 133.8 |
| 35°   | 127.2 | 116.1  | 119.4 |
| 37.5° | 110.6 | 102.8  | 106.2 |
| 40°   | 92.9  | 90.7   | 94.0  |
| 42.5° | 79.6  | 80.7   | 84.0  |
| 45°   | 67.5  | 71.9   | 74.1  |
| 47.5° | 57.5  | 64.1   | 65.2  |
| 50°   | 48.7  | 56.4   | 56.4  |
| 52.5° | 43.1  | 49.8   | 49.8  |
| 55°   | 38.7  | 43.1   | 43.1  |
| 57.5° | 35.4  | 37.6   | 37.6  |
| 60°   | 31.0  | 31.0   | 32.1  |
| 62.5° | 25.4  | 26.5   | 26.5  |
| 65°   | 22.1  | 22.1   | 21.0  |
| 67.5° | 18.8  | 18.8   | 16.6  |
| 70°   | 16.6  | 15.5   | 12.2  |
| 72.5° | 12.2  | 11.1   | 7.7   |
| 75°   | 7.7   | 6.6    | 4.4   |
| 77.5° | 4.4   | 3.3    | 2.2   |
| 80°   | 3.3   | 2.2    | 2.2   |
| 82.5° | 2.2   | 2.2    | 1.1   |
| 85°   | 1.1   | 1.1    | 1.1   |
| 87.5° | 1.1   | 1.1    | 0.0   |
| 90°   | 0.0   | 0.0    | 0.0   |

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

Scaled Data Report



Report Generated By 670245859 / DESKTOP-T8S5UU9



Signify Classified - Internal  
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Peachtree City, GA 30269

Scaled Data Report





— 0°-180°    - - 45°-225°    - - - - 90°-270°

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Scaled Data Report



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Scaled Data Report



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