

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: P886962

Luminaire Tested: ML412LSFL9FS1E-TIR4D25AWW-TL4RWSL-1200LM-3500K

Issue Date: 7/9/2024

Test Information

Test Method: LM-79-2019
Report Number: P886962
TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (G3-2402-314-46)
Test Lab: COOPER LIGHTING SOLUTIONS
Issue Date: 7/9/2024
Manufacturer: COOPER LIGHTING SOLUTIONS
Product Line: HALO
Catalog Number: ML412LSFL9FS1E-TIR4D25AWW-TL4RWSL-1200LM-3500K
Description: 4IN ROUND ML FLEX, SELECTABLE CCT, WITH WW TIR, METALLIC SILVER TRIM
Light Source: (1) STANDARD SELECTABLE LUMEN LED 90CRI / 3500K CCT
Ballast/Driver: -

Summary

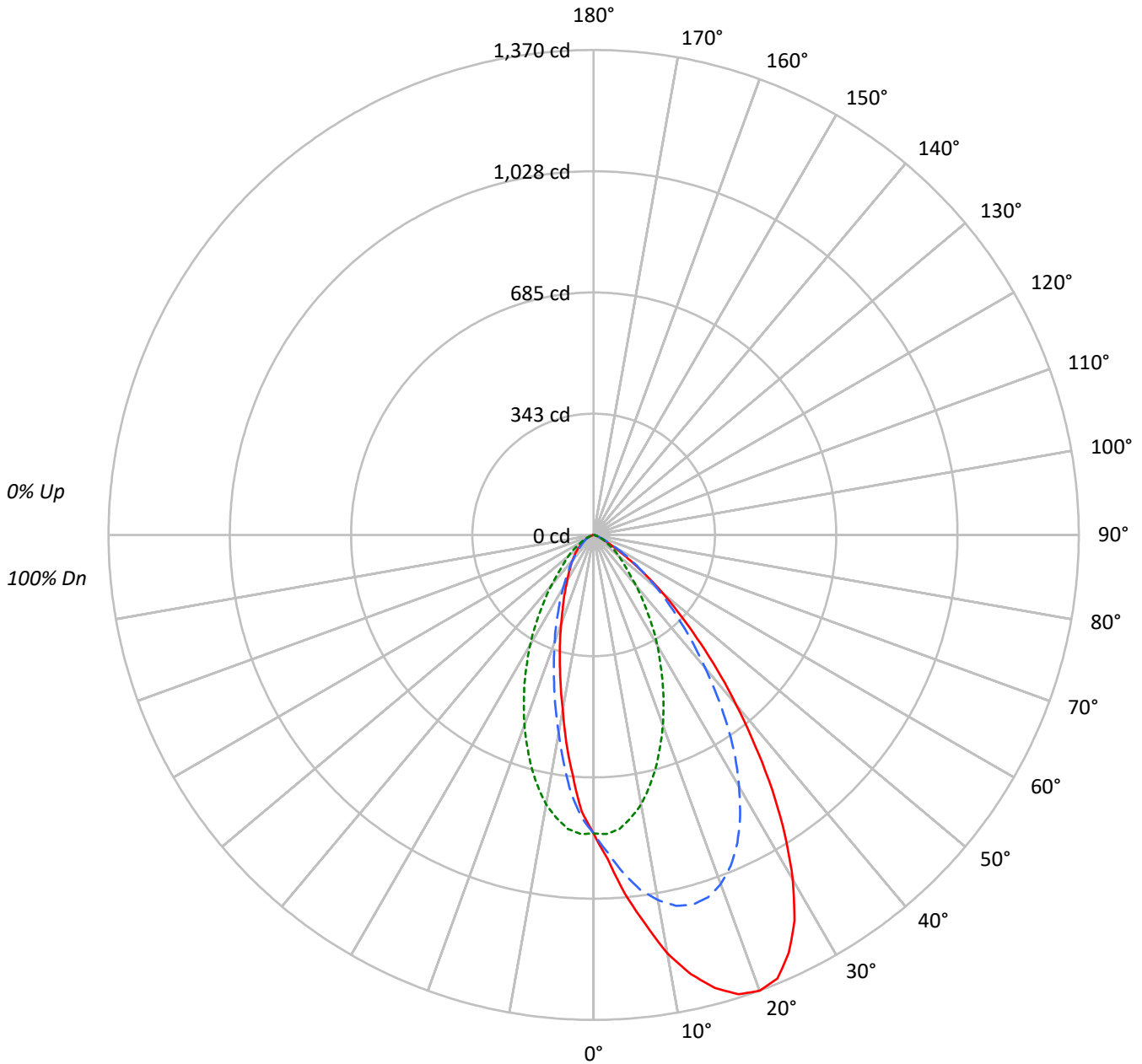
Lumens per Lamp: N/A
Luminaire Lumens: 1065.3 lumens
Efficiency: N/A
Efficacy: 60.5 lumens/watt
Spacing Criteria (0/90/45): 1.14 / 0.8 / 1
Luminous Opening: Circular (Dia: 0.25' x H: 0')
CIE Type: Direct

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



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Luminous Intensity Polar Plot





TEST NUMBER: P886962
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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 | 98 | 96 | 96 | 94 | 93 | 91 | | | | | | | | |
| 2 | 106 | 100 | 95 | 91 | 103 | 98 | 94 | 90 | 95 | 91 | 88 | 92 | 89 | 86 | 89 | 87 | 84 | 83 | | | | | | | | |
| 3 | 99 | 91 | 86 | 81 | 97 | 90 | 85 | 80 | 87 | 83 | 79 | 85 | 81 | 78 | 82 | 79 | 76 | 75 | | | | | | | | |
| 4 | 93 | 84 | 77 | 72 | 91 | 83 | 77 | 72 | 81 | 75 | 71 | 78 | 74 | 70 | 76 | 73 | 69 | 68 | | | | | | | | |
| 5 | 87 | 77 | 71 | 65 | 85 | 76 | 70 | 65 | 74 | 69 | 65 | 73 | 68 | 64 | 71 | 67 | 63 | 62 | | | | | | | | |
| 6 | 82 | 72 | 65 | 60 | 80 | 71 | 64 | 59 | 69 | 63 | 59 | 68 | 62 | 58 | 66 | 62 | 58 | 56 | | | | | | | | |
| 7 | 77 | 66 | 59 | 54 | 76 | 66 | 59 | 54 | 64 | 58 | 54 | 63 | 58 | 54 | 62 | 57 | 53 | 52 | | | | | | | | |
| 8 | 73 | 62 | 55 | 50 | 71 | 61 | 55 | 50 | 60 | 54 | 50 | 59 | 53 | 50 | 58 | 53 | 49 | 48 | | | | | | | | |
| 9 | 69 | 58 | 51 | 46 | 67 | 57 | 51 | 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 | 43 | 41 | | | | | | | | |

AVERAGE LUMINANCE (cd/sqm):

| | 0° | 45° | 90° | 135° | 180° |
|-----|--------|--------|--------|--------|--------|
| 0° | 184941 | 184941 | 184941 | 184941 | 184941 |
| 5° | 224124 | 210983 | 183535 | 161237 | 149724 |
| 10° | 267330 | 233251 | 172119 | 126785 | 111577 |
| 15° | 300864 | 245438 | 154189 | 97799 | 83497 |
| 20° | 319718 | 244951 | 133362 | 75140 | 62445 |
| 25° | 315236 | 232308 | 111708 | 57003 | 47979 |
| 30° | 284829 | 207880 | 90976 | 43197 | 37803 |
| 35° | 235194 | 176235 | 70216 | 33114 | 31106 |
| 40° | 179164 | 139934 | 52813 | 25648 | 26249 |
| 45° | 127951 | 107298 | 39012 | 20157 | 22483 |
| 50° | 86581 | 79110 | 31658 | 15624 | 18558 |
| 55° | 48514 | 53599 | 23626 | 13457 | 15101 |
| 60° | 23858 | 31796 | 17323 | 11227 | 12148 |
| 65° | 12193 | 17148 | 13283 | 8873 | 9391 |
| 70° | 6860 | 8559 | 8912 | 6860 | 6155 |
| 75° | 3643 | 4490 | 5422 | 2711 | 1779 |
| 80° | 1389 | 1389 | 1389 | 0 | 0 |
| 85° | 0 | 0 | 2768 | 0 | 0 |

MAXIMUM LUMINANCE 45°-90°:

Horizontal Angle: 10°
 Vertical Angle: 45°
 Luminance: 129285 cd/sqm



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ZONAL LUMENS:

| Zone | Lumens | % Fixture |
|-----------|--------|-----------|
| 0°-10° | 79.4 | 7.5 |
| 10°-20° | 213.1 | 20.0 |
| 20°-30° | 275.0 | 25.8 |
| 30°-40° | 240.6 | 22.6 |
| 40°-50° | 152.0 | 14.3 |
| 50°-60° | 73.8 | 6.9 |
| 60°-70° | 25.5 | 2.4 |
| 70°-80° | 5.5 | 0.5 |
| 80°-90° | 0.3 | 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° | 567.6 | 53.3 |
| 0°-40° | 808.2 | 75.9 |
| 0°-60° | 1034.0 | 97.1 |
| 0°-90° | 1065.3 | 100.0 |
| 90°-120° | 0.0 | 0.0 |
| 90°-150° | 0.0 | 0.0 |
| 90°-180° | 0.0 | 0.0 |
| 0°-180° | 1065.3 | 100.0 |

CANDELA DISTRIBUTION:

| | 0° | 45° | 90° | 135° | 180° | Flux |
|-----|------|------|-----|------|------|------|
| 0° | 843 | 843 | 843 | 843 | 843 | |
| 5° | 1018 | 958 | 834 | 732 | 680 | 102 |
| 15° | 1325 | 1081 | 679 | 431 | 368 | 374 |
| 25° | 1303 | 960 | 462 | 236 | 198 | 591 |
| 35° | 879 | 658 | 262 | 124 | 116 | 545 |
| 45° | 413 | 346 | 126 | 65 | 72 | 323 |
| 55° | 127 | 140 | 62 | 35 | 40 | 121 |
| 65° | 24 | 33 | 26 | 17 | 18 | 26 |
| 75° | 4 | 5 | 6 | 3 | 2 | 5 |
| 85° | 0 | 0 | 1 | 0 | 0 | 0 |
| 90° | 0 | 0 | 0 | 0 | 0 | |



TEST NUMBER: P886962

CATALOG NUMBER: ML412LSFL9FS1E-TIR4D25AWW-TL4RWSL-1200LM-3500K

CANDELA DISTRIBUTION (FULL):

| | 0° | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 112.5° |
|-------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|--------|
| 0° | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 | 843.4 |
| 2.5° | 916.9 | 913.8 | 920.1 | 910.6 | 902.0 | 893.5 | 886.0 | 867.9 | 858.3 | 845.5 | 822.1 |
| 5° | 1018.2 | 1017.2 | 1008.6 | 990.5 | 971.3 | 945.7 | 921.2 | 888.2 | 862.6 | 833.8 | 776.2 |
| 7.5° | 1106.7 | 1107.8 | 1092.9 | 1064.1 | 1033.2 | 988.4 | 945.7 | 898.8 | 850.8 | 806.1 | 718.6 |
| 10° | 1200.6 | 1187.8 | 1166.4 | 1130.2 | 1076.9 | 1018.2 | 956.4 | 891.4 | 828.5 | 773.0 | 658.9 |
| 12.5° | 1270.9 | 1256.0 | 1228.3 | 1176.0 | 1111.0 | 1035.3 | 955.3 | 875.4 | 797.5 | 728.2 | 597.1 |
| 15° | 1325.3 | 1313.6 | 1275.2 | 1208.0 | 1127.0 | 1035.3 | 940.4 | 848.7 | 758.1 | 679.2 | 528.8 |
| 17.5° | 1360.5 | 1346.6 | 1296.5 | 1219.8 | 1124.9 | 1021.4 | 913.8 | 807.1 | 711.2 | 624.8 | 472.3 |
| 20° | 1370.1 | 1354.1 | 1300.8 | 1213.4 | 1107.8 | 991.6 | 874.3 | 763.4 | 658.9 | 571.5 | 410.5 |
| 22.5° | 1356.2 | 1334.9 | 1279.5 | 1191.0 | 1074.7 | 948.9 | 828.5 | 710.1 | 603.5 | 515.0 | 357.2 |
| 25° | 1302.9 | 1288.0 | 1230.4 | 1134.5 | 1022.5 | 897.8 | 766.6 | 654.7 | 548.0 | 461.7 | 311.3 |
| 27.5° | 1228.3 | 1204.8 | 1155.8 | 1068.4 | 960.7 | 830.6 | 705.8 | 592.8 | 490.5 | 407.3 | 264.4 |
| 30° | 1124.9 | 1105.7 | 1056.6 | 980.9 | 880.7 | 761.3 | 641.9 | 534.2 | 436.1 | 359.3 | 227.1 |
| 32.5° | 1005.4 | 996.9 | 950.0 | 887.1 | 798.6 | 689.8 | 574.7 | 473.4 | 383.8 | 310.3 | 194.1 |
| 35° | 878.6 | 864.7 | 830.6 | 783.7 | 705.8 | 610.9 | 508.6 | 411.6 | 327.3 | 262.3 | 162.1 |
| 37.5° | 747.4 | 742.1 | 715.4 | 672.8 | 613.1 | 531.0 | 440.3 | 351.9 | 281.5 | 221.8 | 135.4 |
| 40° | 625.9 | 629.1 | 603.5 | 573.6 | 522.4 | 455.3 | 378.5 | 299.6 | 233.5 | 184.5 | 113.0 |
| 42.5° | 515.0 | 510.7 | 496.9 | 478.7 | 444.6 | 383.8 | 314.5 | 249.5 | 193.0 | 150.3 | 92.8 |
| 45° | 412.6 | 416.9 | 409.4 | 394.5 | 370.0 | 322.0 | 261.2 | 201.5 | 157.8 | 125.8 | 75.7 |
| 47.5° | 323.1 | 322.0 | 329.5 | 324.1 | 304.9 | 264.4 | 213.2 | 165.3 | 131.1 | 107.7 | 65.0 |
| 50° | 253.8 | 250.6 | 254.8 | 258.0 | 250.6 | 213.2 | 171.7 | 137.5 | 112.0 | 92.8 | 58.6 |
| 52.5° | 182.3 | 185.5 | 194.1 | 203.6 | 199.4 | 169.5 | 138.6 | 112.0 | 93.8 | 77.8 | 48.0 |
| 55° | 126.9 | 133.3 | 141.8 | 156.7 | 150.3 | 130.1 | 107.7 | 90.6 | 72.5 | 61.8 | 40.5 |
| 57.5° | 84.2 | 87.4 | 99.2 | 115.2 | 110.9 | 97.0 | 82.1 | 68.2 | 55.4 | 46.9 | 33.1 |
| 60° | 54.4 | 56.5 | 67.2 | 78.9 | 75.7 | 69.3 | 59.7 | 50.1 | 43.7 | 39.5 | 27.7 |
| 62.5° | 35.2 | 37.3 | 44.8 | 52.2 | 52.2 | 46.9 | 40.5 | 38.4 | 35.2 | 32.0 | 23.5 |
| 65° | 23.5 | 25.6 | 30.9 | 36.3 | 34.1 | 32.0 | 28.8 | 28.8 | 27.7 | 25.6 | 19.2 |
| 67.5° | 16.0 | 17.1 | 21.3 | 23.5 | 22.4 | 20.3 | 20.3 | 22.4 | 21.3 | 19.2 | 13.9 |
| 70° | 10.7 | 11.7 | 13.9 | 14.9 | 13.9 | 12.8 | 13.9 | 16.0 | 14.9 | 13.9 | 10.7 |
| 72.5° | 7.5 | 7.5 | 8.5 | 8.5 | 8.5 | 8.5 | 9.6 | 10.7 | 10.7 | 9.6 | 7.5 |
| 75° | 4.3 | 4.3 | 4.3 | 5.3 | 5.3 | 5.3 | 6.4 | 6.4 | 6.4 | 6.4 | 4.3 |
| 77.5° | 2.1 | 2.1 | 2.1 | 2.1 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 3.2 | 2.1 |
| 80° | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 |
| 82.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 1.1 | 1.1 |
| 85° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 1.1 | 1.1 | 0.0 |
| 87.5° | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 1.1 | 1.1 | 0.0 |
| 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° | 843.4 | 843.4 | 843.4 |
| 2.5° | 797.5 | 784.7 | 781.5 |
| 5° | 732.5 | 694.1 | 680.2 |
| 7.5° | 648.3 | 603.5 | 591.8 |
| 10° | 569.4 | 519.2 | 501.1 |
| 12.5° | 497.9 | 444.6 | 430.8 |
| 15° | 430.8 | 380.6 | 367.8 |
| 17.5° | 373.2 | 328.4 | 315.6 |
| 20° | 322.0 | 281.5 | 267.6 |
| 22.5° | 277.2 | 239.9 | 228.2 |
| 25° | 235.6 | 203.6 | 198.3 |
| 27.5° | 201.5 | 175.9 | 171.7 |
| 30° | 170.6 | 151.4 | 149.3 |
| 32.5° | 145.0 | 131.1 | 132.2 |
| 35° | 123.7 | 115.2 | 116.2 |
| 37.5° | 107.7 | 100.2 | 104.5 |
| 40° | 89.6 | 87.4 | 91.7 |
| 42.5° | 76.8 | 76.8 | 81.0 |
| 45° | 65.0 | 68.2 | 72.5 |
| 47.5° | 54.4 | 59.7 | 62.9 |
| 50° | 45.8 | 52.2 | 54.4 |
| 52.5° | 39.5 | 45.8 | 46.9 |
| 55° | 35.2 | 39.5 | 39.5 |
| 57.5° | 30.9 | 33.1 | 33.1 |
| 60° | 25.6 | 27.7 | 27.7 |
| 62.5° | 21.3 | 22.4 | 22.4 |
| 65° | 17.1 | 18.1 | 18.1 |
| 67.5° | 13.9 | 13.9 | 13.9 |
| 70° | 10.7 | 9.6 | 9.6 |
| 72.5° | 6.4 | 6.4 | 5.3 |
| 75° | 3.2 | 2.1 | 2.1 |
| 77.5° | 1.1 | 1.1 | 0.0 |
| 80° | 0.0 | 0.0 | 0.0 |
| 82.5° | 0.0 | 0.0 | 0.0 |
| 85° | 0.0 | 0.0 | 0.0 |
| 87.5° | 0.0 | 0.0 | 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
Cooper Lighting Solutions Photometric Lab
1121 Highway 74 South
Peachtree City, GA 30269

Scaled Data Report





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

Signify Classified - Internal
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Scaled Data Report



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Scaled Data Report



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Scaled Data Report



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Scaled Data Report



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