

ORDERING INFORMATION

| Capacity | Color | Micropipette Stock No. |
|----------|--------|---------------------------|
| 5 ul | Orange | MP-5 |
| 10 ul | Violet | MP-10 |
| 20 ul | Copper | MP-20 |
| 25 ul | Brown | MP-25 |
| 30 ul | Black | MP-30 |
| 50 ul | Blue | MP-50 |
| 100 ul | Red | MP-100 |
| 200 ul | Green | MP-200 |
| 250 ul | Gold | MP-250 |
| 300 ul | Lime | MP-300 |
| 400 ul | Black | MAP-400 |
| 500 ul | Blue | MAP-500 |
| 750 ul | Green | MAP-750 |
| 1000 ul | Red | MAP-1000 |

Tips, Disposable, Polypropylene

Stock No. MPT-2

Recommended for use with 1 μ l through approx. 150 μ l pipettes. Maximum dispensing volume up to approx. 200 μ l for special applications. Overall length—approx. 2 $\frac{3}{4}$ ".

Stock No. MPT-4

Recommended for pipettes dispensing 200 μ l through 1,000 μ l. Overall length—approx. 3".

WORK STATION, PIPET (pfs)

W 0126 Recommended for use with all MP and MAP pipets.

REPLACEMENT SPRINGS FOR SIGMA FIXED VOLUME PIPETS (pfs)

- S 5010** For MP-5 through MP-100 Pipets
- S 4260** For MP-200 through MP-300 Pipets
- S 1890** For MP-500 through MP-1000 Pipets
- S 6511** For MP-1100 through MP-5000 Pipets

Sigma warrants that its products conform to the information contained in this and other Sigma publications. Purchaser must determine the suitability of the product for its particular use. See reverse side of invoice or packing slip for additional terms and conditions of sale.

SIGMA[®]

CHEMICAL COMPANY

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Telephone 314-771-5750

SIGMA Micropipettes



Note: The printing on a few of our pipettes has tended to wear off prematurely. Please let us know if this occurs.

Thank you for your cooperation.

Please read instructions for best results with your precision-made SIGMA Micropipette.

PRECISION PIPETTING INSTRUCTIONS



Fig. 1

1. Hold the SIGMA Micro-pipette perpendicular to the work station. Thrust the nozzle firmly into a clean tip and lift out the instrument with tip affixed. (Fig. 1).

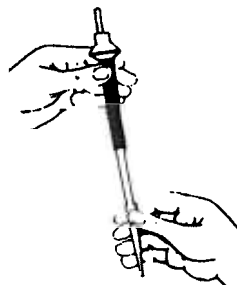


Fig. 2

2. Holding the Micropipette in hand, give a slight twist to the tip to insure a tight seal. (Fig. 2).



Fig. 3

3. Depress the plunger completely before entry into sample solution. (Fig. 3).— See NOTES.



Fig. 4

4. Immerse the tip approximately 1/8" into the sample solution. (Fig. 4).



Fig. 5

5. Allow the plunger to return slowly to the release position. (Fig. 5).

6. Remove the tip from the sample solution. Without touching the tip opening, wipe off any excess sample with a lint-free wiper.

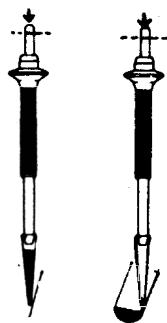


Fig. 6 **Fig. 7**

7. To complete empty the contents of the tip, hold the point against the wall of the receiving vessel (Fig. 6) and depress the plunger slowly to the stop. (Fig. 7). The capillary action between the wall of the receiving vessel and the tip is an important consideration in assuring that all of the sample has been dispensed from the tip.



Fig. 8

8a. After all of the contents have been dispensed, move the tip away from the wall of the receiving vessel before allowing the plunger to return to its release position. (Fig. 8).

8b. There are applications where it is necessary to dispense the contents of the tip into a solution already present in the receiving vessel, without holding the point against the wall. After dispensing all the contents and before releasing the plunger, touch the tip point against the wall to remove any sample residue. Then, move point away from wall and release the plunger. (Figs. 7 & 8).

9. Remove the used tip.

Notes

Occasionally, it is possible that the collar and nozzle of the Micropipette have become loosened in transport. Before using, hand tighten the collar firmly onto the barrel. Then check the nozzle and also firmly hand tighten onto barrel.

At the start of each day's operation, depress and release plunger a few times. Because of the strong positive action of the Micropipette, it is necessary to depress and release the plunger **smoothly** and **slowly**.

After prolonged use, the disposable tips may leave a thin film of plastic on the nozzle. This may cause the SIGMA precision disposable tips not to seat properly. This film may be removed by cleaning off the end of the nozzle with water and a detergent.

The SIGMA Micropipette has been designed to operate with SIGMA precision disposable tips. Other varieties of tips may appear to fit the Micropipette, but performance accuracy ($\pm 1\%$) can be guaranteed only when Sigma disposable tips are used.

Guarantee

The SIGMA Micropipette is unconditionally guaranteed for one year. If, for any reason, other than misuse, the Micropipette fails, return the instrument to SIGMA and it will be repaired or replaced at no charge.

Performance

The following statistical data were obtained utilizing gravimetric measurements. An analytical balance, sensitive to 0.01 milligrams, was used.

Since the Micropipette is designed to deliver micro-quantities, the operating temperature is an important consideration. Each SIGMA Micropipette is rated and calibrated to deliver an intended volume with an accuracy of $\pm 1\%$ at 20-22°C.

Prior to making the tests, distilled water, Micropipette, and disposable tips were brought to 20-22°C.

REPRODUCTION OF ACCURACY PER SINGLE UNIT MICROPIPETTE.

PROCEDURE: each Micropipette received 20 consecutive tests. A new tip was used for each test.

| Size | Mean Value | Standard Deviation | Coefficient of Variation | Coefficient of Accuracy |
|---------|------------|--------------------|--------------------------|-------------------------|
| 5 ul | 5.005 ul | 0.022 ul | 0.4% | 0.1% |
| 10 ul | 10.05 ul | 0.03 ul | 0.3% | 0.5% |
| 20 ul | 20.00 ul | 0.06 ul | 0.3% | 0.0% |
| 25 ul | 25.00 ul | 0.07 ul | 0.2% | 0.0% |
| 30 ul | 29.93 ul | 0.15 ul | 0.5% | 0.2% |
| 50 ul | 50.11 ul | 0.11 ul | 0.2% | 0.2% |
| 100 ul | 100.59 ul | 0.22 ul | 0.2% | 0.5% |
| 200 ul | 200.31 ul | 0.38 ul | 0.1% | 0.1% |
| 250 ul | 251.05 ul | 0.53 ul | 0.2% | 0.4% |
| 300 ul | 301.19 ul | 0.99 ul | 0.3% | 0.3% |
| 400 ul | 399.54 ul | 2.20 ul | 0.6% | 0.1% |
| 500 ul | 500.55 ul | 1.53 ul | 0.3% | 0.1% |
| 750 ul | 750.65 ul | 1.22 ul | 0.1% | 0.0% |
| 1000 ul | 1006.30 ul | 3.27 ul | 0.3% | 0.6% |

PERFORMANCE PER BATCH OF MICROPIPETTES.

PROCEDURE: In each test, 20 different Micropipettes were used. A new tip was used for each test.

| Size | Mean Value | Standard Deviation | Coefficient of Variation | Coefficient of Accuracy |
|---------|------------|--------------------|--------------------------|-------------------------|
| 5 ul | 5.005 ul | 0.025 ul | 0.4% | 0.1% |
| 10 ul | 10.00 ul | 0.04 ul | 0.4% | 0.0% |
| 20 ul | 20.00 ul | 0.11 ul | 0.5% | 0.0% |
| 25 ul | 25.05 ul | 0.12 ul | 0.4% | 0.2% |
| 30 ul | 29.96 ul | 0.17 ul | 0.5% | 0.1% |
| 50 ul | 50.10 ul | 0.28 ul | 0.5% | 0.2% |
| 100 ul | 99.88 ul | 0.50 ul | 0.5% | 0.1% |
| 200 ul | 200.77 ul | 0.83 ul | 0.4% | 0.3% |
| 250 ul | 251.22 ul | 0.97 ul | 0.3% | 0.4% |
| 300 ul | 301.67 ul | 1.42 ul | 0.4% | 0.5% |
| 400 ul | 399.58 ul | 2.71 ul | 0.7% | 0.1% |
| 500 ul | 500.66 ul | 2.09 ul | 0.4% | 0.1% |
| 750 ul | 750.36 ul | 1.29 ul | 0.1% | 0.0% |
| 1000 ul | 1003.63 ul | 3.81 ul | 0.3% | 0.3% |