



Lab Techniques: Using a Micropipettor

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Micropipettor: Introduction

- A micropipettor is a tool used to measure and transfer small volumes of liquids.
- Micropipettors are adjustable and come with different volume ranges.
 - Examples: 0.5-10 μ l
10-100 μ l
20-200 μ l
100-1000 μ l
- Disposable tips are used with micropipettors for liquid transfer.



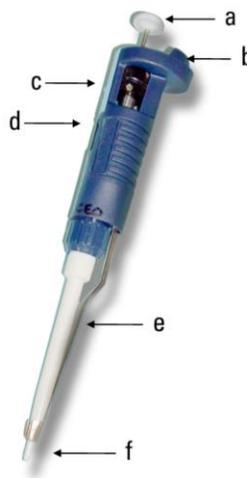
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Micropipettor: Introduction

A Micropipettor, referred to as a pipetman® in many labs, is a tool used to precisely measure liquids in microliters. Some micropipettors measure volumes up to 5 milliliters, but generally micropipettors are used to measure and dispense volumes smaller than one milliliter. Each micropipettor has an upper and lower volume dispensing limit. The lower limit is usually 10% of the upper limit. Most micropipettors have the volume ranges stated on the top of the plunger. The examples above show some of the typical volume dispensing ranges. Disposable tips, color coded by size, are used with micropipettors to hold the liquid being transferred.

Micropipettor: Parts

- a. Plunger button
- b. Tip ejector button
- c. Volume adjustment dial
- d. Digital volume indicator
- e. Shaft
- f. Attachment point for a disposable tip



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Micropipettor: parts

Micropipettors are produced by various manufacturers, but they all share some common features. The basic micropipettors parts are (refer to the above diagram):

a: Plunger button - has two resistances points. Try both so you are familiar with them. The volume range the micropipettor can dispense is usually written on the top of the plunger button.

b: Tip ejector button - depresses to release used tips.

c: Volume adjustment dial – adjust to set the volume to be accurately measured and transferred.

d: Digital volume indicator - displays the exact quantities to be measured in microliters.

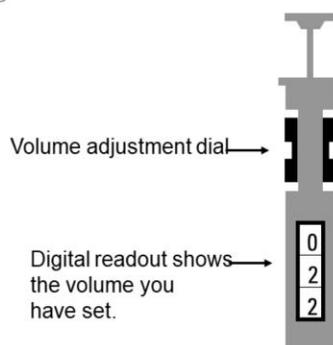
e: Shaft - holds the parts responsible for the displacement of the air in the tip and accommodates the disposable tips.

f: Disposable tips - plastic tips color coded by size, which hold the liquid to be measured and transferred. After each use, it is important to release the tips into a designated container for disposables. Do not point the micropipettor towards anyone while ejecting tips.

Image Reference:

Micropipettor: Setting the Volume

- Select the desired volume to be measured by rotating the volume adjustment knob.



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Micropipettor: Setting the volume

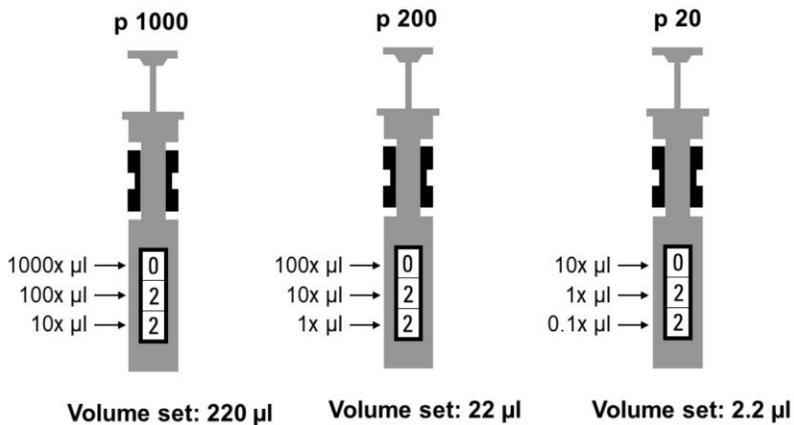
To begin, you must learn how to adjust the volume. The digital readout displays the volume to be measured. Rotate the volume adjustment dial to change the numbers on the digital readout.

Graphic Reference:

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Micropipettor: Reading the Volume

- Each size of micropipettor has a different readout.



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Micropipettor: Reading the volume

The readout is a different for each size of micropipettor. Refer to the diagram above for the calculations. Do not use a micropipettor to transfer quantities higher or lower than the indicated volume ranges.

Graphic Reference:

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Micropipettor: Inserting a Tip

1. Select the correct size tip.
2. Lift the lid off the tip container without touching the tips with your hands.
3. Insert the micropipettor shaft into a tip and press down firmly. This should attach the tip to the micropipettor.
4. Remove the micropipettor with tip attached from the box.



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Micropipettor: Inserting a tip

Once the volume is set, you can insert a disposable tip and start the transfer process. It is important to learn how to hold a micropipettor. The best method for holding a micropipettor is to place it in the palm of your hands and curl your fingers around it, so that the tip ejector button is pointed away from you. This will prevent accidental release of the tip. Experiment with the plunger button to get a feel for the two resistance points.

Locate a box of correct size tips. Sterile tips may be purchased if the experiment requires sterile conditions. Open the tip box lid without touching any of the tips inside. Insert the micropipettor shaft inside a tip and press down firmly. Remove the micropipettor with attached tip from the box and make sure the tip does not touch anything.

Micropipettor: Loading the Tip

1. Holding the micropipettor vertically, push the plunger button to the first resistance point.
2. While holding the plunger button down at the first resistance point, immerse the disposable tip into the liquid sample.
3. Slowly release the plunger button and watch as the liquid to be measured is drawn into the tip.
4. Withdraw the tip from the sample.



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Micropipettor: Loading the Tip

Once the volume is set and the disposable tip is firmly placed on the shaft, you can begin the liquid transfer process. Depress the plunger button to the first resistance point and hold. Next, immerse the disposable tip into the liquid sample. Be careful only to immerse the tip and not the shaft of the micropipettor into the sample. Gently release the plunger drawing fluid into the tip. It is important to do this **slowly**, or you will create bubbles and “splash” the liquid inside the tip. Splashing contaminates the sample, the shaft and the piston space inside the shaft.

Micropipettor: Transferring the Liquid

1. Place the tip in the receiving tube and gently dispense the sample by depressing the plunger button. Push the plunger to the second resistance point to discharge all the liquid.
2. Discard the tip in a waste container by depressing the tip ejector button.



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Micropipettor: Transferring the Liquid

Holding the micropipettor vertically, place the tip in the receiving tube and gently dispense the sample by depressing the plunger to the first resistance point. After a brief pause, push the plunger to the second resistance point to fully discharge the liquid. It is important to avoid any contact between the micropipettor shaft and the receiving tube. Eject the tip in a waste container by depressing the tip ejector.

Micropipettor: Review

1. What part of the micropipettor is used to hold the liquid being transferred?
2. To “load” a micropipettor with liquid, depress the _____ to the first _____ point.
3. Digital volume indicator displays the exact quantities to be measured in _____.
4. The second resistance point is used only to _____ the liquid.



Micropipettor: review

1. disposable tip
2. plunger button, resistance
3. microliters
4. dispense