



# **Standard Operating Procedure (SOP) for Automatic pipettes**

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Dr. Ragauskas group safety meeting



# General scope

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- Automatic pipettes are used to accurately transfer small liquid volumes.
- Glass pipettes are not highly accurate for volumes less than 1 milliliter (1 ml), but the automatic pipettes are both accurate and precise.
- Each pipette can be set to transfer any volume within its own volume range (for adjustable pipette)

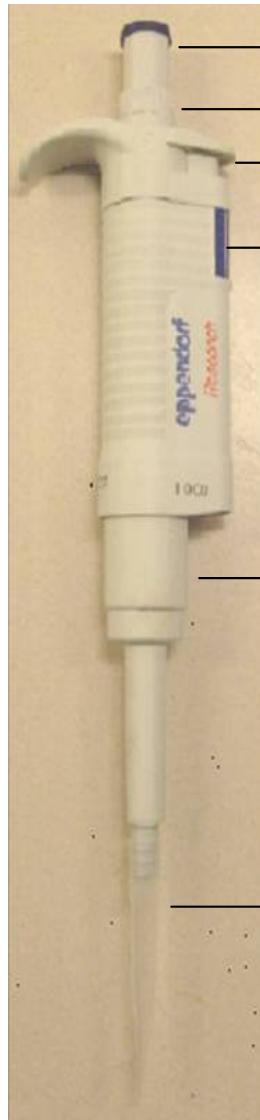


# Prior to use automatic pipette

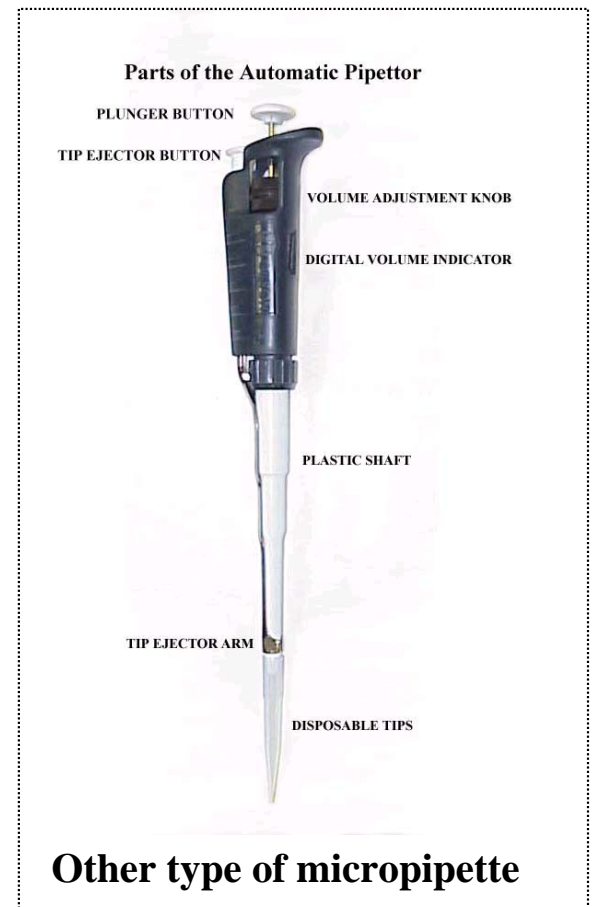
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- Select the proper automatic pipette to transfer a specified volume of sample.
- Select the proper pipette tips.
- Set a specified volume on the volume indicator using the volume setting ring (adjustment knob).
- Read a digital volume in both micro liter ( $\mu\text{l}$ ) and milliliter (ml) units depending on its own volume.
- Operate the control button properly for aspirating or dispensing the sample.

# Parts of the automatic Pipette

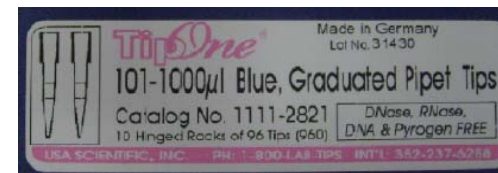
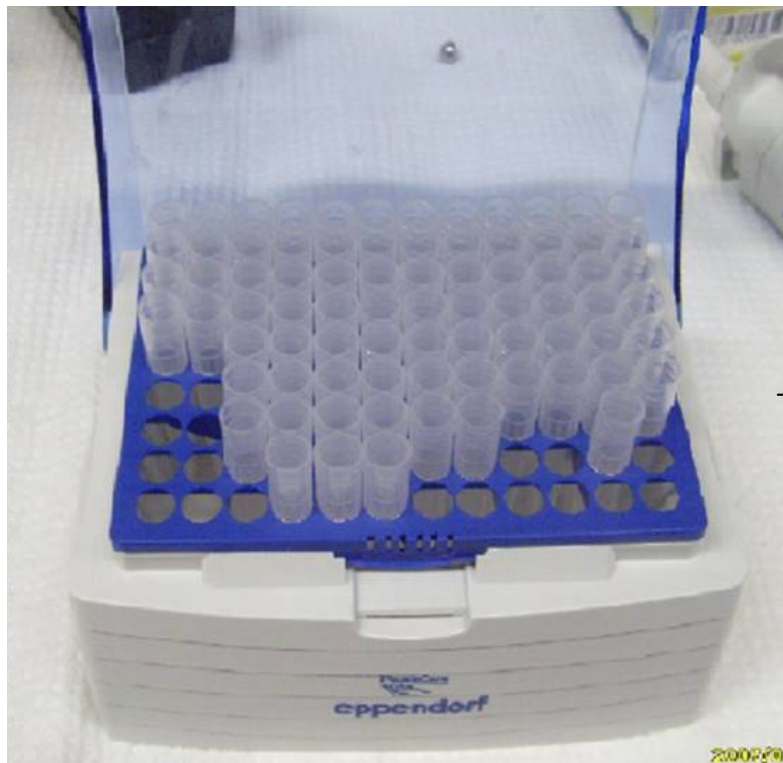


- Control button: to aspirate or dispense sample
- Setting ring (or Volum adjustment knob) : to set the volume
- Ejection button : tip ejection
- Digital volume indicator
- Ejection sleeve
- Disposable tips



# Parts of the Pipette tips

Pipette tips are located in the rack.  
Tip size is noted on the side of the rack.



cf.) the color of the control buttons corresponds to the color of the Eppendorf tip racks.

# Step-wise Operation

1. Set the volume
2. Attach disposable tip
3. Depress the control button to the first stop
4. Immerse tip in sample
5. Draw up the sample
6. Pause
7. Withdraw the tip
8. Dispense the sample
9. Withdraw the pipette
10. Release control button
11. Discard the tip



**Based on the Eppendorf pipette**

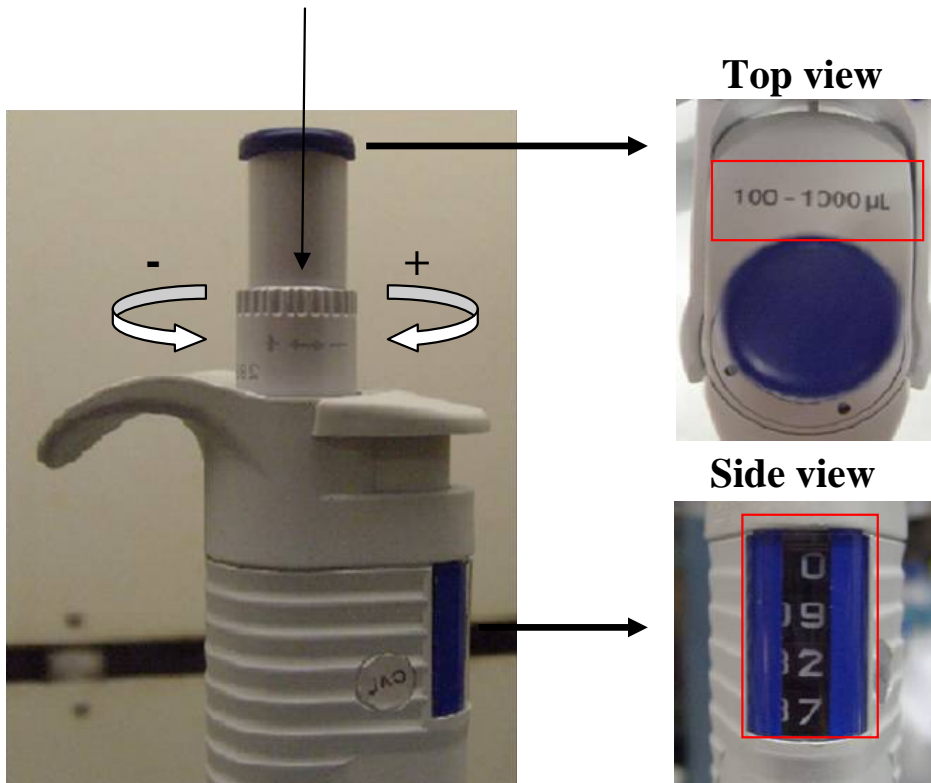
# Operating the Micropipette

## Step 1: Set the Volume

### Eppendorf Research Type

Volume Setting Ring

Digital Volume Indicator



- The volume can be changed continuously by rotating the setting ring.
- The figures (side view) in the digital indicator are read from top to bottom.
- It is advisable to carry out volume setting from the higher down to the lower value.

# Operating the Micropipette

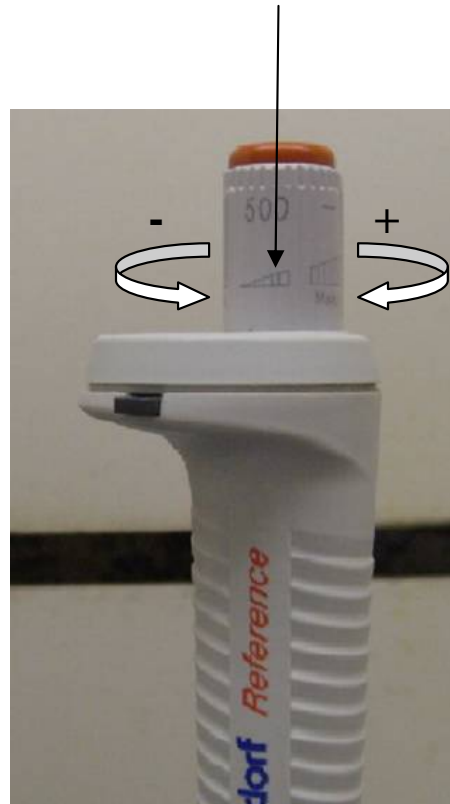
## Step 1: Set the Volume

### Eppendorf Reference Type

**Control Lock**



**Volume Setting Ring**



- First you have to push the **Control Lock** button.
- Then the volume can be changed continuously by rotating the setting ring.
- After setting volume, release the **Control Lock** button
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**Do not rotating the volume setting ring without pushing the control Lock button!**

# Operating the Micropipette

## Step 1: Set the Volume

### Gilson Pipetman Type

#### Volume Adjustment Knob

#### Digital Volume Indicator



- The volume can be changed continuously by rotating the volume Adjustment Knob.
- The figures (side view) in the digital indicator are read from top to bottom.
- It is advisable to carry out volume setting from the higher down to the lower value.

# Operating the Micropipette

## Step 1: Read the Volume – cont.

### Eppendorf Reference/Research Type

The Figures in the digital indicator are read from top to bottom.



<b>Max.</b>	10 mL	200 mL	1000 mL	5000 mL	10 mL
<b>min.</b>	0.5 mL	20 mL	100 mL	500 mL	1 mL
<b>Display</b>	9.51 mL	87.4 mL	927 mL	1475 mL	4.97 mL

# Operating the Micropipette

## Step 1: Read the Volume – cont.

### Gilson Pipetman Type

The Figures in the digital indicator are read from top to bottom.

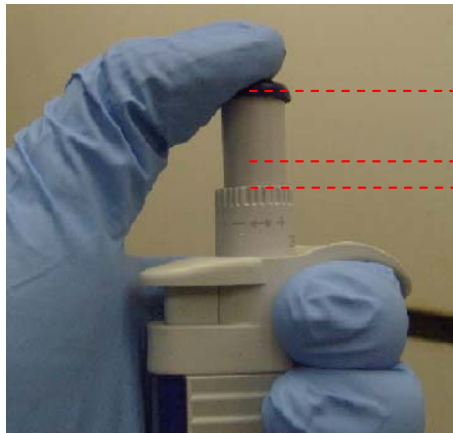


<b>Max.</b>	20 mL	200 mL	1000 mL
<b>min.</b>	2 mL	20 mL	100 mL
<b>Display</b>	6.86 mL	132.4 mL	262 mL

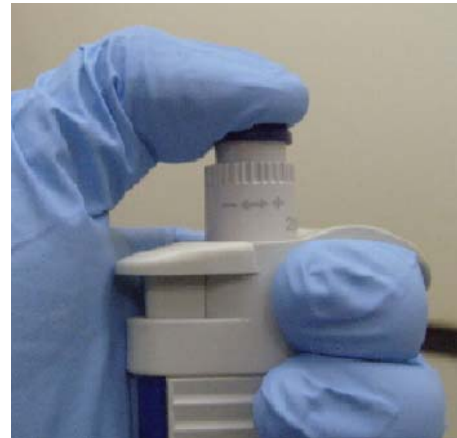
# Operating the Micropipette

## Step 3 ~ Step 5

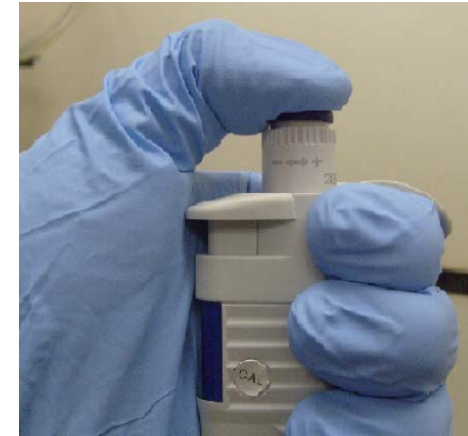
### Step 3: Depress the Control button to the First Stop



a) Start Dispensing



b) 1<sup>st</sup> Stop: dispense



c) 2<sup>nd</sup> Stop: Expel

### Step 4: Immerse Tip in Sample

### Step 5: Draw up the sample

To aspirate the sample into the tip:

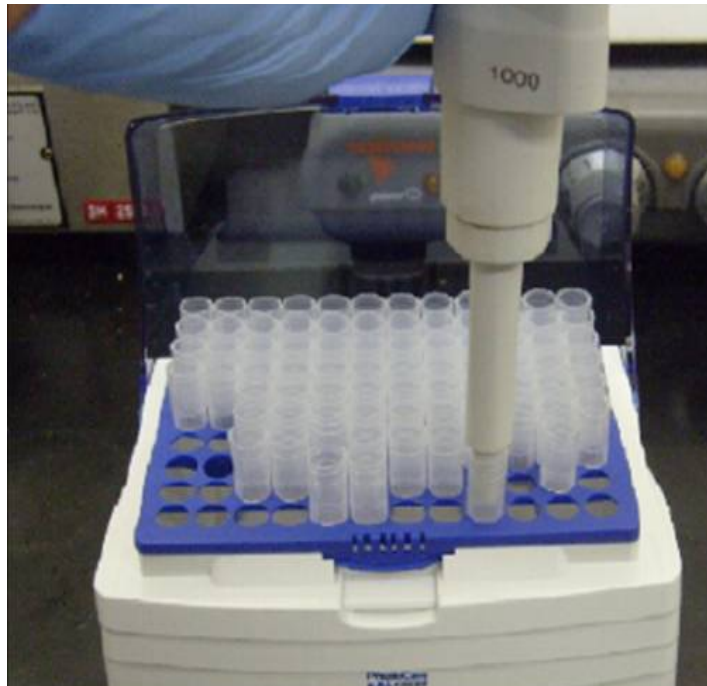
- Allow the control button to return **slowly and smoothly** to the fully extended up position.
- Never let the control button snap up! This draws the exact calibrated volume into the tip if the tip remains below the liquid surface during withdrawal.

## Operating the Micropipette

# Step 2: Attach the Disposable Tip

**The end of pipette is set in the top of tip.**

**Tap the pipette one or two times vertically.**



**Example of tip sizes:**

## Step 6 ~ Step 7

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### Step 6: Pause

Wait a few seconds to ensure that the full volume of sample is drawn into the plastic tip. **WAIT LONGER FOR LARGER VOLUMES. WAIT LONGER FOR MORE VISCOUS ("SYRUP-LIKE") SUBSTANCES.**

### Step 7: Withdraw the Tip



- a. Remove the tip from the sample liquid.
- b. No liquid should remain on the outside of the tip.
- c. Wipe away any droplets on the outside of the tip with a lint-free tissue, such as KIMWIPES, but only wipe droplets from the side of the tip.
- d. **NEVER TOUCH THE TIP OPENING** or you may absorb part of your sample.

## Step 8 ~ Step 9

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### **Step 8: Dispense the Sample**

To dispense the sample from the pipette:

- a. Touch the tip end to the side wall of the receiving vessel
- b. Depress the control button to the **FIRST STOP**.
- c. Pause for at least one second or longer for viscous liquids.
- d. Press the control button to the **SECOND STOP** to expel any residual liquid in the tip

### **Step 9: Withdraw the Pipette**

Withdraw the pipette from the receiving vessel carefully, sliding the tip along the wall of the vessel.

Holding the tip against the side of vessel is especially important when transferring small volumes of liquid.

# Operating the Micropipette

## Step 10 ~ Step 11

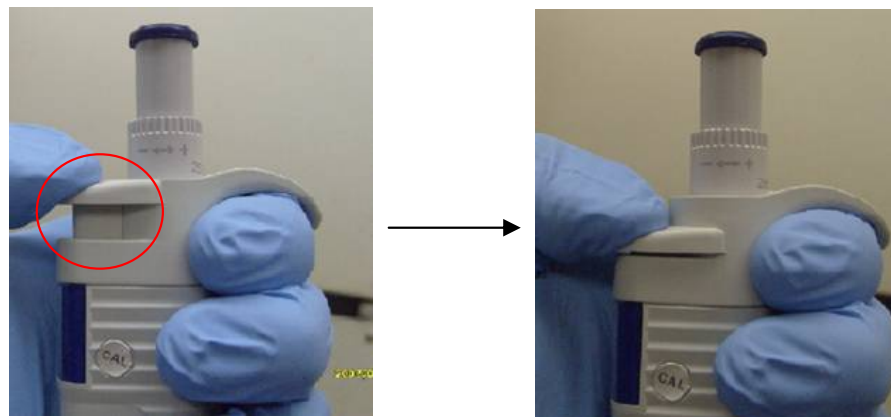
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### Step 10: Release the setting button

**Gently allow the setting button to return to the UP position.  
DO NOT allow it to SPRING BACK (down position)!**

### Step 11: Discard the Tip

**Discard the tip by depressing the tip ejector button, as shown below. A fresh tip should be used for each sample to prevent contamination.**



**Press ejector button to discard tip.**



# Pipetting Guidelines

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1. Consistent **SPEED** and **SMOOTHNESS** when you press and release the control button.
2. Consistent pressure on the control button at the **FIRST STOP**.
3. Consistent and sufficient immersion depth.
4. Nearly vertical positioning of pipette.
5. Avoid all air bubbles in your sample.
6. Never lay the pipette on its side nor invert the pipette if liquid is in the tip.



# Automatic pipette care

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- Do not allow any liquid to enter into the pipette.
- Depending on the frequency of use, all pipettes should be cleaned in a **soap solution** or should be carefully wiped clean using **isopropanol**. They should then be rinsed in **distilled water and dried**. The seals are **maintenance-free** and the **pistons should be lubricated lightly** (using the silicone grease provided) when cleaned or replaced.



# General pipette issues

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- Set the pipette to the desired volume. *Never force the volume adjustment and never exceed the maximum volume for the pipette.*
- A fresh disposable tip is used for each delivery. Do not touch the tip with hands (even if gloved)
- To check for leaks, hold the pipette vertically for approximately 15 seconds with a filled tip. Do not touch the pipette tip. Observe the meniscus of the liquid in the tip. If there is a leak, a droplet is visible on the pipette tip.
- Never lay the pipette down with liquid in the tip because this can cause liquid to flow into the pipette!
- Treat used pipette tips as a chemical waste material



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**For Additional information, see pipette manuals**

**and**

**[http://www.biocompare.com/technicalarticle/519/Brinkmann\(tm\)-sup-Eppendorf\(r\)-sup-SOP-Standard-Operating-Procedure-For-Pipettes-from-Eppendorf-North-America.html](http://www.biocompare.com/technicalarticle/519/Brinkmann(tm)-sup-Eppendorf(r)-sup-SOP-Standard-Operating-Procedure-For-Pipettes-from-Eppendorf-North-America.html)**

**The end**