



# Pipette Challenging Liquids

Pipettes are designed to deliver accurate volumes of aqueous liquids. Here's how to pipette some common non-aqueous liquids.

## 6 Challenging Liquids

**1. Dense (or low-density)**

**2. Foaming**

**3. High Vapor Pressure**

**4. Viscous**

**5. Low Surface Tension**

**6. Infectious, Corrosive, Toxic, Radioactive**

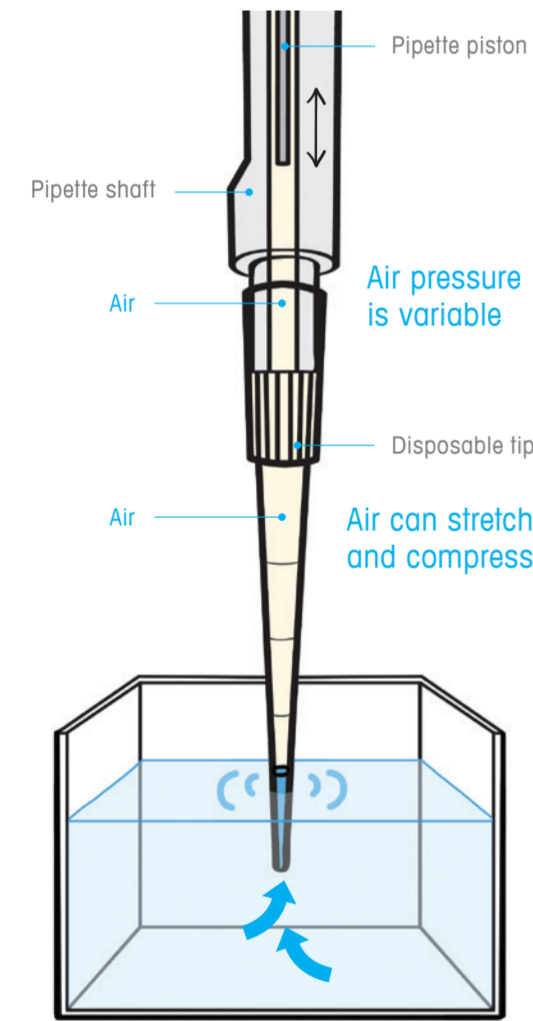
A **positive displacement pipette** is most accurate & precise for these liquids. If that's not an option, these techniques help:

- **Density:** If the solution density is known and an analytical balance is available, then a traditional pipette can be used to determine settings for accurate volume delivery.

Learn to account for density at [mt.com/dense](https://www.mt.com/dense)
- **Foamy:** Pre-rinse the tip, then reverse-pipette slowly. Filter tips protect the pipette from contact with foam.
- **Vapor pressure:** Pre-rinse the tip 5x to equilibrate air and vapor in the pipette chamber. Then reverse-pipette at a constant moderate speed.
- **Viscous:** Reverse-pipette, or use slowed-down regular (forward) pipetting. Low-retention and wide orifice tips help prevent cell shearing and minimize adhesion within the tip.
- **Low tension/high adhesion:** Reverse-pipette. Low-retention tips minimize adhesion.
- **Hazardous:** Use regular (forward) pipetting with filter tips. For low volumes on non-LTS pipettes, 10 µL ShaftGuard tips protect the nozzle from contact with microcentrifuge tubes.

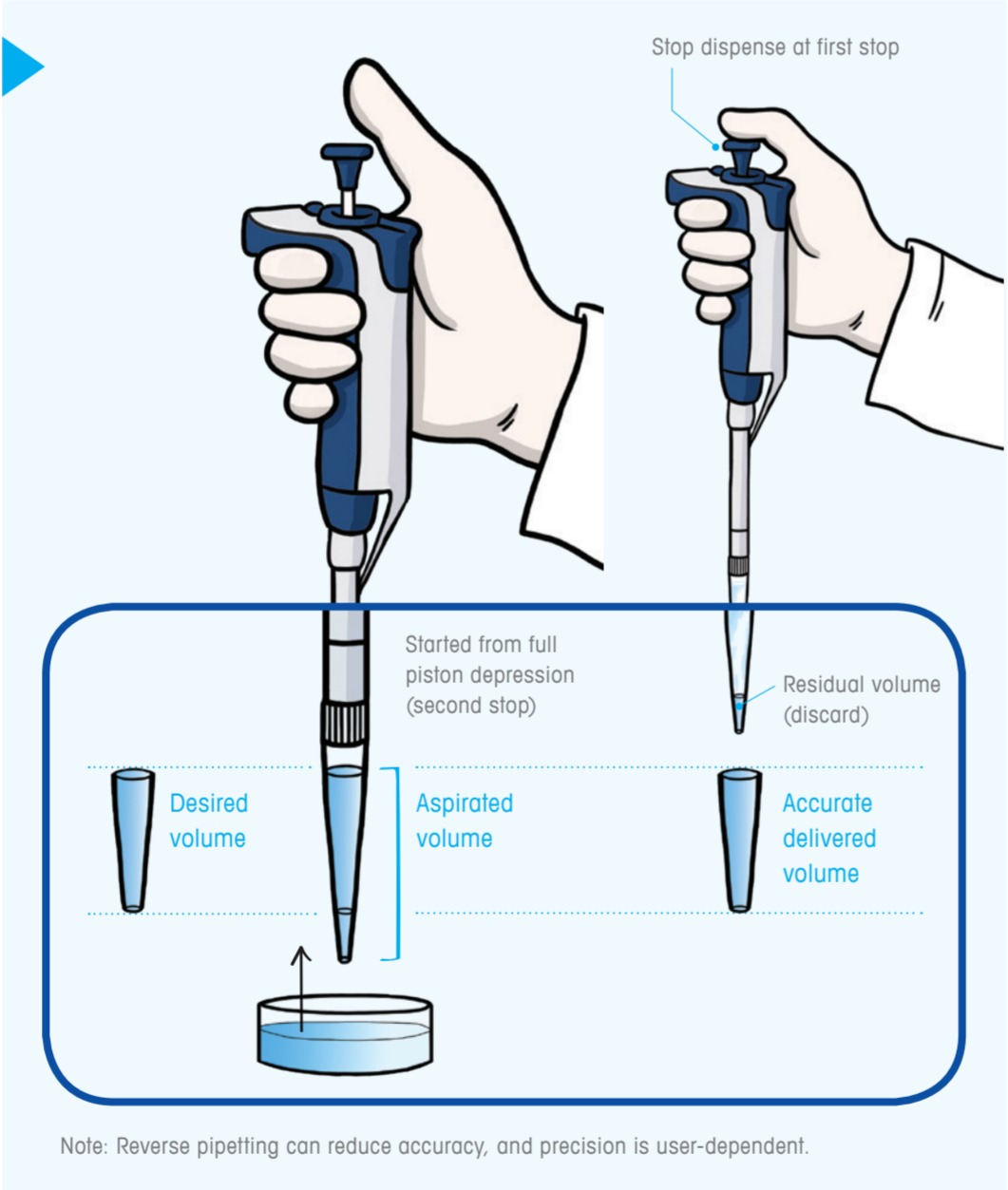
### The Problem Air and Adhesion

Air pressure is variable and liquids can stick to tips.



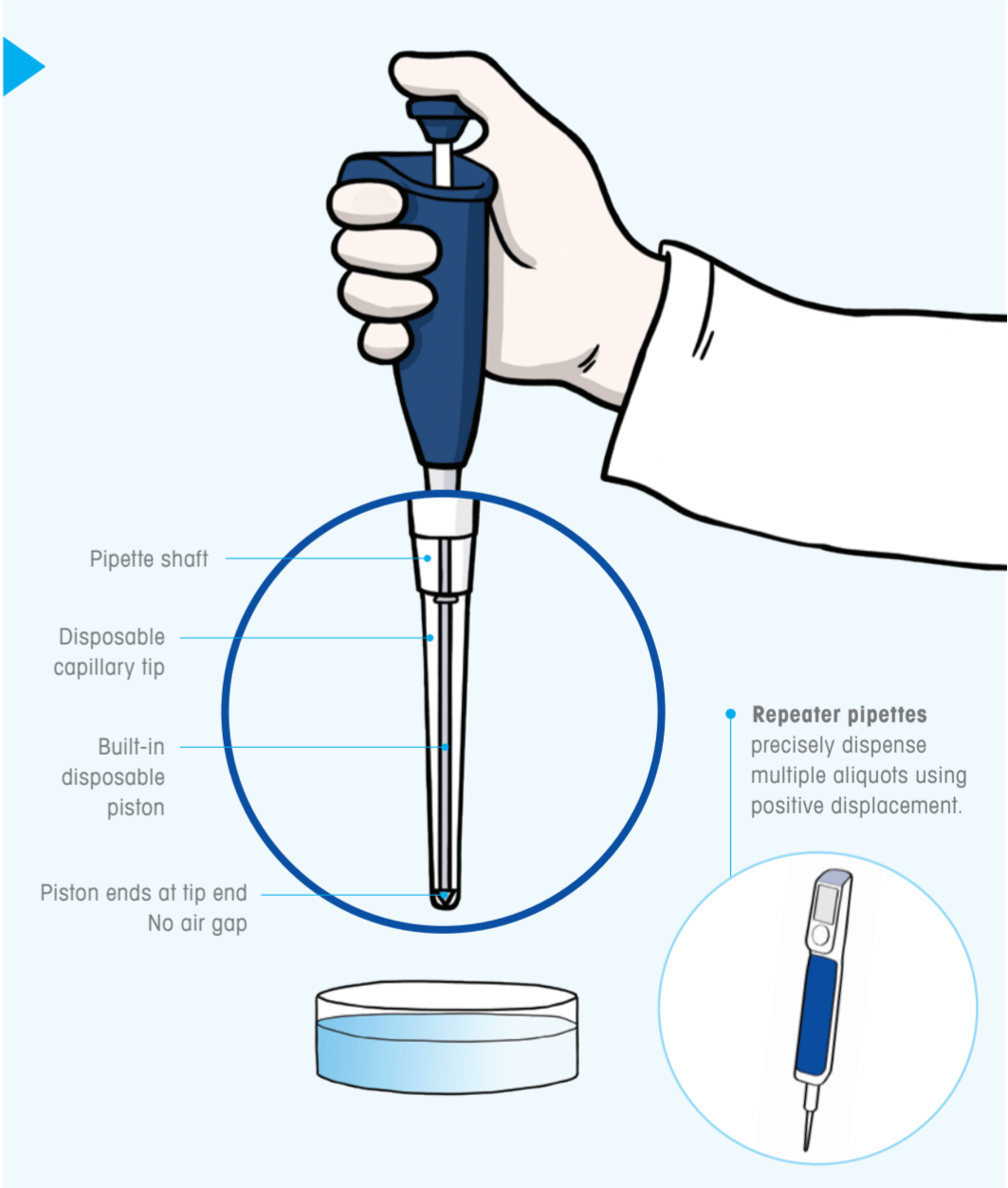
### The Workaround Reverse Pipetting

Aspirate a little extra to dispense the right amount.



### The Solution Positive Displacement Pipettes

No air means no pressure variability and no adhesion.



## Special Tips

**Extended Length**  
For deep receptacles

**Wide Orifice**  
For viscous liquids

**Filter**  
For foaming, fountaining, corrosive or toxic liquids

**Low Retention**  
For viscous and low surface tension liquids

**10 µL ShaftGuard™**  
For shaft and tip ejector protection on universal-fit pipettes

**Capillary Tip**  
Disposable tip for positive displacement pipette includes inner piston

For more about Positive Displacement pipettes, visit [mt.com/pos-d](https://www.mt.com/pos-d)

# RAININ

Feel the difference!