

Master Your Challenging Liquids

When working with challenging liquids, its specific physical characteristics may have an impact on the air-cushion of standard pipettes and thus influence precision and accuracy. Therefore, when working with liquids such as viscous, dense or volatile liquids, special pipetting techniques become essential. A second option is to transfer challenging liquids with positive displacement devices. These instruments can handle most types of liquid and samples are secured in a syringe-like tip.

Problem

Liquid drips out of the tip

Leads to

> Inaccurate volume delivery

Challenging liquid class

> Volatile

Examples

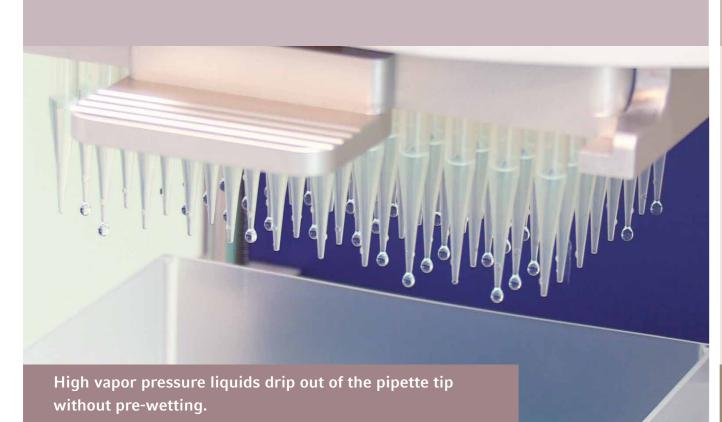
- > Ethanol
- > Low concentrated acetone

Explanation

High vapor pressure liquids lead to expansion of the air-cushion which then leads to liquid dripping.

What to do with air-cushion pipettes?

> Prewet tip min. 5 times by repeated aspiration and dispensing.



Problem Aerosol formation

Leads to

> Contamination of pipette cone and cross-contamination of samples

Challenging liquid class

- > Infectious
- > Toxic

Examples

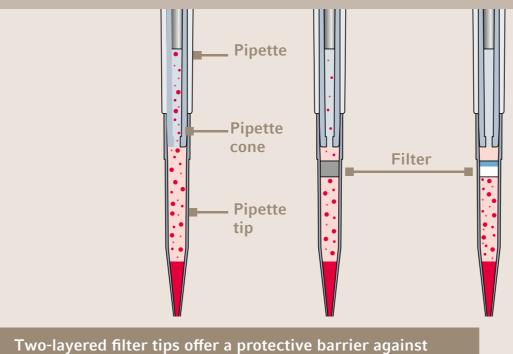
- > Blood
- > Biohazard material
- > DNA/RNA in PCR reactions

Explanation

Aerosols containing contaminated micro-particles can enter the pipette leading to cross-contamination.

What to do with air-cushion pipettes?

- > Use two layered filter pipette tips.
- > Disinfect pipette regularly by wiping with 70% ethanol, or autoclaving.



contamination by aerosols.

Problem Less volume is pipetted than set

Leads to

3

> Inaccurate volume delivery

Challenging liquid class

> Dense

Examples

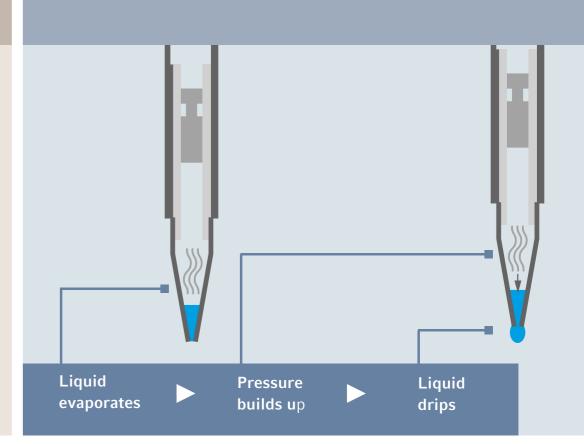
- > Sulfuric acid
- > Phosphoric acid

Explanation

High density of the liquid leads to an expanded air-cushion unable to aspirate the correct volume.

What to do with air-cushion pipettes?

> Pipette must be adjusted.



Problem

Liquid remains in the tip

Leads to inaccurate volume delivery and sample loss

Challenging liquid class

> Viscous

Examples

- > Glycerol
- > 0il

Explanation

Slow flow behavior of liquid because of high inner friction of molecules.

What to do with air-cushion pipettes?

- > Reverse pipetting.
- > Slow aspiration & dispensing speed.



Reverse pipetting shown in 3 steps. The blow-out volume is aspirated additionally and remains in the tip, so that the set volume is delivered accurately.

Challenging liquid class

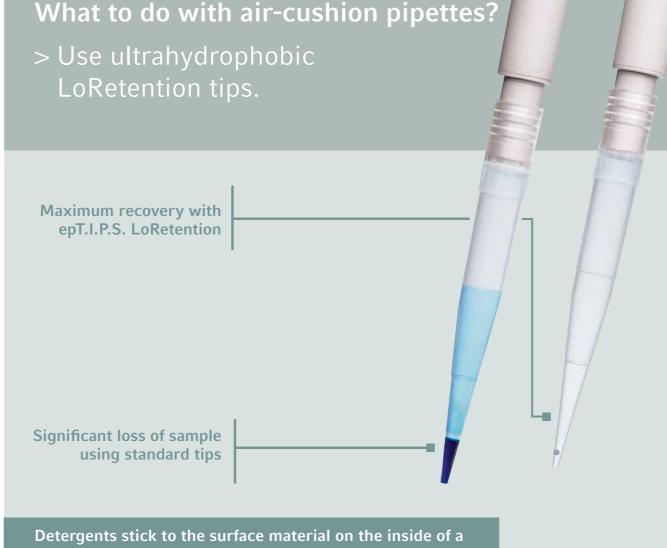
> Detergents

Examples

- > Tween® 20
- > Triton® X-100

Explanation

Detergents stick to classic plastic surfaces, the remaining liquid does not flow down the tip.

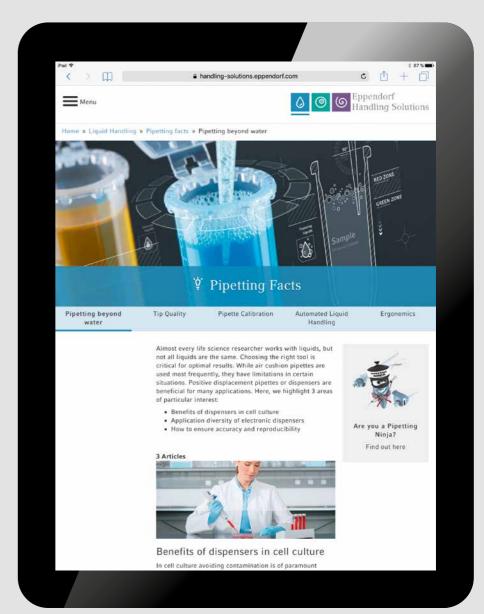


pipette tip. This liquid cannot be dispensed.

Eppendorf Handling Solutions

Are you working with problem liquids or do you wish to improve your pipetting skills? We are developing products and solutions in the areas of Liquid Handling, Cell Handling and Sample Handling. Reproducible results,

optimized workflows, pipetting skills, and the challenges in cell culture are just a few topics presented in this online sphere.





> Learn more about pipetting and have fun as well: www.eppendorf.com/pipetting