

Transferring Non-Aqueous Liquids

Viscosity

Problem: Viscous liquids have a high resistance to flow (e.g. glycerol).

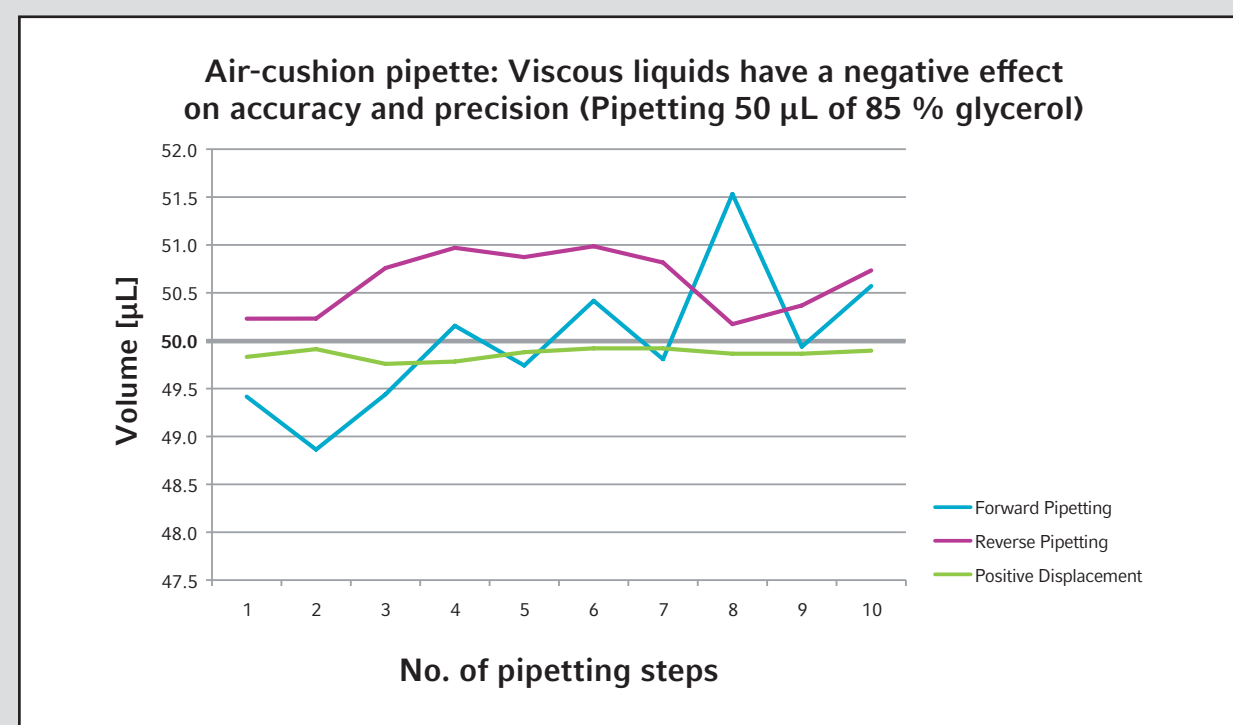
Observation: a) unknown time until liquid has fully risen in tip b) liquid residues stay attached to tip wall.

Prevention air-cushion pipette:

- > Work slowly
- > Reverse pipetting

Recommendation positive displacement:

Sealing lip of piston wipes tip clean.



Density

Problem: The liquid's density influences the size of air cushion (e.g. ethanol).

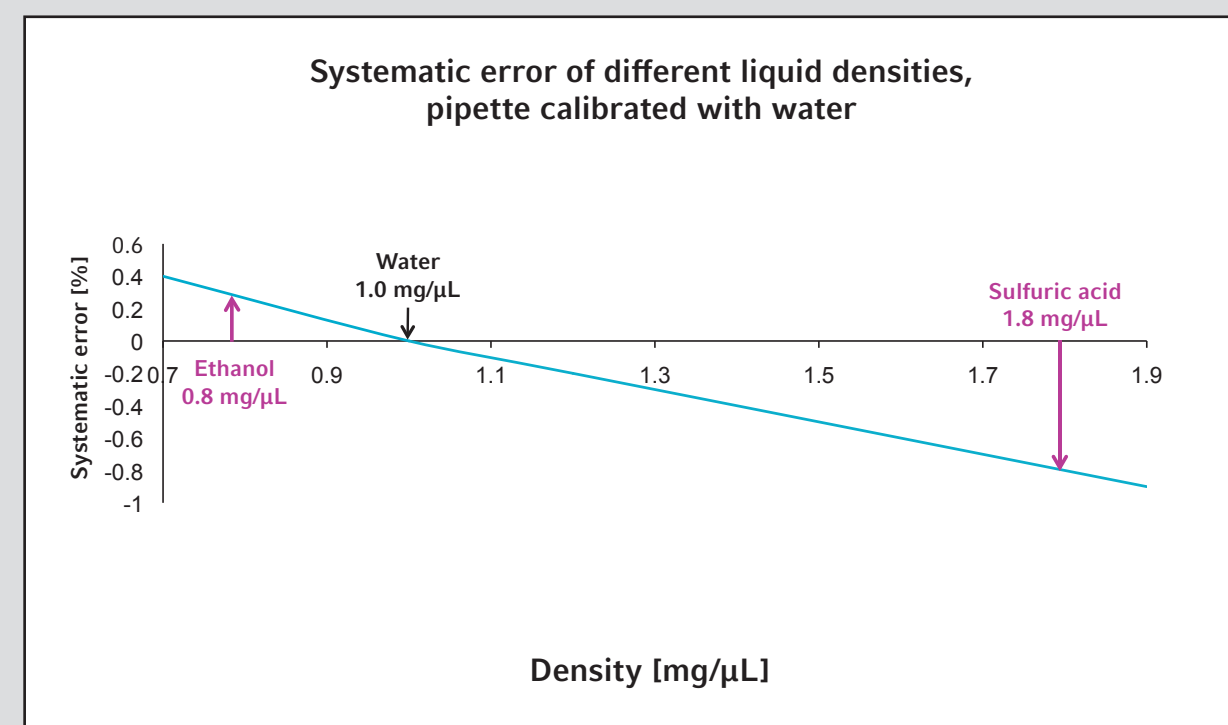
Observation: Too low / too high volume is pipetted.

Prevention air-cushion pipette:

- > Adjust pipette to liquid (becomes fixed-volume pipette for adjusted volume)

Recommendation positive displacement:

No air cushion therefore no problem.



Vapour pressure

Problem: Liquids with high vapour pressure force air cushion to expand (e.g. acetone).

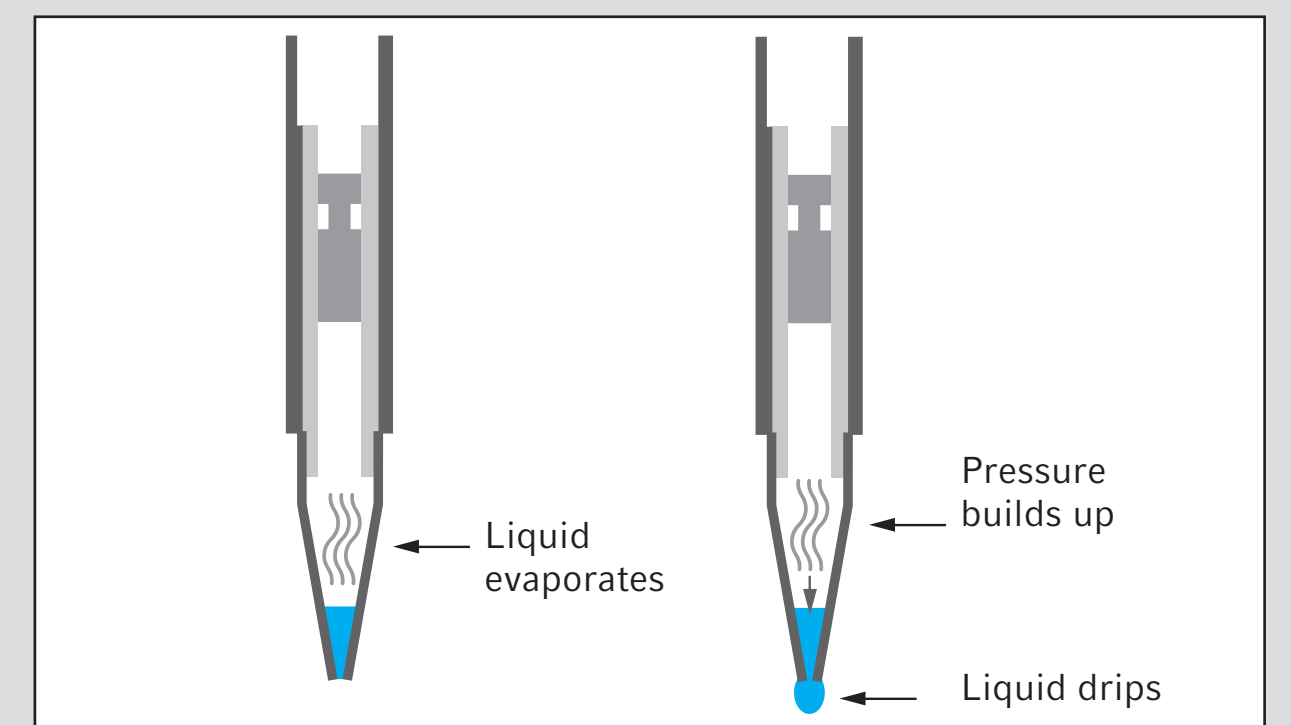
Observation: The pipette drips.

Prevention air-cushion pipette:

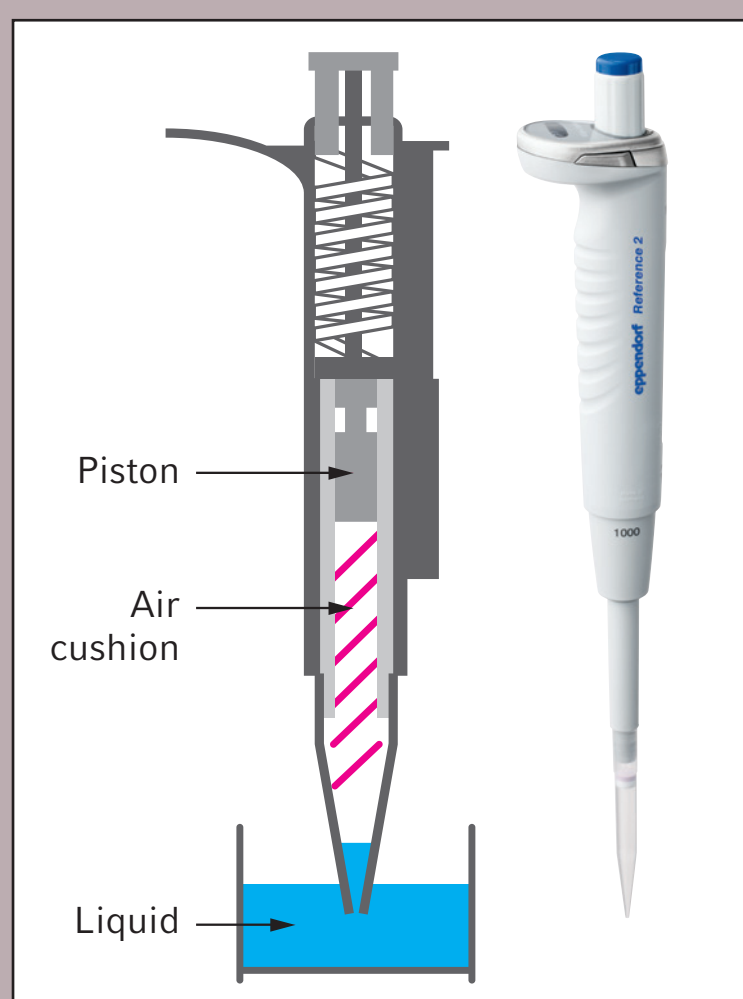
- > Prewet at least 5 times
- > Reverse pipetting (better accuracy, but dripping still occurs)

Recommendation positive displacement:

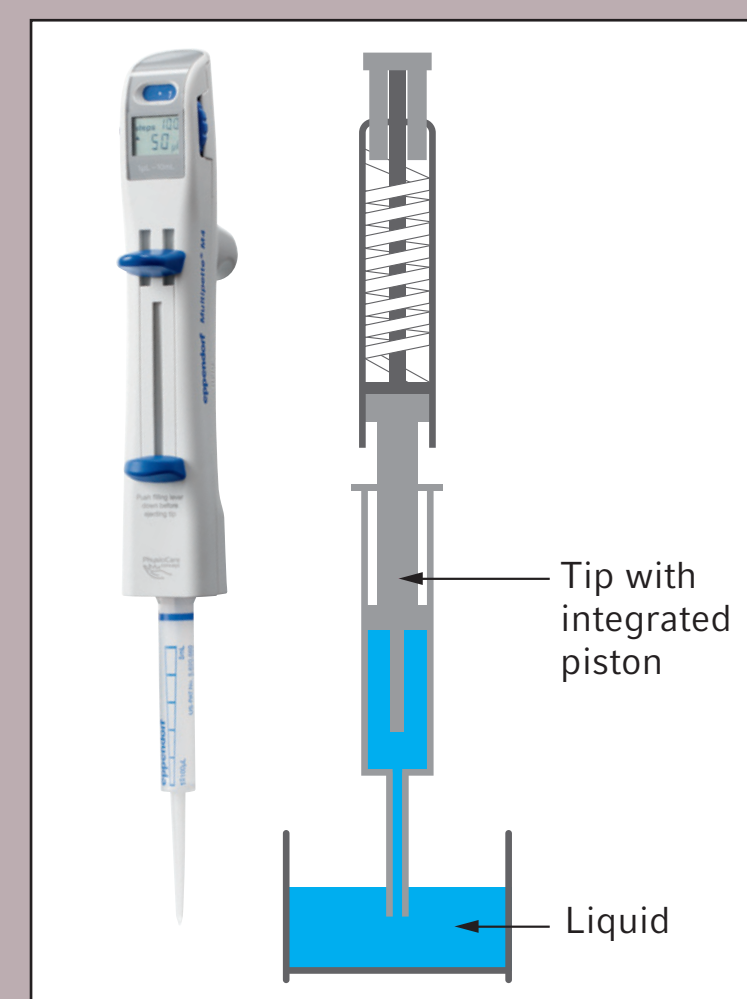
No air cushion therefore no problem.



Air-cushion principle:
Air cushion separates the liquid from the piston



Positive-displacement principle (dispenser e.g. Multipipette®) vs. Air-cushion principle (pipette e.g. Eppendorf Reference® 2)



Positive-displacement principle:
Liquid in direct contact with the piston → No air cushion

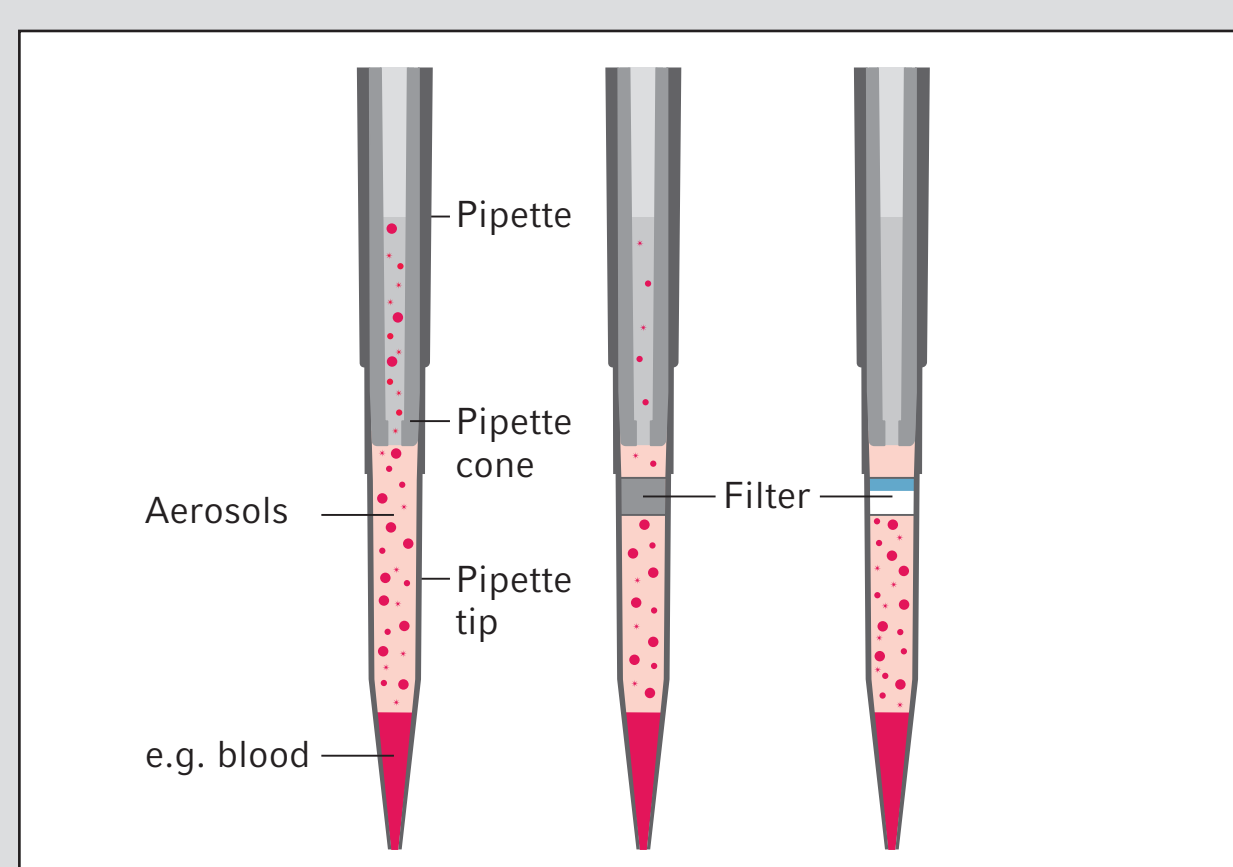
Infectious / radioactive liquids

Problem: Aerosols may contaminate the pipette

Prevention air-cushion pipette: Use filter tips with high efficiency (e.g. ep Dualfilter T.I.P.S.®)

Recommendation positive displacement:

Liquids are safely enclosed in dispenser tip due to sealing lip of the piston.



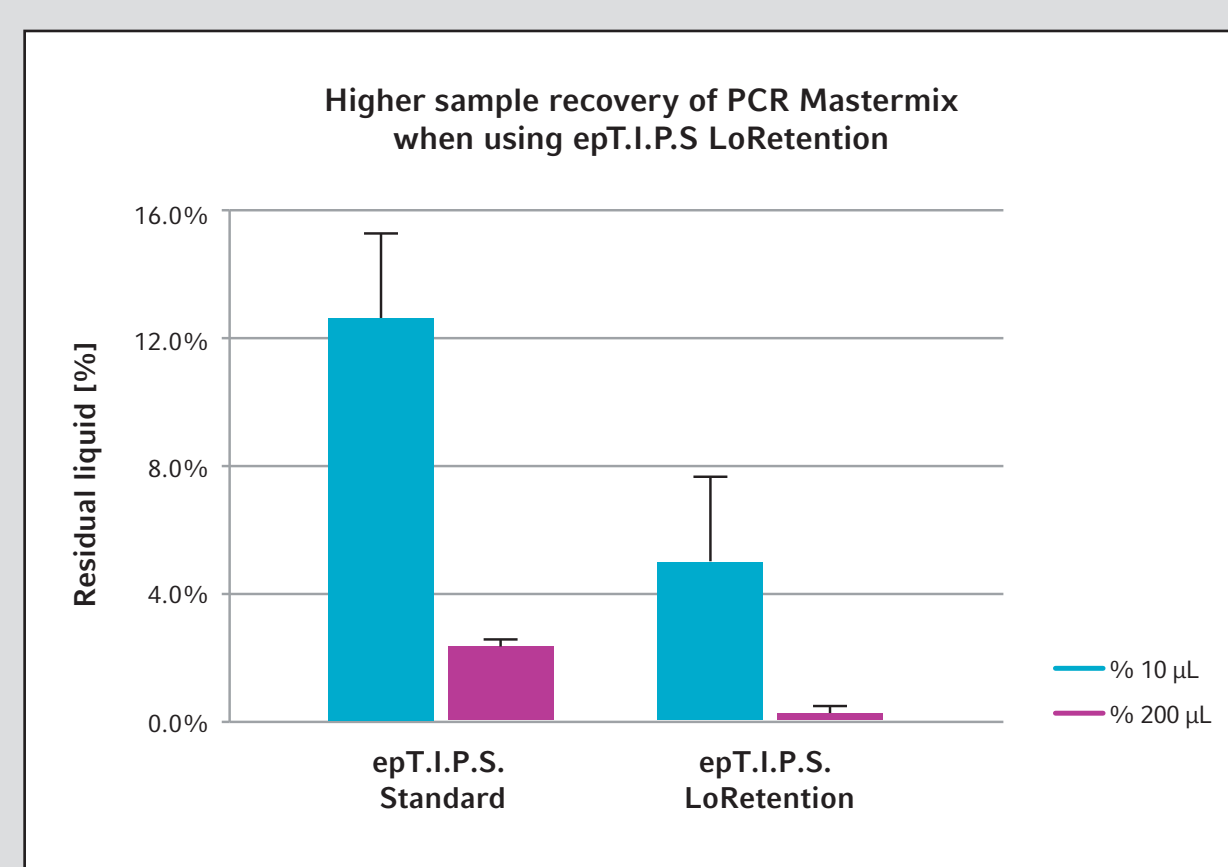
Detergent containing liquids

Problem: Detergents lower the surface tension of water. Liquid residues stay in tip.

Prevention air-cushion pipette: Use tips with low retention effect (e.g. epT.I.P.S.® LoRetention).

Recommendation positive displacement:

Sealing lip of the piston wipes tip clean.



Foaming liquids

Problem: Liquid foams when moved. It is difficult to pipette sample accurately.

Prevention air-cushion pipette: Reverse pipetting.

Recommendation positive displacement:

- > Reverse and residual stroke leave room for foaming
- > Sealing lip of the piston moves tip clean

