



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 on a	Air-cushion pipette: Viscous liquids have a negative effect on accuracy and precision (Pipetting 50 μL of 85 % glycerol)	
52.0		
51.5	\land	

Systematic error of different liquid densities, pipette calibrated with water





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.®)

Detergent containing liquids

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

Foaming liquids

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

Recommendation positive displacement:

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



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.



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



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