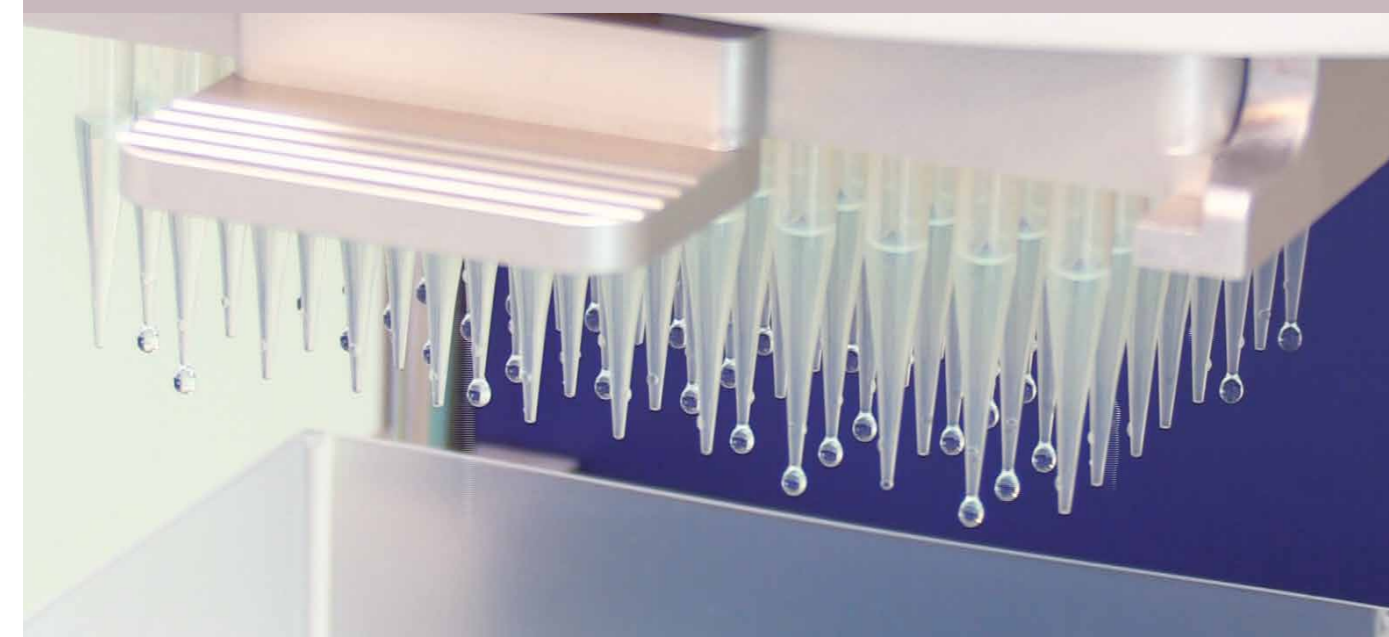
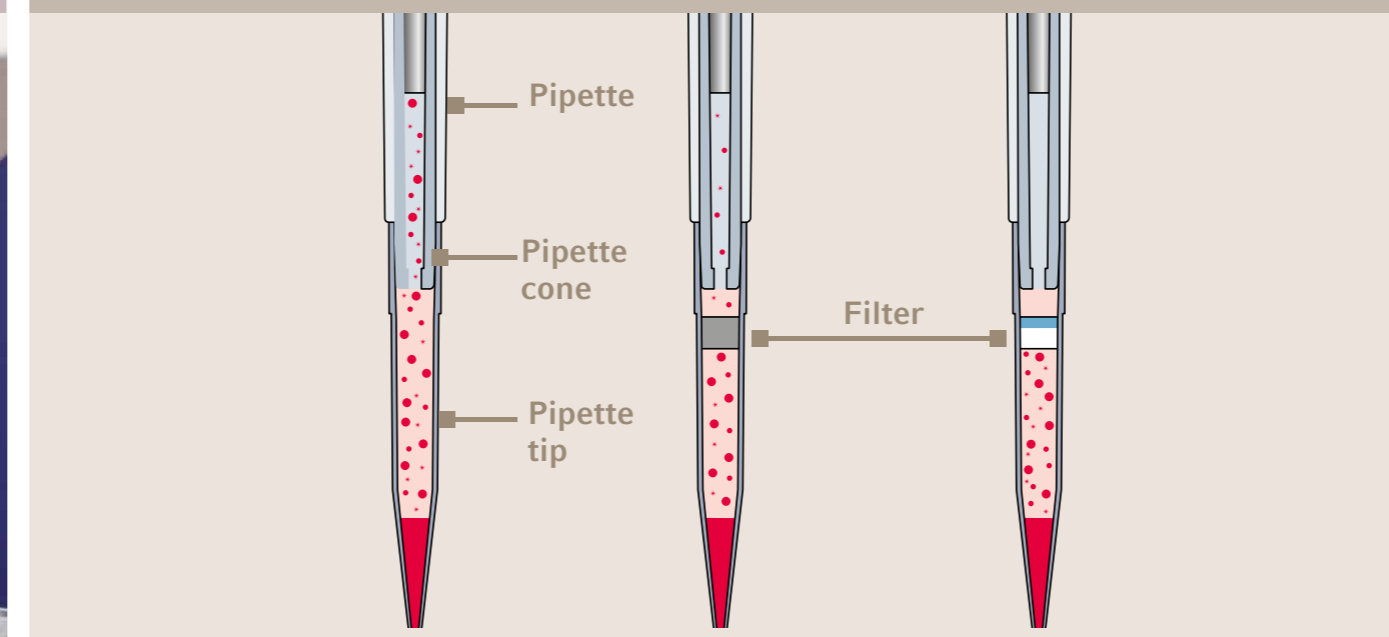
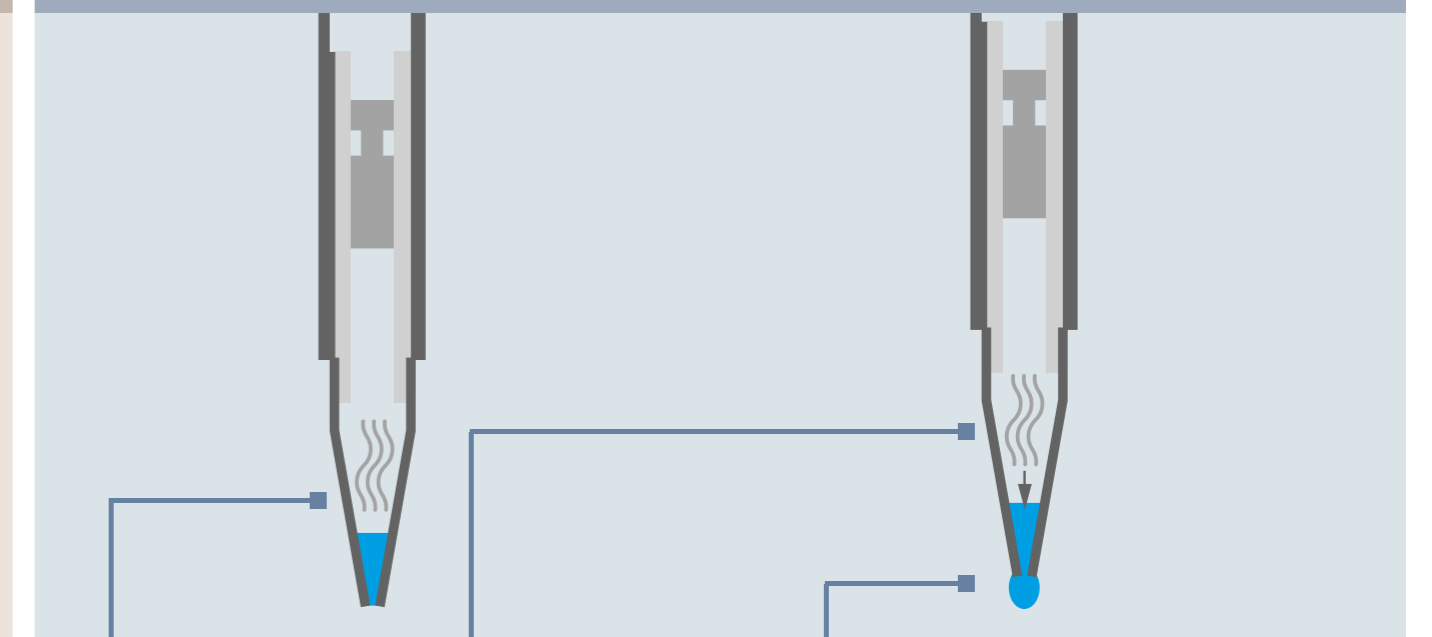




# Master Your Challenging Liquids

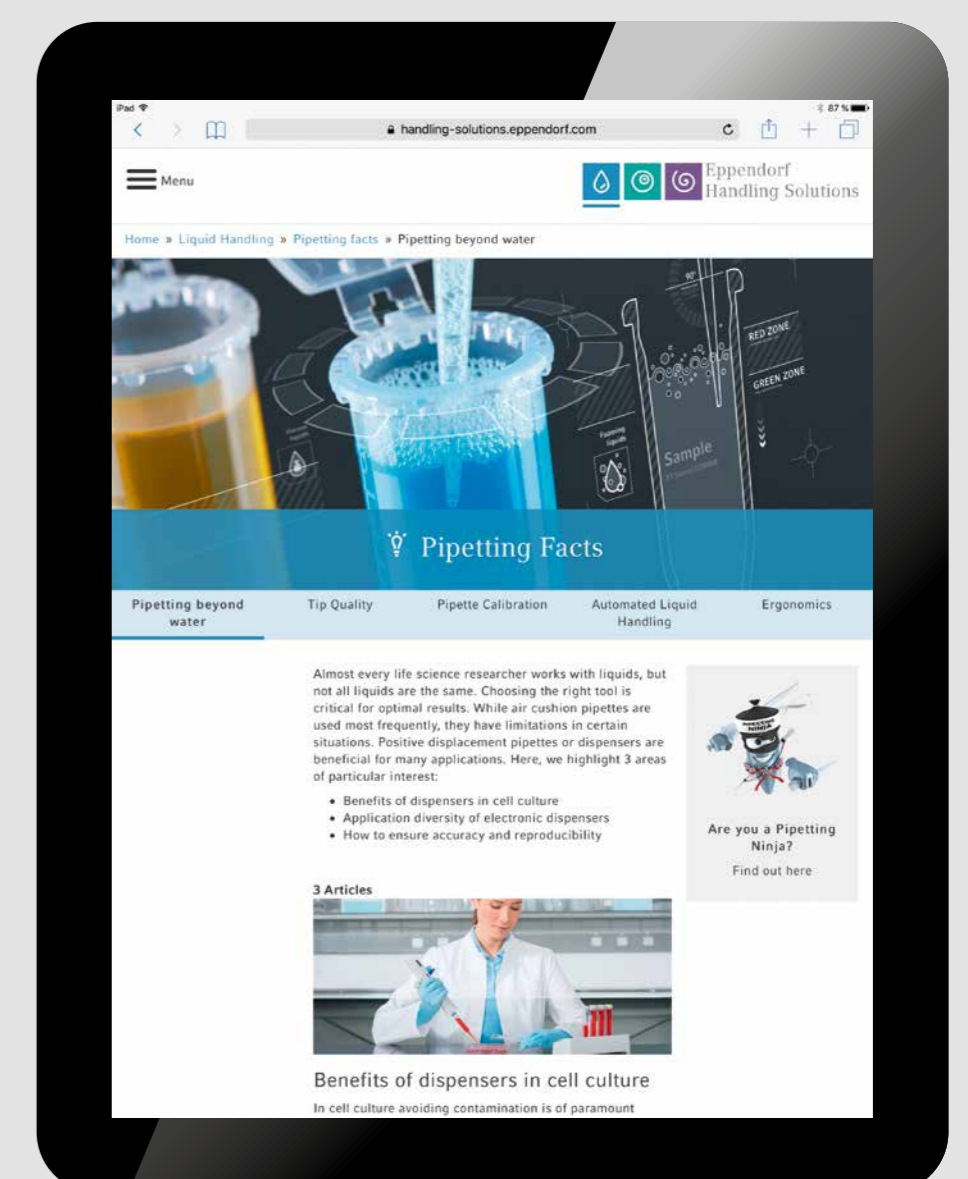
When working with challenging liquids, its specific physical characteristics may have an impact on the air-cushion of standard pipettes and thus influence precision and accuracy. Therefore, when working with liquids such as viscous, dense or volatile liquids, special pipetting techniques become essential. 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.

<p><b>1</b> Problem Liquid drips out of the tip</p> <p><b>Leads to</b> &gt; Inaccurate volume delivery</p> <p><b>Challenging liquid class</b> &gt; Volatile</p> <p><b>Examples</b> &gt; Ethanol &gt; Low concentrated acetone</p> <p><b>Explanation</b> High vapor pressure liquids lead to expansion of the air-cushion which then leads to liquid dripping.</p>	<p><b>2</b> Problem Aerosol formation</p> <p><b>Leads to</b> &gt; Contamination of pipette cone and cross-contamination of samples</p> <p><b>Challenging liquid class</b> &gt; Infectious &gt; Toxic</p> <p><b>Examples</b> &gt; Blood &gt; Biohazard material &gt; DNA/RNA in PCR reactions</p> <p><b>Explanation</b> Aerosols containing contaminated micro-particles can enter the pipette leading to cross-contamination.</p>	<p><b>3</b> Problem Less volume is pipetted than set</p> <p><b>Leads to</b> &gt; Inaccurate volume delivery</p> <p><b>Challenging liquid class</b> &gt; Dense</p> <p><b>Examples</b> &gt; Sulfuric acid &gt; Phosphoric acid</p> <p><b>Explanation</b> High density of the liquid leads to an expanded air-cushion unable to aspirate the correct volume.</p>
<p><b>What to do with air-cushion pipettes?</b> &gt; Prewet tip min. 5 times by repeated aspiration and dispensing.</p>	<p><b>What to do with air-cushion pipettes?</b> &gt; Use two layered filter pipette tips. &gt; Disinfect pipette regularly by wiping with 70% ethanol, or autoclaving.</p>	<p><b>What to do with air-cushion pipettes?</b> &gt; Pipette must be adjusted.</p>
 <p>High vapor pressure liquids drip out of the pipette tip without pre-wetting.</p>	 <p>Two-layered filter tips offer a protective barrier against contamination by aerosols.</p>	 <p>Liquid evaporates → Pressure builds up → Liquid drips</p>

<p><b>4</b> Problem Liquid remains in the tip</p> <p><b>Leads to inaccurate volume delivery and sample loss</b></p>	
<p><b>Challenging liquid class</b> &gt; Viscous</p> <p><b>Examples</b> &gt; Glycerol &gt; Oil</p> <p><b>Explanation</b> Slow flow behavior of liquid because of high inner friction of molecules.</p>	<p><b>Challenging liquid class</b> &gt; Detergents</p> <p><b>Examples</b> &gt; Tween® 20 &gt; Triton® X-100</p> <p><b>Explanation</b> Detergents stick to classic plastic surfaces, the remaining liquid does not flow down the tip.</p>
<p><b>What to do with air-cushion pipettes?</b> &gt; Reverse pipetting. &gt; Slow aspiration &amp; dispensing speed.</p>	<p><b>What to do with air-cushion pipettes?</b> &gt; Use ultrahydrophobic LoRetention tips.</p>
 <p>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.</p>	 <p>Maximum recovery with ePT.I.P.S. LoRetention</p> <p>Significant loss of sample using standard tips</p> <p>Detergents stick to the surface material on the inside of a pipette tip. This liquid cannot be dispensed.</p>

## 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.



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