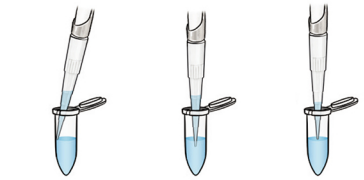
Get Better Results

How you pipette directly affects the success and repeatability of your experiments.
Use these **Good Pipetting Practice**™ techniques to improve your pipetting performance.

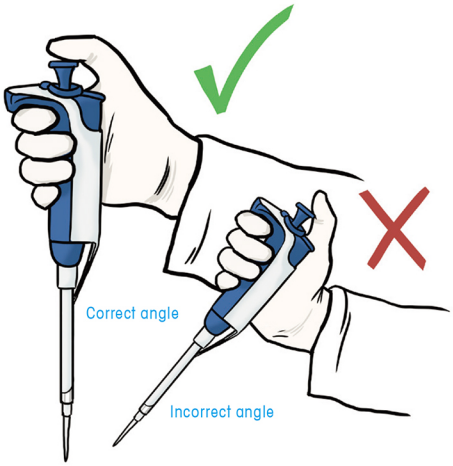
PIPETTING TECHNIQUES

Dispensing

Improve accuracy by up to 1% with good dispensing technique. For highest consistency, touch the vessel wall with the tip to release any remaining sample, then slide it up the wall to prevent liquid from clinging to the orifice. The two other techniques shown also work well with aqueous (non viscous) liquids.

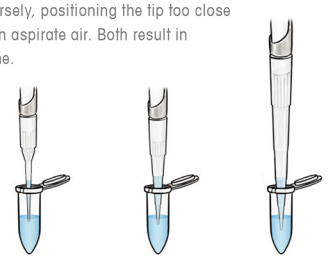


Dispensing against vessel wall | Dispensing into liquid | Dispensing onto liquid surface



Immersion Depth

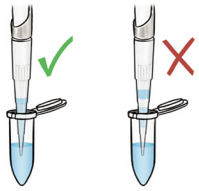
Immersing tips to the correct depth improves accuracy by up to 5%, so use the recommended depths shown here. Immersing too deep can cause too much liquid to be aspirated. Conversely, positioning the tip too close to the surface can aspirate air. Both result in inaccurate volume.



1-10µL | 10-200µL | 200-2000*µL
(>2000µL use 6-10 mm depth)

Rhythm and Speed

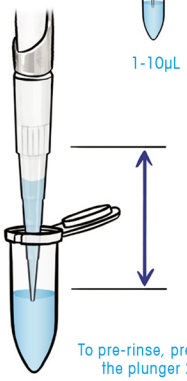
Consistent pipetting rhythm and speed will improve accuracy by up to 5%. Fast or "jerky" aspiration can cause splashing, aerosols, shaft contamination and loss of sample volume.



Good aspiration | Tip that aspirated air

Immersion Angle

Keeping the immersion angle close to vertical can improve accuracy by up to 2.5% in microvolume pipettes. Keep the pipette within 20° of vertical anything greater can affect measurements.

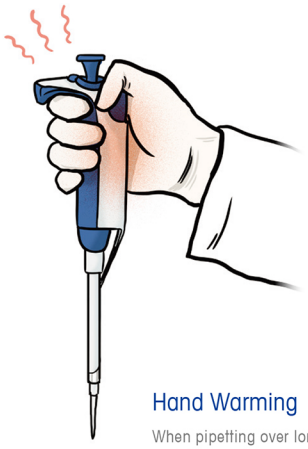


To pre-rinse, press and release the plunger 2 or 3 times

Pre-rinsing

Pre-rinsing can increase accuracy by up to 0.2%. It helps neutralize capillary effects in microvolume pipettes and, for large-volume tips, equalizes the air temperature inside the tip with the temperature of the sample.

INSTRUMENT / ENVIRONMENT

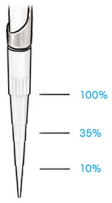


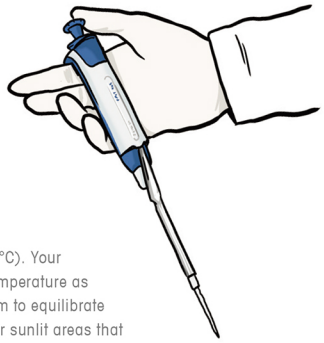
Setting the Micrometer

When changing the volume to a lower setting, dial down to the desired volume setting. But when changing the volume from a lower to a higher setting, turn the selector wheel about 1/3 turn above the desired volume setting, then slowly dial back down to the desired setting. This will avoid "mechanical backlash" and assure greater accuracy.

Volume vs. Range

Improve accuracy and precision by up to 1% by aspirating and dispensing samples within 35% to 100% of a tip's nominal volume. Avoid setting a pipette's volume to less than 10% of its maximum.

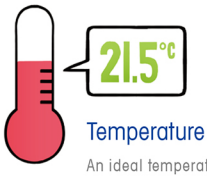




Ergonomics

Practicing good ergonomics improves accuracy and performance. Hand and body fatigue leads to errors, especially when dispensing large numbers of samples.

- Good posture reduces fatigue and the potential for injury
- Pipettes with finger-hooks allow you to relax your grip regularly
- Switching hands periodically reduces fatigue and increases productivity
- Rainin XLS pipettes offer extremely light spring forces and our patented LTS™ LiteTouch™ tip ejection system – essential safety equipment!



Hand Warming

When pipetting over long periods, heat from your hand can cause air inside the pipette to expand and produce inaccurate results. Avoid the effects of hand-warming by placing the pipette on its stand between pipetting cycles, instead of holding it in your hand.

Temperature

An ideal temperature for pipetting is 21.5°C (±1°C). Your instrument and samples should be the same temperature as the room in which you're working, so allow them to equilibrate for 20 minutes if necessary. Also avoid drafty or sunlit areas that can cause large or sudden temperature changes. Pipetting at a constant temperature improves results by as much as 5%.

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