Proper Pipetting Procedures

Proper Air Displacement Pipetting

Conventional pipettes displace a cushion of air between the plunger and the liquid in the tip. For accurate pipetting, liquids must have physical properties similar to water:

- Density
- Viscosity
- Vapor Pressure (volatility)

Hot tip!
For viscous or volatile liquids, use a positive displacement pipette, such as the BRAND® Transferpettor™.

Preparing the Pipette

- Attach a BRAND® or other high quality pipette tip.
- Ensure the volume setting is correct.

The Transferpette® *S* features an innovative thumb-tip adjustment for fast, easy volume changes.

Aspirating the Sample

- Press the pipetting button to the first stop.
- Hold the pipette vertically and immerse the tip 2 to 3mm into the liquid (1/8").
- Release pipetting button slowly and wait 1-2 seconds for level equilibration, and touch the tip against container wall before removing. *(ISO 8655 prescribes pre-wetting of the tip once prior to aspiration of a measured volume).*

Discharging the Sample

- Hold the pipette at a 30-45° angle against the wall of the container.
- Push the pipetting button to the first stop and hold.
- Push the pipetting button to the second stop (blow-out) while wiping the tip against the wall.
- Remove the pipette from the container, and release the button.

Ejecting the Tip

- Hold the pipette shaft over a suitable disposal container and press the tip-ejection key to the stop.

Get to know the BRAND® family of pipettes at www.brandtech.com.

Transferpette® *S* and *Transferpette® electronic*

Simple Service, Easy Calibration™

PLT™ Pipette Leak Tester

For daily functional validation between calibrations. Visit **www.brandtech.com** for more information.

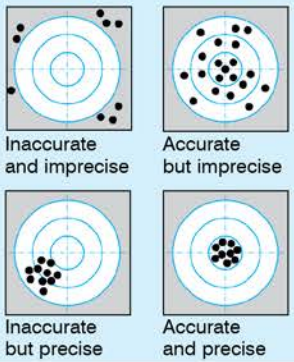
Accuracy and Precision

Calibration is the process of determining the performance of an instrument without mechanical or electronic adjustment.

Adjustment is the manipulation of the instrument post-calibration so that the instrument is aligned within the specified tolerances.

Accuracy of measurement is how close the result comes to the target value.

Precision (reproducibility) describes how closely grouped results are in a set of measurements, in units of volume.



Lab Rats Trust BrandTech'!

Calibration Calculations

Mean Volume is calculated gravimetrically, then converting the weight to volume with a "Z-factor" compensating for temperature/density, pressure and buoyancy, per ISO 8655.

Mean value $\bar{x} = \frac{\sum x_i}{n}$ x_i = results of weighings, n = number of weighings

Mean volume $\bar{V} = \bar{x} \cdot Z$

Z = correction factor (e.g. 1.0029 µL/mg at 20°C, 1013 hPa)

Find a table of Z factors for typical ambient temperatures in the SOP manuals for BRAND® pipettes. Or, consider EasyCal™ software to perform these calculations for you, and document the results. Find Z factors and EasyCal™ at **www.brandtech.com**.

Accuracy is defined as the difference between the measured mean volume and the specified volume, measured as a percentage of the specified volume.

Accuracy

$$A\% = \frac{\bar{V} - V_0}{V_0} \cdot 100$$ V_0 = nominal volume

Precision or Coefficient of Variation (CV%) is defined as the standard deviation of a set of measurements, measured as a percentage of the mean volume.

Standard deviation

$$s = Z \cdot \sqrt{\frac{\sum (x_i - \bar{x})^2}{n - 1}}$$

Coefficient of variation

$$CV\% = \frac{100\ s}{\bar{V}}$$

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