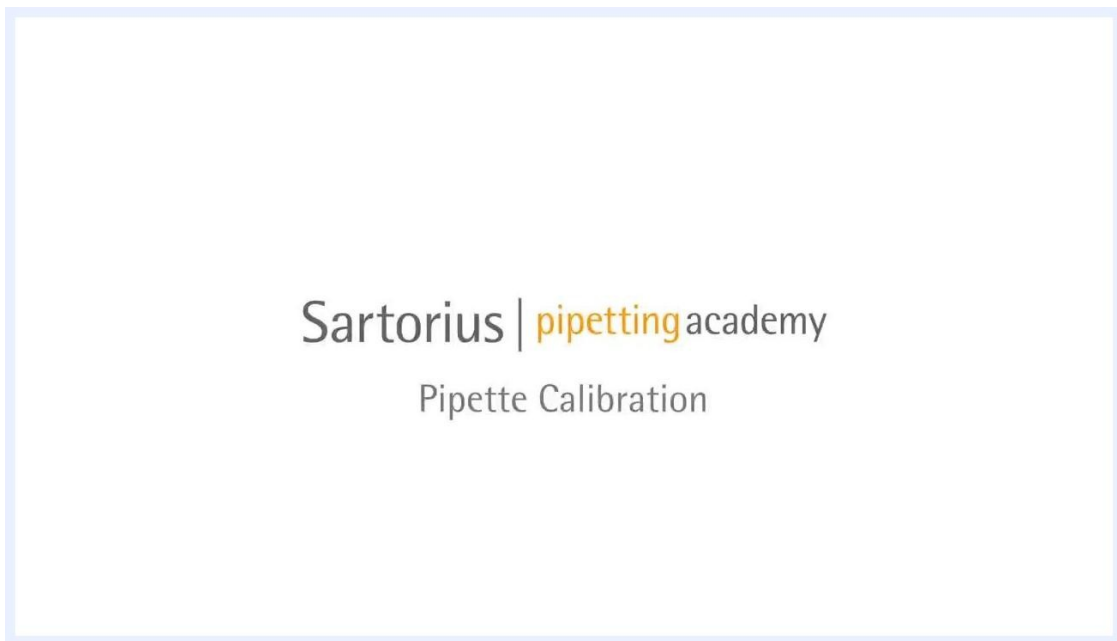
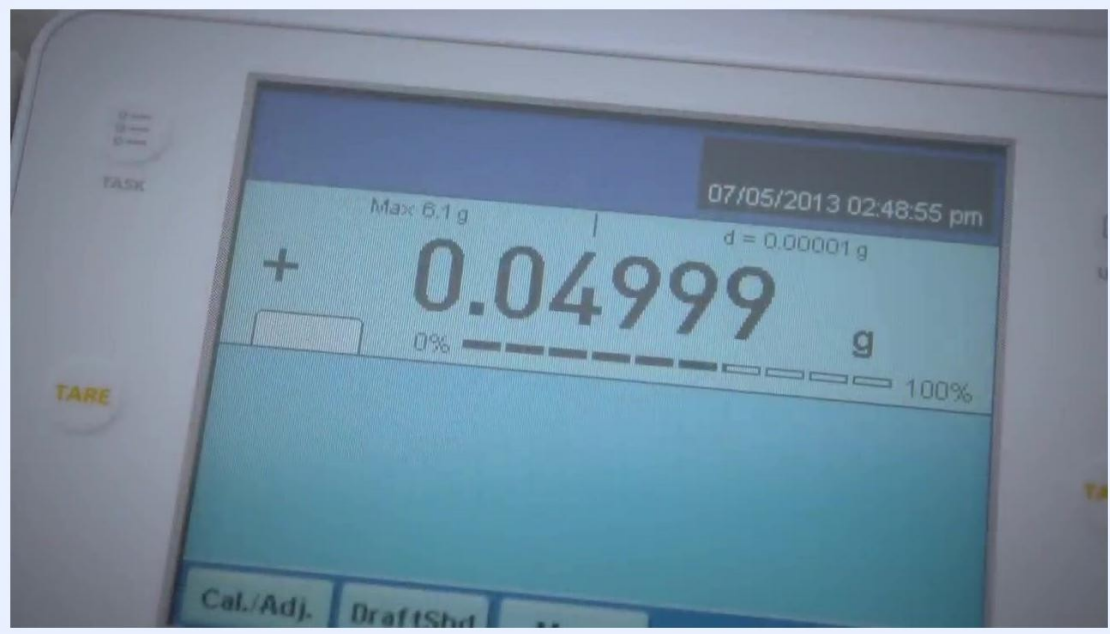


How to Calibrate a Pipette: Instrument Calibration Log

This log documents how to calibrate a pipette in a regulated laboratory setting. Reliable pipetting results depend on three factors — the equipment used, the procedures followed, and the environment in which calibration is performed. Use this log to record instrument details, the calibration procedure, reference standards, measured results, maintenance activity, out-of-tolerance actions, and final approval for each calibration event.



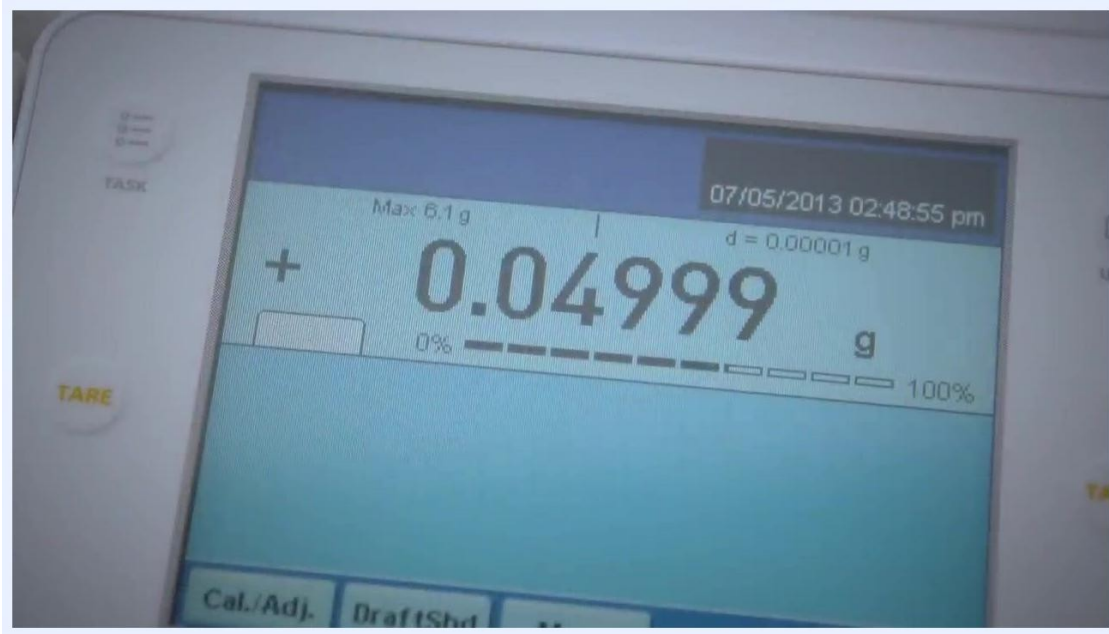
A gloved hand holding a pipette in a laboratory setting, with pipettes, a balance, and a laptop visible in the background



Two laboratory technicians at a calibration station; one holds a pipette over a balance while the other observes and listens

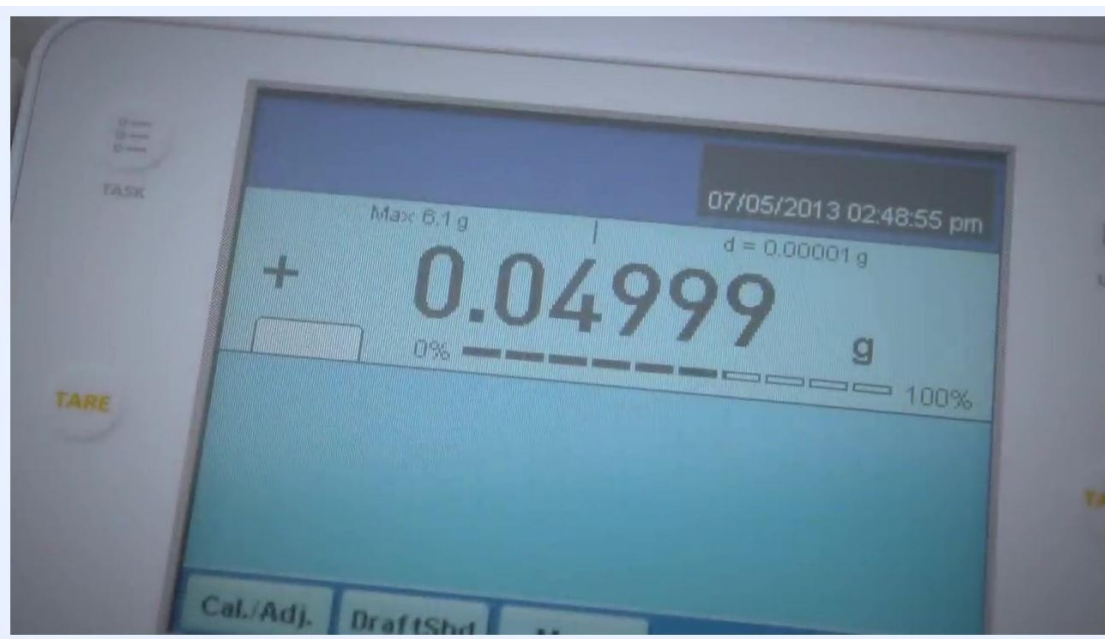
Instrument Details

Record the identifying information for the specific pipette under calibration before you begin. Capture these details from the pipette label and your lab's equipment inventory.



A completely white screen, indicating the end of the video or a transition to a new section. No objects, people, or equipment are visible.

Field	Details
Instrument ID	Unique identifier assigned to the pipette
Model	Pipette model under calibration
Serial Number	Manufacturer serial number
Location	Workstation or lab bench where calibration is performed
Owner	Department, lab, or technician responsible for the pipette
Intended Use	Application for which the pipette is used



Two laboratory technicians working at a calibration station; one uses a pipette over a balance while the other observes, in a clean, organized, well-lit lab

Calibration Schedule

Before starting, confirm your calibration frequency, due date, procedure reference, and the role responsible for performing the work. Set up your workspace so that all required equipment is within easy reach.

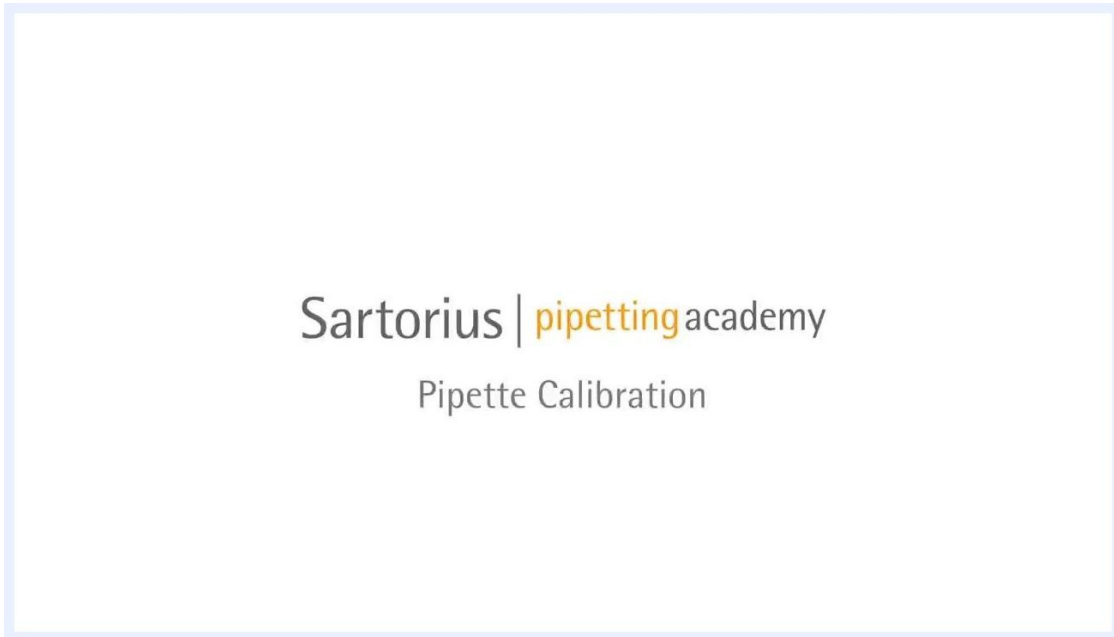
Frequency	Due Date	Procedure Reference	Responsible Role
Record your lab's defined calibration interval	Record the date the next calibration is due	Pipette Calibration Procedure (below)	Calibration technician / lab analyst

Pipette calibration procedure

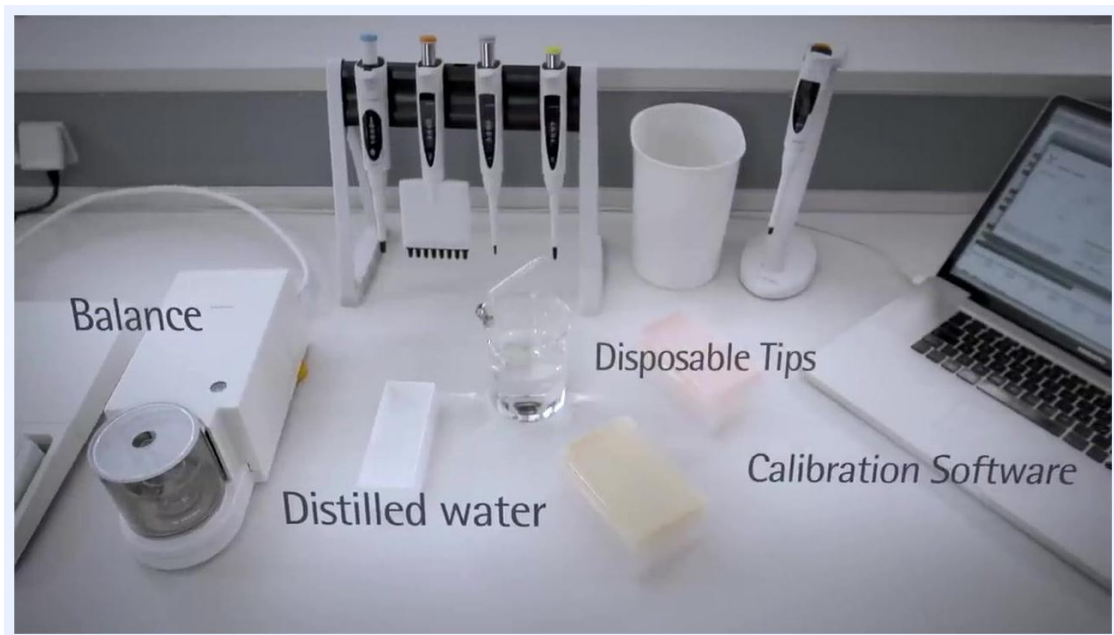
1. Pre-wet the pipette tip by aspirating and dispensing distilled water three to five times before starting calibration. This eliminates evaporation of water into the airspace inside the pipette.
2. Place the balance, pipette tips, and water within reach.
3. Hold the pipette vertically when aspirating water to ensure the correct volume is drawn.

4. Tare (zero) the balance before starting. Calibration software may perform this step automatically.
5. Hold the pipette at a 45-degree angle when dispensing water onto the balance for optimal accuracy.
6. Hold the pipette tip against the wall of the vessel and expel the entire sample. This is especially important for small sample volumes.

7. Maintain an even rhythm and consistent timing throughout the process to ensure reliable results.



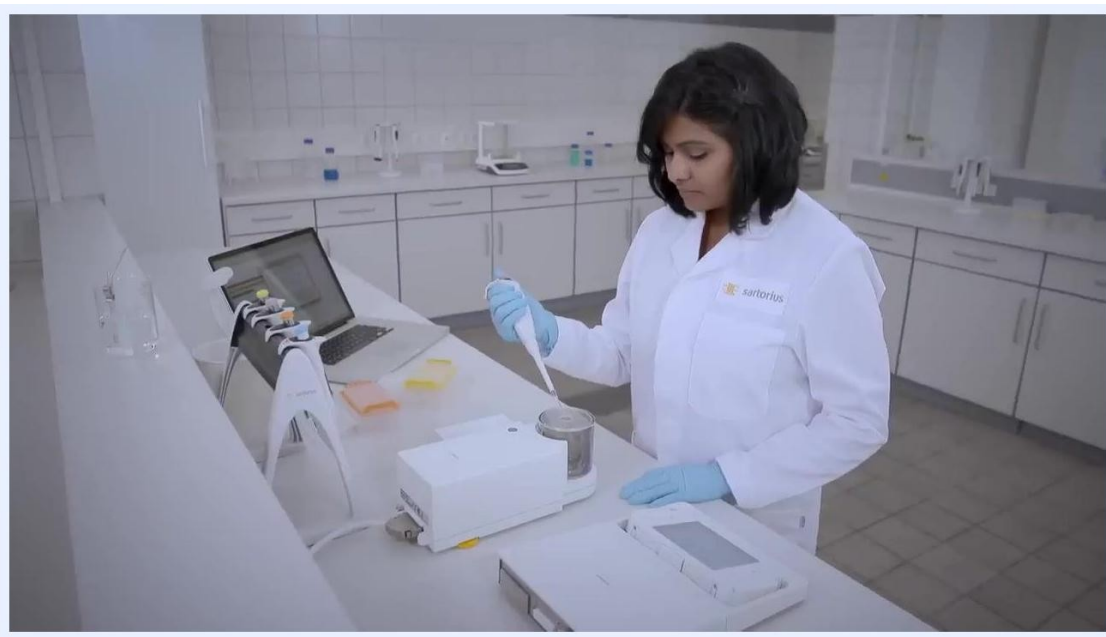
Title screen displaying "Sartorius pipetting academy - Pipette Calibration"



Lab bench with labeled items: balance, distilled water, disposable tips, calibration software, pipettes, and other calibration tools



A person in a lab coat and gloves using a pipette at a balance, with a laptop and calibration equipment visible



A person in a lab coat and gloves holding a pipette at a 45-degree angle over a balance, performing calibration

Perform calibration in a stable, draft-free environment with constant temperature and humidity to reduce environmental effects on your measurements.

Use the same procedure for every calibration session. Consistency in technique is essential for achieving the best calibration results.

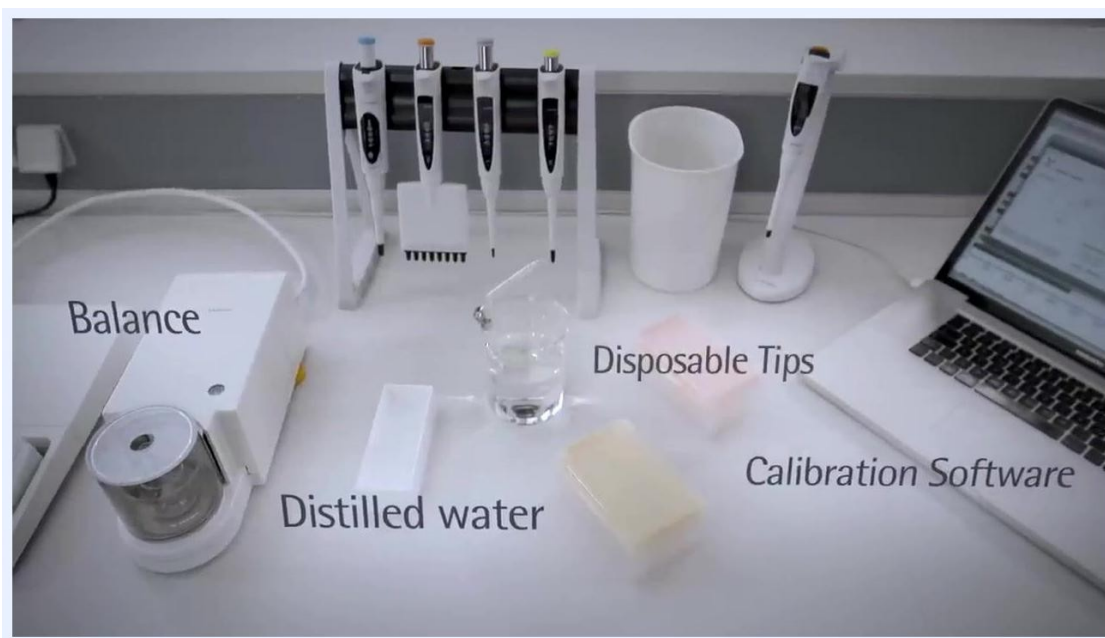


A technician using a pipette at a calibration station, demonstrating a consistent calibration procedure

Standards Used

List the reference tools and materials used to perform calibration, along with their traceability information (certificates, expiration dates, lot numbers as applicable).

Reference Standard / Tool	Purpose	Certificate / Traceability
Analytical balance	Weighing dispensed water to verify volume	Record certificate number and expiration date
Distilled water	Reference liquid for pipetting	Record lot number where applicable
Calibration software	Recording and calculating measurements	Record version and configuration
Disposable pipette tips	Single-use tips for each pipette tested	Record lot number



A laboratory bench with a balance, distilled water, pipettes in a stand, disposable tips, and a laptop with calibration software

Confirm the presence of the balance, distilled water, disposable tips, and calibration software running on a computer at your workstation before proceeding.

Calibration Results

Record the measured values, acceptance limits, pass/fail status, and analyst initials for each calibration run.

Run #	Volume Tested	Measured Mass (g)	Acceptance Limit	Pass/Fail	Analyst Initials
1	Record target volume	0.04999	Record per manufacturer/lab specification	Record result	Record initials
2					
3					

Maintain an even rhythm and consistent timing throughout each run to minimize variability and improve measurement accuracy.

Follow the correct technique throughout: pre-wet the tip, hold the pipette vertically when aspirating, and position it at a 45-degree angle when dispensing into the vessel on the balance. These steps are crucial for minimizing errors caused by evaporation and for ensuring accurate volume delivery.



A laboratory technician working at a calibration station, maintaining a steady workflow in a clean, organized lab environment

In addition to accuracy, evaluate the pipette for precision — the consistency of dispensed volumes across repeated runs. Precision is affected by the calibration environment, the repeatability of the procedure, and the skill of the person performing the calibration.

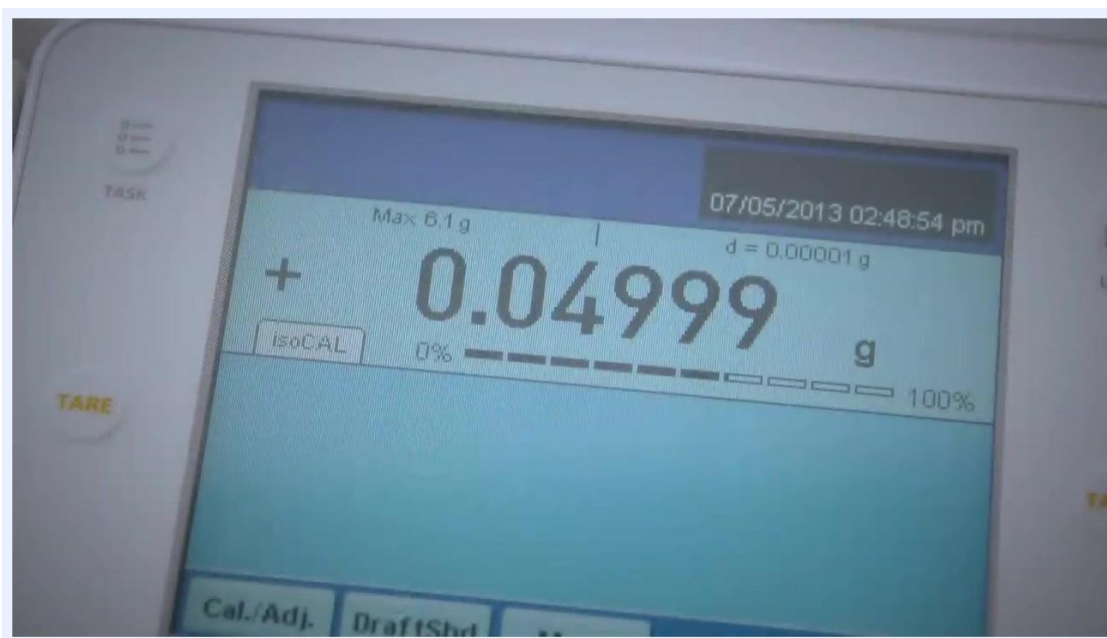
Use the analytical balance and calibration software to record each measurement for traceability. For example, a balance reading of 0.04999 g should be documented as shown.



A technician holding a pipette vertically and at a 45-degree angle, demonstrating correct pipetting technique during calibration



A technician dispensing liquid with a pipette into a vessel on a balance, focusing on precision and repeatability



Close-up of an analytical balance display showing a reading of 0.04999 g, with calibration controls visible

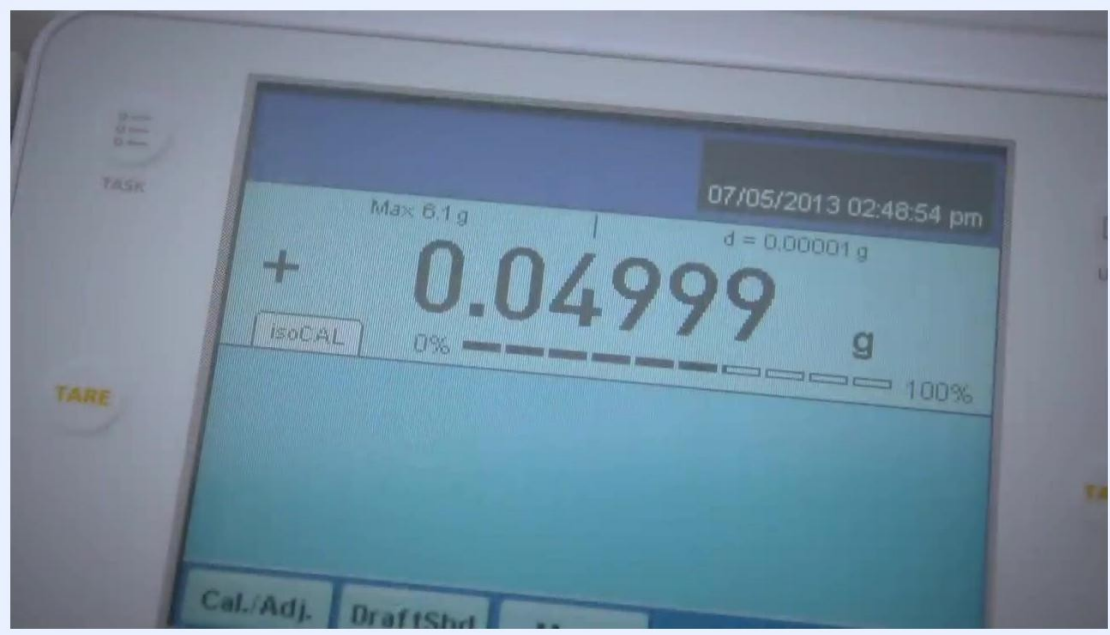
Maintenance

Document any preventive maintenance, adjustments, repairs, or parts replaced, along with the service provider responsible.

Date	Maintenance/ Adjustment Performed	Parts Replaced	Service Provider
	Record any volume adjustment made	Record parts replaced, if any	Record technician or provider

If accuracy cannot be achieved through adjustment, use a calibration tool to adjust the pipette: turn the adjustment mechanism clockwise to increase the dispensed volume, or counterclockwise to decrease it.

When attaching tips to the pipette, do not twist the pipette — only press down to connect the tip securely. Twisting can damage the pipette or the tip and affect accuracy.



A laboratory technician in a white coat and gloves working at a calibration station, maintaining a steady workflow



Close-up of gloved hands adjusting the volume of a pipette using a calibration tool

Out-of-Tolerance Actions

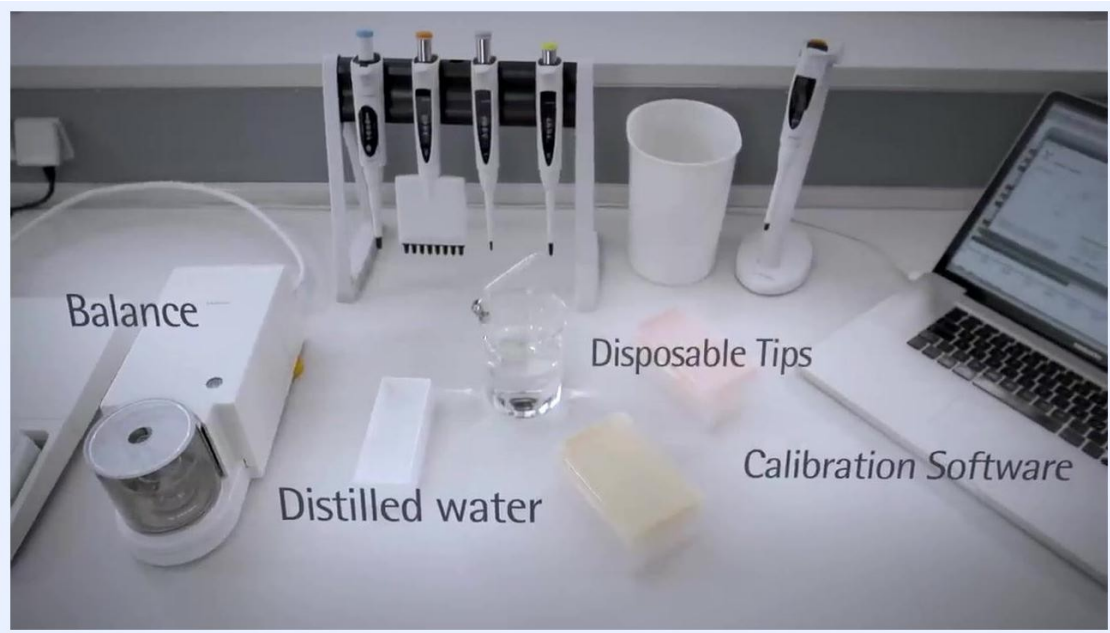
If you cannot adjust the pipette sufficiently to correct an accuracy error, inspect it for leakage, wear, damage, or mechanical malfunction. Do not proceed with calibration or return the pipette to service until it is confirmed to be in good working order.

Field	Details
Impact Assessment	Record whether the deviation affects prior results generated with this pipette
Affected Data Review	Record which batches or tests used this pipette during the out-of-tolerance period
Quarantine	Record quarantine status of the pipette until repaired and re-verified
Corrective Action	Record repair, adjustment, or replacement action taken

Always consider the three critical factors for reliable calibration when investigating an out-of-tolerance result:

- Equipment: Properly maintained and calibrated pipettes, analytical balances, and calibration tools.
- Procedures: Standardized, validated calibration protocols followed consistently.

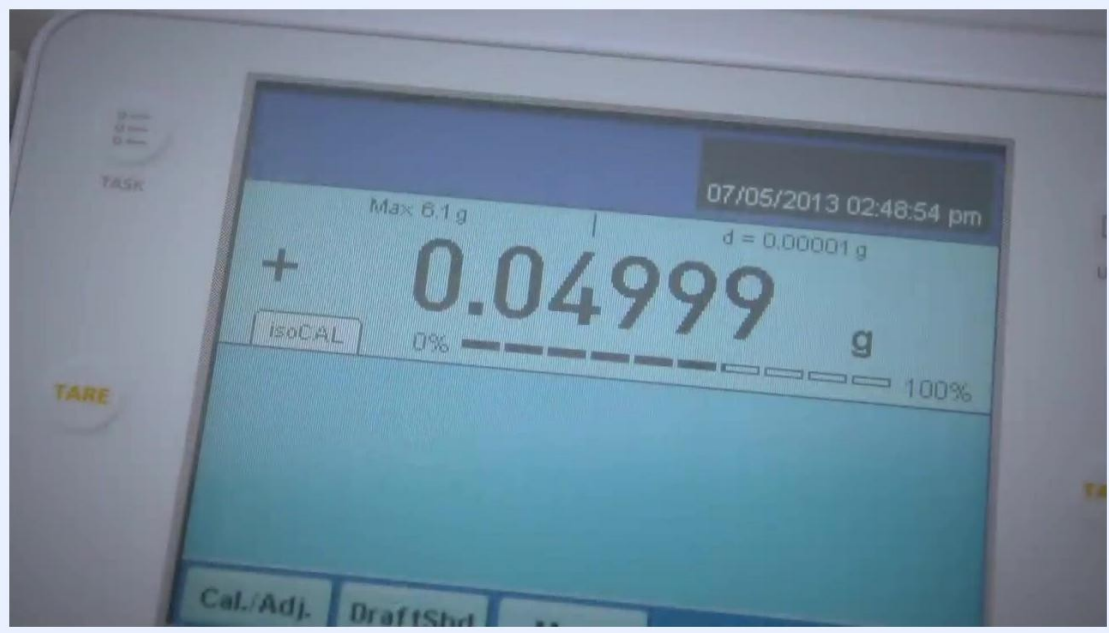
- Environment: A stable, draft-free, clean laboratory with controlled temperature and humidity.



A gloved hand holding a pipette in a laboratory setting, with pipettes, a balance, and a laptop visible in the background

Approval

Always obtain a calibration certificate after performing calibration. The certificate documents the results, the equipment used, and the personnel involved. An accredited certificate will also indicate the measurement uncertainty of the instrument.

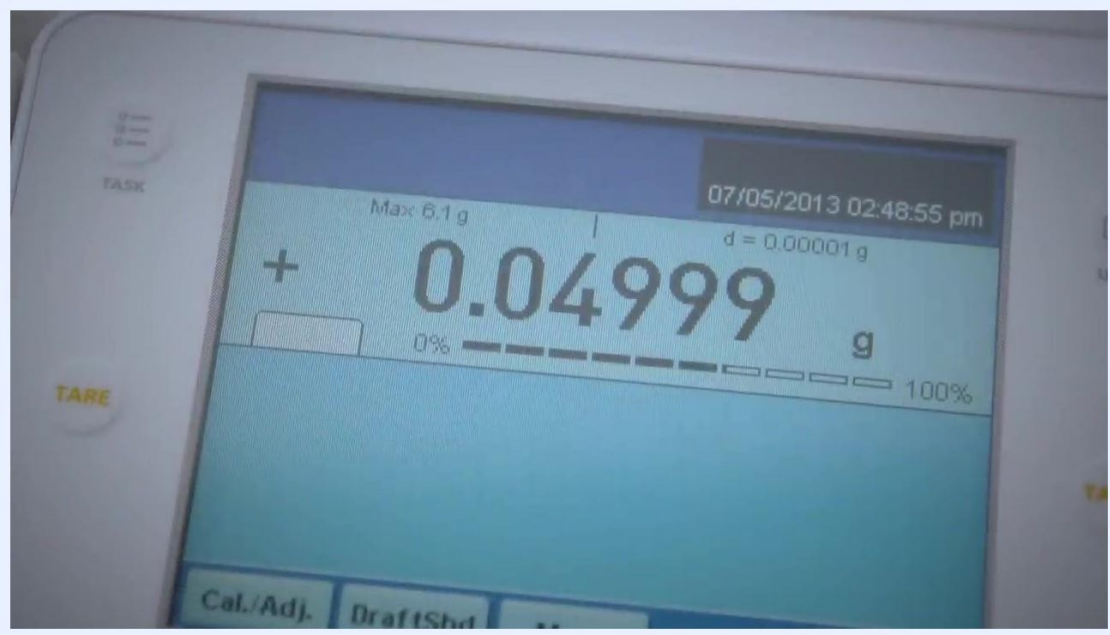


Two technicians in lab coats and gloves working at a calibration station with pipettes, a balance, and a laptop, demonstrating a properly controlled calibration environment

Reviewer	Date	Release-to-Use Decision

Collaborate with colleagues during calibration to ensure procedures are followed correctly and to cross-check results. Discuss any issues or uncertainties with your team to maintain high standards of accuracy and reliability.

Once all calibration steps are complete and results are documented, power down the equipment, clean the workspace, and store all tools and pipettes properly for future use.



Close-up of an analytical balance display showing a reading of 0.04999 g, with maximum capacity, resolution, and timestamp visible; the interface shows the **TARE**, **Cal./Adj.**, and **Draft Shd** buttons