STANDARD OPERATING PROCEDURE

Lab Equipment Calibration SOP

Document no.	SOP-LAB-002
Revision	1.0
Owner	Quality Assurance Manager
Effective date	September 15, 2026
Review cycle	Every 12 months

1. Purpose

To ensure laboratory instruments are calibrated on schedule against traceable reference standards, so that measurements and test results remain accurate and defensible.

2. Scope

Applies to fixed and portable measuring instruments used for testing, such as analytical balances, pH meters, thermometers, ovens, incubators and spectrophotometers. Pipettes are covered by the pipette calibration SOP.

Definitions

Reference standard	A certified weight, buffer solution or other traceable item used to check an instrument's accuracy.
Tolerance	The acceptable range of deviation from the true value for an instrument to remain in service.
Out of tolerance	A calibration result outside the acceptable range, requiring adjustment, service or removal from use.

3. Responsibilities

Calibration Technician	Performs scheduled calibrations, records results and applies calibration labels.
Lab Analyst	Checks the calibration label before using an instrument and reports suspected drift.
QA Manager	Maintains the calibration schedule, reviews certificates and approves instruments returning to service.
Laboratory Manager	Approves budget for outside calibration service and resolves recurring equipment issues.

RACI matrix

Activity	Calibration Technician	Lab Analyst	QA Manager	Laboratory Manager
Maintain calibration schedule and due dates	R	I	A	I
Perform instrument calibration	R/A	I	C	-
Approve out-of-tolerance instrument for service or retirement	R	I	A	C

Activity	Calibration Technician	Lab Analyst	QA Manager	Laboratory Manager
Review calibration certificates	R	-	A	I

R = Responsible, A = Accountable, C = Consulted, I = Informed

4. Materials and PPE

Materials, tools and systems

- Certified reference weights, buffers and thermometers
- Calibration log or CMMS asset register
- Calibration due-date labels
- Manufacturer calibration procedures
- Out-of-service tags

Personal protective equipment

- Disposable nitrile gloves
- Lab coat

5. Procedure

Step	Task	Owner	Done
5.1	**Review the calibration schedule** At the start of the week, check the calibration schedule or CMMS asset register for instruments due for calibration and pull them from the bench rotation.	Calibration Technician	☐
5.2	**Gather reference standards** Select the certified reference weights, buffer solutions or thermometers required for the instrument, and confirm their certificates have not expired. **Checkpoint:** Reference standards used are within their own certification date.	Calibration Technician	☐
5.3	**Inspect the instrument before testing** Check the instrument for physical damage, cleanliness and a stable, level, vibration-free location before starting the calibration procedure.	Calibration Technician	☐
5.4	**Allow warm-up and stabilization** Power on the instrument and allow it to warm up and stabilize for the time stated in the manufacturer's instructions before taking readings.	Calibration Technician	☐
5.5	**Perform the calibration procedure** Follow the manufacturer's calibration procedure for the instrument type, taking readings at the required points across its measuring range.	Calibration Technician	☐
5.6	**Record readings and compare to tolerance** Record each reading against the reference value in the calibration log and compare the deviation to the instrument's stated tolerance. **Checkpoint:** Every reading is recorded before any adjustment is made to the instrument.	Calibration Technician	☐
5.7	**Adjust or arrange service if out of tolerance** If a reading falls outside tolerance, adjust the instrument per the manufacturer's instructions and retest, or tag it out of service and arrange vendor repair. **Warning:** Do not return an out-of-tolerance instrument to use until it passes a repeat calibration.	Calibration Technician	☐

Step	Task	Owner	Done
5.8	**Apply the calibration label** Attach a label showing the calibration date, due date and technician initials to the instrument in a visible location.	Calibration Technician	☐
5.9	**Update the asset register** Enter the calibration result, next due date and any parts replaced into the CMMS asset register for the instrument.	Calibration Technician	☐
5.10	**Notify affected analysts** Tell the analysts who use the instrument that it is back in service, or that it remains out of service pending repair.	Calibration Technician	☐
5.11	**Review certificates and trends** Review completed calibration certificates for the month, watching for instruments with repeated drift that may need replacement.	QA Manager	☐
5.12	**File the calibration certificate** File the signed calibration certificate with the instrument's history file and retain it per the records retention schedule.	QA Manager	☐

6. Quality checks

- No instrument is used past its calibration due date.
- Every calibration record shows the reference standard used and its certificate status.
- Out-of-tolerance instruments are tagged out of service immediately.
- Calibration certificates are filed and retrievable for every active instrument.

7. Records

- Calibration log or CMMS asset register
- Reference standard certificates
- Calibration certificates
- Out-of-service tags and repair records

8. KPIs

- Percentage of instruments calibrated on schedule
- Number of out-of-tolerance results per quarter
- Average time an instrument is out of service for repair
- Number of overdue calibrations

9. Common mistakes

- Using an instrument past its calibration due date because the label was not checked.
- Adjusting an instrument before recording the as-found reading.
- Using an expired reference standard.
- Not updating the asset register after a vendor repair.

10. Revision history

Revision	Date	Description	Reviewed by
1.0	September 15, 2026	Initial release	Ilia Pirozhenko

Approval

Prepared by	Approved by	Date

This is a template. Adapt it to your organization, equipment and local regulations before use.

Scan for the latest version

Opens this template online, where you can download it again in Word, PDF, Excel or CSV — free, no sign-up.

Or add it to Perfect Wiki so your team can find it and ask questions about it in Microsoft Teams, Slack, kChat or Mattermost.