

Standard Operating Procedure (SOP)

Standardized Equipment Calibration and Maintenance Routines

This SOP details the **standardized equipment calibration and maintenance routines**, encompassing regular calibration schedules, maintenance checklists, verification processes, documentation protocols, and corrective action procedures. The objective is to ensure all equipment operates accurately and efficiently, minimizing downtime, enhancing productivity, and maintaining compliance with industry standards and regulations.

1. Purpose

To provide standardized procedures for the calibration and maintenance of all equipment to ensure accurate performance, reliability, and compliance with regulatory standards.

2. Scope

This SOP applies to all equipment requiring regular calibration and maintenance within the facility.

3. Responsibilities

- Equipment Users:** Report issues, perform routine checks, and record equipment usage.
- Maintenance Personnel:** Conduct calibrations, maintenance, verifications, and maintain records.
- Supervisors/Managers:** Ensure SOP compliance, review records, approve corrective actions.

4. Definitions

- Calibration:** The process of adjusting and verifying equipment accuracy against standard measurements.
- Maintenance:** Regular tasks designed to keep equipment working efficiently and reliably.
- Verification:** Procedure to confirm equipment performance post-calibration or maintenance.
- Corrective Action:** Measures taken to address equipment issues or failures.

5. Procedure

5.1 Calibration Schedule

- Identify all equipment requiring calibration.
- Create and maintain a calibration schedule (see sample table below).
- Attach calibration due-date labels on each equipment.

Equipment	Frequency	Last Calibration	Next Due Date
Balance Scale	Monthly	2024-05-01	2024-06-01
pH Meter	Weekly	2024-05-27	2024-06-03
Temperature Logger	Quarterly	2024-04-15	2024-07-15

5.2 Maintenance Checklists

- Establish and use equipment-specific maintenance checklists.
- Include steps such as cleaning, lubrication, inspection for wear, and software/firmware updates.
- Checklists must be filled out and signed off following each maintenance task.

5.3 Verification Processes

1. Conduct functional verification after calibration or maintenance to confirm equipment accuracy.
2. Document and compare results against acceptable tolerance levels.
3. Tag equipment as "Verified" or "Out of Service" as appropriate.

5.4 Documentation Protocols

- Record all calibration, maintenance, and verification activities in the Equipment Logbook or digital system.
- Ensure records include date, tasks performed, personnel involved, calibration standards used, and results.
- Maintain records for a minimum of X years (specify as per your compliance standards).

5.5 Corrective Action Procedures

1. Immediately remove any non-conforming equipment from service.
2. Document the discrepancy and notify the responsible supervisor.
3. Investigate root cause and undertake corrective maintenance or calibration.
4. Repeat verification before returning equipment to service.
5. Document all actions taken.

6. References

- Manufacturer Operation Manuals
- Relevant industry standards (e.g., ISO/IEC 17025, GMP, GLP)
- Company Quality Manual

7. Revision History

Version	Date	Description of Change	Approved By
1.0	2024-06-01	Initial Release	QA Manager