SOP: Calibration and Adjustment Protocols

This SOP details **calibration and adjustment protocols** essential for maintaining the accuracy and reliability of equipment and instruments. It covers procedures for regular calibration schedules, verification methods, adjustment techniques, documentation requirements, and quality control checks. The goal is to ensure consistent performance, compliance with standards, and optimal operational efficiency across all devices used in the process.

1. Purpose

To define standardized procedures for the calibration and adjustment of equipment and instruments to ensure their accuracy, reliability, and compliance with applicable standards.

2. Scope

This SOP applies to all laboratory, production, and testing equipment and instruments requiring calibration and adjustment within the organization.

3. Responsibilities

- **Operators/Technicians:** Initiate calibration as per schedule, perform verifications, and record results.
- **Supervisors:** Review calibration records and ensure corrective actions are implemented.
- **Quality Assurance:** Audit calibration activities and maintain calibration schedules.

4. Definitions

- **Calibration:** The process of configuring an instrument to provide results for a sample within an acceptable range.
- **Adjustment:** Modification of equipment/instrument settings to ensure proper performance.
- **Verification:** Confirmation that calibration and adjustment meet required standards.

5. Calibration Schedule

Equipment/Instrument	Calibration Frequency	Responsible Person
Thermometers	Bi-annually	Lab Technician
Balances	Quarterly	Production Supervisor
Pipettes	Annually	Technical Specialist

6. Verification & Adjustment Procedures

1. Review the equipment's last calibration record before proceeding.
2. Inspect the device for physical damage or signs of malfunction.
3. Use certified reference standards to verify instrument accuracy.
4. If deviation exceeds allowable limits, perform necessary adjustments per manufacturer instructions.
5. Re-verify the equipment's performance after adjustment.
6. Document all actions, including references used, actual readings, adjustments made, and verification results.

7. Documentation Requirements

- Complete a **Calibration Log Sheet** for each equipment/instrument.
- Include unique equipment ID, date, readings before and after adjustment, reference standards, and personnel signature.
- Maintain records for a minimum of 5 years or as required by regulatory standards.

8. Quality Control Checks

- Random audits of calibration records shall be conducted quarterly by Quality Assurance.
- Out-of-tolerance or failed calibrations must trigger investigation and corrective action.
- Repeat calibrations where any discrepancies are found.

9. References

- Manufacturer Manuals
- ISO/IEC 17025 - General requirements for the competence of testing and calibration laboratories
- Internal Quality Manual

10. Revision History

Version	Date	Description	Author
1.0	2024-06-15	Initial Release	QA Manager