

2.3 Equipment Selection

The PI or designee will ensure that the ovens, incubators, and water baths are of the proper type, design, and range to accomplish their required function.

2.4 Identification

The dedicated ovens, incubators, and water baths are identified by serial number, if applicable. When not supplied with a serial number, they will each be assigned a permanent number that will be recorded in the scientific notebook and/or logbook, when that device is used.

2.5 Thermometer

The laboratory possesses a certified calibrated thermometer, calibrated yearly by the SNL Primary Standards Laboratory (PSL) (Albuquerque, NM). The calibration check of any mercury thermometer used in the laboratory is checked annually against the certified calibrated thermometer following procedure SP 12-20, *Thermometer Calibration Check*. The record of the thermometer calibration checks are submitted annually to the WIPP Records Center.

Each thermometer used in the laboratory bears a unique label and is recorded each time it is used to record a temperature measurement in the temperature logbook or scientific notebook.

Any certified calibrated thermometer or calibration checked thermometer will not be used past its expiration date.

2.6 Frequency

The ovens, incubators, and water baths will be temperature checked on approximately a daily basis (i.e., a regular work schedule when the device is in use).

2.7 Logbook Requirements

2.7.1 Naming Convention

The logbook will be titled 'Temperature Logbook' and each will be sequentially numbered using Roman Numerals. Upon completion and after the final QA review, the logbook shall be submitted to the WIPP Records Center.

2.7.2 Format

Section 1 will contain a table of contents. Section 2 of the logbook will contain an introduction that will include the work objectives, a brief description on how to take temperature measurements, the tolerance limits, and corrective action requirements. Section 3 will contain a list of authorized users. Section 4 will contain a list of the ovens, incubator, water baths, their individual serial numbers and the target temperature of the device to be documented. Section 5 will contain a list of thermometers and their calibration expiration dates. Section 6 will contain the Forms SP 12-21-1 (see Appendix A), Temperature Check, where all temperature measurements shall be documented. The logbook will be created to include sections 1-6 as described above and using \approx 50 Form SP 12-21-1s and will be spirally bound to document the temperature measurements.

2.7.3 Logbook Review

The logbook is used to record temperature measurements conducted in the laboratory and will require a QA review, and should occur, at a minimum every six months, and at completion of the logbook. The review will be documented following NP 6-1, *Document Review Process*, using the associated Document Review and Comment (DRC) Form NP 6-1-1. The QA reviewer shall document in the logbook that the review was performed and what part of the logbook was reviewed, followed by the reviewer's signature and date of review. The DRC created from the review will be submitted to the WIPP Records Center after each review.

2.8 Temperature Measurements

A calibrated or calibration checked thermometer shall be used to monitor oven, incubator, water bath, solution or room temperatures. The oven, incubator, and water bath temperatures will be documented in the Temperature Logbook as will any anomalies observed and all other temperature measurements will be recorded as applicable in a scientific notebook.

To take a temperature measurement, insert the thermometer in the oven (incubator, water bath) and let it equilibrate until the thermometer temperature shows a constant value. This value is recorded in the Temperature logbook.

2.9 Acceptance Criteria

Temperature values within 5°C of the target temperature are considered acceptable and no further action is required. If the temperature reading is not within $\pm 5^\circ\text{C}$ of the target temperature, the oven will be adjusted. Once the oven has stabilized, the temperature will be taken again and recorded in the Temperature logbook.

NOTE: If the tolerance limits differ (i.e. higher temperature in the muffle furnace, or differ to satisfy the purpose and scope of a particular Test Plan), then this tolerance limit will be documented in the logbook.

2.10 Corrective Action

If during a temperature measurement, the tolerance limit cannot be met after adjusting the oven, a Corrective Action Request (CAR) will be issued to document the results and impacts related to the change in the equipment performance relative to data collection. Corrective action would include an evaluation to any temperature measurements collected. Results of all activities related to the out-of-tolerance will be summarized in the CAR per the requirements in NP 16-1, *Corrective Action*.

2.11 Maintenance

The thermometers, ovens, incubator, and water bath shall be stored so as to minimize their exposure to dusty and corrosive environments, temperatures outside the range of the thermometer, and mechanical shock and vibration.

3.0 Records

The following QA records generated through implementation of this procedure shall be prepared and submitted to the WIPP Records Center in accordance with NP 17-1, *Records*.

QA Record

- Temperature Logbook
- Form SP 12-21-1, Temperature Check

4.0 Appendices

Appendix A: Form SP 12-21-1, Temperature Check

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