



## 2.3 Thermometer Selection

The PI or designee will ensure that the thermometers are of the proper type, design, range, accuracy, and tolerance to accomplish their required function.

## 2.4 Identification

The thermometers are identified by serial number, if applicable. When not supplied with a serial number, the thermometers will each be assigned a permanent number that will be recorded in the scientific notebook and/or logbook, when that thermometer is used.

## 2.5 Calibration

### 2.5.1 Standard

The calibration check will be performed using a certified calibrated thermometer. The certified calibrated thermometer is calibrated by the SNL Primary Standards Laboratory (PSL) and is received with a calibration report that is submitted to records. The identity, serial number, and calibration expiration date of the certified thermometer used shall be documented on Form SP 12-20-1.

A certified calibrated thermometer will not be used past its expiration date listed on the calibration label provided by PSL.

The calibration check temperature ranges are chosen so that their values bracket the values of the temperatures to be measured. The thermometer should be checked for the largest possible temperature range (e.g. 0°C to 100°C). At least 5 different temperatures must be tested. The increment between the temperature points shall not be smaller than 5°C nor larger than 10°C.

### 2.5.2 Frequency

The thermometers will be calibration checked annually. The thermometers will also be calibration checked if irregular temperature readings are observed.

### 2.5.3 Acceptance Criteria

A calibration check is acceptable if, for each temperature checked, the difference between the temperature read on the certified calibrated thermometer and the temperature on the tested thermometer does not exceed the value of one gradation of the tested thermometer. If the temperature value exceeds one gradation, the thermometer must be tested again. If the temperature still exceeds one gradation, the thermometer will be removed from service and tagged according to NP 12-1, *Control of Measuring and Test Equipment*.

### 2.5.4 Corrective Action

If during the calibration check the thermometer is found out of tolerance, a Corrective Action Request (CAR) will be issued to document the results and impacts related to the change in the thermometer performance. Corrective action could include an evaluation to any temperature measurements collected or a re-evaluation of the calibration check interval. 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*.

## 2.6. 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 Oven Temperature Logbook and all other temperature measurements will be recorded as applicable in a scientific notebook.

## 2.7 Maintenance

The thermometers 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 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

- Scientific Notebook
- Oven Temperature Logbook
- Form SP 12-20-1, Thermometer Calibration Check

## 4.0 Appendices

---

Appendix A: Form SP 12-20-1, Thermometer Calibration Check



This work of authorship was prepared as an account of work sponsored by an agency of the United States Government. Accordingly, the United States Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so for United States Government purposes. Neither the National Technology and Engineering Solutions of Sandia, LLC., the United States Government, nor any agency thereof, nor any of their employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately-owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the National Technology and Engineering Solutions of Sandia, LLC., the United States Government, or any agency thereof. The views and opinions expressed herein do not necessarily state or reflect those of the National Technology and Engineering Solutions of Sandia, LLC., the United States Government or any agency thereof.

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA-0003525.

Parties are allowed to download copies at no cost for internal use within your organization only provided that any copies made are true and accurate. Copies must include a statement acknowledging Sandia's authorship of the subject matter.