



Primary Standards Laboratory Metrology Program

Fact Sheet

Thermometry

The Primary Standards Laboratory (PSL) maintains a wide variety of primary thermometry standards to assure accurate and traceable measurements for its customers. Capabilities include resistance thermometry (SPRTs/PRTs, thermistors, and RTDs), liquid-in-glass thermometry, thermocouple thermometry, temperature simulator/readout calibrations, and on-site calibrations of temperature chambers, and associated recorders and controllers.

All the primary thermometry standards are directly traceable either to the National Institute of Standards and Technology (NIST) or to fundamental quantities. Standard platinum resistance thermometers are certified by comparison to fixed temperature points at the argon triple point, mercury triple point, water triple point, gallium melting point, and the zinc, tin, and aluminum freezing point temperatures.

The thermometry project also provides services such as temperature measurement consultations, Measurement Assurance Plans (MAPs), and a thermometry training course, ENGR500, which encompasses physical principles and provides guidance on the use of thermometry devices.

Capabilities (k=2)

Below is a representative sample of our capabilities. We are accredited under Lab Code 105002-0 by the National Institute of Standards and Technology/ National Voluntary Laboratory Accreditation Program (NIST/NVLAP). For full details, see

<http://ts.nist.gov/standards/scopes/1050020.pdf>

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| • SPRTs | -189°C to 660°C ± 0.005°C |
| • RTD/PRT | -80°C to 660°C ± 0.21°C |
| • THERMISTORS | -80°C to 100°C ± 0.09°C |
| • THERMOCOUPLES Type S/R: 0 to 1100°C Base Metal | ± 0.5°C to 2.2°C to ASTM specifications |
| • LIQUID-IN-GLASS | -80°C to 150°C ± 0.06°C |
| • SIMULATOR/READOUT | ± 0.1°C to 4.5°C |



Thermocouple Calibration Station

Major Resources

- Fixed-point temperature cells
- Various baths, dry wells, and temperature chambers
- F18 thermometry bridges and a Hart 1590 Super Thermometer





Triple Point of Water Check with SPRT



Thermotron Temperature Chamber

Contacts

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