



Primary Standards Laboratory Thermometry Project

Fact Sheet

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 (Standard Platinum Resistance Thermometers [SPRTs]/Platinum Resistance Thermometers [PRTs], thermistors, and Resistance Thermometer Devices [RTDs]), liquid-in-glass thermometry, thermocouple thermometry, temperature simulator/readout calibrations, on-site calibrations of temperature chambers, and associated recorders and controllers.

All the primary thermometry standards are directly traceable either to the Systeme International through the National Institute of Standards and Technology (NIST) or to fundamental quantities. SPRTs 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 and Measurement Assurance Plans (MAPs) to provide guidance on the use of thermometry devices.



Thermocouple Calibration Station

Capabilities

Below is a representative sample of PSL's thermometry capabilities. The Temperature Project is accredited under Lab Code 105002-0 by the NIST/National Voluntary Laboratory Accreditation Program (NVLAP). For full details, see <http://ts.nist.gov/standards/scopes/1050020.pdf>

Capability	Range	Uncertainty (k=2)
SPRTS	-189°C to 660°C	0.005°C
RTD/PRT	-80°C to 660°C	0.02°C to 0.07°C
Thermistors	-80°C to 100°C	0.03°C
Thermocouples		
Type S/R	0 to 1200°C	0.6°C to 3.0°C
Base Metal		To ASTM specifications
Liquid-in-glass	-80°C to 150°C	0.06°C
Simulator/readout		To manufacturer's specifications
On-site temperature chambers		3°C

Major Resources

- Fixed-point temperature cells
- Various baths, dry wells, and temperature chambers
- F18 thermometry bridges and a Hart 1594 Super Thermometer





**Triple Point of Water Check with
SPRT**



Temperature Chamber

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