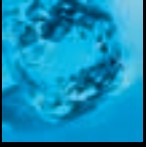


Troemner Calibration Services – Temperature



Precision & Balance Matched Only By Nature.



Troemner's Temperature Calibration Laboratory utilizes the most advanced equipment and training to provide the lowest temperature measurement uncertainties available in the market place. Troemner's Temperature Laboratory is ISO/IEC 17025 compliant with NVLAP accreditation for comparison temperature calibrations. An application has been submitted to NVLAP for accreditation for fixed point temperature calibration. Troemner offers a complete range of temperature calibration services from -196°C to 1100°C for SPRT's, RTD's, Thermistors, Thermocouples Digital Readouts and Liquid-in-Glass Thermometers.

Facility and Environment

Troemner's Temperature Calibration Laboratories meet strict ISO/IEC 17025 guidelines. Environmental conditions in the Laboratory are strictly monitored and controlled.

Comparison temperature calibrations have NVLAP accreditation.

Equipment

Troemner's Temperature Calibration Laboratory is outfitted with the latest state-of-the-art equipment for fixed point and comparison temperature calibrations. Equipment includes an ASL F18 Thermometry Bridge, a variety of cells covering eight temperature fixed points (Al, Zn, Sn, In, Ga, Hg, Ar and H_2O), four high precision resistors and four baths (Alcohol, Oil, Water and Alumina).

Temperature devices that can be calibrated include SPRT's, PRT's, RTD's, thermistors, thermocouples, digital readouts and liquid-in-glass thermometers. Equipment is interfaced to computers for processing calibration data to ensure the accuracy of the data collection process and eliminate transposition errors.

Staff

Troemner's metrology staff has received training in temperature calibrations at NIST and has extensive experience in temperature calibration.

Processes

Troemner can tailor a calibration for your temperature-measuring device from primary fixed-point calibrations for calibrating in-house temperature standards and high precision temperature devices to secondary comparison calibrations for less accurate temperature measuring devices. All primary temperature standards are directly traceable to the NIST.



Troemner Calibration Services – Temperature

ITS-90 TEMPERATURE CALIBRATIONS

Device	Calibration Service	Temperature	Uncertainty	Accreditation
SPRT, Precision Thermistor	Fixed Point Calibration	-189.3443°C (Argon Triple Point)	1.04 mk	<i>Application Submitted</i>
		-38.8344°C (Mercury Triple Point)	0.84 mk	<i>Application Submitted</i>
		0.01°C (Water Triple Point)	0.29 mk	<i>Application Submitted</i>
		29.7646°C (Gallium Melt Point)	0.94 mk	<i>Application Submitted</i>
		156.5985°C (Indium Freeze Point)	1.22 mk	<i>Application Submitted</i>
		231.928°C (Tin Freeze Point)	1.37 mk	<i>Application Submitted</i>
		419.527°C (Zinc Freeze Point)	1.69 mk	<i>Application Submitted</i>
		660.3223°C (Aluminum Freeze Point)	2.16 mk	<i>Application Submitted</i>
SPRT, PRT	Comparison to SPRT	-196°C to 660°C	±8 to 21 mk	NVLAP
Thermistor	Comparison to SPRT	-40°C to 150°C	±8 to 10 mk	NVLAP
Thermocouple	Comparison to SPRT or Type S Thermocouple	-196°C to 1100°C	1.1 mk	<i>Application Submitted</i>
Liquid-in-Glass	Comparison to SPRT	-40°C to 250°C	±8 to 20 mk	<i>Application Submitted</i>
Digital Readouts	Resistance Accuracy	0 to 10k Ohms	±8 to 26 ppm	NVLAP

All include ITS-90 coefficients, temperature vs. resistance tables or temperature vs. W value tables available upon request
 Italics are estimates until NVLAP approval

Temperature Calibration Services Include:

- **Temperature calibration services** – from -196°C to 1100°C for SPRT's, RTD's, Thermistors, Thermocouples, Digital Readouts and Liquid in Glass Thermometers.
- **Calibration Method** – Fixed-Point and Comparison
- **ISO/IEC 17025 compliant laboratory**

- **NVLAP accreditation for Comparison, Fixed-Point is pending**
- **Annealing of SPRTs and PRTs**
- **Fast turnaround time**

Troemner offers a variety of standard calibration services. We can also customize a calibration to meet your requirements. The various services available from Troemner include:

NVLAP Calibration Certificate for Comparison Temperature Calibrations - A detailed, multi-page temperature certificate designed to meet all regulatory and audit requirements including all ISO (including ISO/IEC 17025), FDA, GMP, GLP, DOD, NCCLS, CLIA, ANSI/NCCL Z540-1, and nuclear requirements. The NIST-administered National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 105013-0) approves all procedures for this detailed temperature certificate. To review the document details please visit our website at www.troemner.com.

NIST Traceable Certificate for Fixed-Point Temperature Calibrations – A detailed, multi-page temperature certificate traceable to NIST that contains calibration data for comparisons to one or several fixed point cells. The calibration is ISO/IEC 17025 compliant and NVLAP accreditation for fixed-point temperature calibrations is pending. To review the document details please visit our website at www.troemner.com.

