



Troemner's Temperature Calibration Service With NVLAP Accredited Comparison Calibrations

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Henry Troemner LLC has developed a Temperature Calibration Laboratory at our facility in Thorofare, New Jersey. This laboratory is NVLAP (National Voluntary Laboratory Accreditation Program) accredited for comparison temperature calibrations. Troemner also offers fixed point temperature calibrations. NVLAP accreditation for fixed point calibrations is currently pending.

Troemner is the market leader in the manufacture of precision weights and during the last decade has continued to increase our weight offering with NVLAP and UKAS (United Kingdom Accreditation Service) accredited mass calibration services. Troemner has recently expanded our NVLAP accredited calibration disciplines to include temperature as well as pipettes, humidity, pressure, mass density determination and mass magnetic susceptibility determination. ISO 17025 compliant thermal mass flow (gas) and electrical, time and frequency measurements are also available.

Troemner's NVLAP accredited Temperature Calibration Services include:

- **Comparison Calibration Services from -196 degrees C to 660 degrees C** for SPRT's (Super Platinum Resistance Thermometers), PRTs, RTDs (Resistance Thermometer Device), Thermistors and Digital Readouts.
- **NVLAP accreditation for Fixed Point Calibrations** is pending data collection and participation in the NIST MAP program.

Troemner's ISO/IEC 17025 Compliant Temperature Calibration Services include:

- **Comparison Calibration Services** from -196 degrees C to 1100 degrees C for Thermocouples and Liquid in Glass Thermometers.
- **Fixed Point Calibration Services** from Argon to Aluminum.
- **Latest equipment and training from ASL, Isotech, Pond Engineering and Hart Scientific.**
- **Training from NIST Thermometry Group.**
- **Customized calibrations to meet your requirements.**

The temperature calibration laboratory meets strict ISO/IEC 17025 guidelines. Special precautions have been made to reduce the effects of electrical noise, radio frequencies and other potential interference problems. Environmental conditions are strictly monitored and controlled.

The laboratory is outfitted with the latest state of the art equipment. The measuring device is an Automatic Systems Laboratories (ASL) model F18 A/C resistance Ratio Bridge. NIST has calibrated the bridge and calculated the linearity using a Hamon network. Three way resistor compliments are also used to verify the linearity of the bridge.

A variety of cells covering eight temperature fixed points is also utilized in the laboratory. These cells include gallium (Ga), indium (In), tin (Sn), zinc (Zn), aluminum (Al), mercury (Hg), Argon (Ar) and Water (H₂O). Control charts are kept for statistical analysis of the fixed point realizations as part of an internal measurement assurance program.

Troemner can tailor a temperature calibration suitable for your temperature measuring device utilizing fixed point temperature cells for primary temperature calibrations and comparison methods for secondary type temperature calibrations. Primary, fixed point temperature calibrations yield the highest accuracies suitable for calibrating in-house temperature standards and high precision devices. Secondary comparison temperature calibrations are suitable for less accurate temperature measuring devices.

Comparison Thermometer Calibrations:

To determine the accuracy of your device, Troemner may use a comparison method of calibration. This method consists of a standard SPRT and a check standard SPRT, the customer's probe and a temperature controlled bath/furnace. Prior to determining the accuracy of a customer probe, several steps will be taken.

Upon receipt at Troemner, your probe is cleaned with acetone and then alcohol prior to introduction into the laboratory where it will transfer from one bath to another. This cleaning process reduces the possibilities of cross contamination. After the probe has entered the laboratory, the insulation resistance is checked at ambient temperature. This value is compared to ASTM limits. The "as found" Triple Point of Water (TPW) is then collected.

The thermometer is then annealed. Another insulation resistance check is performed during the annealing. A post annealing TPW measurement is made. The "as found" TPW and post annealing TPW are compared to ensure the thermometer is stable within laboratory limits and manufacturer specifications. Subsequent annealings may be necessary before calibration can continue.

The temperature comparison is completed using a temperature controlled bath or furnace. The temperature is determined using a laboratory SPRT and a check standard to validate the process. Data is collected in ascending temperature and a final TPW is collected. The final TPW is compared to the post anneal TPW value against laboratory limits and manufacturer specifications



to ensure stability of the thermometer during the calibration process. Coefficients are calculated and reported on the certificate along with the “as found” and final TPW values. Resistance values at the calibration temperatures are also reported.

Once your temperature device has been calibrated and a certificate is generated, it is shipped back to you with the appropriate documentation. The NVLAP Calibration Certificate gives you the confidence that your device meets all necessary requirements (ISO, FDA, etc). **The turnaround time for this service is two weeks.**

The following chart provides information on Troemner’s Temperature Calibration Capabilities.

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

For over 160 years, Troemner has been committed to achieving the highest measurement capability and offering the lowest measurement uncertainties possible. Today, Troemner leverages its expertise and commitment to offer this Temperature Calibration Service, along with the other calibration services mentioned above, to meet all of your measurement and compliance needs. You can continue to count on Troemner for **consistency** of calibration results, **customized** calibrations to meet your needs and of course the **confidence** you desire that the procedures and calibrations are traceable and accurate.

For more information visit our website at www.troemner.com or contact us at 1.800.352.7718.



201 Wolf Drive, PO Box 87,
 Thorofare, NJ 08086-0087 USA
 Phone: 856-686-1600
 Fax: 856-686-1601
<http://www.troemner.com>
 e-mail: troemner@troemner.com