



## Calibration Solutions

be certain.

**MTS CALIBRATION SERVICES HELP ENSURE THE VALIDITY OF YOUR TEST DATA AND THE EFFICIENCY OF YOUR TEST LAB.** OUR ONSITE CALIBRATION SERVICES, AS WELL AS OUR FACTORY METROLOGY AND CALIBRATION LABORATORY CAPABILITIES, WILL PROVIDE YOU WITH A SOLID FOUNDATION FOR DELIVERING ACCURATE TEST DATA AND MEANINGFUL RESULTS.



## Unmatched value for test system calibration

In today's competitive and cost-conscious marketplace, you need to generate accurate test data faster than ever before. How quickly you can produce accurate results has a direct impact on your project's success. That is why proper calibration is critical. MTS provides a full range of professional calibration services accredited to ISO/IEC 17025. Where applicable, our calibration services are compliant with national and international standards.

Nobody is more qualified to help you deliver consistent, verifiable results, test after test, in the most cost-efficient manner possible.



### Expertise

Our test system expertise allows us to offer true end-to-end system calibrations. Highly trained MTS field service engineers possess a deep understanding of your test equipment, along with the methods and software required for full system calibration. We see beyond calibration alone, applying our system and calibration expertise toward ensuring that your entire test setup is performing at its optimal level.

### Efficiency

Proprietary MTS software provides the industry's fastest and most efficient calibration. Our proven, automated process helps to ensure your calibration is done correctly the first time, saving you money by reducing your downtime. MTS Onsite Calibration requires minimal assistance from your staff, so your technicians can continue to focus on your testing schedule while we meet your calibration needs.

### Value

MTS brings industry-leading software, extensive calibration expertise, and a deep understanding of your test equipment and the latest industry standards. Additionally, our calibration equipment is traceable through National Metrology Institutes, such as the National Institute of Standards and Technology (NIST). Combined, these capabilities create an unparalleled solution for providing one of the most accurate, efficient and all-encompassing calibration programs available anywhere in the world.



## Deliver consistent, verifiable test results with confidence

Upholding test data integrity through regular calibration is not only a requirement, but a strategic imperative for your organization. Accuracy is essential to conducting the highest-quality testing in the least amount of time — and at the lowest cost. Professional calibration optimizes test equipment performance and helps you deliver accurate, reliable results every day.

### WHAT ARE THE STANDARDS?

- » ASTM International. This organization plays a leadership role in addressing the standardization needs of the global marketplace. ASTM International is one of the largest voluntary standards development programs in the world — a trusted resource for technical standards for materials, products, systems and services.
- » ISO 9001. The International Organization for Standardization (ISO) promotes the development of international manufacturing, trade, and communication standards. ISO 9001 management practices establish a quality system.
- » ISO/IEC 17025. This standard describes good laboratory practice and requires proficiency testing of individuals performing tests or calibrations. It also requires a quality system, along with a corresponding management structure to which that system must adhere.
- » ANSI/NCSL Z540-1. The American National Standards Institute/National Conference of Standards Laboratories (ANSI/NCSL) set of calibration and quality assurance practices draws on several earlier ISO documents.

### WHAT DRIVES THEM?

- » FQA. The Fastener Quality Act (FQA) requires that certain fasteners conform to the specifications under which they are alleged to be manufactured. It provides for accreditation of laboratories engaged in fastener testing, requiring the inspection, testing and certification of fasteners covered by the Act in accordance with standardized methods.
- » API PTLAP. The American Petroleum Institute Petroleum Laboratory Accreditation Program (API PTLAP) allows petroleum refineries and independent laboratories that test petroleum products to be accredited using procedures listed in API Standard 1512. Based on ISO/IEC, the program involves onsite assessments and results in three-year certifications.
- » Nadcap (formerly NADCAP, National Aerospace and Defense Contractors Accreditation Program). This organization defines the global cooperative standards for aerospace engineering, defense and related industries.





## Expert, end-to-end calibration onsite at your facility

MTS Onsite Calibration provides a convenient, time-efficient and cost-effective means of keeping your testing instrumentation calibrated to exacting industry standards.

MTS has field service organizations trained to perform your necessary onsite transducer and system calibrations. Many of the MTS Onsite Calibration services are ISO/IEC 17025 accredited and comply with a wide range of ASTM and ISO test methods. Our engineers are equipped with the necessary calibration equipment, traceable through NIST or other recognized National Metrology Institutes, and utilize our proprietary automated calibration software to reliably deliver your calibration data. A calibration report and certificate is issued showing As Found/As Left calibration data.



### ADDITIONAL ONSITE CALIBRATION OFFERINGS

- » For transducers that are integrated into test systems:
  - torque
  - pressure
  - linear displacement
  - angle (rotary transducers)
- » Revolutions per minute (RPM) for test systems
- » Temperature for environmental chambers
- » Thermocouples
- » Resistance temperature detectors
- » FlexTest<sup>®</sup> controllers
- » FlexDAC<sup>™</sup> systems

### FORCE CALIBRATIONS IN COMPLIANCE WITH ASTM E4 AND ISO 7500-1

Verifies test system ability to indicate static and quasi-static forces within the requirements of the standard.

### CRACK-OPENING DISPLACEMENT (COD) GAGES

Includes calibration of COD gages in compliance with ASTM E399 (plane-strain fracture toughness of metallic materials), and ASTM E561 (R-curve determination).

### EXTENSOMETER CALIBRATION PER ASTM E83 AND ISO 9513

Calibration in compliance with ASTM E83, Standard Practice for Verification and Classification of Extensometer System.

### ACCELEROMETER CALIBRATION

Includes calibration of transducers with or without conditioners or charge amplifiers for both uniaxial and triaxial accelerometers.

### STATIC ALIGNMENT VERIFICATION

Testing system misalignment can lead to false early specimen failure. Using our standard 709 alignment software and 12 gage alignment devices, our field engineers will perform an Alignment Verification in compliance with ASTM E1012.

### DYNAMIC FORCE VERIFICATION

Some level of under- and/or over-testing exists when running cyclic testing of materials. MTS can help minimize these effects by performing Dynamic Force Verification in compliance with NASM1312 and ASTM E467.

### SPEED VERIFICATION FOR MONOTONIC TESTING

Originally designed to verify crosshead speed for electromechanical test systems, this traceable process can also be used for verification of actuator speed for servohydraulic test systems performing monotonic testing of materials verification in compliance with ASTM E2658.

### MTS vehicle test systems

#### MTS K&C CALIBRATION SERVICES

Full system calibration for 1-axle or 2-axle configurations including accessories.

#### MTS MODEL 320 ROAD SIMULATOR CALIBRATION SERVICES

Displacement transducer calibration.

#### MTS MODEL 329 ROAD SIMULATOR CALIBRATION SERVICES

Force and/or displacement transducer calibration for corner, axle, or 2-axle system configurations.

#### MTS MULTI-AXIAL SIMULATION TABLE (MAST<sup>™</sup>) CALIBRATION SERVICES

For your six-channel MAST system, choose from three end-to-end calibration packages.

#### MTS TIRE TEST SYSTEM CALIBRATION SERVICES

Full calibration to either current or new matrix standards.

#### CUSTOM SYSTEM CALIBRATION SERVICES

Contact MTS for calibrations that can be done on a time & materials basis for custom or other systems not listed above.





## Highly precise instrumentation measurement

The ISO/IEC 17025 accredited MTS Metrology Laboratory can help you minimize and understand measurement risk by identifying error sources and stating the uncertainty of the measurement process. Through this laboratory, we currently provide calibration for more than 6,000 instruments in use around the world. The MTS Metrology Laboratory also supports various MTS Field Service accreditations.

The MTS Metrology Laboratory provides a full range of in-house calibration services to meet your measurement and test equipment special requirements, including both ISO/IEC 17025 accredited and non-accredited calibration services.



### APPLYING THE LATEST TECHNOLOGY TO MEET YOUR INSTRUMENT CALIBRATION NEEDS

Our state-of-the-art 25,000-lbf Primary Dead Weight Standard ensures that your force standards are calibrated with the greatest levels of accuracy possible. The standard meticulously applies the forces required to calibrate force transducers, force gages, and other types of force measuring instruments in accordance with ASTM E74 and ISO 376 specifications.

The 25,000-lbf Dead Weight Standard is the only means of achieving ISO 376 Class 00 and Class 0.5 accuracy classifications. It can also be used to calibrate both compression and tension forces with ultra-low-level uncertainties.

### Technical competence assessments

Our accredited calibration process allows a common artifact to be measured in our environment with our methods and equipment. Measurement results are then compared to other results and used to show consistency and process control.

We participate in rigorous cross-laboratory comparisons to assess how well our measurement results compare with other established calibration laboratories. Such proficiency testing is an excellent means of helping us improve our technical competence.

### Measurement uncertainty analysis (MUA)

We routinely assess and monitor our measurement processes to identify and quantify sources of measurement uncertainty. We will then provide a statement of measurement uncertainty to you, so you can assess your own measurement processes for uncertainty contribution.

### Unbroken chain of comparisons

Before any measurement can have meaning, it must first be based on a foundation of nationally recognized standards. That's why all MTS measurements are supported by reference standards traceable to the SI unit through the National Institute of Standards Technology (NIST) or other recognized National Metrology Institutes (NMIs). This traceability is clearly stated on every calibration certificate issued.

### Proprietary methods

We continually write, append and approve our own procedures as a means of minimizing errors arising from the calibration process. MTS is also active on ASTM and ISO committees to ensure that our methods fully satisfy current calibration requirements.

### Areas of calibration expertise

- » Force
- » Torque
- » Vibration
- » Pressure Linear Displacement
- » Electrical Instrumentation
- » Dimensional and Mechanical Instruments
- » Temperature and Humidity
- » Time and Frequency



## Cost-effective Factory Calibration

Our experienced calibration technicians use the best procedures available to provide credible and traceable MTS transducer calibrations, in the disciplines of force, pressure, torque and strain. ISO/IEC 17025 accredited factory calibration services are available for a variety of transducers.

### HOW OFTEN IS CALIBRATION REQUIRED?

The answer to this question depends on several variables, all of which are unique for every lab, quality management system and ASTM or ISO requirement.

Generally speaking, ASTM and ISO standards specify that recalibration should be performed annually, assuring the test system meets specific minimum calibration criteria as prescribed by published standards.

Calibration is also necessary whenever a test system is moved, repaired, or needs to operate in a different range of use.

We'll work closely with you to develop a custom calibration approach that provides the best results for you.

### MTS SWIFT® Evo System calibration

Our factory calibration includes a proprietary, automated SWIFT Evo calibration system that applies true vector loading to ensure the most accurate calibrations possible.



MTS SWIFT® Evo System calibration

### Force transducer calibration

Includes axial calibration up to 220,000 lbf for use with MTS controller electronics.

### Torque transducer calibration

Includes calibration up to 100,000 lbf-in for use with MTS controller electronics.



Extensometer calibration

### Extensometer calibration

Includes calibration for use with MTS controller electronics. We have specially-designed adapters to complete the appropriate calibration on a wide range of extensometers.

### Pressure calibration

Pressure transducer calibration includes calibration up to 10,000 psi for use with MTS controller electronics.

## Regional Business Centers

### THE AMERICAS

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## A global leader in test solutions and support

MTS is recognized worldwide for helping people build confidence in the performance of their products. Our unmatched calibration solutions play a critical role in helping test professionals achieve the highest levels of certainty.

We also field one of the largest, most experienced worldwide service, support and consulting staff of any testing solution provider. Our calibration offerings are designed to help you maximize your productivity and uptime, while getting the longest functional life possible from your MTS investments.



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