ISO 6892-2 Metallic Materials - Tensile Testing (*elevated temperature*)

MTS Criterion® & MTS Exceed®
Electromechanical Universal Test Systems

MTS Landmark®
Servohydraulic Test Systems

TEST METHOD SUMMARY

Tensile testing of metallic materials per ISO 6892-2, is used to determine mechanical material property data at elevated temperature. Uniaxial tensile force is applied to material specimens in any form to investigate the stress/strain behavior at elevated temperature and critical materials properties including yield strength, yield point elongation, tensile strength, elongation, and reduction of area.

Solutions for ISO 6892-2 typically include these types of components:

LOAD FRAME OPTIONS*

MTS offers electromechanical Criterion® and Exceed® universal test systems and dynamic servohydraulic Landmark® test systems that are ideal for performing accurate and repeatable monotonic tensile testing of metallic materials at elevated temperatures per ISO 6892-2.

MTS Criterion universal testing systems are engineered to support the needs of advanced Research & Development. MTS Exceed universal testing systems are best suited for Quality Control testing by delivering the reliable performance needed to meet the uptime demands of high-volume production environments.

The MTS Criterion and the MTS Exceed universal testing machines range from tabletop to floor-standing electromechanical models with force ratings of up to 600 kN / 135 kip.

The MTS Landmark dynamic servohydraulic test system with its superior stiffness and alignment capabilities, is an ideal choice if additional fatigue and fracture testing capabilities are required. Systems are available in highly configurable floor-standing and tabletop models with force ratings from 5 kN / 1 kip to 500 kN / 110 kip.

As an alternative to a new load frame, you can replace outdated controls / hydraulics of existing MTS or another manufacturer's electromechanical, servohydraulic or custom test systems, including: **Instron®, **Zwick®, **Tinius Olsen™, **SATEC®, **Baldwin® and more with an MTS ReNew™ Upgrade.

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ENVIRONMENTAL CHAMBER - ELEVATED TEMPERATURE TESTING UP TO 540°C / 1000°F*

Environmental Chambers

- Maximum temperature range of -150°C to 540°C (-240°F to 1000°F)
- Options for MTS Criterion, Exceed and Landmark systems
- Compatible with clip-on, optical and video extensometers

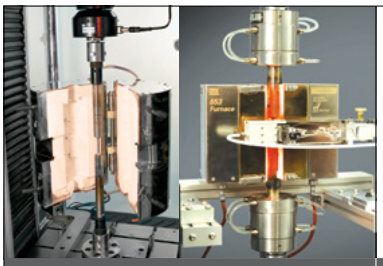
Mechanical & Hydraulic Grips

- Versatile, economical mechanical wedge grips for testing up to 315°C (600°F)
- Hydraulic wedge grips support adjustable gripping force to prevent specimen slippage or grips for testing up to 540°C (1000°F)
- A universal joint for grips that mount with a clevis adapter or an alignment fixture for stiff mounted grips, to improve the alignment

Extensometers

- Clip-on extensometers are the most commonly used economical strain measurement solution
- The MTS Advantage™ Video Extensometer is just one of many non-contacting strain solutions available for tension testing of metals
- Meet and/or exceed ISO 9513 Class 0.5 and ASTM E83 Class B1 calibration requirements

HOT GRIP & FURNACE- ELEVATED TEMPERATURE TESTING UP TO 1000°C / 1800°F*

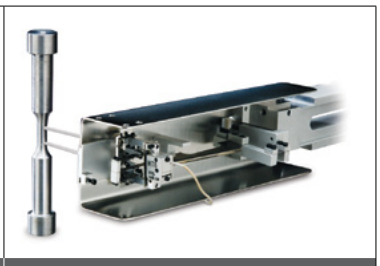


High Temperature Furnaces

» Capable of test temperatures ranging from 100°C to 1000 °C (220°F to 1800°F)
» Accommodates high temperature pin-end, threaded-end and button-head specimen adapters
» Three-zone design in conjunction with hot grip design for low thermal gradient

High Temperature Grips

» Adapter for pin-end sheet metal specimens
» Adapter for threaded-end specimens
» Hydraulic grips support constant, adjustable specimen clamping force for testing button-head, efficiency button-head, and threaded-end specimens
» A universal joint for grips that mount with a clevis adapter or an alignment fixture for stiff mounted grips, to improve the alignment



High Temperature Extensometer

» Lightweight, low-contact-force devices for measuring strain in tests up to 1200° C (2200°F in furnaces (air & water cooled models)
» Meet and/or exceed ISO 9513 Class 0.5 and ASTM E83 Class B1 calibration requirements

SOFTWARE & CONSULTING OPTIONS*

About MTS TestSuite™ TW

The efficient MTS TestSuite TW software provides the versatility required to address unique and complex testing requirements.

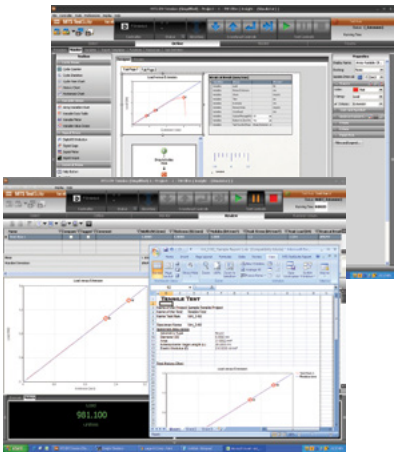
twe TestSuite TW Elite includes all the test definition capacity and flexibility test designers need to create and edit custom test sequences while accommodating the specific runtime needs of lab personnel.

twx TW Express is designed for the test operator and is used to run tests created with TW Elite and can be used without fear of inadvertently modifying the Test Method. This application allows the operator to easily execute even the most complex tests and monitor data or calculated values in runtime views that can be tailored by both test designers and operators.

ISO 6892-2 Metallic materials - Tensile testing - at elevated temperature

To simplify testing to ISO 6892-2, MTS has developed a TestSuite TW test method template that will set-up and run the recommended tensile tests.

» Crosshead/actuator or extensometers can be used for strain measurement and control
» Post-test review tab and reports show data in stress-strain plots and highlight calculated values such as yield strength, yield point elongation, tensile strength, elongation, and more
» Raw data can be exported in many formats including CSV and TXT
» Test methods, calculations, review displays, and report layouts can be customized by the user



MTS Consulting Can Enable LIMS Integration & Other Lab Efficiency Enhancements

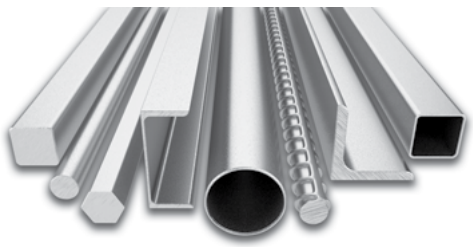
MTS consultants are available to support seamless data integration from your TestSuite test templates to your laboratory information management system (LIMS). Lab Efficiency Enhancements could include:

» Integrating bar code scanners, reading data from micrometers and calipers, supporting automated specimen temperature control
» Automating the interface of two-way communications between TestSuite and virtually any LIMS system

*NOTE: This technical note is intended to show some of the more common solutions used for this particular application. Most often, additional options are available and necessary to accomplish more comprehensive test objectives.

APPENDIX - TEST SPECIMEN DETAIL

ISO 6892-2 refers to ISO 6892-1 with regards to the supported specimen types and dimensions, in addition to giving specific recommendations for geometries of test pieces for thin products, for wires and for bar type specimens. ISO 6892-1 supports a variety of specimen types and dimensions ranging from foils, sheets, thick plates, wires, rounds, bars to tubes / pipes to support a variety of products. Additional specimen types as referenced for example in ISO 11960, ASTM A370, ASTM E8, DIN 50125 or JIS Z 2241 are permissible. Please consult ISO 6892-2 or referenced standards for more detailed information about the supported specimen geometries.



MTS Systems Corporation
14000 Technology Drive
Eden Prairie, MN 55344-2290 USA
Telephone: 1-952-937-4000
Toll Free: 1-800-328-2255
E-mail: info@mts.com
www.mts.com

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