



MTS Criterion® & MTS Exceed®
Electromechanical Universal Test Systems



MTS Landmark®
Servohydraulic Test Systems



MTS ReNew™
Upgrade for Hydraulic & Electromechanical Test Systems

ASTM E8/E8M Tensile Testing of Metallic Materials

TEST METHOD SUMMARY

Tensile testing of metallic materials per ASTM E8/E8M, is used to determine mechanical material property data. Uniaxial tensile force is applied to material specimens in any form to investigate the stress/strain behavior, and critical materials properties including yield strength, yield point elongation, tensile strength, elongation, and reduction of area.

Solutions for ASTM E8 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 per ASTM E8/E8M.

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. Due to the large variety of metals and specimen dimensions that can be tested per ASTM E8/E8M, the required force capacities can differ significantly. MTS offers frame models that address the smaller force requirements for testing metal foils or thin wires up to high-force requirements for testing thick plate type specimens.

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. Many of the models have dual-zone test spaces to reduce set-up times if you frequently change test requirements.




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As an alternative to a new load frame, you can replace outdated controls / hydraulics of existing MTS or another manufacturer's static-hydraulic, electromechanical, servohydraulic or custom test systems, including: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




***Trademark owned by their respective owners, not affiliated with MTS Systems Corporation.*

EXTENSOMETRY OPTIONS*

ASTM E8/E8M requires that extensometers conform to ASTM E83. MTS offers a variety of extensometer types, ranging from clip-on, automatic to non-contacting optical and video extensometers, that meet or exceed requirements for calibration according to ASTM E83 Class B1 and ISO 9513 Class 0.5 standards. Factors like the specimen material, shape and dimension, the requirements for test efficiency and budget need to be considered when choosing the appropriate strain measurement solution.

		
Clip-on Extensometers	Automatic Extensometer	Non-Contacting Extensometer
<ul style="list-style-type: none"> » Most commonly used economical strain measurement solution » Provide reliable, repeatable means to accurately measure axial strain for testing round or flat specimen geometries 	<ul style="list-style-type: none"> » Automatic specimen attachment and self-adjusting gage length positioning ensures test consistency and supports high-volume testing by eliminating the need for operator intervention » Optional transverse strain measurement to support the calculation of the plastic strain ratio "r-value" for sheet metals 	<ul style="list-style-type: none"> » The MTS Advantage™ Video Extensometer is just one of many non-contacting strain solutions available for tension testing of metals » Potential options for analyzing all critical tensile properties include 1D, 2D, and 3D measurements, real-time display, post-test analysis, video replay, specimen reanalysis, and more

GRIP OPTIONS*

			
Mechanical Wedge Grips	Hydraulic Wedge Grip	Hydraulic Single & Double Side-Acting Grips	Threaded & Shoulder Grips
» Versatile, economical grip good for a variety of specimen types	» Adjustable gripping force to prevent specimen slippage or crushing	» Adjustable gripping force and centering to prevent specimen slippage or crushing	» For threaded-end specimens » For shoulder-block or button-end specimens

MTS provides a vast array of manual, pneumatic and hydraulic grips that set the standard for accuracy and repeatability, exceeding industry standards to ensure repeatable testing and credible test data.

GRIP FACE OPTIONS*


Wedge Grip Faces
» MTS wedges come in a variety of surfaces to meet test requirements for flat and round specimens of various material types

SOFTWARE & CONSULTING OPTIONS*

About MTS TestSuite™ TW	ASTM E8 Tensile Testing of Metallic Materials Test Method Template
The efficient MTS TestSuite TW software provides the versatility required to address unique and complex testing requirements.	To simplify testing to ASTM E8, MTS has developed a TestSuite TW test method template that will set-up and run the recommended tensile tests.
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.	» Crosshead/actuator or extensometers can be used for strain measurement and control
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.	» 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

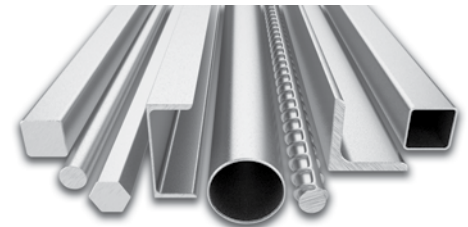


MTS Consulting Can Enable LIMS Integration & Other Lab Efficiency Enhancements
MTS consultants are available to support seamless data integration from your TestSuite test templates to your laboratory information management system (LIMS). Lab Efficiency Enhancements could include:
» Integrating bar code scanners, reading data from micrometers and calipers, capturing video via webcam
» 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

ASTM E8/E8M 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. Standard round tension specimens with various end types ranging from smooth, threaded to button-head can be selected for testing. Please consult ASTM E8/E8M for more detailed information about the supported specimen geometries.



MTS Systems
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

ISO 9001 Certified QMS

MTS, MTS Criterion, MTS Exceed and MTS Landmark are registered trademarks, and MTS TestSuite, MTS ReNew and MTS Advantage are trademarks of MTS Systems within the United States. These trademarks may be protected in other countries. RTM No. 211177.

© 2021 MTS Systems
100-525-917a ASTM E8/E8M • Printed in U.S.A. • 09/21