



## MTS Exceed® Series 40 Electromechanical Universal Test Systems

Affordable monotonic testing solutions

be certain.

COMBINING PROVEN LOAD FRAME TECHNOLOGY WITH EASY-TO-USE TEST SOFTWARE AND A VARIETY OF ACCESSORIES, **MTS EXCEED™ UNIVERSAL TEST SYSTEMS** ARE DESIGNED TO HELP YOU ADDRESS THE FULL RANGE OF MONOTONIC TEST DEMANDS WITH UNCOMPROMISED RELIABILITY AND SUPERIOR VALUE.



## Address Broad Application Needs

MTS is one of the world's leading manufacturers of mechanical testing and simulation solutions, providing the superior technology, expertise and global support that customers need to meet their business objectives. MTS Exceed Universal Test Systems reflect the knowledge and best practices gained from decades of testing industry leadership.

This broad portfolio of load frames, software and accessories delivers exceptional control, reliability and ease-of-use to address a full range of monotonic test applications.

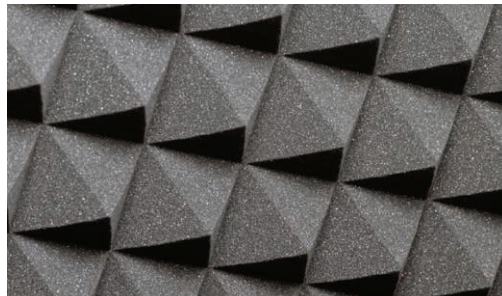
MTS Exceed test systems are compliant with international standards and designed to meet the requirements of all common testing standards such as ISO, JIS, ASTM, DIN and others. They provide an ideal balance between functionality and cost, and are able to satisfy common testing needs across a broad range of industries while offering an excellent return on investment.

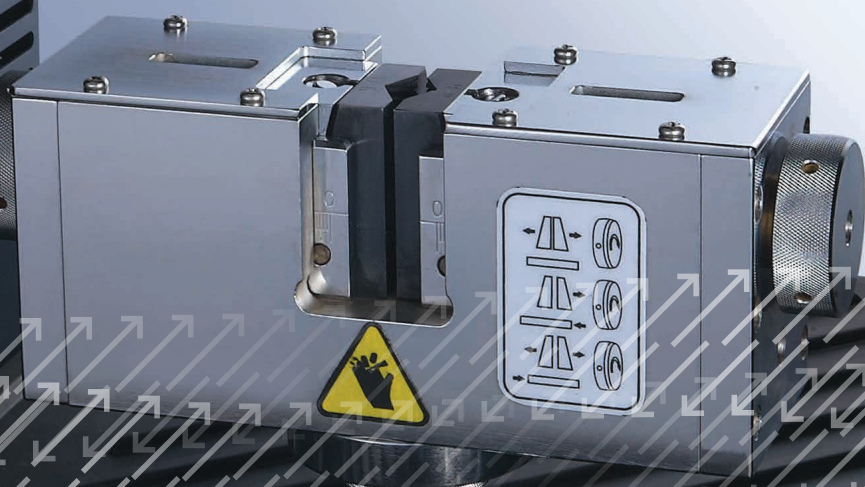
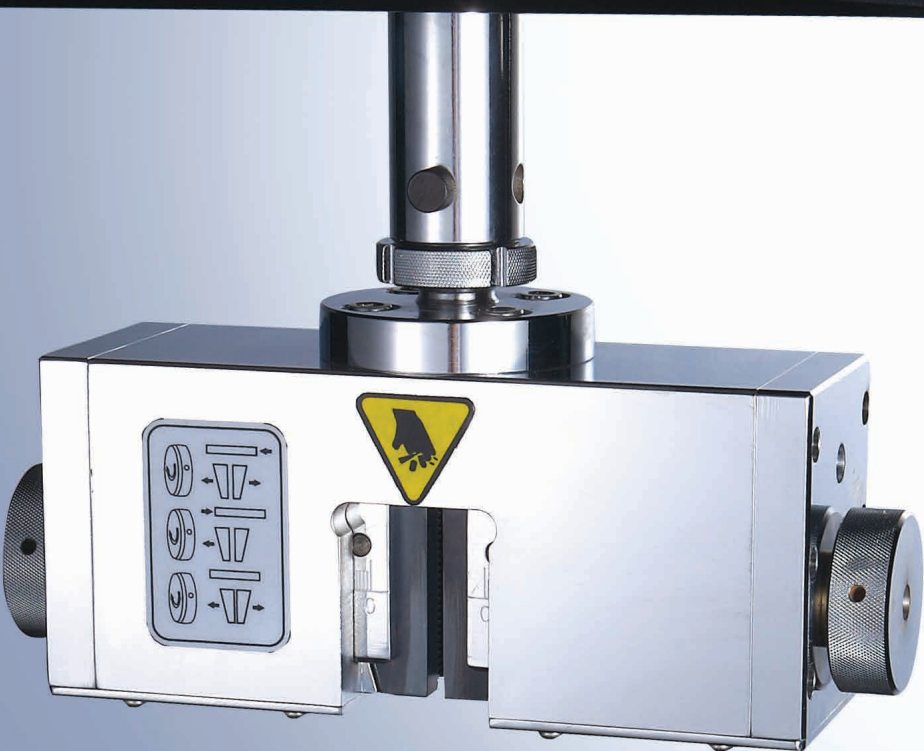
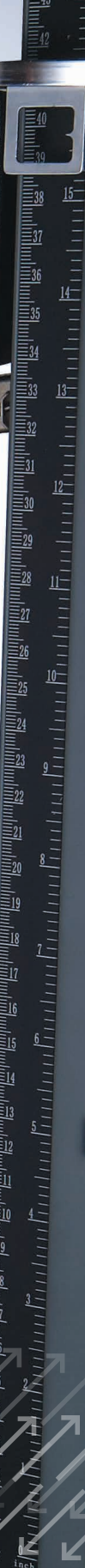
### APPLICATIONS

- » Tension
- » Compression
- » Flex/bend
- » Shear
- » Peel
- » Tear

### MATERIALS AND COMPONENTS

- » Metals
- » Composites
- » Polymers
- » Construction materials
- » Wood and paper products
- » Biomedical products
- » Fibers and textiles
- » Adhesives and coatings
- » Foam
- » More





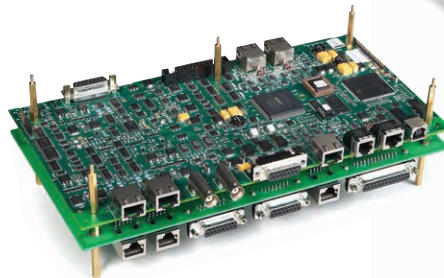
## Uncompromised Reliability

Through seamless integration of software, controls and mechanical hardware, MTS Exceed systems deliver the reliable, repeatable performance needed to meet the robust quality compliance and uptime demands of high-volume production environments.

### Proven load frame technology

MTS Exceed Series 40 electromechanical load frames are ideal for performing accurate and repeatable monotonic testing on specimens ranging from thin film plastics to composites and alloys.

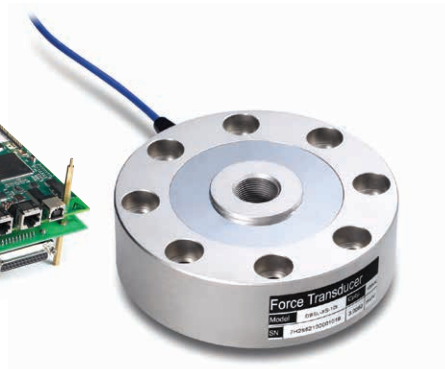
Available in numerous high-stiffness configurations, these frames feature high-resolution MTS digital controls and compact AC servomotor drives to provide high-speed, low-vibration testing across a broad range of force capacities. The servomotor reliability is greatly improved by an oversized, thicker ball screw.



High-resolution digital controllers

MTS digital controllers deliver high-speed, closed-loop control and an industry-leading 1,000 Hz data acquisition rate. This capacity allows you to generate high-resolution test data for more meaningful analysis, achieve higher fidelity across test runs, and gain statistically significant test samples more quickly and efficiently.

- » 1000 Hz control loop rate
- » Up to 1000 Hz data acquisition rate
- » 20-bit resolution
- » Built-in USB 2.0 for PC communication
- » Self-ID capability for calibration and auto-ranging
- » Two optional strain inputs in addition to the system load cell
- » Three optically isolated digital inputs and outputs
- » Two BNC monitor connectors
- » Test area enclosure interlock connector



Precision, TEDS-enabled loads cells

Highly accurate MTS load cells are designed to offer high stiffness and stability with low non-linearity. They provide overload and side load protection and are designed with built-in shunt resistors to facilitate regular verification of accuracy using calibration routines featured in MTS software.

To increase efficiency and reduce potential operator error, they feature TEDS (Transducer Electronic Data Sheets) self-identification capabilities that follow the recently adopted IEEE 1451.4 standard. This enables an MTS Exceed system to automatically detect installed load cells and download specific calibration information.



## Easy-to-Use Systems

MTS Exceed systems are equipped with many time-saving features. Floor-standing models have dual zone designs that save testing time by eliminating the need for fixture changes between tensile and compression tests.

Additionally, the new MTS TestSuite™ TW Essential Software offers a straightforward and intuitive interface to simplify test setup and operation.

### Guided test setup

With new MTS TestSuite TW Essential (TWS) software, test setup is extremely easy. Using a highly visual interface, the software guides the entire process from pre-test to post-test and allows the user to input specimen details and calculations along the way.

### One-direction calibration

These systems require calibration in one direction only, which greatly minimizes the time and effort needed to maintain and calibrate the load frame.

### Convenient, ergonomic handsets

MTS handsets facilitate streamlined test setup by enabling operators to perform standard system control functions such as start, stop, pause and crosshead positioning while standing close to the test specimen. The handset can display test status messages, system performance messages, and test results. Two programmable function keys are set up in the software as digital inputs,

allowing users to define test functions such as start test, pause and hold position.

The handset features a compact, ergonomic design for both right-handed and left-handed operators, plus a large text display that provides information at a glance.



## Exceptional Value in its Class

MTS Exceed 40 systems are capable of performing the heavy load of test tasks found in an industrial manufacturing environment. With features and control capabilities typically found on higher-end model load frames, these systems provide superior value for the investment.

### System safety features

To help ensure operator well-being and compliance with the latest international safety directives, MTS Exceed systems are designed to accommodate a variety of safety features, including:

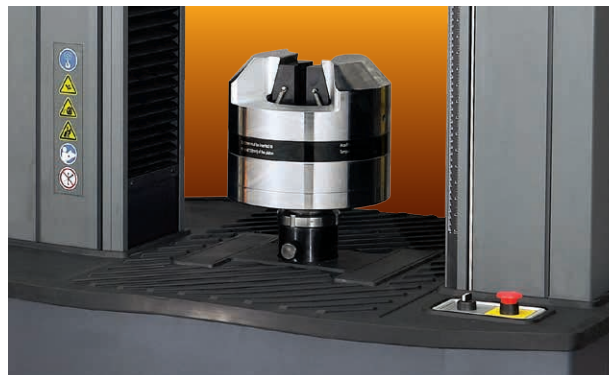
- » Integrated control pod
- » System status light – indicates whether the load frame drive is energized and ready for testing
- » E-stop
- » Test control handset
- » Mechanically adjustable limits that stop the crosshead at predetermined points
- » Motor overheat device that automatically turns off the motor power supply
- » Limit-setting for load, extension, strain or any other data channel



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### Durable, easy-to-maintain test space

MTS Exceed systems feature durable, protective rubber matting to extend the life and enhance the maintainability and utility of the system test space. Series 40 systems include heavy work surface mats that are designed to protect the load frame base and facilitate easy test space cleanup and maintenance. Molded edges on the mats prevent tools from rolling off, and an integrated groove pattern channels spills and debris away from the work area.



### Load cell savings

The dual-test zone design allows one load cell to be used for two types of test on the same load frame. This feature not only saves testing time, but it reduces overall load cell expense for the lab.



## Electromechanical Universal Test Systems

Choose from a comprehensive line of compact and reliable electromechanical systems for low- to medium-force monotonic testing

MTS Exceed Series 40 systems feature a complete selection of universal test systems for meeting a wide range of monotonic production testing requirements. Highly reliable and easy to operate, these systems employ responsive, low-vibration MTS electromechanical drives and integrated, digital closed-loop controls to test in load, position and strain control at force capacities ranging from 5 N to 600 kN.

Series 40 systems are available in a variety of compact, high-stiffness one- and two-column tabletop configurations for low- to medium-force testing, or robust two-column floor-standing configurations for medium- to high-force testing. Easy-to-use MTS TestSuite TW software, a large and growing library of standards-compliant test methods, and a full complement of accessories extend the utility of these systems across a broad spectrum of materials, including:

- » Plastics
- » Thin films
- » Fibers and threads
- » Adhesives
- » Foam
- » Elastomers
- » Biomaterials
- » Wood and paper products
- » Thin metals
- » Wire
- » High-strength metals
- » Components
- » Fasteners
- » Composites



E42

**Rated force capacity:** 5 N - 5 kN

**Applications:** Steel wire, plastics, fine wire, fibers and threads, biomaterials, thin films, adhesives, foam, packaging, paper products, consumer products.

### SERIES 40 SYSTEM KEY FEATURES

- » Complete selection of compact, high-stiffness 1- and 2-column load frame configurations
- » High-speed, low-vibration MTS electromechanical drives
- » World-class, maintenance-free AC servomotor and amp
- » Precision, pre-loaded ball screws
- » Non-clutched drives, rated for full speed at maximum force
- » High-resolution, digital closed-loop controls (integrated into load frame)
- » Convenient test setup and control handset
- » Versatile, easy-to-use MTS TestSuite TW software with standards-compliant test template library (ASTM, ISO, DIN, EN, BS, and more)
- » Load cells with TEDS self-identification capabilities
- » Complete selection of grips, fixtures, environmental systems and extensometers (optional)
- » Dual-zone test space (Models 44 and 45) reduce setup time
- » Anti-rotation grip/fixture mounting
- » Optional T-slot table
- » Automatic limit checking of crosshead position, overload, over-temperature, over-voltage, etc.
- » Durable test space protection



E45.105

**Rated force capacity:** 50 kN, 100 kN

**Applications:** Plastics and metal materials.





E43

**Rated force capacity:** 5 N - 10 kN

**Applications:** Plastics, rubber, and other non-metal materials.



E44

**Rated force capacity:** 100 N - 30 kN

**Applications:** Metal and non-metal materials.



E45.305

**Rated force capacity:** 200 kN, 300 kN

**Applications:** Metal materials.



E45.605

**Rated force capacity:** 200 kN, 300 kN, 600 kN

**Applications:** Metal materials.

## MTS Exceed Series 40 Specifications - Common

Accuracy Class

ISO 7500 Class 0.5 / Class 1 or ASTM E4

<b>Force capacity</b>	± 0.5% of reading	± 1% of reading
<b>Force range*</b>	1 to 100% of rated force capacity	0.5 to 1% of force rated capacity
<b>Rated maximum force at max. test speed</b>	100%	
<b>Rated maximum test speed at maximum force</b>	100%	
<b>Speed accuracy</b>	Set speed < 0.01 mm/min: speed accuracy is within ± 1.0% of set speed Set speed ≥ 0.01 mm/min: speed accuracy is within ± 0.5% of set speed	
<b>Position accuracy</b>	Within ± 0.5%	
<b>Strain measuring range</b>	0.2% - 100% FS	
<b>Strain accuracy**</b> (depending on extensometer)	Class 0.5 and Class 1	
<b>Security protection</b>	Over-force, travel limits, over-voltage and others	
<b>Over force protection</b>	10%	
<b>Data acquisition rate</b>	1000 Hz	
<b>Control loop rate</b>	1000 Hz	
<b>Environmental requirements</b> (For indoor use only) <i>Operating temperature</i> <i>Operating humidity</i> <i>Storage temperature</i> <i>Maximum storage humidity</i> <i>Maximum attitude</i>	5° C to 40° C (41° F to 104° F) 5% - 85% non-condensing -18° C to 49° C (0° to 120° F) 90% non-condensing 2000 meters	
<b>Motor &amp; drive system</b>	AC Servo Motor	
<b>Ballscrews</b>	Pre-Forced	
<b>Position measurement</b>	Encoder	
<b>Additional DC conditioning channels</b>	2 channels (Examples: resistive extensometers and load cells)	
<b>Additional digital conditioning channels</b>	1 channel (Examples: long travel extensometer and quadrature encoders)	

\* Range dependent on filter setting and laboratory environment.

\*\* Extensometer calibration services are available to meet ISO 9513, ASTM E83.

## MTS Exceed Series 40 Specifications - Comparative

Model	E42.503	E43.104	E43.504	E44.104
<b>Maximum rated force capacity</b>	5 kN (1100 lbf)	10 kN (2200 lbf)	50 kN (11000 lbf)	10 kN (2200 lbf)
<b>Force capacity options</b>	5 N, 10 N, 20 N, 50 N, 100 N, 200 N, 500 N, 1 kN, 2 kN, 5 kN 1 lbf, 2 lbf, 5 lbf, 10 lbf, 20 lbf, 45 lbf, 110 lbf, 220 lbf, 450 lbf, 1100 lbf	5 N, 10 N, 20 N, 50 N, 100 N, 200 N, 500 N, 1 kN, 2 kN, 5 kN, 10 kN 1 lbf, 2 lbf, 5 lbf, 10 lbf, 20 lbf, 45 lbf, 110 lbf, 220 lbf, 450 lbf, 1100 lbf, 2200 lbf	20 kN, 30 kN, 50 kN 4500 lbf, 6700 lbf, 11000 lbf	100 N, 250 N, 500 N, 1 kN, 2 kN, 5 kN, 10 kN 20 lbf, 50 lbf, 110 lbf, 220 lbf, 450 lbf, 1100 lbf, 2200 lbf
<b>Frame type</b>	Table top	Table top	Table top	Floor-standing
<b>Test zones</b> (single/dual)	Single	Single	Single	Single/Dual
<b>Maximum test speed</b>	508 mm/min (20 in/min)	508 mm/min (20 in/min)	508 mm/min (20 in/min)	508 mm/min (20 in/min)
<b>Minimum test speed</b>	0.001 mm/min (0.00004 in/min)	0.001 mm/min (0.00004 in/min)	0.001 mm/min (0.00004 in/min)	0.001 mm/min (0.00004 in/min)
<b>Position resolution</b>	0.000051 mm (0.0000022 in)	0.000041 mm (0.0000016 in)	0.00006 mm (0.0000023 in)	0.000036 mm (0.0000014 in)
<b>Vertical test space</b>	<i>Standard</i> 700 mm (27.6 in)	1000 mm (39.4 in)	1000 mm (39.4 in)	1150 mm (45.28 in)
<b>crosshead travel</b>	<i>Extended</i> 1000 mm (39.4 in)	1300 mm (51.2 in)	1300 mm (51.2 in)	1450 mm (57.09 in)
<b>Space between columns</b>	100 mm (3.94 in)	340 mm (13.4 in)	420 mm (16.5 in)	400 mm (15.75 in)
<b>Frame height</b>	<i>Standard</i> 1300 mm (51.18 in) <i>Extended</i> 1600 mm (63.0 in)	1617 mm (63.7 in) 1917 mm (75.5 in)	1770 mm (69.7 in) 2070 mm (81.5 in)	1862 mm (73.3 in) 2162 mm (85.12 in)
<b>Frame width</b>	642 mm (25.28 in)	681 mm (26.81 in)	820 mm (32.3 in)	845 mm (33.27 in)
<b>Frame depth</b>	582 mm (22.91 in)	588 mm (23.15 in)	775 mm (30.5 in)	716 mm (27.19 in)
<b>Weight</b>	<i>Standard</i> 120 kg (265 lb) <i>Extended</i> 130 kg (287 lb)	120 kg (265 lb) 130 kg (287 lb)	325 kg (716 lb) 345 kg (761 lb)	435 kg (959 lb) 450 kg (992 lb)
<b>Power requirement</b>	Single-phase 200-240 V AC, 3 Amp 50/60 Hz, 600 W	Single-phase 200-240 V AC, 3 Amp 50/60 Hz, 600 W	Single-phase 200-240 V AC, 6 Amp 50/60 Hz, 1600 W	Single-phase 200-240 V AC, 3 Amp 50/60 Hz, 600 W



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Model	E44.304	E45.105	E45.305	E45.605
<b>Maximum rated force capacity</b>	30 kN (6600 lbf)	100 kN (22000 lbf)	300 kN (66000 lbf)	600 kN (132000 lbf)
<b>Force capacity options</b>	100 N, 250 N, 500 N, 1 kN, 2 kN, 5 kN, 10 kN, 20 kN, 30 kN 20 lbf, 50 lbf, 110 lbf, 220 lbf, 450 lbf, 1100 lbf, 2200 lbf, 4400 lbf, 6600 lbf	50 kN, 100 kN 11000 lbf, 22000 lbf	200 kN, 300 kN 44000 lbf, 66000 lbf	200 kN, 300 kN, 600 kN 44000 lbf, 66000 lbf, 132000 lbf
<b>Frame type</b>	Floor-standing	Floor-standing	Floor-standing	Floor-standing
<b>Test zones (single/dual)</b>	Single/Dual	Single/Dual	Single/Dual	Single/Dual
<b>Maximum test speed</b>	508 mm/min (20 in/min)	508 mm/min (20 in/min)	250 mm/min (9.84 in/min)	254 mm/min (10 in/min)
<b>Minimum test speed</b>	0.001 mm/min (0.00004 in/min)	0.001 mm/min (0.00004 in/min)	0.001 mm/min (0.00004 in/min)	0.001 mm/min (0.00004 in/min)
<b>Position resolution</b>	0.000040 mm (0.0000015 in)	0.000041 mm (0.0000016 in)	0.000017 mm (0.0000007 in)	0.000016 mm (0.0000006 in)
<b>Vertical test space crosshead travel</b>				
<i>Standard</i>	1150 mm (45.28 in)	1050 mm (41.34 in)	1100 mm (43.30 in)	1300 mm (51.2 in)
<i>Extended</i>	1450 mm (57.09 in)	1350 mm (53.15 in)	1400 mm (55.12 in)	
<b>Space between columns</b>	400 mm (15.75 in)	600 mm (23.62 in)	580 mm (22.83 in)	750 mm (29.52 in)
<b>Frame height</b>				
<i>Standard</i>	1862 mm (73.3 in)	2133 mm (83.98 in)	2360 mm (92.91 in)	2820 mm (111.02 in)
<i>Extended</i>	2162 mm (85.12 in)	2433 mm (95.79 in)	2660 mm (104.72 in)	
<b>Frame width</b>	845 mm (33.27 in)	1230 mm (48.43 in)	1215 mm (47.83 in)	1660 mm (65.35 in)
<b>Frame depth</b>	716 mm (27.19 in)	870 mm (34.25 in)	960 mm (37.80 in)	1272 mm (50.08 in)
<b>Weight</b>				
<i>Standard</i>	435 kg (959 lb)	1400 kg (3086 lb)	1700 kg (3748 lb)	3500 kg (7716)
<i>Extended</i>	450 kg (992 lb)	1450 kg (3197 lb)	1750 kg (3758 lb)	
<b>Power requirement</b>	Single-phase 200-240 V AC, 6 Amp 50/60 Hz, 1200 W	Single-phase 200-240 V AC, 10 Amp 50/60 Hz, 2000 W	Three-phase 380-415 V AC, or 440-480 V AC, 6.8 Amp 50/60 Hz, 5000 W	Three-phase 380-415 V AC, or 440-480 V AC, 7.2 Amp 50/60 Hz, 5000 W

## Full-Featured, Easy-to-Use Testing Software

Leverage the industry's most comprehensive package of test-ready methods, analysis and reporting features, and test definition capabilities

MTS TestSuite TW software provides an easy-to-use and adaptable solution for optimizing your production testing productivity and capability. For standard monotonic testing, MTS TestSuite Essential (TWS) guides the user through the testing process. For more complex requirements, MTS TestSuite Elite (TWE) allows for complete freedom in test design.



single software application. The software also features broad compatibility with industry-leading MTS digital controls and several load frames in addition to those in the MTS Exceed family, including MTS Criterion® load frames and MTS Landmark® load frames.

### Global standardization

Multi-language capabilities and hundreds of pre-packaged, standards-compliant test templates allow you to establish and maintain a truly global standardized testing methodology, while also improving lab productivity.

### Production-enhancing features

MTS TestSuite TW software allows you to conduct the full range of monotonic tests with superior productivity and “drag-and-drop” simplicity. It offers the ease-of-operation required for fast quality assurance and quality control testing, along with the versatility required to efficiently address unique and more complex test requirements. Other productivity-enhancing functionality including integrated analysis, reporting, several options for creating tests, and a separate application for test execution.

### Scalable for the long term

MTS TestSuite TW software supports multiple technologies and test types, varying levels of operator expertise and wide-ranging geographical needs, delivering the ideal solution for adapting to future needs. Support for electromechanical, static-hydraulic and servohydraulic systems allows for lab standardization under a

### Modular design meets your current and future needs

The MTS TestSuite TW software family is a set of applications and templates that you can configure to meet the unique needs of your test program, each designed for a specific purpose. You have the freedom to purchase what you need now, with the flexibility to enhance your capabilities as your test program changes.



# MTS TestSuite TW Essential Software

The perfect application for quick and easy monotonic testing

## Guided test setup

MTS TestSuite TW Essential software makes it easier than ever to design a test. At each stage of the testing process, from pre-test to post-test, the software guides the user through simple and visually-intuitive screens. Entering specimen parameters is easy with the visual cues.

## Test operation

Your users will find it very easy to execute tests, using screens that are clean, clear and easy to understand. To run a test, operators simply choose a test and then follow the interactive menus through completion. The test run is broken up into easy steps:

- » Test Procedure
- » Signals
- » Calculations
- » Events
- » Return to Zero

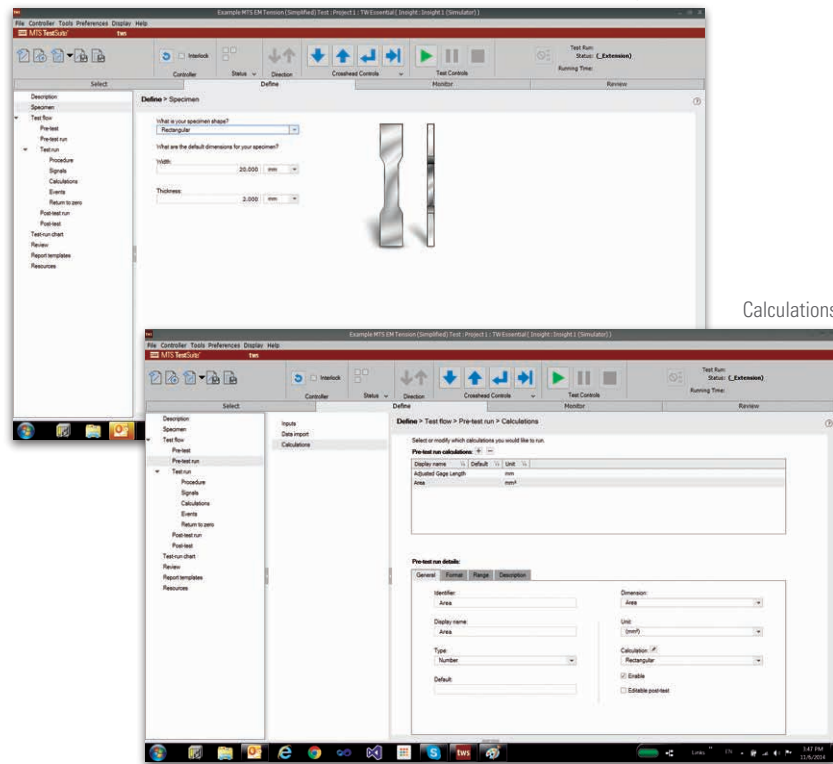
The software also runs a variety of preset templates, including those for peel, tear, shear, tensile, compression, creep, stress and cycle tests.

The Test Procedure is greatly simplified from MTS TestSuite Elite software, with far fewer activities.

## Test reporting

MTS TestSuite TW software equips you with flexible tools for presenting and sharing test data through detailed runtime reports that can be output to a user-friendly standard report template.

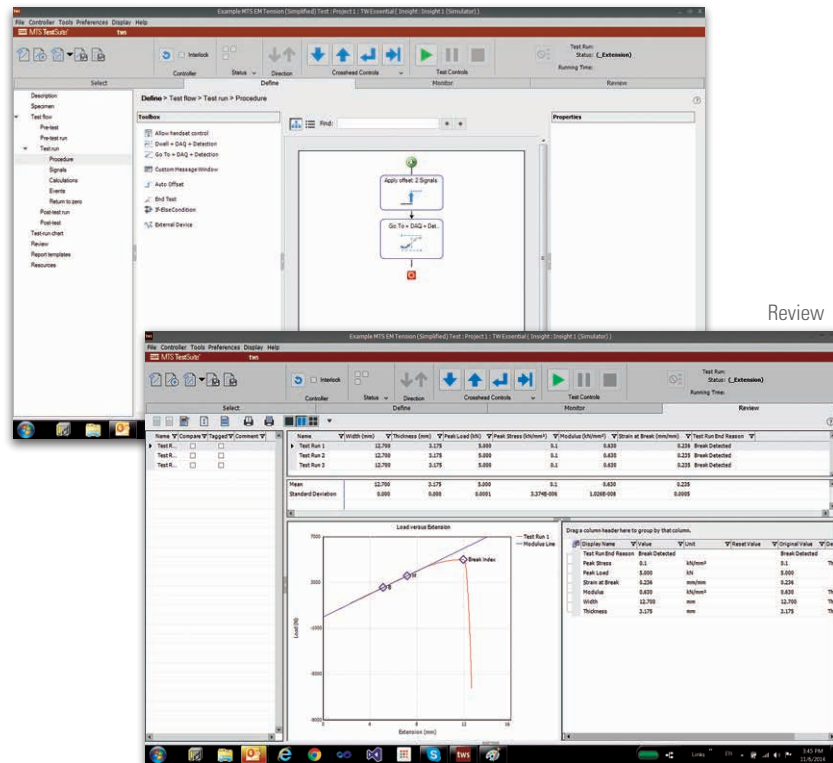
Specimen



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Calculations

Procedure



Review

## Broad Selection of Test Accessories

Find the ideal grips and fixtures, environmental simulation solutions, and extensometers to match the needs of your production testing

The MTS Exceed systems offering includes the high-performance test accessories required to meet a full spectrum of material and small component testing – from basic quality control to complex biomedical simulations. This array comprises the world's highest-performing selection of extensometers, a variety of environmental simulation solutions, and a complete range of grips and fixtures.

### Grips and fixtures



Hydraulic Wedge Grips



Wedge Grips



Pneumatic Grips



Wedge-Screw Grips



Side Action Grips



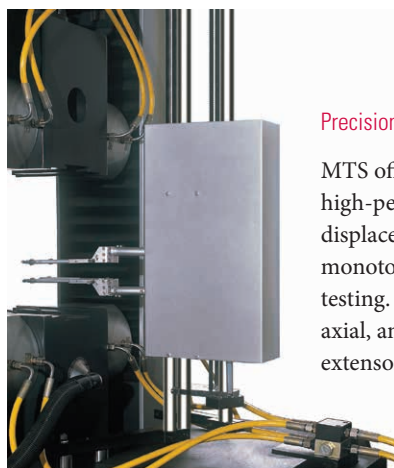
Compression Platen



Bend Fixture



Roller Grips



### Precision extensometers

MTS offers a comprehensive and high-performing array of strain and displacement measuring tools for monotonic materials and component testing. This includes extended length, axial, and high-temperature extensometers.

### Environmental simulation systems

MTS environmental simulation systems enable the testing of materials and components under a wide variety of real-world conditions.

## Unmatched Service and Support

Find a broad selection of proven programs designed to maximize uptime, enhance efficiency and reduce cost of ownership

MTS Exceed systems are backed by the global MTS Service & Support organization. This highly experienced team offers lifecycle management services for all your test systems and is committed to maximizing the uptime and operational efficiency of your test system. With the expertise to support your test equipment from pre-installation to decommission and at every point in between, MTS has the service solutions to meet your needs for test schedule predictability, data integrity, system performance optimization and budget management.

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### Onsite services

MTS builds the most rugged test solutions available, but constant motions and forces applied to test specimens ultimately take their toll. Our field service engineers have a worldwide reputation for applications expertise, and will respond to your request for support or repair quickly and efficiently. MTS can also assist with installation or movement of lab equipment.



### Engineering services

Find a complete set of professional engineering services, including systems engineering, test consulting and facilities design services. MTS experts will listen to your test objectives, analyze your situation, and translate your desires to specific system requirements.

### Training

MTS training programs are designed to improve operator efficiency and optimize system performance. Expertly led, the courses provide hands-on learning to make sure your staff is thoroughly familiar with your test systems and know how to operate them effectively. In addition to a broad selection of standard courses, MTS can customize courses to meet your specific lab needs and deliver the training at our Training Center or your workplace.

### Calibration & alignment

All test labs must calibrate their testing equipment to help ensure data accuracy, and MTS provides top-quality, accredited calibration services. We can complete calibration at your location, or in our factory metrology labs. We also offer a range of services, including load frame alignment services, designed to help minimize data variance.

### Maintenance & monitoring

Based on service experiences accumulated over decades, MTS has a set of well-defined routine maintenance offerings tailored for specific systems and components, to help extend equipment life and provide you with confidence in your equipment operation. We also offer sophisticated assessment tools to better understand equipment condition and anticipate potential issues before they become larger problems.

### Upgrade solutions

As technology improves, an upgrade is often the most economical way of expanding your lab capabilities and extending the life of existing test equipment. MTS offers upgrades and replacements for all areas of your test system, including mechanical components, controllers and software.

## Regional Business Centers

### THE AMERICAS

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100-299-975c Exceed 40 Printed in U.S.A. 12/15