



## MTS Criterion® Series 40 Electromechanical Universal Test Systems

High-performance monotonic testing solutions for research, development and manufacturing

be certain.

## THE **MTS CRITERION FAMILY OF UNIVERSAL TEST SYSTEMS**

COMBINES HIGH-PERFORMANCE LOAD FRAME TECHNOLOGY, EASY-TO-USE MTS TESTSUITE™ TW SOFTWARE, AND A FULL COMPLEMENT OF TEST ACCESSORIES TO ADDRESS THE MONOTONIC TESTING DEMANDS OF A DIVERSE SPECTRUM OF USERS, RANGING FROM THE PIONEERING RESEARCHER TO THE HIGH-VOLUME MANUFACTURER.



## Supporting the Evolving Needs of Advanced Research & Development

Engineers and researchers worldwide rely on MTS for the testing technology and expertise required to pursue research and development of the next generation alloys, ceramics, composites and polymers so critical to the futures of industries such as aerospace, power generation, ground transportation and biomedical. High-performance MTS Criterion systems are engineered to support these critical endeavors by enhancing the over-all flexibility and efficiency of a research and development test lab.

3

### Cost-efficient monotonic solutions

MTS Criterion systems provide research and development labs with a cost-efficient means to augment and extend the utility of their most valuable testing equipment and resources. Capable of delivering highly accurate and repeatable tension, compression, flexure and other basic tests, these systems free up high-demand dynamic systems for more complex evaluations. Additionally, MTS Criterion systems employ the same MTS TestSuite software platform, and can share many of the same high-quality accessories, utilized by dynamic MTS Landmark® servohydraulic test systems.

### Versatile, high-performance hardware & software

The MTS Criterion family comprises an array of versatile, high-performance components to meet the exacting test needs of advanced researchers and help them adapt readily to evolving demands. This array includes a broad selection of configurable load frame hardware, high-resolution controls, a customizable software toolset, and a full complement of precision grips, fixtures, extensometers and environmental simulation systems.

### MTS application expertise

MTS Criterion systems are backed by the global MTS Service & Support organization, which is capable of providing the test application and systems integration expertise needed to optimize test system effectiveness and mitigate the risks of pursuing unique or complex custom test applications.



AVX Video Extensometer

## Tightly Integrated Monotonic Solutions for Your Specific Testing Environment

Combining the latest in MTS mechanical testing innovation

MTS Criterion Systems integrate the latest MTS hardware and software platform innovations with an expanding selection of test accessories to deliver highly accurate and repeatable monotonic testing for exacting materials research.

### A complete portfolio of universal load frames

The MTS Criterion family includes a comprehensive line of compact Series 40 Electromechanical load frames 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 very broad range of force capacities. MTS Criterion load frames comply fully with the latest global safety directives, including:

- » MACHINERY 2006/42/EC
- » LOW VOLTAGE 2006/95/EC
- » EMC Directive 2004/108/EC
- » GOST-R



## Series 40 Electromechanical Universal Test Systems

A comprehensive line of compact and reliable electromechanical systems for meeting a full spectrum of low- to medium-force monotonic testing requirements

MTS Criterion 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 test systems employ high-speed, low vibration MTS electromechanical drives and integrated, digital closed-loop controls to test in load and position control at force capacities ranging from 1 N to 600 kN. Series 40 systems are available in a

variety of compact, high stiffness 1- and 2-column table-top configurations for low to medium force testing, or robust 2-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 templates, and a full complement of accessories extend the utility of these systems across a very broad spectrum of materials, including:

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

5

### 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 ballscrews
  - 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 template library (ASTM, ISO, DIN, EN, BS, and more)
- » MTS load cells with TEDS self-identification capabilities
- » Complete selection of grips, fixtures, environmental systems and extensometers
- » Optional Dual Zone test space (Models 44, 45.504, and 45.105) for maximizing efficiency
- » Anti-rotation grip/fixture mounting
- » Optional T-Slot table
- » Linear motion guides for superior alignment
- » Automatic limit checking of crosshead position, overload, over temperature, over voltage, etc.
- » Optional EU-compliant Integrated Safety Enclosures
- » Fully compliant with MACHINERY 2006/42/EC, LOW VOLTAGE 2006/95/EC, EMC Directive 2004/108/EC, and GOST-R
- » Durable test space protection





## State-of-the-art MTS Testing Technology

Optimizing test fidelity, operational efficiency, ease-of-use, safety and maintainability

MTS Criterion Systems integrate precision MTS control technologies and numerous design innovations to optimize test fidelity, operational efficiency, ease-of-use, safety and maintainability.



### 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 higher resolution test data for more meaningful analysis, achieve higher fidelity across test runs, and gain statistically significant test samples more quickly and efficiently. MTS digital controllers integrate seamlessly into Series 40 electromechanical load frames and Series 60 Integrated Operations Platforms.

- » 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
- » Two BNC monitor connectors
- » A test area enclosure interlock connector



### Precision, TEDS-enabled load 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 Criterion System to automatically detect installed load cells and download specific calibration information.

### 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 and a large text display that provides information at a glance.

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

MTS Criterion Systems feature durable, protective rubber matting to extend the life and enhance the maintainability and utility of the system test space. The Series 40 systems feature heavy work surface mats, which are designed to protect the load frame base and facilitate easy test space cleanup and maintenance. Work surface mats feature molded edges to prevent tools from rolling off and an integrated groove pattern to channel away spills and debris.



7

### Globally-compliant system safety features

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

- » A full complement of integrated test space enclosures
  - Automatic, low-velocity travel when the enclosure door is open
  - Integrated test space enclosure interlocks
  - 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 to stop the crosshead at predetermined points
- » Motor overheat device to automatically turn off the motor power supply
- » Ability to set limits for load, extension, strain, or any other data channel



#### Model 41

**LOAD FRAME CONFIGURATION:** 1-column, Table-top, Electromechanical

**RATED FORCE CAPABILITIES:** 1 N, 5 N, 25 N, 50 N, 100 N, 250 N, 500 N, 1 kN

**TEST SPACE:** single zone

**ENVIRONMENTAL SIMULATION:** small fluid baths

**TYPICAL SPECIMENS:** plastics, fine wire, fibers and threads, biomaterials, thin films, adhesives, foam, packaging, paper products, consumer products



#### Model 42

**LOAD FRAME CONFIGURATION:** 1-column, Table-top, Electromechanical

**RATED FORCE CAPABILITIES:** 1 N, 5 N, 25 N, 50 N, 100 N, 250 N, 500 N, 1 kN, 2 kN, 5 kN

**TEST SPACE:** single zone

**ENVIRONMENTAL SIMULATION:** small fluid baths

**TYPICAL SPECIMENS:** plastics, fine wire, fibers and threads, biomaterials, thin films, adhesives, foam, packaging, paper products, consumer products



#### Model 43

**LOAD FRAME CONFIGURATION:** 2-column, Table-top (integrated), Electromechanical

**RATED FORCE CAPABILITIES:** 100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 30 kN, 50 kN

**TEST SPACE:** single zone

**ENVIRONMENTAL SIMULATION:** full range of fluid baths

**TYPICAL SPECIMENS:** small components, reinforced plastics, metals, wire, composites, elastomers, wood products, textiles, biomaterials, paper products, adhesives, foam, consumer products



#### Model 44

**LOAD FRAME CONFIGURATION:** 2-column, Floor-standing, Electromechanical

**RATED FORCE CAPABILITIES:** 100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 30 kN

**TEST SPACE:** single or dual zone

**ENVIRONMENTAL SIMULATION:** full range of fluid baths, high-temperature furnace, environmental chamber

**TYPICAL SPECIMENS:** small components, reinforced plastics, metals, wire, composites, elastomers, wood products, textiles, paper products, adhesives, foam, consumer products





## Model 45

**LOAD FRAME CONFIGURATION:** 2-column, Floor-standing, Electromechanical

**RATED FORCE CAPABILITIES:** 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 30 kN, 50 kN, 100 kN, 150 kN, 200 kN, 300 kN, 500 kN, 600 kN

**TEST SPACE:** single or dual: C45.504, C45.105, single: C45.305, C45.605

**ENVIRONMENTAL SIMULATION:** full range of fluid baths, high-temperature furnace, environmental chamber

**TYPICAL SPECIMENS:** metals, building components, large fasteners, composites, wood products



C45.105



C45.305



C45.605

9

## Model 45.504 Wide

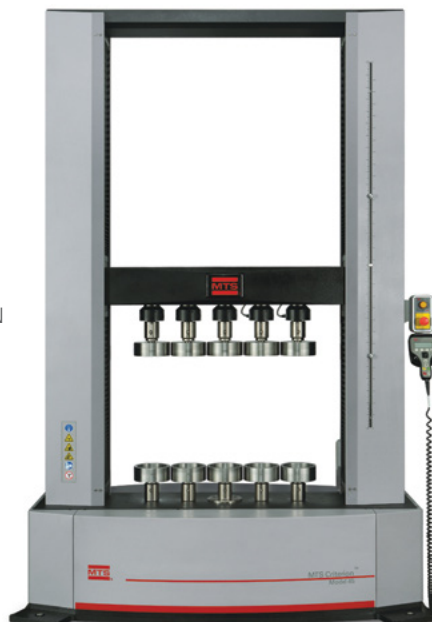
**LOAD FRAME CONFIGURATION:** 2-column, Floor-standing, Electromechanical

**RATED FORCE CAPABILITIES:** 1 kN, 2.5 kN, 5.0 kN, 10 kN, 20 kN, 30 kN, 50 kN

**TEST SPACE:** single, multistation (optional)

**ENVIRONMENTAL SIMULATION:** full range of fluid baths, high-temperature furnace, environmental chamber

**TYPICAL SPECIMENS:** metals, building components, large fasteners, composites, wood products



MTS Criterion Series 40 Specifications - Comparative

		Model 41	Model 42	Model 43			Model 44	
		C41.103	C42.503	C43.104	C43.304	C43.504	C44.104	C44.304
Maximum Rated Force Capacity	kN	1	5	10	30	50	10	30
Force Capacity Options	lbf	220	1100	2200	6600	11000	2200	6600
	N, kN	1 N, 5 N, 25 N, 50 N, 100 N, 250 N, 500 N, 1 kN	1 N, 5 N, 10 N, 25 N, 50 N, 100 N, 250 N, 500 N, 1 kN, 2 kN, 5 kN	100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN	100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 30 kN	100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 30 kN, 50 kN	100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN	100 N, 250 N, 500 N, 1 kN, 2.5 kN, 5 kN, 10 kN, 20 kN, 30 kN,
	lbf		0.2, 1, 2, 5, 10, 20, 50, 110, 220, 450, 1100	20, 50, 110, 220, 500, 1100, 2200	20, 50, 110, 220, 500, 1100, 2200 4400, 6600	20, 50, 110, 220, 500, 1100, 2200 4400, 6600, 11000	20, 50, 110, 220, 500, 1100, 2200	20, 50, 110, 220, 500, 1100, 2200 4400, 6600
Frame Type	Guide Columns Floor-standing/ Table-top	1 Table-top	1 Table-top	2 Table-top	2 Table-top	2 Table-top	2 Floor-standing	2 Floor-standing
Test Zones	Single/Dual	Single	Single	Single	Single	Single	Single or Dual	Single or Dual
Maximum Test Speed	mm/min	3000	2000	2000	1020	750	2000	1020
	in/min	118	78.7	78.7	40.16	30	78.7	40.1
Minimum Test Speed	mm/min	0.005	0.005	0.005	0.005	0.005	0.005	0.005
	in/min	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Position Resolution	mm	0.00005	0.00005	0.00005	0.00006	0.00006	0.000049	0.00006
	in	0.000002	0.000002	0.000002	0.0000024	0.0000024	0.0000019	0.0000024
Power Requirements	V AC	200 - 230 V AC, 5 Amps, 50 / 60 Hz, 1000 W	200 - 230 V AC, 5 Amps, 50 / 60 Hz, 1000 W	200 - 230 V AC, 10 Amps, 50 / 60 Hz, 2000 W	200 - 230 V AC, 12 Amps, 50 / 60 Hz, 2400 W	200 - 230 V AC, 12 Amps, 50 / 60 Hz, 2400 W	200 - 230 V AC, 10 Amps, 50 / 60 Hz, 2000 W	200 - 230 V AC, 12 Amps, 50 / 60 Hz, 2400 W
	phase		1	1	1	1	1	1
Space Between Columns	mm	100*	100*	425	420	420	400	400
	in	3.94*	3.94*	16.73	16.54	16.54	15.75	15.75
Vertical Test Space	Standard Length	mm	1100	820	1200	1200	1190	1190
		in	43.31	32.3	47.2	47.2	46.9	46.9
Extended Length	mm		1120	1500	1500	1500	1490	1490
	in		44.1	59.1	59.1	59.1	58.7	58.7
Crosshead Travel	Standard Length	mm	900	650	1000	1000	1000	1000
		in	35.4	25.6	39.4	39.4	39.4	39.4
Extended Length	mm		950	1300	1300	1300	1300	1300
	in		37.4	51.2	51.2	51.2	51.2	51.2
Frame Height	Standard Length	mm	1520	1332	1616	1752	1951	1951
		in	59.84	52.44	63.6	68.97	76.8	76.8
Extended Length	mm		1632	1916	2052	2052	2251	2251
	in		64.25	75.43	80.78	80.78	88.6	88.6
Frame Width	mm	560	704	794	826	826	861	861
	in	22.05	27.7	31.3	32.5	32.5	33.9	33.9
Frame Depth	mm	530	636	757	768	768	689	689
	in	20.87	25	29.8	30.2	30.2	27.1	27.1
Frame Weight	Standard Length	kg	60	112	175	305	367	395
		lb	132	246	385	671	807.4	869
Extended Length	kg		125	190	325	325	383	410
	lb		275	418	715	715	842.6	902

\* For single-column load frames this measurement denotes the distance between grip center and column cover

		Model 45				
		C45.504	C45.504 Wide	C45.105	C45.305	C45.605
<b>Maximum Rated Force Capacity</b>	kN	50	50	100	300	600
	lbf	11000	11000	22500	66000	132000
<b>Force Capacity Options</b>	N, kN	1 kN, 2.5 kN,	1 kN, 2.5 kN,	1 kN, 2.5 kN,	150 kN, 200 kN,	500 kN, 600 kN,
		5 kN, 10 kN,	5 kN, 10 kN,	5 kN, 10 kN,	300kN	
		20 kN, 30 kN,	20 kN, 30 kN,	20 kN, 30 kN,		
		50 kN	50 kN	50 kN, 100 kN,		
	lbf	220, 500, 1100,		220, 500, 1100,	33000, 44000,	
		2200, 4400,		2200, 4400, 6600,	66000	
		6600, 11000		11000, 22500		
<b>Frame Type</b>	Guide Columns	2	2	2	2	2
	Floor-standing/ Table-top	Floor-standing	Floor-standing	Floor-standing	Floor-standing	Floor-standing
<b>Test Zones</b>	Single/Dual	Single or Dual	Single	Single or Dual	Single	Dual
<b>Maximum Test Speed</b>	mm/min	750	750	750	750	254
	in/min	30	29.53	30	30	10
<b>Minimum Test Speed</b>	mm/min	0.005	0.005	0.005	0.005	0.005
	in/min	0.0002	0.0002	0.0002	0.0002	0.0002
<b>Position Resolution</b>	mm	0.000047	0.000047	0.000047	0.000049	0.000016
	in	0.0000019	0.0000019	0.0000019	0.0000019	0.0000000
<b>Power Requirements</b>	V AC	200 - 230 V AC,	200 - 230 V AC,	200 - 230 V AC,	380 - 480 V AC,	380 - 480 V AC,
		12 Amps,	12 Amps,	22 Amps,	20 Amps,	20 Amps,
		50 / 60 Hz,	50 / 60 Hz,	50 / 60 Hz,	50 / 60 Hz,	50 / 60 Hz,
	phase	2400 W	2400 W	4400 W	9000 W	5200 W
		1		1	3	3
<b>Space Between Columns</b>	mm	600	1000	600	650	750
	in	23.62	39.37	23.62	25.59	29.52
<b>Vertical Test Space</b>						
<i>Standard Length</i>	mm	1220	1520	1220	1540	2000
	in	48.0	59.81	48.0	60.63	78.74
<i>Extended Length</i>	mm	1520		1520	1840	
	in	59.8		59.8	72.44	
<b>Crosshead Travel</b>						
<i>Standard Length</i>	mm	1000	1300	1000	1100	1750
	in	39.4	51.18	39.4	43.31	68.90
<i>Extended Length</i>	mm	1300		1300	1400	
	in			51.2	55.12	
<b>Frame Height</b>						
<i>Standard Length</i>	mm	2269	2554	2269	2535	3490
	in	89.3	100.6	89.3	99.8	137.4
<i>Extended Length</i>	mm	2569		2569	2835	
	in	101.1		101.1	111.61	
<b>Frame Width</b>	mm	1315	1710	1315	1362	1660
	in	51.77	67.32	51.77	53.6	65.35
<b>Frame Depth</b>	mm	957	957	957	1100	1272
	in	37.7	37.68	37.7	43.31	50.08
<b>Frame Weight</b>						
<i>Standard Length</i>	kg	1195	1700	1195	1605	3500
	lb	2629	3748	2629	3538	7700
<i>Extended Length</i>	kg	1265		1265	1695	
	lb	2783		2783	3737	

\* For single-column load frames this measurement denotes the distance between grip center and column cover

## MTS Criterion Series 40 Specifications - Common

<b>Force Accuracy*</b>	± 0.5% of applied force	± 1.0% of applied force
<b>Force Range**</b>	1 to 100% of rated force capacity	0.5 to 1% of force rated capacity
<b>Rated Force Capacity at Max Test Speed</b>	100%	
<b>Maximum Test Speed at Rated Force Capacity</b>	100%	
<b>Speed Accuracy</b>	Set speed < 0.01mm/min: speed accuracy is within ± 1.0% of set speed  Set speed ≥ 0.01mm/min: speed accuracy is within ± 0.5% of set speed	
<b>Position Accuracy</b>	within ± 0.5%	
<b>Strain Accuracy***</b>	± 0.5% of applied strain	
<b>Security Protection</b>	Over-force, travel limits, over-voltage and others	
<b>Over-Force Protection</b>	110%	
<b>Data Acquisition Rate</b>	1000 Hz	
<b>Control Loop Rate</b>	1000 Hz	
<b>Environmental Requirements</b>		
<i>Operating Temperature</i>	5 to 40°C 41 to 104°F	
<i>Operating Humidity</i>	5 to 85% Non-condensing	
<i>Storage Temperature</i>	-18 to 49°C 0 to 120°F	
<i>Maximum Storage Humidity</i>	90% Non-condensing	
<i>Maximum Altitude</i>	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 force cells)	
<b>Additional Digital Conditioning Channels</b>	1 channel (Examples: long travel extensometer and quadrature encoders)	

\* Applicable onsite calibration services are available to meet ISO 7500-1, ASTM E4.

\*\* Exceptions apply. See your local MTS contact.

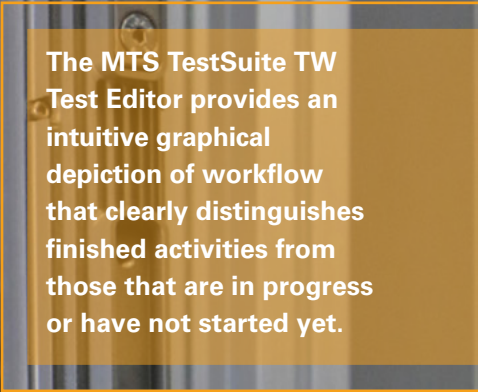
\*\*\* Extensometer calibration services are available to meet ISO 9513, ASTM E83.

Shipping Information

		Model 41	Model 42	Model 43			Model 44	
		C41.103	C42.503	C43.104	C43.304	C43.504	C44.104	C44.304
Standard Length Frame								
Dimensions - Crated	mm	820 x 1100 x 1760	1200 x 960 x 1570	1036 x 956 x 1865	2040 x 1140 x 1160	2040 x 1140 x 1160	2165 x 1100 x 930	2165 x 1100 x 930
	in	32.28 x 43.31 x 69.29	47.2 x 37.8 x 61.8	40.8 x 37.6 x 73.4	80.31 x 44.88 x 45.67	80.31 x 44.88 x 45.67	85.24 x 43.31 x 36.6	85.24 x 43.31 x 36.6
Weight - Crated	kg	110	247	312	560	560	600	600
	lb	242.5	543.3	686.4	1232	1232	1320	1320
Extended Length Frame								
Dimensions - Crated	mm		1120 x 1070 x 1920	1150 x 1110 x 2200	2340 x 1140 x 1160	2340 x 1140 x 1160	2465 x 1100 x 930	2465 x 1100 x 930
	in		44.1 x 42.1 x 75.59	45.27 x 43.7 x 86.6	92.1 x 44.88 x 45.67	92.1 x 44.88 x 45.67	97.05 x 43.31 x 36.6	97.05 x 43.31 x 36.6
Weight - Crated	kg		326	438	580	580	695	695
	lb		717.2	963.6	1276	1276	1529	1529

		Model 45				
		C45.504	C45.504 Wide	C45.105	C45.305	C45.605
Standard Length Frame						
Dimensions - Crated	mm	2620 x 1620 x 1600	2960 x 2000 x 1410	2620 x 1620 x 1600		3680 x 1960 x 1760
	in	103.15 x 63.78 x 62.99	116.5 x 78.74 x 55.5	103.15 x 63.78 x 62.99	114.96 x 65.35 x 65.35	144.89 x 77.17 x 69.29
Weight - Crated	kg	1880	2150	1880	2010	4050
	lb	4136	4739	4236	4422	8928
Extended Length Frame						
Dimensions - Crated	mm	2920 x 1620 x 1600		2920 x 1620 x 1600	3220 x 1660 x 1660	
	in	114.96 x 63.78 x 62.99		114.96 x 63.78 x 62.99	126.77 x 65.35 x 65.35	
Weight - Crated	kg	1980		1980	2210	
	lb	4356		4356	4862	





The MTS TestSuite TW Test Editor provides an intuitive graphical depiction of workflow that clearly distinguishes finished activities from those that are in progress or have not started yet.



## MTS TestSuite Software

Efficient and versatile software for productive materials and component testing

MTS TestSuite TW software facilitates the accurate and repeatable mechanical testing of materials, components and finished goods. It provides the versatility required to address unique and complex test requirements, along with ease-of-operation. With this software, test engineers will have utmost flexibility to create and run tests, analyze data and report results in a way that matches their specific mechanical testing needs, now and well into the future.

15

### The MTS TestSuite TW Software family

Comprises a set of applications and templates that can be bundled together to meet specific test program or organization needs.

**TW Elite** is the engine that drives all the MTS TestSuite TW offerings. It 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.

**TW Express** is designed for the test operator and is used to run tests created with TW Elite. 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.

**Reporter Add-In** for report design and generation, there is a Reporter Add-In for use with Microsoft Excel® that allows the easy organization of raw data and creation of impressive reports with little time investment or manual intervention.

**Templates** from the straightforward test to the extremely complex calculation. MTS test templates offer a wide array of solutions to reduce test creation time, streamline test execution and support adherence to testing standards. Four types of template solutions are available to meet a range of testing needs:

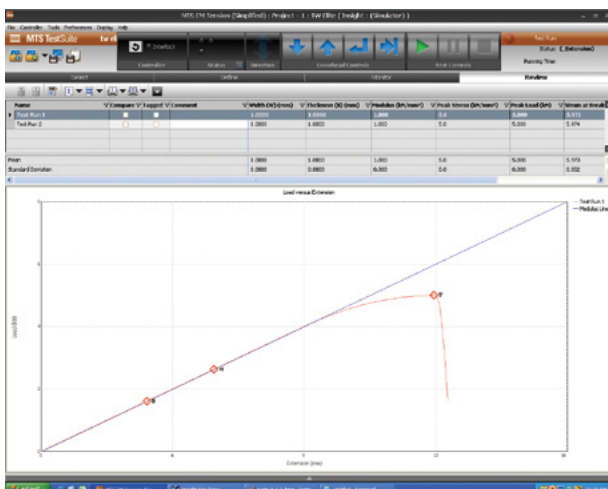
**BASE TEMPLATES** are included with the software application and include five tensile, two flex, five peel/tear, and three compression templates that may be modified to meet specific needs.

**ADVANCED PRE-PACKAGED TEMPLATES** make it fast and simple to run tests according to ASTM, ISO and EN standards.

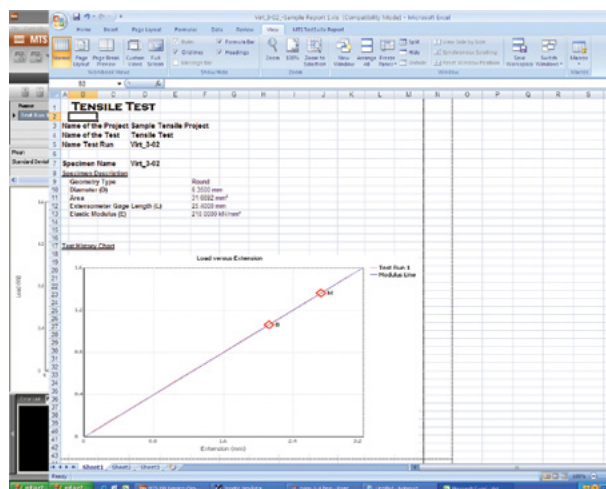
Purchased individually or in application-specific bundles, they also can be modified to meet unique requirements.

**MTS CUSTOM TEMPLATES** are available for the most complex or challenging test applications. Users can turn to MTS experts for custom test template development, saving valuable test engineering time and resources.

An integrated **METHOD CONVERTER** automatically converts TestWorks® 4 software test methods to TW templates for use with MTS TestSuite TW software.



Interactive markers, text and construction lines enable operators to flexibly plot data and zoom in on an area of interest at any time.



Easily create a report against a defined template as part of a test.

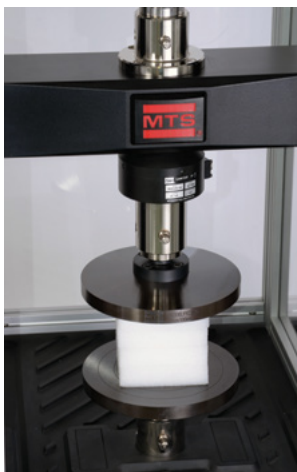
## A Full Complement of Test Accessories

Choose the right mix for your specific testing needs

### Grips, platens & fixtures

MTS Criterion System users can draw upon an extensive offering of grips and fixtures, environmental simulation systems and extensometers to address standard and custom test requirements across a full spectrum of monotonic materials testing applications, including tension, compression, flex/bend and shear, peel, tear creep, stress and more.

- » Advantage™ Accessories comprise a highly versatile, full-featured set of grips for demanding R&D testing of advanced composites and alloys. Ideal for the specific needs of the high-end researcher, this accessory family accommodates a very broad range of clamping force and temperature requirements and features numerous control and grip face options.
- » The MTS Fundamental™ family includes basic, affordable accessories for standard monotonic testing of metals, polymers, construction materials, composites, wood and paper products, fibers and textiles, adhesives and coatings, foam and more.
- » The Bionix® Accessories family includes affordable and extremely durable grips, fixtures, platens and environmental simulation systems for monotonic testing of biomedical materials and components in fluids heated to body temperatures.



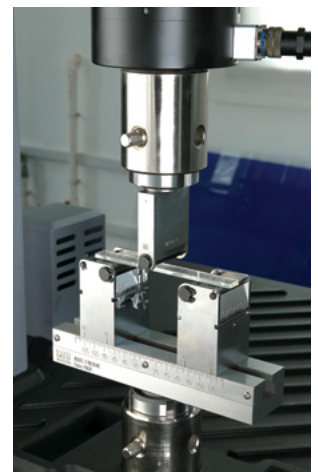
Compression Platens



Bollard Grips



Pneumatic Grips



Bend Fixture



Wedge Grips



Vise Grips



Capstan Grips



Scissor Grips



## Environmental simulation systems

MTS environmental simulation systems enable the testing of materials and components under a wide variety of real world conditions. Available systems include high temperature furnaces, environmental chambers and liquid baths.

17



### FLUID BATHS

Versatile and easy-to-use, the Bionix EnviroBath facilitates efficient and accurate mechanical testing of biomedical and general material specimens in fluids heated to body temperatures. The EnviroBath is available in a variety of volume configurations to accommodate a wide range of test requirements. A universal adapter design ensures full compatibility with MTS electromechanical and servohydraulic load frames, and a wide variety of Bionix grips and fixtures.



### FURNACES

MTS furnaces are ideal for conducting tension, compression, bend and cyclic fatigue testing of metals, composites and ceramics at high temperatures. A center-split design facilitates easy specimen and fixture access, and mounting brackets are available for a variety of MTS and non-MTS load frames.



### CHAMBERS

MTS environmental chambers enable the testing of materials and components across a range of controlled temperature, humidity or caustic conditions. Typical uses include elastomer, plastics and composite tests, body and engine mount tests, shock absorber tests, tire cord tests, laminate tests, and vibration isolator tests.

## Precision extensometers

MTS offers the world's most comprehensive and highest-performing array of strain and displacement measuring tools for monotonic materials and component testing. This array includes displacement gages, a variety of axial, diametral, cross-sectional and biaxial extensometers, and a selection of both laser and video non-contacting solutions.



Video Extensometer



High Elongation Extensometer

## Unmatched MTS Service & Support

Committed to maximizing test system uptime and operational efficiency

MTS Criterion 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.

### 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. Our service team can help you properly disassemble the equipment, pack it for transportation and install it at a new location. In addition, we offer consumables and spare parts for new-generation MTS equipment and most of our legacy systems.

### Engineering services

MTS offers 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. Leveraging years of application expertise, MTS will engineer the right solution that meets your testing needs and business conditions. We can provide test designs, fixture engineering, control system evaluation, data collection and results analysis. By referencing the best practices of test labs worldwide, MTS can help you design test facilities, including hydraulic distribution systems, and recommend long-range lab investment plans that support your business growth strategies or research plans.



Extensometer Calibration



Load Frame Alignment



## Training

MTS training programs are designed to improve operator efficiency and optimize system performance. Expertly led and completely customizable, 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

Making sure that equipment is operating at full capacity and test projects are completed on time without interruption are important aspects of test lab management. 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: mechanical components, controllers and software. Our Software Maintenance Enhancement and Support (ME&S) agreements make it easy to stay current with rapidly changing software technology. Within your contract period, you will automatically receive updates to all software covered in your contract.



MTS TestSuite TW Software Training

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