

MTS Acumen[™] Electrodynamic Test Systems

A streamlined, highly intuitive platform for dynamic and static testing

DESIGNED TO DRIVE INNOVATION IN MATERIAL AND COMPONENT TESTING, **MTS ACUMEN TEST SYSTEMS** DELIVER SUPERIOR PRECISION AND UNPRECEDENTED EASE OF USE FOR DYNAMIC AND STATIC TESTING. ENERGY-EFFICIENT ELECTRODYNAMIC ACTUATION ENABLES THESE FLEXIBLE SYSTEMS TO BE INSTALLED QUICKLY WITH MINIMAL IMPACT IN YOUR FACILITY.



MTS Acumen Electrodynamic Test Systems

A powerful, versatile platform from a global leader in materials testing

MTS Acumen electrodynamic test systems deliver the capabilities researchers and test engineers need to perform high-fidelity dynamic and static tests that are vital to improving the efficiency, reliability and performance of materials and components.

Combining the extensive functionality MTS solutions are known for with a usercentric design, MTS Acumen systems give test professionals a fast, easy way to establish or expand in-house capacity. These compact systems are easy to install, operate and maintain. They leverage more than four decades of MTS mechanical testing expertise, offering a solution that demonstrates our commitment to providing high-quality systems for the full spectrum of materials testing.

Accurate

MTS Acumen systems provide highly precise load and motion control. They perform reliably and ensure high-fidelity results, test after test. The streamlined design features a rigid load frame and a direct-drive linear motor, assuring exacting control of force and displacement. Unique integration with MTS TestSuite[™] Multipurpose Software also enables automatic setup, smooth task flow, simplified actuator control and intuitive limit setting, reducing the risk of human error.

Efficient

Electrodynamic actuation consumes less energy than other technologies. It also allows MTS Acumen systems to be put into service quickly, without additional infrastructure. Test engineers can use these systems in any location with a conventional electrical outlet. Once the systems are a part of your facility, you can expect clean, quiet and cost-effective operation.

Easy to use

Everything about MTS Acumen systems is designed for safe, user-friendly operation, from the standard T-slot table to the simple facility power connection to the bundled, color-coded cabling. The controls and software are based on industry-proven MTS solutions, ensuring excellent usability and minimal training. These systems also require very little maintenance.



Explore the Possibilities

Flexible MTS Acumen systems enable diverse material and component testing

MTS Acumen systems accommodate a broad spectrum of testing needs, yet they are easy to install and intuitive enough for anyone to master. These unique qualities make MTS Acumen systems the right choice for researchers and test engineers who are developing a next generation of high-performance materials and components.

Materials

Start-ups

Materials researchers are conducting demanding work on polymers, composites and other materials that do not require large specimen testing for accurate characterization. MTS Acumen systems are a perfect fit for these applications. They enable accurate dynamic and static tests and can be installed in any facility, even when floor space is at a premium. These systems perform essential materials tests, including tension, compression, flex/bend, fatigue and many others. Making the switch to in-house testing can be a crucial step for entrepreneurs, experienced researchers and other innovative thinkers at start-up organizations. MTS Acumen systems offer a convenient way to perform your tests on site and minimize outsourcing. Whether your team is working in an office, a workshop or a traditional lab, MTS Acumen systems can be ready to use almost immediately.

EXTENSIVE TEST CAPABILITIES

- » Fatigue and fracture
- » Component strength and durability
- » FDA regulatory tests for biomaterials and components
- » Tension
- » Compression
- » Flex/bend

Biomedical

MTS Acumen systems are well-suited to testing biomaterials and medical device components. They can be situated anywhere and are easily relocated, so it is not necessary to plan your facility around the load frame. An optional fluid bath allows you to accurately subject test specimens to in-vivo conditions. The systems also have an elegant appearance that communicates quality and attention to detail, which is critical when demonstrating prototypes to physicians and investors.

Research and development

Because they frequently attempt to solve the most complex industry challenges, researchers need to explore multiple ideas and change direction quickly. MTS Acumen systems are built to meet this need. They are powerful and flexible enough to support a variety of tests. They also facilitate fast setup and changeover, as well as equally efficient test execution.



Expertly Engineered

Ensure accurate performance for dynamic and static tests

Every aspect of MTS Acumen systems has been carefully considered to help researchers and engineers test with confidence and generate reliable, repeatable results.



MTS Acumen systems enable researchers and test engineers to conduct highly accurate dynamic and static tests on a wide range of materials. 5

Advanced electrodynamic actuation

A unique direct-drive linear motor allows MTS Acumen systems to deliver high accuracy and repeatability in a compact footprint. The actuator's rigid integrated bearings provide smooth, low-friction performance, enabling the precise control required for high-fidelity waveform reproduction as well as long system life. The actuator also includes a high-resolution digital encoder to ensure accurate control and measurement of specimen position.

High-stiffness configuration

The reliable stiffness of MTS Acumen systems is the direct result of large-diameter columns, a substantial base plate and crosshead, and a single large-diameter actuator shaft with bearings mounted close to the specimen. High lateral stiffness keeps the force train in alignment to help prevent measurement error.

Force accuracy

MTS Acumen systems feature industryleading load cells that provide excellent force accuracy and low-noise performance. Each load cell includes a fully integrated acceleration sensor. This allows MTS TestSuite Multipurpose software to automatically compensate for error due to acceleration when the load cell is mounted directly to the actuator. This top-mounting scheme effectively allows the T-slot table to accommodate fluid baths and other large or uncommon component test fixtures.

Exceptional durability

Dynamic test systems must be able to withstand the rigorous vibrations typical of long-term testing. MTS Acumen systems employ billet aluminum components, housings and handles, and they incorporate other rugged, highquality materials that ensure long-term durability and damage-resistance.

Simple by Design

Clean appearance outside, thoughtful engineering inside

What is immediately striking about MTS Acumen electrodynamic test systems is how they look. Specifically engineered for simplicity, these systems feature a modern, streamlined design that appeals to seasoned experts, as well as those who are testing for the first time.

Easy installation

MTS Acumen systems have a streamlined installation process which begins with connecting the system to a conventional electrical outlet. The universal power supply and standard IEC electrical connection allow this to happen anywhere in the world, without rewiring your facility. Because these systems rely on high-performance electric actuation, there is no additional infrastructure required and the entire installation process can be finished in one day. The complete solution – including the controller and an optional enclosure –

one day. The complete solution – including the controller and an optional enclosure – occupies very little floor space in your facility, and is easy to relocate once it is commissioned.

Scalable controllers

With MTS Acumen systems, a single MTS FlexTest[®] digital controller can manage multiple load frames. This eliminates the need to configure and accommodate a separate controller for every test system, which helps save space and provides additional flexibility for locating these systems within your facility. Controller scalability also reduces total costs, making it more affordable for any facility to add capacity as demand increases.

Streamlined cabling

A distinctive cable management scheme ensures an uncluttered appearance. Underneath the housing, cables and connection points are color-coded to ensure quick, error-free attachment. These cables are then bundled into a single harness and hidden within the hollow columns of the load frame. Connection points at the base of the load frame are also color-coded for convenience. The result is a well-organized system that always keeps the test space clear.

Superior serviceability

MTS Acumen systems require minimal routine maintenance, maximizing your test productivity. However, should a service need arise, these systems are built for fast, convenient serviceability. The entire load frame has a minimal number of fasteners, and MTS technicians only need a few simple tools to complete most maintenance tasks. The upper hood can be detached by removing four screws, allowing easy access to critical components.

Quiet operation

When you start using the MTS Acumen system, you will notice it runs much more quietly than other systems. Even when operating at maximum capacity, the system is quiet enough for operators to sit close by and monitor test progress.



MTS Acumen test systems balance solid industrial design and testing functionality to deliver an integrated solution that continues to meet your needs as testing objectives evolve.

Smart, Safe and Convenient

MTS Acumen systems promote simple, safe, user-friendly operation

Raising the bar for user-centric design, MTS Acumen systems create a test environment that caters to the way operators actually work.

Comprehensive controls

The frame-mounted control assembly gives operators extensive command of the system. Powered crosshead lifts make it easy to reconfigure the test space. Sensors and lights indicate when the crosshead is locked correctly, reducing the risk of error. You can also control an external pneumatic grip supply, eliminating the need for a separate box or footswitch. The E-Stop halts the system at the touch of a button, and a remote option is also available. For added convenience, the frame-mounted controls can be attached to either side of the load frame for right- or left-handed access, as well as tilted for operators who are standing or sitting.

Integrated piloted attachment system

Maintaining proper system alignment is easy with the piloted attachment system. Incorporated into the actuator and T-slot table, this system expedites attachment of load cells and accessories with threaded attachment points. Tight tolerances help prevent errors and minimize the need for a separate alignment fixture in many kinds of tests. Also, operators can complete changeovers using only a single tool because all threaded connections use common M6 threads and screws.

At-a-glance system status

Operators can multi-task while keeping a close eye on tests using the large status light located on the main housing of MTS Acumen systems. Clearly visible from a distance, this bright light lets you see if a test is running, a test has been completed, or a fault condition has occurred. The light also shows whether the system is on standby (without power to the actuators), in low power mode (for repositioning fixtures and specimens) or at full power for testing.

Crosshead locks

Crosshead locks are manually operated, featuring ergonomically designed handles. When these handles are in the locked position, the crosshead cannot be moved. Sensors detect the locked or unlocked state, which is reflected on the framemounted controls and in the software user interface.

Simplified fixturing

Install a wide range of specimen shapes quickly and easily using the standard T-slot table, which simplifies fixturing and system configuration. Switching the load cell assembly from the base mount to the actuator only requires you to change four easily accessible screws. Operators can interact freely with specimens and fixtures at all times due to conventional, front-facing system orientation that



MTS Acumen test systems with the optional safety enclosure are SIL-2 safety rated.

allows 180° access to the test space. Plus, operators do not lose time looking for the proper adapter because each optional adapter kit works with a variety of fixtures.

Integrated safety features

To protect operators and comply with international safety standards, MTS Acumen systems offer a variety of standard safety features, including an integrated actuator brake, redundant velocity monitoring, and an actuator design that helps minimize pinch points. With the optional integrated enclosure, the system meets the SIL-2 safety rating. 7

Seamless Software Integration

Test systems and software work in concert to maximize efficiency

MTS TestSuite Multipurpose Software delivers the test definition, execution, analysis and reporting capabilities required for electrodynamic testing. The intuitive user interface is optimized for MTS Acumen systems, enabling a level of integration that dramatically improves the ease and efficiency of test setup, execution and reporting. Modules and templates for fatigue, fracture, tension and other test types are available to address specific test standards.



The interface for MTS TestSuite Multipurpose software guides operators through the test setup process, maximizing productivity and minimizing the risk of error.

Guided test setup

Task-centric workflow is a defining characteristic of the user interface for MTS Acumen systems. During test setup, the software guides users through each task in the correct order. For experienced operators, this scheme improves convenience and productivity. For those unfamiliar with the testing process, it minimizes the learning curve. Most important, it increases usability for all operators without compromising the system's test capabilities.

User-selectable tuning

To accommodate a variety of skill sets and levels of operator experience, the MTS Acumen software interface offers several load frame tuning options, from fully automatic to fully manual and everything in between. For many operators, automatic tuning is fastest and easiest because the software works independently to detect and enter specimen parameters. For advanced operators, manual tuning provides access to raw control loop parameters.

System-ready indicator

To expedite test setup, a system-ready indicator in the software user interface provides easy troubleshooting to make sure your test is ready to run. It continuously notifies operators of conditions that could prevent the test from running – such as tripped limits or an open enclosure door – so these issues can be remedied before they occur and the test can proceed smoothly.

Intuitive limit setting

Typically, adjusting limits and calculating offsets can be confusing and timeconsuming. This is why MTS Acumen systems and MTS TestSuite Multipurpose software work together to make sure what you see in the test space matches what you see on screen. Setting limits no longer occurs only in a table. Instead, operators drag limits up or down in a visual depiction of the test system on screen. This makes it easy to view status or change limits, check whether limits are enabled or disabled, and know exactly what needs to happen to protect your specimen.



Creating the test flow is easy. Use existing templates or create a new test by dragging test activity icons into the Test Editor and arranging them in the preferred order of execution.

Simplified actuator control

To help operators confirm that test requirements do not exceed the available range, the software interface displays a visual representation of the actuator's location in relation to the maximum available test space. When moving the actuator, operators no longer need to know whether a positive or negative value will produce the desired result. Instead, operators simply click the up or down button in the software interface for quick and easy actuator adjustment.

Parallel iconography

Icons used on the system's frame-mounted controls are identical to the icons used in MTS TestSuite Multipurpose software. When a status changes at the system level, the change is immediately reflected in the software user interface, using the same visual language. This reduces the risk of error and ensures easier coordination between the physical world and the software. Intuitive icons also make system operation less language-dependent, facilitating easier adoption by users around the world.

Robust analysis and reporting

MTS TestSuite Multipurpose software features powerful capabilities for interacting with post-test data. Integrated analysis tools include movable markers, text and construction lines, and the ability to define a region of interest and zoom in for closer inspection. In addition, the software equips users with flexible tools for presenting and sharing test data through detailed standard or custom runtime reports.

Complete Test Solutions

MTS Acumen test systems offer the proven, high-quality components required to configure the right solution for your specific needs and begin testing quickly.

Controllers

Versatile MTS FlexTest[®] controllers deliver the capabilities required to meet your testing needs today and tomorrow. These digital controllers provide high-speed closed-loop control, data acquisition, function generation and transducer conditioning.



Accessories

Configure a wide range of tests using a broad selection of high-quality accessories for MTS Acumen systems. Use the versatile Bionix[®] EnviroBath for testing medical devices or biomaterial specimens in fluids. Additional accessories include pneumatic grips (wedge or bollard), manual grips (screw or vise action), aluminum compression platens, bend fixtures and other fixtures for a variety of specialized applications.









Comprehensive service and support

The MTS global team of service, support and consulting professionals is one of the largest and most experienced of its kind. We offer lifecycle management services for electrodynamic and other materials and component testing systems, enabling you to maximize productivity and uptime, as well as deploy new test programs with greater efficiency. Our complete offering includes:

- » System installation
- » Training and setup/operations guidance
- » Expert test consulting and application support
- » Advanced systems integration expertise
- » Software upgrades
- » Ongoing maintenance support

Learn more today

Contact us for more information about how MTS Acumen electrodynamic test systems can quickly expand your testing capabilities.



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