

ADMET

Materials Testing Systems

eXpert 6000 Series®

Planar Biaxial Materials Testing Systems



Quantify Material Response Under Independent Biaxial Loads

ADMET planar biaxial testing systems are designed to generate **well-defined planar stress and strain states** through the independent, simultaneous control of two orthogonal loading axes. The system enables controlled application of prescribed loading ratios and strain paths, allowing direct measurement of **anisotropic and nonlinear material response under biaxial tension and compression**. High-resolution force measurement and synchronized displacement acquisition support accurate characterization of **directional stiffness, coupling effects, and deformation behavior** in films, membranes, elastomers, textiles, and soft biomaterials.



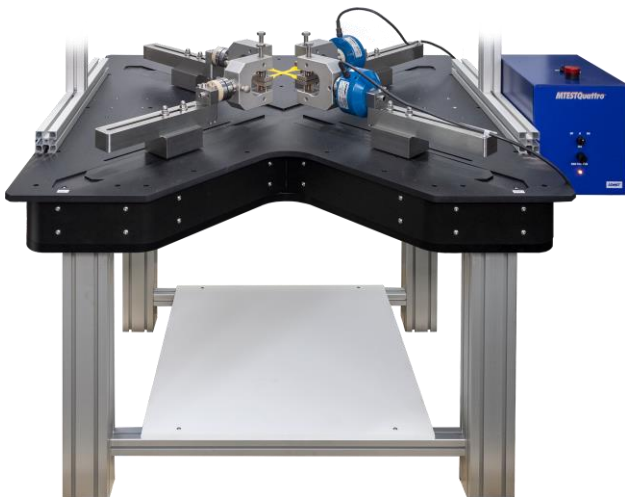
► All eXpert 6000 systems are be fitted w/ MTESTQuattro® Windows-based test controller

System Highlights

Independent Orthogonal Axis Control: Each loading axis is controlled independently, enabling user-defined biaxial loading ratios ($\lambda_1:\lambda_2$) and arbitrary strain paths. This architecture supports stress- and strain-controlled protocols for evaluating anisotropy, symmetry, and coupling behavior under planar loading conditions.

Synchronized Force and Displacement Acquisition: Force and displacement are measured simultaneously along both axes, supporting accurate calculation of planar stresses and strains during monotonic and cyclic loading.

Extensometry and Imaging Options: ADMET offers a wide range of extensometers and Digital Image Correlation (DIC) systems engineered for advanced strain field measurement on the eXpert 8000 Series.



eXpert 6000 Series Specifications

Design Feature	Specification
Force and Actuation	- Options for two- and four-actuator planar biaxial configuration - Configurable force capacity up to 100 kN per axis - Low-force systems with high-accuracy miniature load cells also available for soft materials
Motion and Control	- Opposing crosshead motion toward specimen center - Fully synchronized multi-axis control - Independent or ratio-based load, displacement, or strain control modes - Wide range of quasi-static test speeds
Displacement and Strain Measurement	- Fine (encoder-based) displacement measurement with nanometer-scale resolution - Non-contact optical strain and video extensometry options also available - Digital image correlation (DIC) systems also available
Specimen Geometry and Environment	- Stroke and crosshead spacing optimized to specimen size - Horizontal planar configuration standard - Environmental chambers and heated fluid baths available
Grips and Specimen Interface	- Application-specific biaxial grips for soft tissues, membranes, films, textiles, and elastomers - Custom pin, clamp, hook, or suture-based gripping options - Symmetric grip alignment to maintain uniform in-plane loading - Designed to minimize slippage, stress concentrations, and edge effects
 ADMET's eXpert 6000 series planar biaxial systems are engineered-to-order. Send your specification or test requirement, and we will offer a test system designed specifically for your needs at a reasonable price.	

Measurement Performance – ADMET offers best-in-class accuracies for repeatable and reliable testing



Load Measurement Accuracy: +/- 0.5% of reading down to 1/500 of load cell capacity. Meets or exceeds ASTM E4, BS/EN/ISO 7500-1: 2004, DIN 51221 and JIS B7721 standards. ADMET self-identifying load cells are offered with all systems.



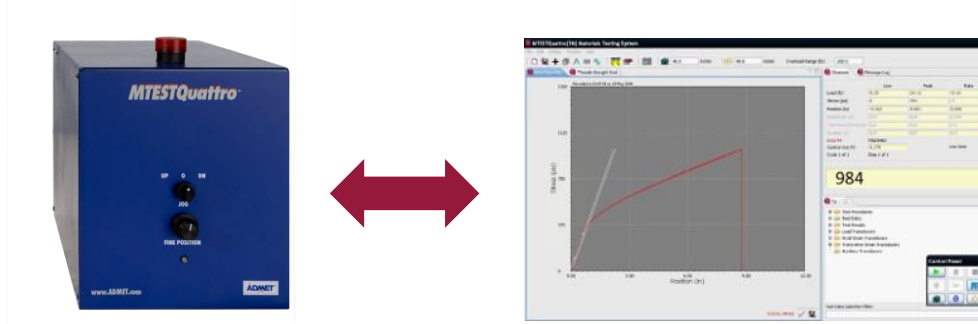
Strain Measurement Accuracy: +/- 0.5% of reading down to 1/50 of full scale with ASTM E83 class B extensometers. Meets or exceeds ASTM E83 and BS/EN/ISO 9513:2002 standards.



Crosshead Position Accuracy: The greater of +/- 0.01mm or +/- 0.05% of displacement.

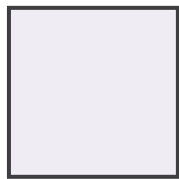
MTESTQuattro® Windows-Based Controller and Software

ADMET Planar Biaxial Testing Machines come equipped with **MTESTQuattro®**, our most advanced test controller, which is a PC-based unit that offers a wide range of flexibility in control, data acquisition, analysis, and reporting. This controller features 8 kHz servo update periods and programmable log rates to 1 kHz and is manipulated by a state-of-the-art Windows-based software.

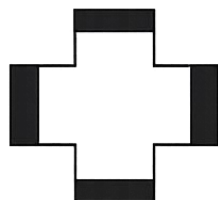


Interface Area	MTESTQuattro® Control System Capabilities
Interface and Usability	- Native Windows-based software with intuitive, graphical user interface - Designed for both novice users and advanced researchers - Customizable layouts with real-time plots, numeric displays, and system status indicators
Analysis	- Extensive built-in calculations library - Full support for ASTM, ISO, and EN specification analysis - User-defined calculations for custom research protocols • Real-time and post-test data analysis
Test Methods	- Built-in method creation tools with unlimited user-defined test procedures - Supports load, displacement, strain, and multi-channel control modes - Multi-step and multi-axis test sequencing - Save, reuse, and modify test templates for consistent results
Multi-Axis Control	- Synchronized control of multiple actuators and feedback channels - Independent or ratio-based control across axes - Real-time closed-loop control for complex biaxial and multi-degree-of-freedom testing
Data Acquisition	- High-speed, synchronized data acquisition across all channels - Real-time plotting of force, displacement, strain, and auxiliary inputs - Configurable sampling rates and trigger conditions
Reporting	- Store, organize, and manage test data within the software - Fully customizable test reports with charts, tables, and calculated results - Print-ready and digital report output
Data Export and Integration	- Export data to common formats (CSV, Excel®, MATLAB®) - Supports integration with external sensors and devices - Digital and analog I/O for environmental chambers and accessories
Safety and System Control	- User-defined limits, interlocks, and emergency stop logic - Real-time monitoring of system status and fault conditions - Designed for safe operation during unattended or automated testing

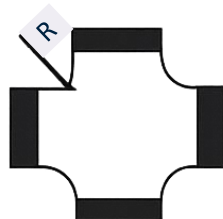
Specimen Geometries and Grips



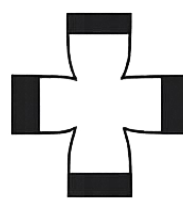
Square



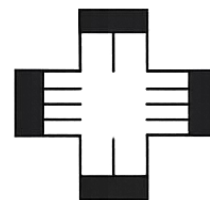
Cruciform



*Cruciform with
Fillets*



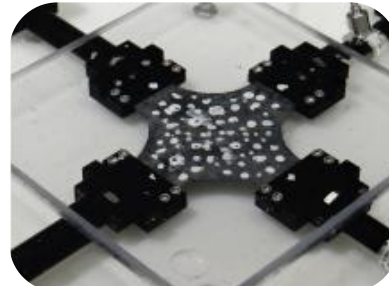
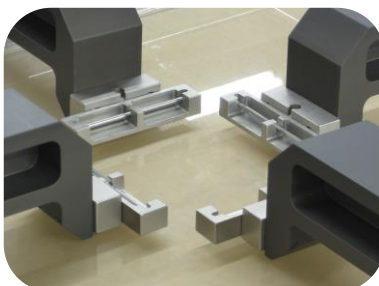
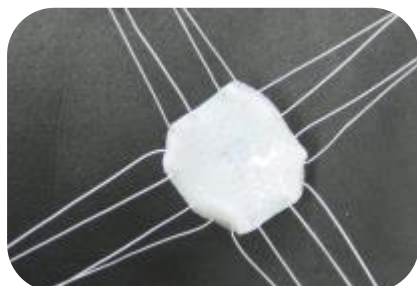
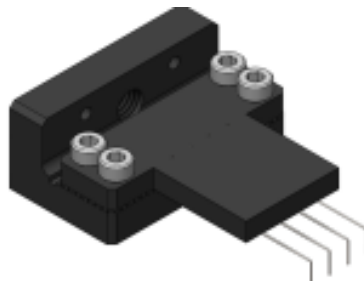
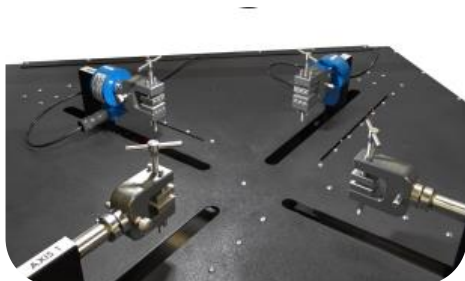
*Cruciform
Tapered*



*Cruciform with
Slits*

Square specimens are commonly used when testing soft biologic tissues, primarily because soft materials are difficult to cut into more complex geometries. When testing square samples, it is critical that the grips allow for lateral expansion of the specimen so it can retain its square or rectangular shape under increasing loads. ADMET offers several suture- and rake-style gripping options, along with specimen preparation jigs, to facilitate reliable and repeatable testing of soft biologic tissues.

Cruciform specimens use clamp grips applied to each arm to transfer force into the central region of the specimen. Research has shown that the optimal cruciform geometry depends on both the stiffness of the material and how easily it can be formed into the desired shape. ADMET offers a wide range of clamp grips with smooth, serrated, or rubber-faced surfaces in various sizes and capacities to accommodate diverse testing needs. Specimen preparation fixtures are also available to ensure efficient, accurate, and repeatable loading of samples into the test system.



Service and Training

ADMET strives to make its materials testing products powerful and easy-to-use. Free technical support is standard with the purchase of any ADMET product. We also offer an array of services to help you use your ADMET system to its fullest potential.

Available Services

- ✓ On-site installation and training.
- ✓ Custom analysis and report generation.
- ✓ Creation of, or connectivity to, your in-house database program.
- ✓ Online training with WebEx.
- ✓ On-Site ISO/IEC 17025:2017 Calibration Services.
- ✓ Preventative Maintenance Planning.
- ✓ Install, Operational Qualification (IQ/OQ) Documentation.

ISO/IEC 17025:2017 On-Site Calibration Services

ADMET provides a full range of calibration and maintenance services designed to fit your needs and budget. Our in-house calibration and service team has deep, hands-on knowledge of ADMET systems and is equipped to support you in any situation. Customers who require accredited calibrations in their laboratories or production facilities can establish calibration contracts with ADMET, ensuring automatic service at customer-defined calibration intervals. Proven maintenance programs help minimize downtime on production testing equipment, and each contract can be customized to match your specific equipment and operational requirements.

As a matter of course, we provide all calibration passwords to you at the time of your instrument or machine purchase. This enables you to choose who performs calibration and maintenance on your systems.

ASTM Calibration Standards offered:

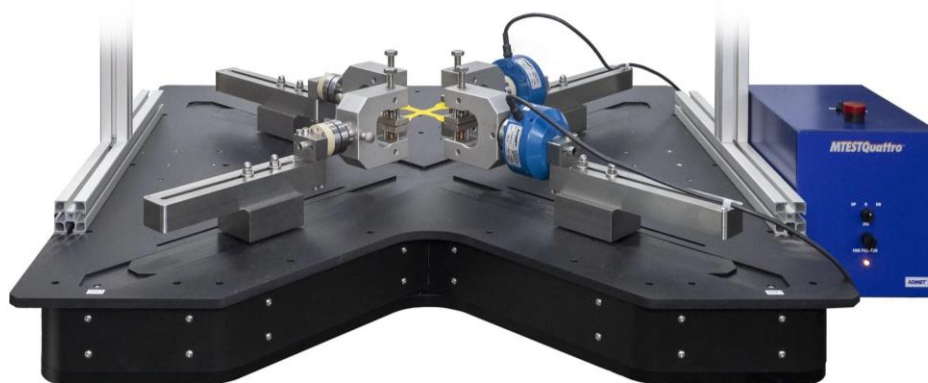
- ASTM E4 – Tension/Compression Force Verification
- ASTM E2309 – Crosshead Displacement Verification
- ASTM E2658 – Crosshead Speed Calibration
- ASTM E83 – Extensometer Verification and Classification
- ASTM E2624 – Torque Calibration



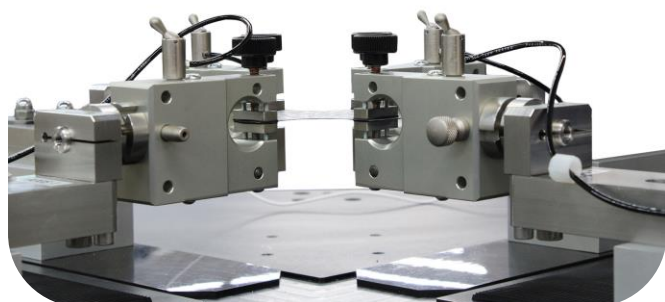
Submit An Inquiry At:
calibration@admet.com



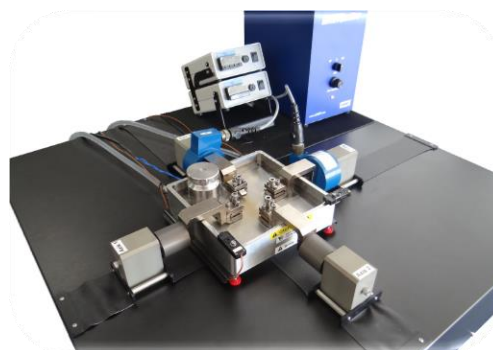
Application Gallery: eXpert 6000 Series



eXpert 6000 Planar Biaxial Testing System with Cruciform Sample



Closeup of Pneumatic Vise Grips on eXpert 6000



eXpert 6000 with Temperature-Controlled Bath



All ADMET systems and software are designed, engineered, and manufactured in the United States.

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