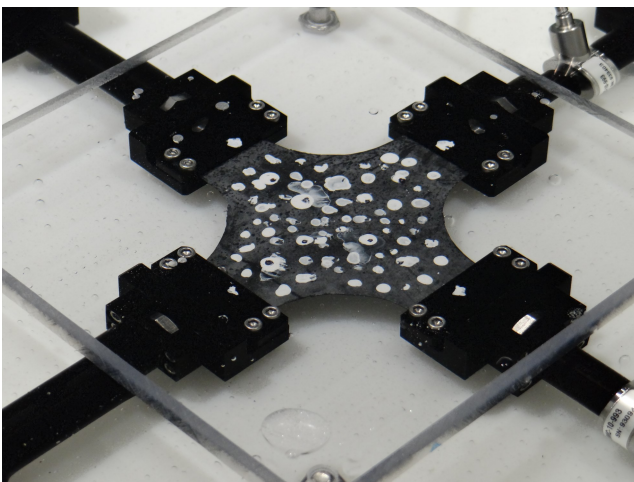


eXpert 8000 Series Planar Biaxial Testing



eXpert 8000 Series 200N Planar Biaxial Fatigue Testing System equipped with Digital Image Correlation (DIC) system, heated fluid bath with temperature controller and ADMET's MTESTQuattro® Materials Testing System.



Cruciform with fillets shaped sample held with clamp grips submerged in recirculating heated fluid bath. Digital Image Correlation (DIC) System uses random pattern applied to specimen surface to determine strain fields as specimen is loaded. Optical glass is placed at the surface of the fluid so that the camera images are not distorted by surface ripples.

ADMET eXpert 8000 Planar Biaxial Testing Systems are ideal for subjecting biomaterials, elastomers, fiber reinforced composites, films, plastic fabrics and textiles to a variety of different stress states and measuring their mechanical response. Whether you are characterizing anisotropic, hyper-elastic or heterogeneous materials, ADMET's Planar Biaxial Testing Systems are equipped for the task.

Since the stress and strain ranges of interest can vary greatly depending on the materials to be tested, ADMET eXpert 8000 Planar Biaxial Testing Systems are engineered to meet your needs. As a means of emulating real-world conditions, the two orthogonal actuators can be programmed to move independently or in a coordinated motion under force or strain control. Both static and fatigue tests are performed via ADMET's MTESTQuattro® controller. Suture racks, clamps, pin arrays or rake grips are offered for holding square or cruciform shaped samples. ADMET also provides specimen jigs to ensure consistent specimen setup. Specimens can be tested in air at ambient or elevated temperatures or an optional fluid bath with heating and cooling can be provided to produce the desired physiological environment. All planar biaxial test systems are optionally offered with a Digital Image Correlation (DIC) System for accurate non-contacting strain measurements.

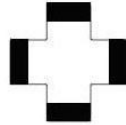
- Offered in capacities to 5kN (1,125lbf)
- Actuator strokes and speeds are tailored to specimen size and testing requirements. 24 inches max cross-head separation is standard.
- Capable of performing static and cyclic fatigue tests to 10 Hz.
- A variety of specimen grip types are available including clamps, rakes and sutures.
- A recirculating bath or heating elements are available for testing at elevated temperatures in air or fluids.
- Offered with a 2D or 3D Digital Image Correlation (DIC) system for advanced strain field measurements.
- Equipped with ADMET's MTESTQuattro® Materials Testing System. Users can specify simple, cyclic or complex control profiles under force, position or strain control.

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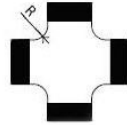
Specimen Geometries & Grips



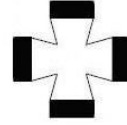
Square



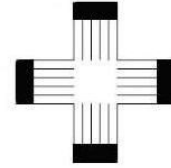
Cruciform



Cruciform w/fillets



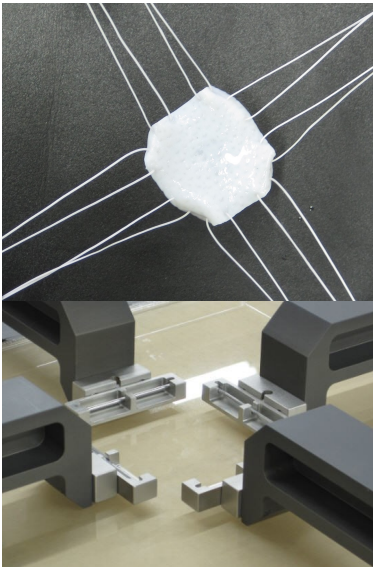
Tapered Cruciform



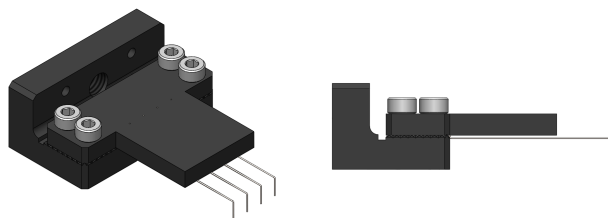
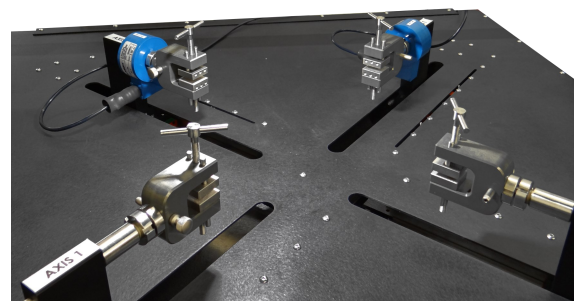
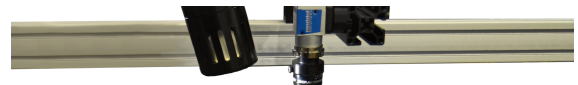
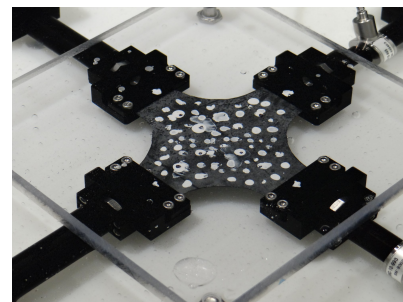
Cruciform w/slots

Square specimens are used when testing soft biologic tissues mainly because it is difficult to cut soft materials into more complex shapes. The key when testing square samples is that the grips allow for lateral expansion of the specimen so that it can retain its square or rectangular shape under increasing forces. ADMET offers several types of suture or rake grips with specimen preparation jigs to facilitate the testing of soft biologic tissues.

Cruciform shaped specimens use clamp grips applied to each arm to transfer force to the central area of the specimen. Research has shown that the optimum cruciform shape is dependent on the stiffness of the material and the ease at which it can be shaped into its desired geometry. ADMET offers a wide array of clamp grips with smooth, serrated or rubber faces of different sizes and capacities to accommodate your testing needs. Specimen preparation fixtures are also available to efficiently and accurately load your samples into the machine.



Square sample with sutures held in trampoline style grip capable of being submerged in fluid.



Rake grip design using stainless quilting pins. Design allows for tine spacing to expand as forces increase. Rake mounts into standard clamp grip.

ADMET offers a variety of clamp or vise grips to meet your testing needs.

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Strain Measurement

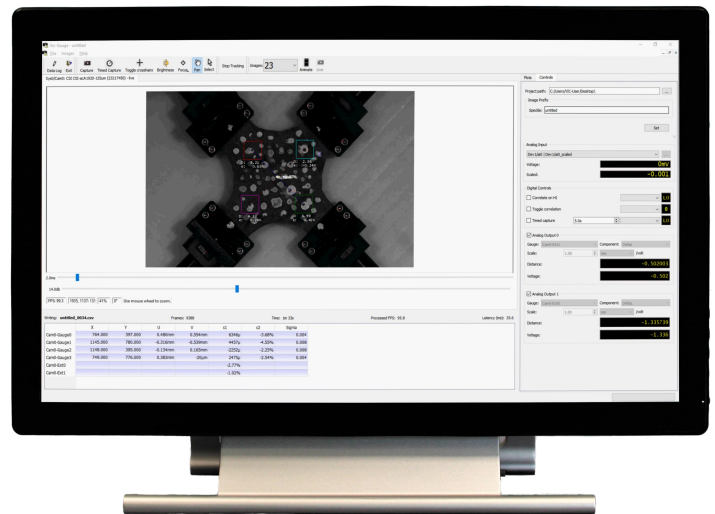
Another important aspect of planar biaxial testing is the measurement of strain fields and determination of stress states in the central area or gauge portion of the specimen. In some cases crosshead position can be used to approximate strain. However, for soft compliant materials, a non-contacting approach using Digital Image Correlation (DIC) is necessary.

ADMET offers both 2D and 3D DIC solutions. Our 2D system utilizes optimized correlation algorithms to provide full-field two-dimensional displacement and strain data. In-plane displacements are measured at every pixel subset within the area of interest, and full-field strain is computed with many tensor options. The 2D DIC system measures in-plane displacements and strains over 2000% with measurement resolution as low as 10 microstrain. Specimen sizes ranging from microns to meters are easily measured.

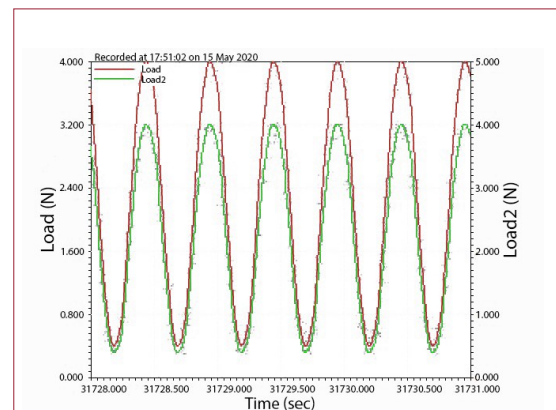
Test Control

ADMET's MTESTQuattro® Materials Testing System enables users to define a wide array of test procedures for applying a multitude of stress-strain loading states. The program is capable of applying constant ratios of stress or strain over a range of values or can perform cyclic loading and unloading in the predominant fiber and cross-fiber directions to determine key mechanical properties. MTESTQuattro's flexibility allows users to accurately perform a wide range of planar biaxial tests and is capable of:

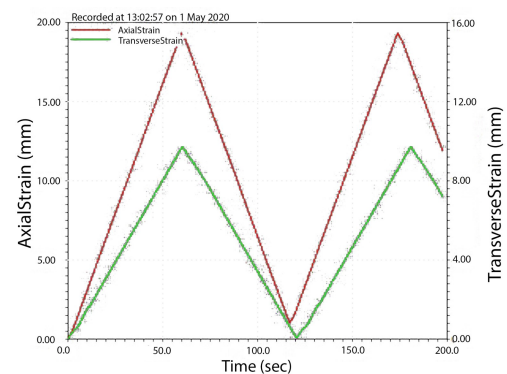
- Force Control
- Displacement Control
- Strain Control using Digital Image Correlation (DIC) System
- Sine, square and triangular cyclic waveforms
- Independent or synchronized control of X & Y actuators



Digital Image Correlation (DIC) Main Screen.



Force Amplitude Control at 2 Hz.



Strain control on both axis using DIC system strain measurements.



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