MTS Ultrasonic Velocity Test Solution

Gain insight into geomaterials porosity, elastic constants, anisotropy, fluid saturation and other critical attributes

- Calculate dynamic Young's modulus, shear modulus and Poisson's ratio
- Leverage the industry-leading MTS Model 656 Triaxial Cell
- Achieve seamless integration with MTS rock mechanics test systems
- Acquire a complete geomaterials testing solution from one source
- Enhance materials testing flexibility
- Improve predictions of overall rock mass properties

The MTS Ultrasonic Velocity Test Solution is an effective, scalable research platform designed for studying the behavior of geomaterials core samples when subjected to temperatures and pressures that replicate extreme in situ environments. The highly detailed characterizations gained through such studies yield insight into the specimen's porosity, elastic constants, anisotropy, fluid saturation and other critical attributes.

The MTS Ultrasonic Velocity Test Solution comprises state-of-the-art platen hardware, application software and electronics for control and data acquisition. These components are meticulously engineered and tightly integrated to deliver accurate, dependable performance in demanding triaxial test applications at temperatures up to 120°C (250°F) and pressures up to 140 MPa (20,000 psi).

This solution is specifically designed for use with the MTS Model 656 Triaxial Cell, an industry-leading accessory that can be seamlessly integrated into robust MTS Model 815 or Model 816 Rock Mechanics Test Systems. It can also be added as an upgrade to many already existing models of triaxial cells from MTS.

Streamlined, consolidated test package

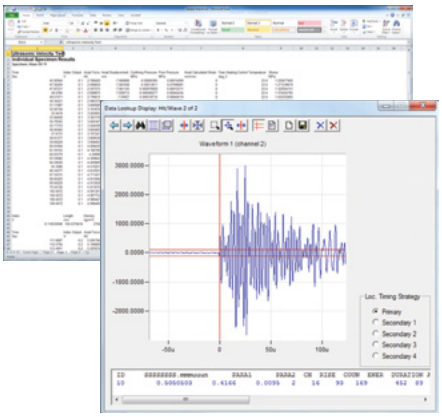
The MTS Ultrasonic Velocity Test Solution features tightly integrated controls, data acquisition, signal processing electronics and PC, all bundled together within the consolidated system electronics console. This approach eliminates the need for a separate oscilloscope and pulser/receiver, as well as a second PC for executing ultrasonic velocity tests and acquiring or analyzing data. With fewer peripheral electronics to manage, the MTS Ultrasonic Velocity Test Solution offers simplified setup and more intuitive operation.

The MTS Ultrasonic Velocity Test Solution includes:

- Specially designed ultrasonic platens, transducers, cabling and feedthroughs capable of sustaining superior performance in demanding triaxial test conditions
- MTS 793.64 Rock Ultrasonic Software for advanced control, test monitoring, data acquisition and processing
  - Compensates for changes in specimen length due to test stresses and integrates calculations into test data
  - Allows use of Microsoft® Excel® for plotting and reporting of integrated test data
  - Automatically consolidates test data by combining ultrasonic measurements with specimen mechanical properties and system load cell data
- Parametric Analog Signal Input enables simultaneous, correlated physical and environmental test parameters to be acquired during velocity measurement; these include force/stress, confining/pore pressures, axial/circumferential strain and temperature
- 8-channel ultrasonic and acoustic digital processing electronics (expandable to accommodate additional channels for more advanced test configurations)
  - Data acquisition rates up to 132 MB/second
  - 16-bit resolution
  - 4 high-pass/low-pass filter selections per channel
  - Digital I/O for event triggering

The MTS Ultrasonic Velocity Test Solution features state-of-the-art hardware, software and electronics that integrate seamlessly with MTS Model 656 Triaxial Cells and MTS Models 815 and 816 Rock Mechanics Test Systems.

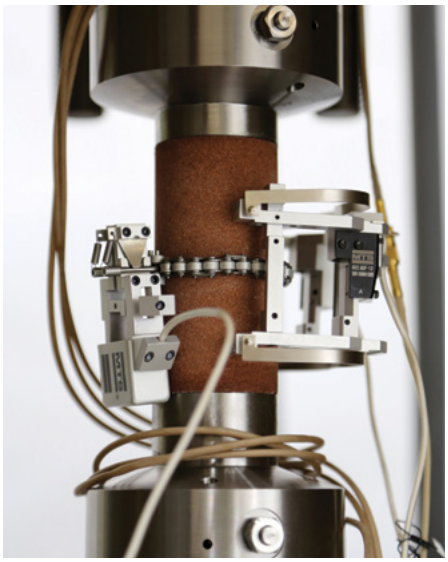
1 Specialized software for the MTS Ultrasonic Velocity Test Solution is based on the proven MTS 793 platform, renowned for combining exceptional stability with flexible performance.



2 Consolidated system electronics console combines:

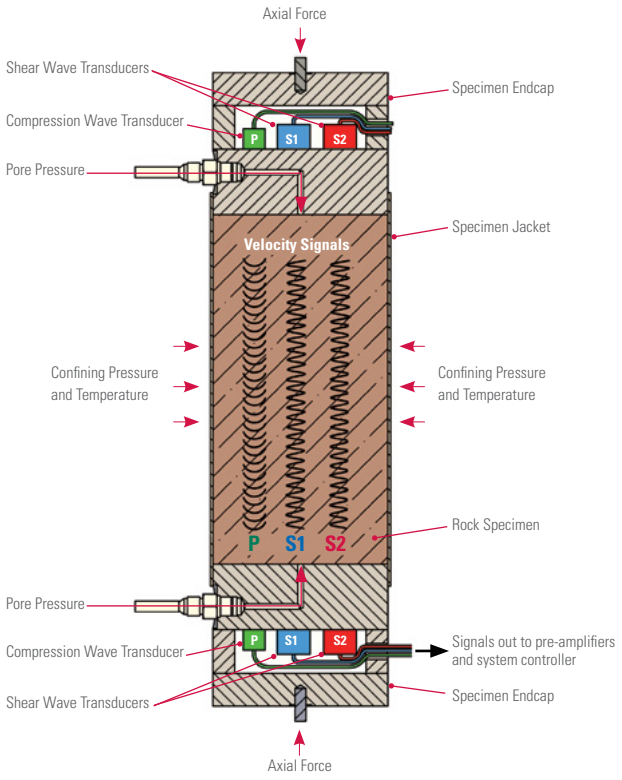
- FlexTest system controller
- Temperature controller
- System PC, which integrates and synchronizes Rock Mechanics Test System with ultrasonic velocity signal processing electronics

3 Robust ultrasonic platen hardware is designed specifically for use with industry-leading MTS triaxial cells.



ADVANCED GEOMATERIALS TESTING

Ultrasonic velocity testing delivers highly detailed characterizations of geomaterials core specimen's, yielding insight into specimen porosity, permeability, grain structure, deformational stress and other critical attributes. To do this, the MTS solution propagates a compression sound wave and two orthogonal shear waves along the longitudinal axis of the core sample. It then measures the time of flight through the specimen, calculating dynamic elastic properties that can be compared to static properties collected using traditional techniques.



MTS Ultrasonic Velocity Solution Specifications

Pressure	140 MPa (20,000 psi) maximum confining pressure
Temperature	120°C (250°F) maximum operating temperature
Ultrasonic Platen	» Available in a wide range of specimen diameters, both metric and English units, up to 102 mm (4 inches); aspect ratios 2:1 » Pore fluid ports for pore pressure (140 MPa maximum) from MTS and/or customer supplied sources » Optional spherical seats available to ensure proper specimen alignment
Data Management	Automatically integrated data acquisition and report consolidation of ultrasonic measurement parameters with specimen mechanical properties and test system load cell data
Consolidated Hardware	Ultrasonic measurement activities including pulse generation, data acquisition, waveform display, and parametric data integration performed exclusively by MTS test system controller and PC

Leverage MTS integration expertise

Propagating and measuring ultrasonic waves for a specific test profile require complex integration of the rock mechanics test system, triaxial cell, ultrasonic platens and transducers, and other components. With extensive experience implementing complex test configurations, MTS understands the critical issues related to system integration. We can ensure everything works in sync, facilitating precise control and accurate measurements, reducing risk and increasing confidence in your test results.

Learn more today

Contact your MTS representative to learn more about how the MTS Ultrasonic Velocity Test Solution can optimize your geomaterials testing program.

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