

GCTS is committed to designing accurate testing systems by integrating innovative software engineering with advanced hardware. GCTS systems perform at the highest levels of reliability, providing efficient systems that satisfy customer needs and expectations.

► **STX-600**
Large Scale Dynamic / Stress-Path Soil Triaxial System



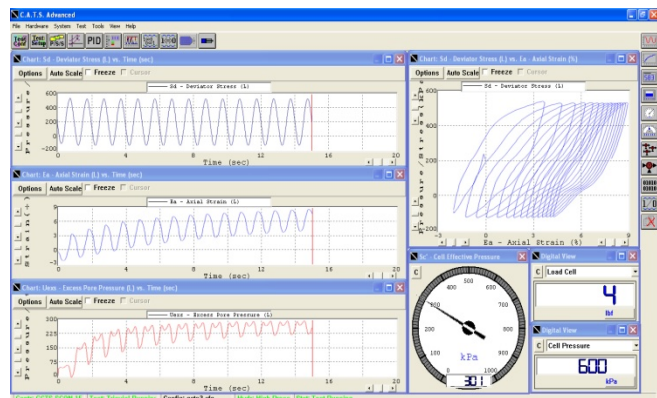
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- **Electro-Hydraulic digital servo control**
- **Dynamic and static triaxial tests**
- **Frequencies up to 20 Hz**
- **300 mm Specimen Diameter**
- **Axial loads up to 500 kN**
- **Cell Pressures up to 1,000 kPa**
- **Direct servo control of stress, strain (axial, radial, volumetric, etc.) or any other calculated variable**

DESCRIPTION

The STX-600 triaxial testing system is intended for performing dynamic tests on soils with large particle sizes such as gravelly soils and railway ballasts. The triaxial cell accepts 300 mm diameter samples with heights up to 700 mm. This system is typically use to carry liquefaction, resilient modulus, cyclic strength, complex modulus, and other dynamic triaxial tests including synchronized cyclic axial and confining stress loading.

This system also provides the necessary versatility to automatically perform conventional triaxial tests as well as advanced procedures such as stress or strain path.



CATS Software

The standard STX-600 system includes all the necessary hardware and software to automatically perform all triaxial stages including saturation, consolidation, and easily created cyclic and static customized test procedures. It allows creation of an unlimited variety of waveforms including user-generated profiles such as a digitized earthquake record or other vibration records. The program helps the user select the proper testing parameters and provides the necessary information required to automatically execute the desired test.

The Graphical User Interface helps minimize learning time and enables laboratory personnel to conduct more complex, but realistic, testing programs at substantially lower operating cost and also with minimal operator error.

This system includes a load frame mounted on a heavy duty steel table. The load frame can be ordered with optional hydraulic lifts to easily position the actuator cross-head for performing other tests such as 3 or 4-point bending using the appropriate fixture. These frames can be configured with different flow capacity servo valves to obtain the required cyclic amplitudes. Performance charts printed below show the cyclic response of the standard and optional servo valves.

The triaxial cell included with the STX-600 system is constructed of stainless steel. The standard unit features a reinforced see-through Plexiglas cell wall. All the standard GCTS triaxial cells can accommodate smaller diameter specimens using optional platens. These triaxial cells accept specimens with a length of 2 to 2.25 times the diameter. Also included is a split sample compaction mold to from 300 mm diameter specimens made of anodized aluminum.

The STX-600 system includes a pressure control panel complete with servo control of the cell and back pressure, 20 liter fluid reservoir, venturi vacuum pump, volume change device, automatic ball valve, flow indicators, etc. making this panel very convenient and easy to operate. A Pressure gauge provides visual verification of confining and pore pressures. Convenient "quick-connect" fittings allow for easy connection of pressure lines and filling/draining the fluid reservoirs. Sight tubes are also available to show the available amount of fluid in each fluid circuit. Each pressure controller allows for the servo control of the confining and back pressure as a function of pressure or any other measured or calculated test parameter. With both pressure controllers, advance tests such as stress/strain path, K_0 , permeability, etc. can be easily performed.



STX-600 Dynamic Triaxial Cell

The STX-600 is operated with our fully integrated SCOM-1500 digital signal conditioning/controller and the state-of-the-art CATS-TRX-SOIL, true 32-bit, Windows XP software. Conducting Triaxial tests have been greatly simplified by the incorporation of direct user programming of test calculated parameters in the units of interest (stress, strain, etc.) based on the specimen dimensions. Up to 20 test parameters are automatically defined and corrected taking into account such things as piston uplift force from confining pressure application and changes in specimen area during the test. These parameters are calculated in real time and are available for display, graph and/or control. In addition, CATS software allows you to define user defined parameters to obtain multiple sensor averages or corrections as a function of other inputs. Using calculated test parameters directly eliminates complex and lengthy pre-calculations to design test programs. This allows the user to concentrate on the material behavior rather than on the electronics and equipment operation.

The embedded microprocessor is capable of performing all test functions even if the Windows computer crashes. It provides automatic dynamic control mode switching between any connected transducer or calculated parameter ("bump-less transfer"). This controller also conditions all transducers used for triaxial testing and provides real time linearization of any input using high-order polynomials. This digital controller

is capable of updating the control loop at up to 6 kHz required to control the loads for high frequency dynamic tests. The SCON-1500 has several adaptive compensation techniques to improve the control precision without user intervention. Controlling the actual axial stress (as opposed to the axial load) and use of the Peak and Valley compensation ensures the precision of the programmed waveform amplitude even after the specimen undergoes significant deformations or stiffness degradation. This is an important feature in order to maintain the desired cyclic amplitudes throughout the entire test. Our system includes a 150,000 per second sampling rate with 16-bit (0.0015%) resolution and "sample-and-hold" Digital-to-Analog (A/D) Converter. The sample-and-hold ensures that the converted values from all attached sensors (load cells, deformation, etc.) represent a single instant in time eliminating any data skew from delays in the A/D converter. GCTS hardware-software interface includes both an analog anti-alias filter for high frequencies and a digital filter for lower frequencies. This configuration produces a very stable and precise signal measurement and control system as required to perform dynamic triaxial tests.

Any desired unit can be used for display or report test parameters and even allowing combining different unit systems.

GCTS software also offers compatibility with network systems for monitoring or sending your test data directly to any computer connected to your network. Using a Windows network system in your lab facilitates transferring of your test data directly into other Windows programs such as Word or Excel for report generation as well as to easily backup your important test results.

Together with GCTS excellent support from our highly qualified and experienced staff, we are sure to provide the best option and price-performance value.

SPECIFICATIONS

Systems built to customer specifications. Contact GCTS for detailed specifications.

WARRANTY

One (1) year parts and labor.

