Geocomp

Technologies to manage risk for infrastructure

Advanced Cyclic Direct Simple Shear Testing System

Advanced design for superior results

Advanced Cyclic Direct Simple Shear

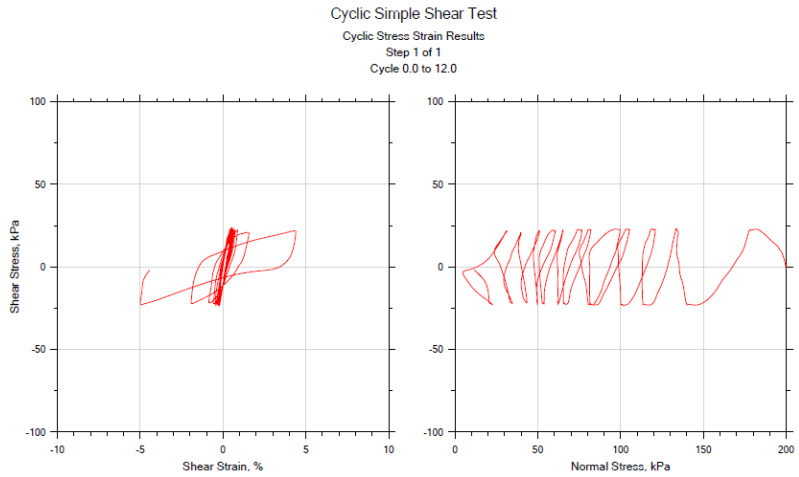
The Advanced Cyclic Direct Simple Shear (ACDSS) system is designed to offer superior performance, accuracy and results for academic researchers and commercial testing laboratories. This state-of-the-art machine allows users to measure cyclic strength, liquefaction characteristics or cyclic properties of soils such as Modulus and Damping. Researchers can also upload stress ratio or strain time history files (e.g. earthquake motion) for analysis.

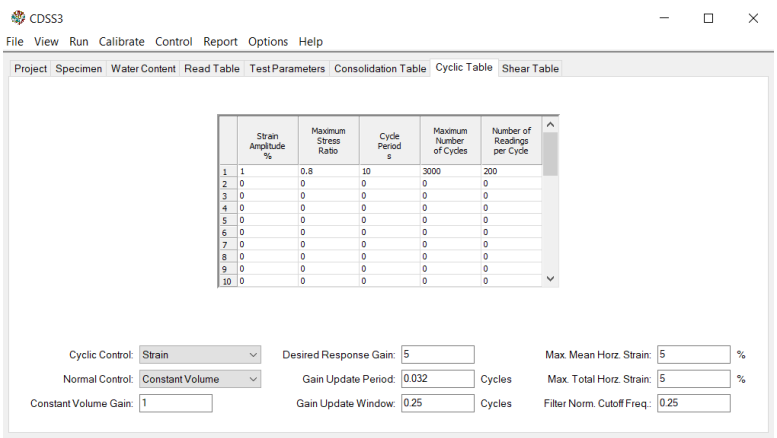
Cyclic direct simple shear testing requires the proper combination of frame stiffness and very precise load and volume control to produce reliable data. The ACDSS system is built to excel in these aspects. We've also incorporated technology and software features to ensure a broad range of user needs are met in terms of both ease of use and sophisticated options.

ACDSS Configuration

The ACDSS unit comes complete with:

- Zero backlash servo controlled linear actuators
- Force and displacement sensors with mounting fixtures, including advanced multi-axis load cell
- Water bath container with side access for sample placement
- Top and bottom caps with installed sintered bronze porous stones (pinned)
- Teflon® coated stack of aluminum rings for lateral confinement
- Slide table and components
- Related test accessories
- Automated control and data acquisition software to perform consolidation, cyclic direct simple shear, and post cyclic shear





System Features

- Extremely rigid frame design
- Large diameter axial loading piston and precision crafted anti-rocking system
- Passive or active height control
- Stress or strain controlled loading
- Apply irregular stress ratio and strain time history (e.g. earthquake motion)
- Capable of static direct simple shear tests in drained (constant load) and undrained (constant volume) condition with or without shear bias
- Supports linear encoders for precise and noise free displacement measurement
- Faster sampling rates, up to 1000 Hz
- Software configurable excitation voltage for sensors
- Remote network access for real-time monitoring and control
- Software generates full report of the test or raw data (.CSV export)
- Upgradeable to perform bidirectional cyclic direct simple shear testing

Sample Test Result & Software View

(pictured left)

Applicable Test Standards:

- ASTM D6528, D8296

Specifications

Specimen size: 2.5 in (63.5 mm) diameter standard
Also available: 2.0 in (50 mm) and 4.0 in (101 mm) diameter
Horizontal loading capacity: 4.5 kN (1000 lbf) standard
Vertical loading capacity: 11 kN (2500 lbf) standard
Power: 208-240V, 50/60 Hz, 1 phase
Horizontal displacement: Cyclic peak to peak strain of up to 10%; Monotonic strain of up to 25%
Vertical displacement (stroke): 50 mm (2.0 in)
Sensors:

- Two 4.5 kN (1000 lbf) low profile load cells with resolution of 0.18 N (0.04 lbf). Optional 9 kN (2000 lbf) for vertical axis.
- Optional advanced 2/10 kN (500/2250 lbf) multi-axis load cell to reduce frictional effects
- One +/- 50 mm (2 in) maximum range vertical displacement transducer resolved to 7.6 x 10^{-5} mm (3 x 10^{-5} in) with long life of 100 x 106 movements
- One +/- 50 mm (2 in) maximum range horizontal displacement transducer resolved to 7.6 x 10^{-5} mm (3 x 10^{-5} in) with ling life of 100 x 106 movements
- Noise free linear encoders can be used upon request (resolution as low as 0.1 microns)
- External displacement gauges can be used upon request

Loading frequency: For both horizontal axis, monotonic loading and cyclic loading from 0.033 Hz up to 10 Hz
Data logging and control:

- Two embedded controllers, one for each axis
- Eight analog channels with signal conditioning and power supplies built-in
- Two digital channels
- Built-in 24 bit Data Acquisition and Control (limited externally to 16 bit)

Safety Features:

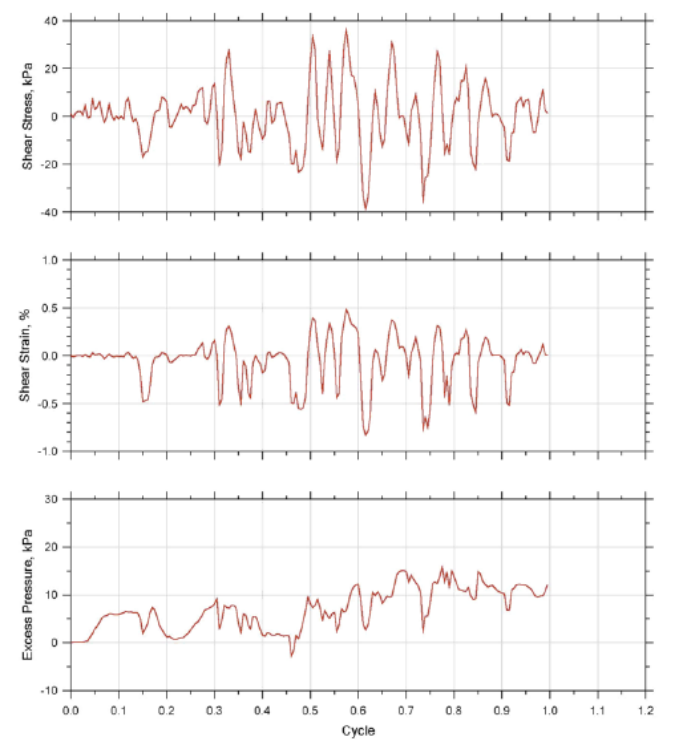
- Upper and lower micro-switch mechanism to prevent actuator over travel
- Left and right micro-switch mechanism to prevent actuator over travel
- Built-in software safety shut-off when sensors max out
- Overcurrent, over temperature shutdown

Reporting:

- Reporting modulus and damping for each cyclic step and modulus reduction and damping increase for multiple step tests. Report also includes P-P shear strain and stress vs. cycle, shear stress vs. shear strain, and pore pressure ratio vs. cycle.
- Complete tabular and graphical reporting to be used and implemented in numerical analysis software and site-response analysis
- Raw data reporting
- All tabular reports can be exported to Excel spreadsheets

Optional Features:

- P&S wave velocity measurement option using bender/extender elements



Geocomp Products

We design and manufacture automated laboratory testing systems and remote monitoring devices. We focus on creating products that help our clients accomplish their goals efficiently and quickly, whether it be in teaching, research, commercial, or other applications. We design our automated testing systems to help the user perform tests efficiently and quickly and produce high-quality results. Our remote monitoring systems are robust, versatile, and are easy to use in varying environmental settings. We serve numerous clients in over 140 countries. Join our many satisfied customers and make us your trusted source for remote monitoring equipment and automated laboratory testing systems.

Automated Laboratory Testing Product Line

Incremental Consolidation
Constant rate of consolidation including constant rate of strain, constant rate of loading, constant gradient, and constant excess pore pressure ratio
Triaxial: 1.4 to 6 inch diameter specimen
Stress Path Triaxial: 1.4 to 6 inch diameter specimen
Cyclic Triaxial: 1.4 to 6 inch diameter specimen
Direct and Residual Shear: 2.5, 6, and 12 inch specimen diameter
Direct Simple Shear and Cyclic Direct Simple Shear: 2.5, 4, and 12 inch diameter specimen
Resilient Modulus: 1.4 to 6 inch diameter specimen
Resonant Column-Torsional Shear: 2.8 inch diameter specimen

Field Systems Product Line for Wireless Data Logger

iSite™-HS: 8 channel Ethernet data logger with up to 1000Hz synchronized logging on each channel
iSiteCentral™: cloud-based, web monitoring of sensors and documents in real-time including apps and alerts

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