

**Suitable for ASTM D6528**

**Actuator System:**

Electro-mechanical

**Available Load ranges:**

Axial Load: 5kN

Shear Load: 5kN

**Software**

Fully automated

**Control Parameters:**

Axial Load/ Displacement

Shear Load/Displacement

Active Height Control

**Available options**

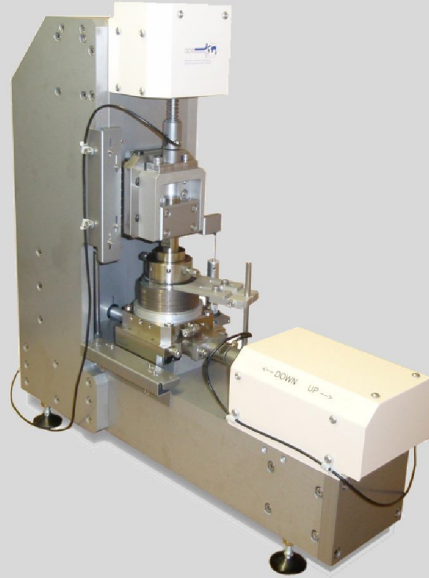
10kN Upgrade

Bender Elements

Local Strain

Option: Can be upgraded to Direct Shear

# GDS Standard Simple Shear System (STDSS)



## What is it?

The GDS Standard Simple Shear (STDSS) testing system is a stand alone simple shear device with no requirements for compressed air or hanging weights. The STDSS device can also be used to perform direct shear tests with the addition of optional direct shear platens and so is a combined machine.

The STDSS has been developed based on the experience we have achieved with our dynamic simple shear device, the EMDCSS which is a state of the art system for simple shear testing.

A cylindrical soil specimen is laterally confined by Teflon impregnated low friction retaining rings, ensuring a constant cross sectional area. A shear force loading is then applied. Vertical displacement is prevented using active height control (via the axial force actuator), therefore constant volume conditions are enforced (i.e. Simple Shear).

## Features

Axial and shear loads (or displacements) are provided by proven GDS electro-mechanical force actuators. Axial and shear load readings are controlled under closed-loop feedback.

Topcap fixity is assured through a system of crossed roller linear guides to minimise topcap rocking during shearing.

The STDSS is a benchtop unit with a very small foot print of approximately 750mm x 200mm. This allows the system to fit into most laboratories. The only laboratory service required for the STDSS is mains electricity (110Vac – 240Vac).

Sample preparation and insertion into the system is made easy by using the included sample preparation and topcap support apparatus. This ensures that no load is applied to the sample during preparation and insertion.

### Technical Specifications

- Accurate electro-mechanical actuators
- Available sample sizes (one size supplied with system):
  - $\Phi$ 50mm
  - $\Phi$ 70mm
  - Other sizes available on request
- Built in data logging for axial and shear loadcells
- Low friction sample slip rings
- High quality, low friction linear guides used to ensure strength and alignment in normal and shear directions.
- Available control parameters:
  - Axial Load / Stress
  - Axial Strain / displacement
  - Shear Load / Stress
  - Shear Strain
- Available control modes for each control parameter:
  - Ramp (monotonic), Cycle (slow speed) and hold

- The STDSS uses the steps of the stepper motor to report axial and shear displacement. Additional accuracy can be achieved with the addition of an external GDS 16-bit Data logger and separate axial and shear displacement transducers for a more direct reading of the sample movement.
- The system can be upgraded by the addition of bender elements to measure small strain stiffness, please see below for further details.
- System designed to conform to and above the requirements of ASTM D6528.

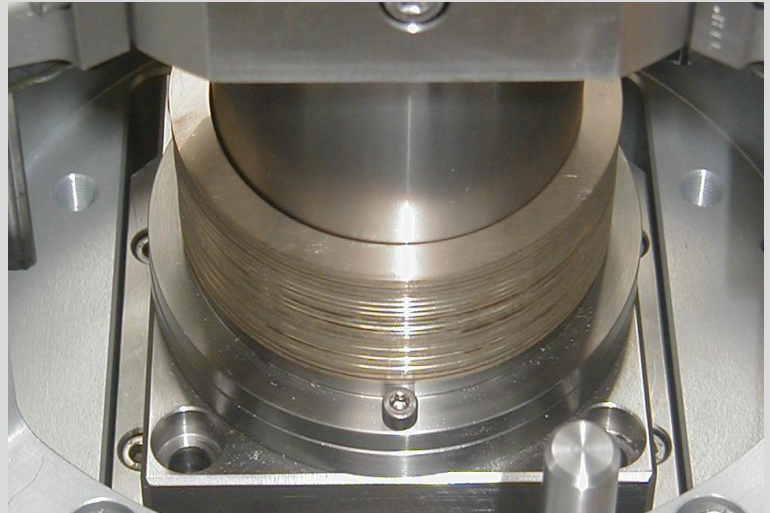


Fig. 1 An STDSS Sample under test.

### Upgrade to bender element testing

Any STDSS system may be upgraded to perform P and S wave bender element testing with the addition of the following items (see Fig. 2):

- Bender element pedestal with *new* inserted element
- Bender element top cap with *new* inserted element
- High-speed data acquisition card

Signal conditioning unit, amplification of source and received signals (P and S wave) with user-controlled gain levels (via software).

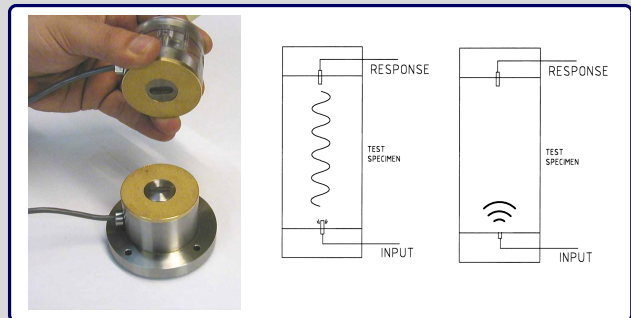


Fig. 2 P and S wave elements

For further information on bender element testing, please refer to the dedicated Bender Element Testing datasheet.

### GDSLAB control software

The GDSLAB control and acquisition software from GDS is a highly developed, yet extremely flexible software platform. Starting with the Kernel module and the ability to perform data acquisition only, additional modules may be chosen for your testing requirements. Some currently available modules available are as follows:

- SATCON (saturation and consolidation)
- Standard triaxial
- Stress path testing (p, q and s, t)
- Advanced loading tests
- Unsaturated testing
- K0 consolidation
- Permeability
- Simple Shear

GDSLAB has the ability to be configured to your hardware choice, no matter how unique the arrangement. A text file (\*.ini) or initialisation file is created that describes the hardware connectivity to the PC. The hardware layout is available in graphical format via the GDSLAB 'object display'. This makes setting up the devices and checking the connectivity extremely simple, as in Fig. 3.

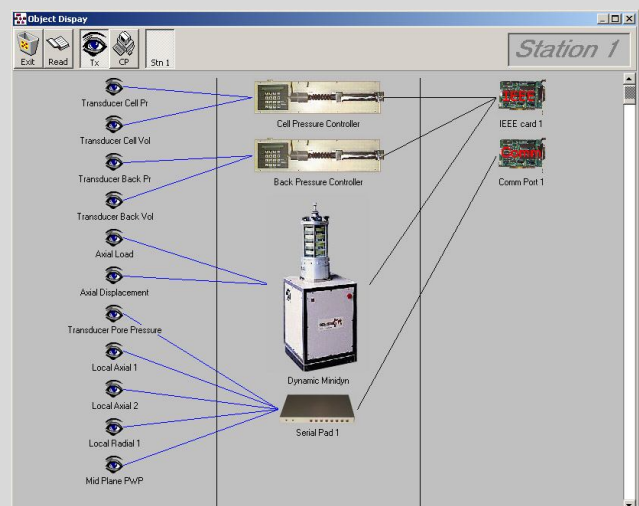


Fig. 3 GDSLAB object display showing a DYNNTS setup

For further information on GDSLAB, please refer to the dedicated GDSLAB datasheet.