

Time driven evolution in Testing Machines

Newsletter on Advanced Geotechnical Testing



- **IIT Kharagpur** - Combined Triaxial & Direct Shear Apparatus
- **IIT Roorkee** - Polyaxial Testing System
- **IIT Bombay** – Fully Automatic Dynamic Simple & Direct Shear Apparatus
- **IIT Bombay** - 50kN Cyclic Triaxial for Soil and Asphalt Testing

Rock Testing

Features

Combined Triaxial and Direct Shear Apparatus

- 1) The modular rock shear testing system combines the opportunities of a triaxial rock testing & a direct shear system.
- 2) Building block system
- 3) Fully automated and controlled by flexible and programmable GEOsys software.
- 4) The rock shear testing system is able to perform static and dynamic loading tests on rock samples up to 100 mm with an axial force up to 10000 kN and a shear force up to 1500 kN.

Polyaxial Testing System

- 1) Designed to induce stress on cubic samples via three independent controlled principal axes ($\sigma_1 \neq \sigma_2 \neq \sigma_3$)
- 2) Hydraulic facturing test.
- 3) Directional permeability test.
- 4) Pore or hydrostatic pressure.
- 5) System for measuring P-and S-wave in combination with acoustic emissions.
- 6) Temperature controlling up to 200 deg C.

Combined Triaxial and Direct Shear Apparatus

With the evolution of time and space in technological aspects has brought about advancement in testing machines. This combined triaxial and direct shear apparatus comes in a high stiffness 4-column construction designed for uniaxial and triaxial rock testing or wall type construction for more stiffness. It is also capable of handling creep loading. For the best noise protection it consists of advanced high quality hydraulic power pack. 2000 kN triaxial and direct shear apparatus has been supplied to Department of Mining Engineering, Indian Institute of Technology, Kharagpur, wherein it will be used for evaluation of rock properties



Polyaxial Testing System

This unique experimental testing system is a customized solution used to study the behaviour of rock under various dimensional and compressive stress regimes. This fits to the research goals of geothermal energy researchers, hydrologists, petroleum reservoir engineers and researchers in the mining section, geophysics and geotechnical sectors. The system is capable of testing a wide range of materials from granite to mudstones and also for post-failure regime of high-strength brittle rocks. This system is installed at Department of Civil Engineering, Indian Institute of Technology, Roorkee wherein it is being used for understanding rock & rock mass behaviour under 3D insitu stress conditions.



Soil Testing

Fully Automatic Dynamic Simple & Direct Shear Apparatus



This is an advanced fully automatic simple-shear apparatus with two high quality servomotor drives for static, cyclic and dynamic shear loads up to 10kN. It has a sophisticated robust construction in connection with high-quality mechanic and electronic components and includes of a high stiffness frame and actuator system to compensate and deformation in static or cyclic loading.

The machine includes of two high quality servomotor drives for performing vertical load.

Cyclic Triaxial for Soil & Asphalt Testing

50kN high quality servo hydraulic closed-loop controlled triaxial load frames are suitable for generating high accuracy static and cyclic loads for soil and asphalt testing. Load Frames with cyclic and static load up to 1000 kN are available. These high quality stress/path triaxial testing systems are consisting basically of a rigid 2 column-load frame, a cyclic actuator, a multi-channel high speed control system with 20 bit resolution for dynamic axis load and actuators for cell-pressure, back-pressure and optional pore air pressure.

This equipment is currently being used by IIT Bombay .



Features

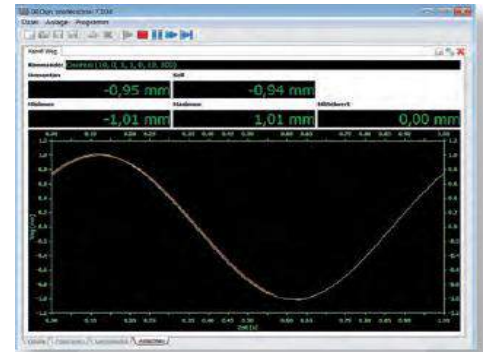
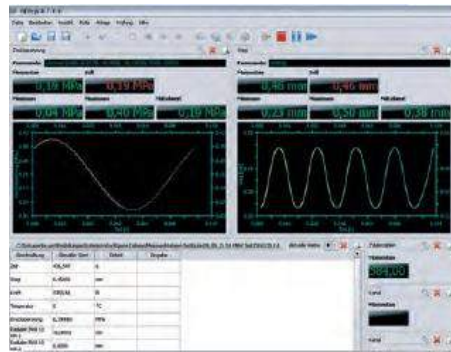
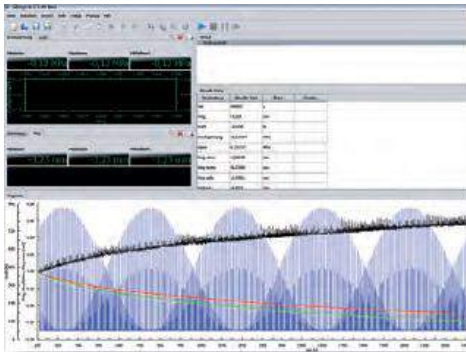
Fully Automatic Dynamic Simple & Direct Shear Apparatus

- 1) High stiffness frame & actuator system to compensate any deformation in static or cyclic loading.
- 2) Suitable for drained and un-drained direct or simple shear tests.
- 3) Double side horizontal and vertical ball-bearing guided cross-head for load piston and shear boxes.
- 4) Closed-loop controlled height for constant volume conditions.
- 5) High accuracy displacement transducers for settlement and displacement (strain).

Cyclic Triaxial for Soil & Asphalt Testing

- 1) Standard Triaxial tests (CD, CU, UU)
- 2) B-value check control
- 3) Stress Path Triaxial tests (p, q and s, t)
- 4) Resilient modulus
- 5) Uniaxial compression test
- 6) Consolidation tests
- 7) User defined test procedure with advance GEOsys Software
- 8) High precision strain, stress and position closed-loop controlled load frame.
- 9) Several upgrading features.
- 10) Isotropic and anisotropic consolidation

Fully Automatic and programmable data acquisition software



It is a Multifunctional, easily programmable controlling and data acquisition software with report function for static and dynamic tests. It is one unique platform for all kinds of material testing (soil, rock, construction, asphalt). The program supports numerous hardware and laboratory devices of familiar manufacturers. An upgrade and incorporation of existing devices into the system is possible. It has user roles for easiest handling. Also, provided optional interface enabling to integrate additional hardware. Multiple ways of displaying current and reference values.

Supports platform independency The test procedures is a modular composition which incorporates the following-Management of hardware components; User supplied, calculated measurands Easy to use front end for defining test procedures; Interactive handling; Data acquisition. All measuring data will be provided in ASCII-Format. The data recording can be time adjusted or according to strain rate. Has unlimited test stages with up to 3 stop or control criteria are available, each for the different sequences like consolidation, Saturation and shear stages.

Diagrams consisting of various plots of arbitrary channels and scaling. The presentation entirely adopted by the end users' needs. Content of logs is also displayed. The tree view is adopted to track the state of the test. Screen layout can be adjusted by the user. The available screen space can therefore be split horizontally and vertically and display items can be stacked. Large assortment of available tests specifications are also available.

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