floXlab

Your supplier of high-pressure laboratory instruments and advanced geotechnical testing equipment

TRUTEST

True Triaxial Rock Compression Test System

An advanced True Triaxial system with fully independent control of the three principal stresses (σx ≠ σy ≠ σz) — for high-precision 3D mechanical characterization of cubic rock specimens under realistic in-situ stress conditions.

TRUE TRIAXIAL • ROCK MECHANICS • 3D STRESS PATHS

Overview

Independent control of σx, σy and σz on cubic rock specimens.

100 MPa

Max stress per axis (σx, σy, σz)

150 °C

Operating temperature (option)

0.5 µm

LVDT displacement resolution

300³ mm

Specimen size (100³ / 200³ / 300³)

WHAT TRUTEST DELIVERS

THE SYSTEM

- Advanced True Triaxial Rock Testing System
- Fully independent principal stresses (σx ≠ σy ≠ σz)
- High-precision 3D characterization of cubic specimens

PERFORMANCE

- Stress capacity up to 100 MPa per axis
- High-resolution deformation measurement (0.5 µm LVDT)
- Full 3D stress–strain analysis under controlled paths

OPTIONAL

- Thermo-mechanical testing up to 150 °C
- Real-time Acoustic Velocity (P & S waves)
- Acoustic Emission 2D / 3D fracture localization

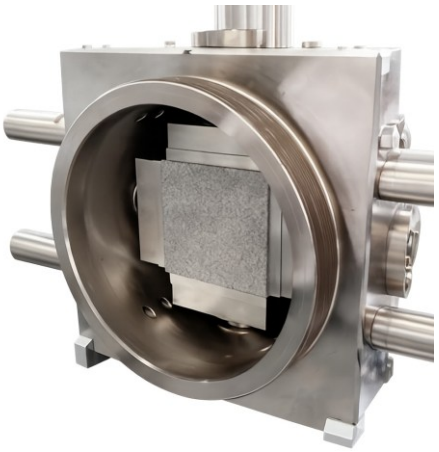
Working Principle

Six-actuator cubic cell — opposed loading on every face for symmetric stress paths.

Cell Configuration

SIX PLATENS · SIX ACTUATORS · THREE OPPOSING PAIRS (X, Y, Z)

- **Cubic specimen on six rigid platens**
  Hardened platens transmit load directly from the actuator pistons onto each face.
- **Opposed-actuator layout**
  Symmetric stress application — minimal bending, no parasitic effects.
- **High-resolution displacement**
  One LVDT per actuator, 0.5 µm resolution, real-time strain along each axis.



Cubic specimen inside the six-platen cell

Hydraulic Loading Principle

THREE SYRINGE PUMPS · CLOSED-LOOP SERVO CONTROL

- **Pump-driven actuator pairs**
  Each opposing actuator pair fed by an independent high-pressure syringe pump.
- **Decoupled stress states**
  Loading regimes from uniaxial to true triaxial (σ1 ≠ σ2 ≠ σ3) under closed-loop servo control.

AXIAL FORCE

$$F = P \times A$$

Force = Pressure × Piston Area

System & Modules

Core hydraulic architecture and three optional advanced-monitoring modules.

01 True Triaxial Cell

Cubic-specimen cell with six rigid platens, frontal opening for installation, sliding actuator assembly, secure locking. Optional integrated heating up to 150 °C.

02 Hydraulic Actuators

Six independent actuators in three opposing pairs (X, Y, Z) — stress capacity 100 MPa per axis. LVDT on each actuator (0.5 µm) for real-time displacement.

03 Three Syringe Pumps

High-pressure syringe pumps, one per axis. Modes: pressure / displacement / flow. Working pressure 70 MPa, 250 ml volume, 60 ml/min max flow.

04 Acoustic Velocity (option)

Six P/S transducers on opposite faces — Vp, Vs1, Vs2 along X, Y, Z. Detects microcrack initiation, stress-induced anisotropy and stiffness evolution.

05 Acoustic Emission (option)

16 broadband AE sensors, 125 – 750 kHz, 40 dB preamp, 16-bit / 10 MHz acquisition — for 2D / 3D event localization during loading.

06 Hydraulic Fracturing (option)

Integrated fluid-injection platen for pre-drilled boreholes. Measures breakdown pressure and tracks fracture propagation — combinable with the AE module.

Get in Touch

Speak to our specialists about your application — every TRUTEST system is configured to your research.

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