floXlab

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

PREPEAK

Pre-Failure Triaxial Rock Compression Tester

A high-pressure triaxial system engineered for pre-failure stress loading on rock specimens — keeping the core intact for precise, well-controlled stress states under independent radial, axial and pore pressure control.

ROCK MECHANICS • PRE-FAILURE TESTING • CUSTOM CONFIGURATION

Overview

A pump-actuated triaxial system designed for pre-failure stress loading.

70 MPa

Axial / Confining / Pore pressure

445 kN

Maximum axial load

150 °C

Operating temperature

54.7 mm

Specimen diameter (L = 2 × Ø)

KEY FEATURES

Pump-actuated triaxial design

Built-in hydraulic piston applies deviatoric stresses to the core sample, enabling anisotropic stress states.

Optimized for pre-failure loading

Unlike rock-failure testers, PREPEAK keeps the rock intact for precise, well-controlled stress states.

Independent pressure control

Distinct radial and axial confining pressures applied independently to the specimen.

Advanced measurements enabled

Stable stress conditions for acoustic, petrophysical and mechanical studies under controlled loading.

Fully customizable configuration

Pressure, temperature, specimen size and test modules tailored to your requirements — Hastelloy option for corrosive fluids.

Testing Capabilities

A comprehensive series of geomechanical and petrophysical tests under controlled laboratory conditions.

Rock Deformation

TIME-DEPENDENT BEHAVIOR

- **Creep & long-term deformation**
  Constant-load compaction, time-dependent strain, reservoir depletion simulation

Petrophysical Properties

STRESS-DEPENDENT RESPONSE

- **Rock compressibility**
  Stress-induced volume reduction and pore-structure compaction
- **Stress-dependent porosity & permeability**
  Pore-throat closure, anisotropic flow in the deforming pore network
- **Acoustic velocity (Vp / Vs) & electrical resistivity**
  Microcrack closure, anisotropy development, pore-structure evolution

Damage & Failure Monitoring

SUB-FAILURE DETECTION

- **Acoustic Emission (AE)**
  Microcrack initiation and damage evolution under sub-failure cycling
- **Hydraulic fracturing AE**
  Borehole pressurization, microcrack detection, fracture propagation

Optional Test Modules

Tailor PREPEAK to your research needs — six specialized add-on modules.

01 Creep & Deformation

In-vessel axial LVDTs and a diametral extensometer for long-term deformation, rock compressibility and porosity under sustained load.

02 Permeability

LP-700 Darcy-law measurement with upstream/downstream transducers, differential-pressure sensors and back-pressure regulator. Range 0.01 mD – 10 D.

03 Electrical Resistivity

2-point axial electrodes, upgradeable to 4-point with lateral electrodes in Viton sleeve. LCR meter 12 Hz – 10 kHz, frequency-dependent analysis.

04 Acoustic Velocity

P- and S1/S2-wave measurement at 1 MHz via piezoelectric platens. Six coaxial feedthroughs, high-speed pulser-receiver, operating up to 120 °C.

05 Acoustic Emission

Six lateral AE sensors with 40 dB amplification, 32 – 1000 kHz filters. 16-bit / 10 MHz / 8-channel acquisition. ~2 mm event location accuracy.

06 Hydraulic Fracturing

Fracturing platens with integrated injector for Ø 6.35 mm boreholes. Combined with AE: breakdown-pressure measurement and real-time fracture tracking.

Get in Touch

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

ADDRESS

23 rue du Port
92000 Nanterre
France

EMAIL

contact@floxlab.com
www.floxlab.com

PHONE

+33 (0) 1 81 93 12 85

SCAN ME

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