floXlab

PRODUCT CATALOG · EDITION 2026

Precision Instrumentation Portfolio.

Engineered laboratory and field solutions for rock mechanics, reservoir stimulation and high-pressure fluid handling.

01 ROCK MECHANICS

02 RESERVOIR STIMULATION

03 HIGH-PRESSURE PUMPS

Contents

A complete map of the Floxlab portfolio — instruments, systems and products.

01 ROCK MECHANICS (continued)

02 RESERVOIR STIMULATION p. 175

03 HIGH-PRESSURE PUMPS p. 237

FLOXLAB — ENGINEERING EXCELLENCE SINCE 2013

Company Profile

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

ROCK MECHANICS | RESERVOIR STIMULATION | HIGH-PRESSURE PUMPS

WHO WE ARE

FLOXLAB

Engineering firm based in the Paris region, specialised in the design and manufacture of high-pressure laboratory instruments and advanced geotechnical testing equipment.

- Engineering firm based in the Paris region
- Specialised in high-pressure equipment design & manufacturing
- In-house mechanical, electrical and software engineering
- Worldwide references across research labs and industry
- Custom solutions tailored to specific testing requirements

FLOXLAB Headquarters — Nanterre, France

30+	Worldwide	100%
Years of expertise	Customer references	Custom engineering

Our Expertise

Integrated engineering capabilities from concept to commissioning

01

Mechanical Design

In-house mechanical engineering for pressure vessels, load frames and high-pressure fluid systems — fully customisable for specific operating conditions.

02

Hydraulic & Fluid Systems

Expert design of servo-controlled hydraulic and pneumatic circuits, syringe pumps and back-pressure regulators for precise flow and pressure control.

03

Control & Acquisition

Integrated electronic instrumentation, PID servo-control and multi-channel data acquisition — calibrated and validated on each delivered system.

04

Application Software

User-friendly supervision interface with synoptic displays, automated test sequences, real-time monitoring and standardised reporting.

DESIGN → MANUFACTURING → COMMISSIONING → TRAINING & AFTER-SALES SUPPORT

Product Lines

Three complementary families covering all high-pressure laboratory needs

01 ROCK MECHANICS

Specimen prep & testing

- Specimen preparation tools
- Rock testers
- Load-frame triaxial systems
- Pump-actuated triaxial systems
- Triaxial cells and fixtures

02 RESERVOIR STIMULATION

Fracturing & conductivity

- Proppant conductivity systems
- Hydraulic fracture test systems
- Acid fracture conductivity
- Proppant test cells

03 HIGH-PRESSURE PUMPS

Flow & pressure control

- High-pressure syringe pumps
- Continuous-flow pumps
- Automated pressure controllers
- Automated valves

Flagship Systems

A complete testing ecosystem for laboratories and research centers worldwide

CORE PREPARATION TOOLS

Specimen preparation

Precise cutting of rock specimens to specific dimensions for mechanical testing programs.

GEOTEST EXPRESS

Automated rock compression testing

Perform triaxial compression tests under both static and dynamic conditions.

PROPPANT CONDUCTIVITY SYSTEM

Short-term proppant pack conductivity

Evaluate the performance of hydraulic fracturing proppants under realistic downhole conditions.

SYRINGE PUMP

High-pressure injection pump

Ultra-precise, pulse-free fluid flow control under high pressure with flexible operating modes.

COMPLETE PORTFOLIO: Specimen preparation · Rock testers · Triaxial systems · Proppant test system . Pumps . Valves

Our Commitments

Values that drive the Floxlab engineering experience

01 — QUALITY

Built to last

- In-house design & manufacturing
- Rigorous pressure testing
- Certified components
- Traceable calibration

02 — CUSTOMISATION

Your project, our expertise

- Tailored specifications
- Special pressure & temperature ranges
- Hastelloy / Inconel options
- Custom test modules

03 — SUPPORT

Long-term partnership

- On-site commissioning & training
- Remote technical support
- Software updates
- Spare parts & refurbishing

"We don't just sell equipment — we engineer solutions and support them throughout their lifecycle."

Worldwide References

Floxlab systems operate in research laboratories and industry across five continents

EUROPE • AMERICAS • ASIA • MIDDLE EAST • AFRICA

KEY INDUSTRIES

Oil & gas reservoir research
Core analysis, formation evaluation

Mining & tunneling engineering
Rock strength, ground stability

Geothermal energy development
Thermal and mechanical characterisation

Carbon storage (CCS/CCUS)
Sealing and injection studies

Civil engineering
Foundation design, slope stability

CUSTOMER PROFILES

University research laboratories
Rock mechanics & petrophysics studies

National research institutes
Public science programs

Oil company R&D centers
Reservoir & stimulation research

Service companies & core analysis
Commercial testing laboratories

Government & geological surveys
Regulatory and mapping agencies

GET IN TOUCH

Let's discuss how Floxlab can support your testing programs

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FLOXLAB — High-pressure laboratory instruments • Advanced geotechnical testing equipment

FAMILY ONE

Rock Mechanics

A complete range of rock testing instruments — from index testers and acoustic systems to load-frame and pump-actuated triaxial platforms — designed for academic, research and industrial geomechanics laboratories.

ROCK MECHANICS • LABORATORY EQUIPMENT

Specimen Preparation Tools

A complete laboratory workflow — from raw rock to test-ready plug

The Floxlab Specimen Preparation Suite brings together four purpose-built machines that integrate into a single, repeatable laboratory workflow. From coring and cutting to grinding and flatness verification, every step is engineered for precise, ASTM-compliant specimens in rock mechanics research and industry.

THE FOUR-STEP WORKFLOW

1

ACM-300

Coring

Extract cylindrical plugs from rock cores and blocks with diamond coring bits.

2

SC-450

Cutting

Cut specimens to precise length using a Ø 450 mm diamond blade.

3

SG-300

Grinding

Grind end surfaces flat and parallel with a Ø 300 mm diamond cup wheel.

4

SF-300

Flatness

Verify ASTM D4543 compliance with a precision digital dial indicator.

STANDARDS & COMPLIANCE ASTM D4543 • ASTM D7012 • ASTM D7070 • ASTM D5084

Purpose-built by Floxlab — engineered in France, trusted in laboratories worldwide.

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Coring & Cutting

ACM-300 Automatic Coring Machine • SC-450 Automated Cutting Saw

ACM-300 Automatic Coring Machine

Plug extraction from rock cores and blocks

GENERAL VIEW

INTERNAL VIEW — CORING IN OPERATION

The ACM-300 plugs cylindrical specimens from rock cores of various diameters or from blocks of similar size. It works with all types of diamond coring bits and delivers clean, repeatable plugs ready for downstream mechanical testing. Three rotation speeds, adjustable lowering speed and drilling force, internal core-drill irrigation via rotary seal, and horizontal or vertical sample clamping — with an optional recirculating coolant system.

2,520 rpm	Ø 102.6 mm	300 mm	2.2 kW
Max rotation	Max Ø drilling	Max depth	Motor power

SC-450 Automated Specimen Cutting Saw

Precise diamond-blade cutting of rock specimens

GENERAL VIEW

INTERNAL VIEW — DIAMOND BLADE & CARRIAGE

The SC-450 is a robust automated saw for cutting rock specimens with a diamond blade, delivering precise cuts in a self-contained laboratory unit. Designed for natural rock specimens with or without water, it accepts prismatic or cylindrical samples up to Ø 170 × L 400 mm, features a hydraulic carriage with adjustable feed, a closed-loop 40 L cooling system, and an integrated vacuum cleaner for dry cutting.

Ø 450 mm	1,450 rpm	170 × 400 mm	2.2 kW
Max blade	Rotation speed	Max specimen	Motor power

Grinding & Flatness Check

SG-300 Automated Specimen Grinder • SF-300 Specimen Flatness Gage

SG-300 Automated Specimen Grinder

Precise surface grinding of rock specimens

GENERAL VIEW

INTERNAL VIEW — GRINDING WHEEL & CLAMPS

The SG-300 is a robust automated grinder for rock specimens using a diamond cup wheel. Surpassing industry standards, it delivers flat, parallel surfaces essential for accurate mechanical testing. Features include a Ø 300 mm diamond wheel at 1,450 rpm, wet or dry grinding with integrated vacuum, a closed-loop 40 L cooling system, and mobility on four lockable wheels.

Ø 300 mm	1,450 rpm	170 × 400 mm	210 kg
Diamond wheel	Rotation speed	Max specimen	Weight

SF-300 Specimen Flatness Gage

ASTM D4543 compliance verification

GENERAL VIEW — GRANITE BASE & DIAL INDICATOR

The SF-300 ensures precise measurement of a specimen's flatness. A specimen is positioned on a Grade-A granite base (class 00), and a vertically mounted digital dial indicator reads out the degree of flatness to laboratory precision — the essential QC step before mechanical testing. Accepts specimens up to 300 mm (12 in) high and weighs only 20 kg on a compact benchtop footprint.

ASTM	±0.0001"	0.01 mm	20 kg
D4543 compliant	Accuracy	Resolution	Benchtop weight

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Applications & Contact

Trusted for rock mechanics research and industry

STANDARDS & COMPLIANCE

ASTM D4543 Preparing rock core as cylindrical specimens (SF-300)

ASTM D7012 Compressive strength & elastic moduli of intact rock

ASTM D7070 Creep of rock core under constant stress

ASTM D5084 Hydraulic conductivity of saturated porous materials

APPLICATIONS

Petroleum & reservoir engineering
Core analysis, permeability, compressibility

Mining & tunneling
Rock strength, deformability, failure characterization

Civil engineering & geomechanics
Foundation design, slope stability studies

Academic research
Triaxial, hydraulic fracturing, acoustic emission

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AVS-A

Acoustic Velocity System

P & S wave velocity and dynamic elastic constants of rock cores

AVS-A — turnkey bench-top acquisition setup with PC + Applilab

Geotechnical & Rock Mechanics Testing Equipment

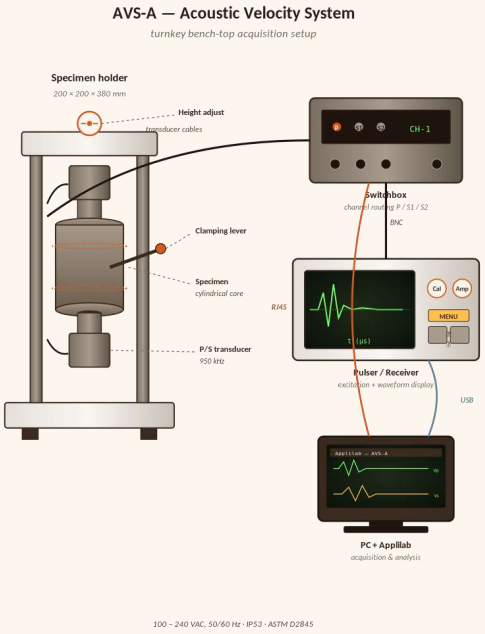
Overview

What the AVS-A does, in brief

- Ultrasonic pulse-transmission through rock cores
- Measures P-wave (Vp) and S-wave (Vs) velocities
- Computes dynamic Young's, shear, bulk moduli & v
- Three modes — compressional P, shear S1 and S2
- 1 MHz transducers — high-resolution time-of-flight
- Fast-loading specimen holder with centring collars
- Turnkey acquisition with PC + Applilab software
- Compliant with ASTM D2845 — IP53 rated

Main Components

Bench-top setup — annotated diagram



Specimen Holder

Fast-loading frame, 200 × 200 × 380 mm

P / S Transducers

1 MHz resonance — P, S1 and S2 modes

Pulser / Receiver

Excitation electronics + waveform display

Switchbox

Routes signals across P / S1 / S2 channels

PC + Applilab Software

Automated acquisition, analysis & reporting

Centring Collars & Lever

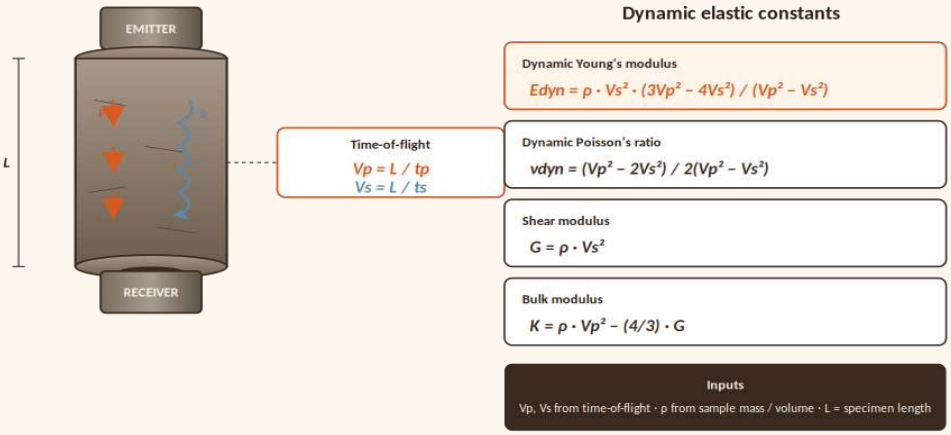
Precise alignment and grip of specimen

Measurement Principle

Pulse transmission — ASTM D2845

Wave propagation & dynamic elastic moduli

ASTM D2845 — pulse transmission through cylindrical rock specimens



Why it matters

Non-destructive elastic characterisation of cores — feeds geomechanical modelling, reservoir & rock-mass studies

How the test works

- Cylindrical core machined and centred in holder
- Acoustic gel applied at both transducer faces
- Pulser excites at 1 MHz, P or S mode
- Receiver captures the transmitted waveform
- Time-of-flight tp and ts read on oscilloscope
- Vp = L/tp, Vs = L/ts → dynamic moduli computed

Technical Specifications

Test method	Acoustic velocity — ASTM D2845	**Output**	Vp, Vs, Edyn, vdyn, G, K
Standards	ASTM D2845	**Specimen holder**	200 × 200 × 380 mm
Test cycle	Pulse transmission — P and S waves	**Pulser/receiver**	340 × 215 × 215 mm
Resonance freq.	1 MHz	**Switchbox**	200 × 200 × 400 mm
Wave modes	Compressional P, shear S1 and S2	**Operating range**	5 – 40 °C, indoor use
Protection	IP53 — coupling gel supplied	**Power supply**	100 – 240 VAC, 50/60 Hz

Applications

Where the AVS-A delivers value

Tunnelling & TBM

Dynamic moduli for geomechanical modelling of reservoirs and underground works

Mining

Rock-mass characterisation for mining geomechanics and slope studies

Civil Engineering

Calibration of seismic data with laboratory velocities on cores

Quarrying & Aggregates

Petrophysical correlations between Vp, Vs and porosity, anisotropy

Geomechanics R&D

Dynamic vs static moduli comparison studies in research laboratories

Field & Lab Use

Non-destructive QC of cores prior to triaxial or compression tests

Get in Touch

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ROCK MECHANICS • ACOUSTIC TESTING

AVS-0

Overburden Acoustic Velocity System

Acoustic velocity measurement under confining pressure — ASTM D2845

AVS-0 — 300 kN compression frame coupled to acoustic triaxial cell

Geotechnical & Rock Mechanics Testing Equipment

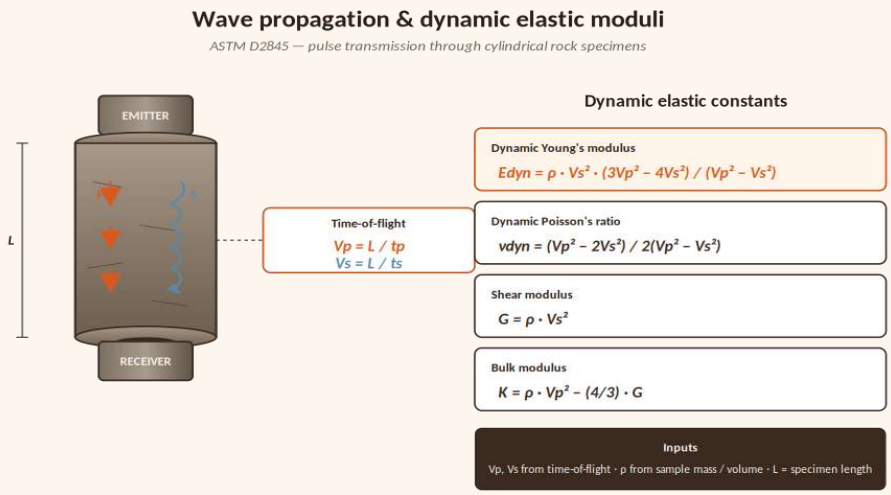
Overview

Acoustic triaxial system for dynamic rock characterisation

- Propagation of P, S1 and S2 acoustic waves through cores
- Confining pressure up to 10,000 psi (70 MPa)
- Automated computation of velocities & dynamic moduli
- High-pressure acoustic cell + 300 kN compression frame
- Fast pulser-receiver — ultrasonic excitation at 1 MHz
- High-speed A/D converter for clean waveform capture
- Computer-controlled with intuitive Floxlab software
- Compliant with ASTM D2845 standard

Measurement Principle

Pulse transmission — ASTM D2845



How the test works

- Cylindrical core machined and centred in HOEK cell
- Acoustic gel applied at both transducer faces
- Pulser excites at 1 MHz, P or S mode
- Receiver captures the transmitted waveform
- Time-of-flight tp and ts measured
- Vp = L/tp, Vs = L/ts → dynamic moduli computed

Why it matters

Non-destructive elastic characterisation of cores under realistic stress — feeds geomechanical modelling, reservoir & rock-mass studies

System Architecture

Four integrated subsystems

1 Compression Frame

Hydraulic frame applies axial load

- Servo-hydraulic actuator 300 kN
- Modes: force, displacement, stress, strain
- Hydraulic pressure up to 20 MPa, 1 L/min
- Ethernet interface to acquisition PC

2 Acoustic Triaxial Cell

HOEK-type high-pressure cell

- Steel cylinder, threaded removable end caps
- Two seated acoustic platens (P, S1, S2)
- Confining pressure up to 70 MPa (10,000 psi)
- Heating mantle option up to 120 °C

3 Acoustic Pulser-Receiver

Ultrasonic excitation & conditioning

- High energy & gain for attenuating materials
- Suited to low-frequency geological samples
- Auto P / S1 / S2 wave selection box
- High-speed A/D converter — clean signal capture

4 Data Acquisition System

PC + proprietary Floxlab software

- Fully automated acquisition and control
- Logging & display of P, S1, S2 waveforms
- Compressional & shear velocities computed
- Determination of dynamic elastic constants

Technical Specifications

Axial load	300 kN	**Wave types**	P, S1 and S2
Confining pressure	up to 70 MPa (10,000 psi)	**Temperature**	Ambient (heating to 120 °C, opt.)
Specimen Ø	1.5 in (38.1 mm) — others on request	**Wetted parts**	Stainless steel
Specimen length	Twice the diameter	**Power supply**	110 – 220 VAC, 50/60 Hz
Frequency	1 MHz	**Standard**	ASTM D2845

Unique design — rapid specimen change without draining the confining fluid

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ROCK MECHANICS • FRACTURE TOUGHNESS TESTING

FTA

Fracture Toughness Apparatus

Chevron-notch three-point bend testing on rock core specimens

FTA — 10 kN servo-controlled press, ISRM Level I & II compliant

Geotechnical & Rock Mechanics Testing Equipment

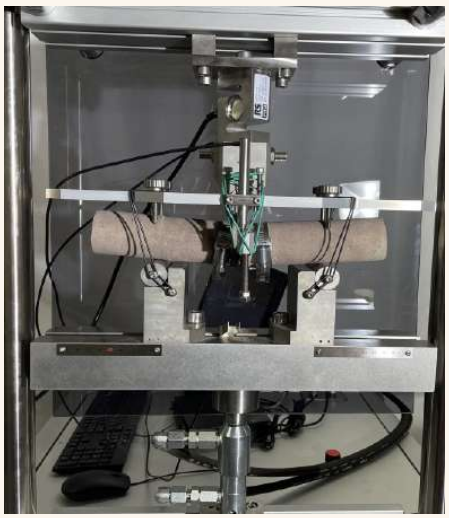
Overview

Purpose-built apparatus for rock fracture toughness measurement

- Determines fracture toughness — resistance to crack propagation
- Chevron-notched core in three-point bend configuration
- ISRM Suggested Method — Level I & Level II evaluation
- 10 kN servo-controlled press with high-precision load cell
- Continuous monitoring of LOAD, LPD and CMOD
- Two LVDT transducers + clip-on gauge synchronized
- Computer-controlled with Floxlab software & reporting
- Specimens of 54.7 mm and 4-inch diameter

Test Principle

Chevron-bend method for stable crack propagation



1 LOAD
Measured by a 10 kN load cell with ± 0.5 % accuracy

2 LPD
Load-point displacement measured by two LVDT transducers

3 CMOD
Crack-mouth opening displacement measured by a clip-on gauge

K_IC values derived from LOAD, LPD and CMOD

Stable crack propagation along the chevron ligament — ISRM Method 1 (Chevron Bend)

System Architecture

Four integrated subsystems

1 10 kN Hydraulic Press

Rigid bench-top press

- Fixed crosshead with two stiff lateral columns
- Hydraulic actuator integrated in lower crosshead
- Rapid piston displacement for positioning
- Precise & controlled loading during testing

2 10 kN Load Cell

High-precision force sensing

- Direct, real-time axial force reading
- Maximum load: 10 kN
- Accuracy: ± 0.5 % of full scale
- Direct interface with data acquisition station

3 3-Point Bend Fixture

ISRM Method 1 (Chevron Bend)

- Holds chevron-notched core in 3PB setup
- Specimens of 54.7 mm and 4-inch diameter
- Two support rollers + one loading roller
- Easy and fast specimen installation

4 Fracture Toughness Software

Floxlab proprietary software

- Predefined templates for fast execution
- Automatic K_IC Level I & Level II computation
- Real-time graphs of LOAD, LPD and CMOD
- Professional test report generation

Technical Specifications

Standard	ISRM Suggested Method	**Vertical clearance**	310 mm
Compression rating	10 kN (1 ton)	**Load cell accuracy**	± 0.5 % full scale
Specimen Ø	54.7 mm and 4 inches	**Load cell sensitivity**	approx. 2 mV/V
Specimen length	16 inches	**Weight**	250 kg
Horizontal clearance	500 mm	**Power supply**	220 VAC, 50 Hz

Step-by-step user-guided workflow — from sample setup to professional K_IC report

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LP700

Liquid Permeameter

Steady-State Liquid Permeability Measurement on Core Samples

PRODUCT BROCHURE

Floxlab • Geotechnical & Rock Mechanics Testing Equipment

Product Overview

What the LP700 does — and how it's built

The LP700 is a steady-state liquid permeameter for accurate permeability measurement on core plug samples. It combines a high-pressure injection pump, a hydrostatic coreholder, dual differential-pressure transducers and a back-pressure regulator on a compact bench-top frame — all driven from a PC supervision station running the Applilab software.

Key Features

01

Steady-State Method

Direct application of Darcy's law on saturated cores.

02

Constant Flow Injection

Dual-cylinder pump up to 25 cc/min.

03

High-Pressure Capability

Confining, pore & back pressure up to 10,000 psi.

04

Dual ΔP Range

Two transducers: ±50 psi & ±500 psi for wide K range.

05

Back Pressure Regulator

Stable outlet pressure for clean measurement.

06

Software Acquisition

Applilab — real-time, automatic, Excel export.

Technical Specifications

Parameter	Value
Measurement type	Liquid steady-state (Darcy)
Confining pressure	0 – 10,000 psi
Pore pressure	0 – 10,000 psi
Back pressure	0 – 10,000 psi
Flow rate	0 – 25 cc/min (HPLC)

Parameter	Value
Pressure transducers	10,000 psi — 0.1% FS
Differential transducers	Validyne ±50 / ±500 psi
Specimen diameter	1" or 1.5"
Specimen length	Twice the diameter
Power supply	110/220 VAC, 50/60 Hz

Principle & Applications

How it works — and where it delivers value

Measurement Principle — Darcy's Law

$$K = (Q \cdot \mu \cdot L) / (\Delta P \cdot A)$$

K – permeability (mD) • Q – flow (cc/min) • μ – viscosity (cP) • L – length (mm) • ΔP – pressure drop (psi) • A – section (cm²)

1 Saturate
Core fully saturated with the test liquid is mounted in the coreholder.

2 Confine
Confining pressure seals the sleeve against the rock specimen.

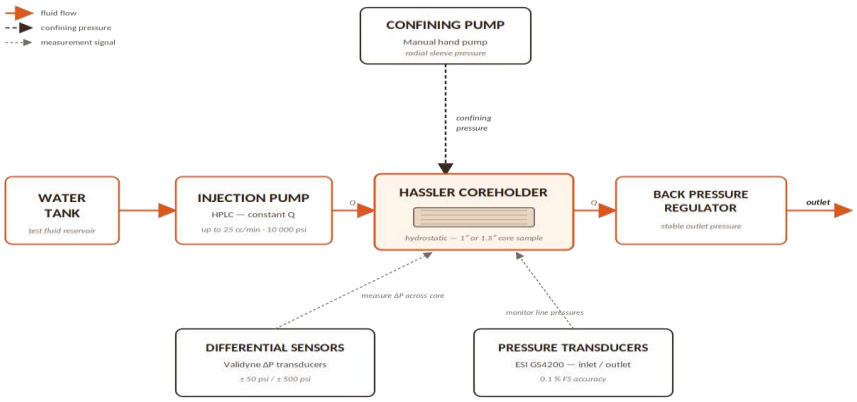
3 Inject
Injection pump delivers fluid at constant flow rate Q.

4 Regulate
Back-Pressure Regulator holds the outlet pressure constant.

5 Stabilize
Steady-state regime: ΔP across the core stabilizes.

6 Compute
K is computed directly from Darcy's law.

System Schematic



Applications

Conventional Reservoirs
Routine absolute K on sandstone & carbonate cores.

Enhanced Oil Recovery
Baseline K before/after EOR fluid injection studies.

Carbon Storage (CCS)
K of reservoir & seal layers for CO_2 injection.

Aquifer & Hydrogeology
K of aquifer rocks for groundwater modeling.

Academic Research
Petrophysical characterization of porous media.

Quality Control
Routine QC of preserved or restored core samples.

Get in Touch

Floxlab — your partner for rock testing solutions

We design and manufacture geotechnical and rock mechanics testing equipment for laboratories worldwide. Reach out to discuss your application or request a tailored quotation.

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Geotechnical & Rock Mechanics Testing Equipment

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Original

Cerchar Apparatus

Determination of the Cerchar Abrasivity Index on Rock Samples

Cerchar Original — fully mechanical hard-rock abrasivity tester

Geotechnical & Rock Mechanics Testing Equipment

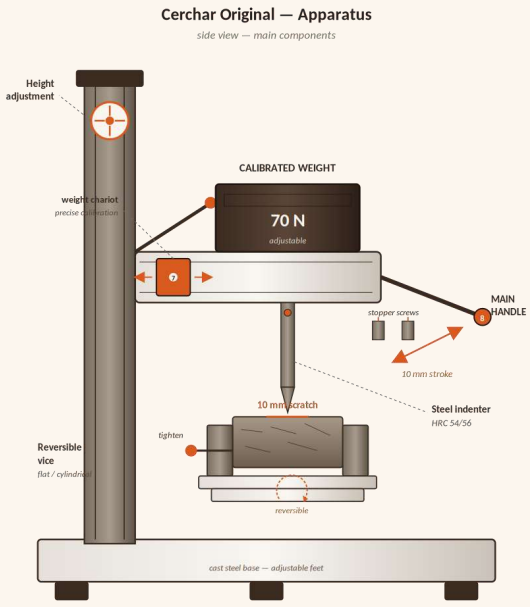
Overview

What the Cerchar Original does, in brief

- Cerchar abrasivity test for hard-rock samples
- Determines the Cerchar Abrasivity Index (CAI)
- 70 N adjustable load — fine-tuned by chariot
- HRC 54/56 indenter hardness — replaceable
- 10 mm scratch length on the rock surface
- Specimens up to Ø 76 mm × H 150 mm
- Fully mechanical — no power, air or hydraulics
- Compliant with ASTM D7625, NF P94-430-1, ISRM

Main Components

Side view — annotated diagram



Steel Indenter
HRC 54/56 hardened pin, replaceable

Calibrated Weight
70 N adjustable — fine-tuned by chariot

Reversible Vice
Flat or cylindrical specimens, up to Ø 76 mm

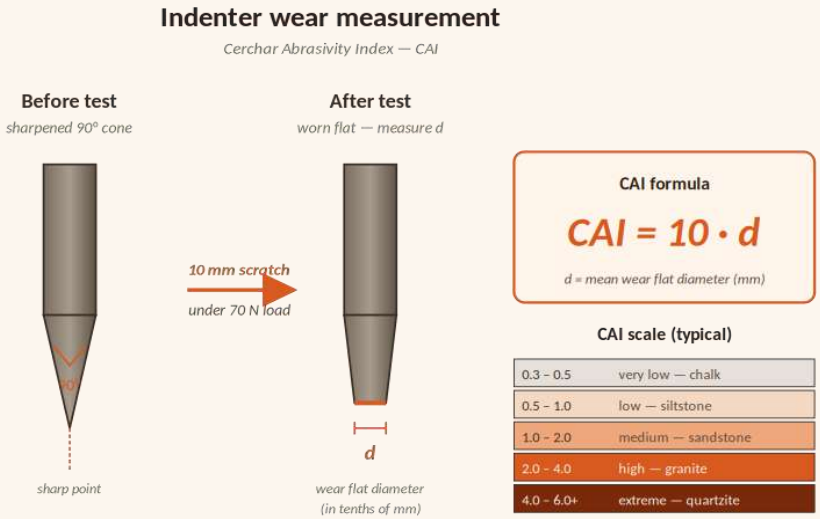
Main Handle
Drives the indenter through 10 mm stripe

Height Adjustment
Arm height adjustment for specimens

Base Plate
Cast steel frame, levelled with feet

Measurement Principle

Cerchar method — abrasivity by indenter wear



How the test works

- A sharp pin is pressed against fresh rock
- 70 N load applied via dead weight
- Main handle drives a precise 10 mm stripe
- Pin wears in proportion to abrasivity
- Wear flat diameter d measured under microscope
- 5+ stripes averaged to compute CAI

Technical Specifications

Test method	Cerchar abrasivity — indenter wear	**Indenter material**	Steel — Rockwell HRC 54/56
Standards	ASTM D7625-10, NF P94-430-1, ISRM	**Total weight**	25 kg
Indenter load	70 N adjustable (calibrated by chariot)	**Dimensions**	260 × 460 × 375 mm
Scratch length	10 mm	**Operating range**	5 – 40 °C, indoor use
Specimen Ø max	76 mm (3 in)	**Power supply**	None — fully mechanical
Specimen H max	150 mm (6 in)	**Optional accessories**	Sharpening tool, microscope

Applications

Where the Cerchar Original delivers value

Tunnelling & TBM

Cutter wear prediction for tunnel boring machines and underground excavation

Mining

Drill bit and tool wear assessment for hard-rock mining

Civil Engineering

Hard-rock excavation feasibility for underground construction

Quarrying & Aggregates

Tool selection and wear forecast for rock processing

Geomechanics R&D

Rock characterization and abrasivity ranking in research labs

Quality Control

Routine QC of cutting tools and certified rock specimens

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West

Cerchar Apparatus

Determination of the Cerchar Abrasivity Index on Rock Samples

West Cerchar apparatus — fully mechanical hard-rock abrasivity tester

Geotechnical & Rock Mechanics Testing Equipment

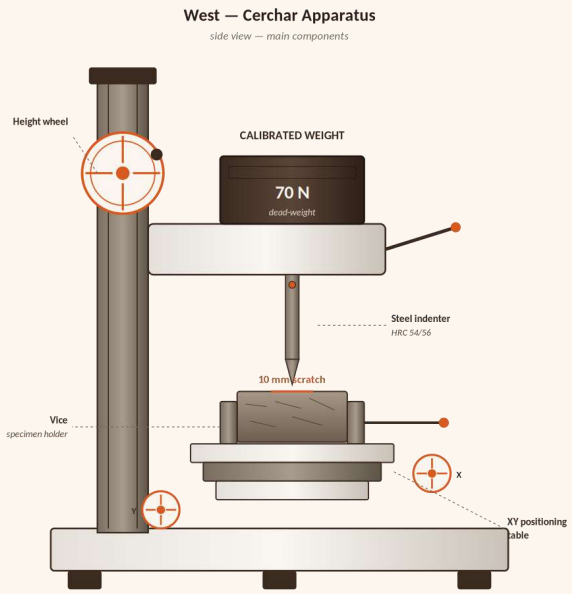
Overview

What the West does, in brief

- Cerchar abrasivity test for hard-rock samples
- Determines the Cerchar Abrasivity Index (CAI)
- 70 N constant load on a steel indenter
- HRC 54/56 indenter hardness — replaceable
- 10 mm scratch length on the rock surface
- Specimens up to Ø 76 mm × H 150 mm
- Fully mechanical — no power, air or hydraulics
- Compliant with ASTM D7625, NF P94-430-1, ISRM

Main Components

Side view — annotated diagram



Steel Indenter
HRC 54/56 hardened pin, replaceable

Calibrated Weight
70 N constant dead-weight load

Vice + Specimen
Holds rock up to Ø 76 mm × H 150 mm

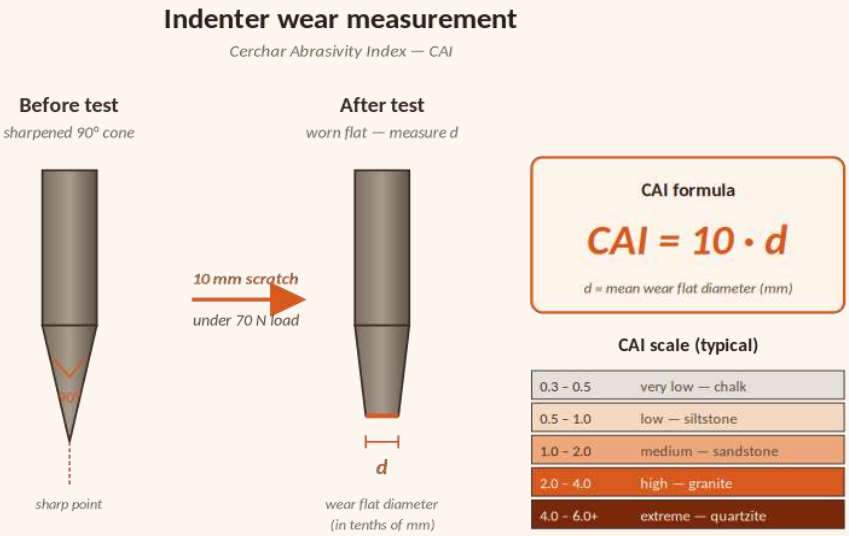
XY Positioning Table
Draws the precise 10 mm scratch

Height Wheel
Manual vertical adjustment to specimen

Base Plate
Cast steel frame, levelled with feet

Measurement Principle

Cerchar method — abrasivity by indenter wear



How the test works

- A sharp pin is pressed against fresh rock
- 70 N load applied via dead weight
- XY table draws a 10 mm stripe
- Pin wears in proportion to abrasivity
- Wear flat diameter d measured under microscope
- 5+ stripes averaged to compute CAI

Technical Specifications

Test method	Cerchar abrasivity — indenter wear	**Indenter material**	Steel — Rockwell HRC 54/56
Standards	ASTM D7625-10, NF P94-430-1, ISRM	**Total weight**	25 kg
Indenter load	70 N (calibrated dead weight)	**Dimensions**	260 × 460 × 375 mm
Scratch length	10 mm	**Operating range**	5 – 40 °C, indoor use
Specimen Ø max	76 mm (3 in)	**Power supply**	None — fully mechanical
Specimen H max	150 mm (6 in)	**Optional accessories**	Sharpening tool, microscope

Applications

Where the West delivers value

Tunnelling & TBM

Cutter wear prediction for tunnel boring machines and underground excavation

Mining

Drill bit and tool wear assessment for hard-rock mining

Civil Engineering

Hard-rock excavation feasibility for underground construction

Quarrying & Aggregates

Tool selection and wear forecast for rock processing

Geomechanics R&D

Rock characterization and abrasivity ranking in research labs

Quality Control

Routine QC of cutting tools and certified rock specimens

Get in Touch

Floxlab — Geotechnical & Rock Mechanics Testing Equipment

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PDP200

Pulse Decay Permeameter

High-Pressure Permeability Measurement for Tight Rocks

PRODUCT BROCHURE

Floxlab • Geotechnical & Rock Mechanics Testing Equipment

Product Overview

What the PDP200 does — and how it's built

The PDP200 is a fully automated pulse decay permeameter for accurate, high-pressure permeability measurement of low-permeability rock cores. It combines a robust high-pressure coreholder, calibrated upstream/downstream gas reservoirs and a thermostatic enclosure in a single platform — all driven from a PC supervision station. Compliant with API RP 40.

Key Features

01

Pulse Decay Method

Transient analysis for ultra-low permeability.

02

High Confining Pressure

Up to 10,000 psi (≈ 70 MPa).

03

Pore Pressure Control

Up to 3,000 psi (≈ 21 MPa) with N_2.

04

Thermostatic Stability

Stable temperature inside enclosure.

05

Automated Sequencing

Software-driven valves & pulses.

06

Remote Supervision

Operate, monitor and acquire from PC.

Technical Specifications

Parameter	Value
Standards	API RP 40 (Core Analysis)
Permeability range	0.1 µD to 0.1 mD
Max confining pressure	10,000 psi (≈ 70 MPa)
Max pore pressure	3,000 psi (≈ 21 MPa) — N_2
Specimen diameter	1" or 1.5"

Parameter	Value
Specimen length	Twice the diameter
Air supply	100 psi compressed air
Power supply	220 VAC ±10%, 60 Hz, 500 W
Overall dimensions	90 × 150 × 60 cm
Weight	80 kg

Principle, Software & Applications

How it works — and where it delivers value

Pulse Decay Principle

1 — Pressurize
Reservoirs and sample equilibrate at pore pressure.

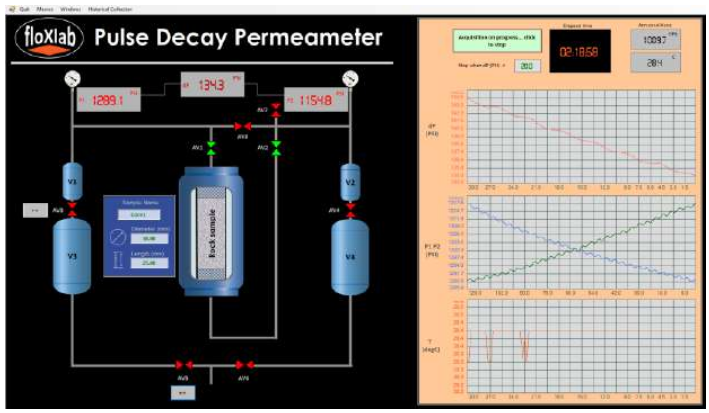
2 — Apply Pulse
Small ΔP applied upstream across the sample.

3 — Decay
Gas migrates — P1 drops, P2 rises.

4 — Compute
ΔP decay rate is fitted to compute permeability.

$$k = f\ (\ \Delta P \text{ decay rate, sample geometry, fluid properties }\ )$$

Software & Measurement



Applilab interface

- Real-time P1, P2 and ΔP
- Automated valve sequencing
- Live charts & temperature
- Configurable stop threshold
- Automatic permeability calc.
- Volume calibration routine
- Historical data archive
- Export & reporting

Applications

Oil & Gas Reservoirs
Tight gas, shale gas & unconventional reservoirs.

Carbon Storage (CCS)
Caprock integrity & seal evaluation for CO_2.

Geomechanical Studies
Stress–permeability coupling, damage & fractures.

Academic Research
Petrophysical characterization in laboratories.

Nuclear Waste Repositories
Host rock & engineered barriers under stress.

Cement & Concrete
Gas permeability of low-porosity materials.

Get in Touch

Floxlab — your partner for rock testing solutions

We design and manufacture geotechnical and rock mechanics testing equipment for laboratories worldwide. Reach out to discuss your application or request a tailored quotation.

Contact information

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Geotechnical & Rock Mechanics Testing Equipment

floXlab

PLT100

Point Load Tester

Determination of the Point Load Strength Index Is(50) and UCS estimate

PLT100 — two-column hydraulic press with carrying case

Geotechnical & Rock Mechanics Testing Equipment

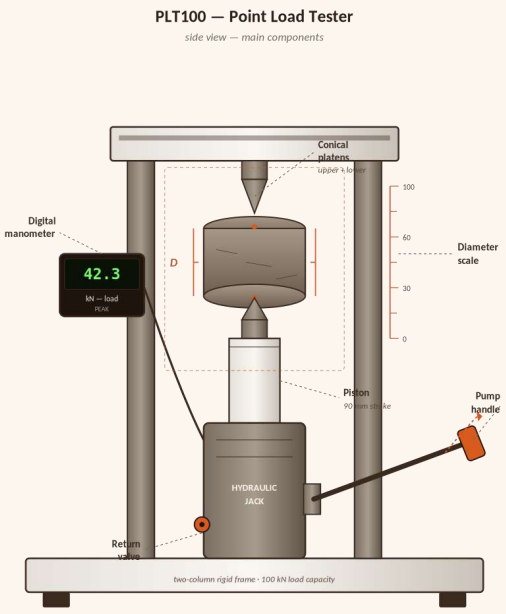
Overview

What the PLT100 does, in brief

- Quick rock strength test on cores or lumps
- Determines Point Load Strength Index Is(50)
- 100 kN load capacity — manual hydraulic press
- Conical platens — stainless steel, replaceable
- Digital manometer with peak-load capture
- Diametral, axial, block & irregular lump tests
- Compact bench-top — 42 kg, with carrying case
- Compliant with ASTM D5731 & 2006/42/EC

Main Components

Side view — annotated diagram



Conical Platens

Upper fixed + lower on piston, stainless steel

Hydraulic Jack

Manual pump — up to 10 kpsi actuator pressure

Piston

90 mm stroke — clearance 185 × 140 mm

Digital Manometer

Live load reading in kN with PEAK capture

Diameter Scale

Graduated ruler — reads specimen diameter D

Return Valve

Releases pressure to lower the piston safely

Measurement Principle

Point Load Test — ASTM D5731

Measure P
peak load
at failure

→

Compute Is
Is = P / De²
uncorrected

→

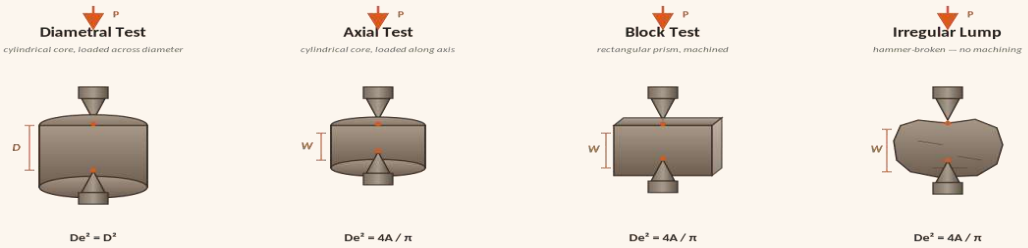
Size correction
Is(50)
to Ø 50 mm

→

UCS estimate
UCS ≈ k · Is(50)
k ≈ 22 – 24

Test Types

Four standard configurations — uncorrected index Is = P / De²



Uncorrected Point Load Strength Index

$$Is = P / De^2$$

P = failure load (N) · D = equivalent core diameter (mm) · A = W × D = cross-section area

Technical Specifications

Test method	Point Load Test — ASTM D5731	**Platens material**	Stainless steel — conical
Standards	ASTM D5731, 2006/42/EC	**Total weight**	42 kg
Load capacity	100 kN max	**Dimensions**	280 × 300 × 560 mm
Actuator pressure	10 kpsi max	**Operating range**	5 – 40 °C, indoor use
Press clearance	185 × 140 mm	**Power supply**	2 × AA (manometer only)
Piston stroke	90 mm	**Optional fixtures**	Brazilian, block punch index

Applications

Where the PLT100 delivers value

Tunnelling & TBM
Quick UCS estimate for hard-rock excavation feasibility studies

Mining
Rock strength screening of cores and lumps from exploration drilling

Civil Engineering
Site investigation, foundation design and ground classification

Quarrying & Aggregates
QC of extracted material and sorting by strength

Geomechanics R&D
Rock strength characterization and anisotropy studies

Field & Lab Use
Compact, portable & battery-powered — ready for the field

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SDIM

Slake Durability Index Machine

Assessment of rock weathering & abrasion resistance

SDIM — twin-drum bench-top apparatus for slake durability testing

Geotechnical & Rock Mechanics Testing Equipment

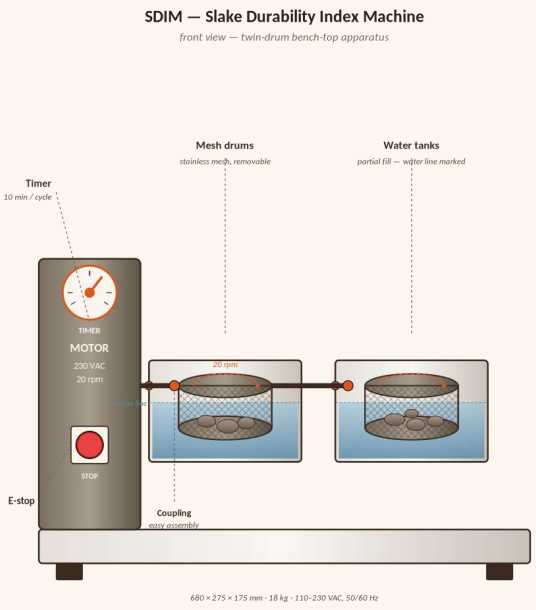
Overview

What the SDIM does, in brief

- Twin-drum slake durability test for weak rocks
- Determines the Slake Durability Index Id2
- Two desiccation–imbibition cycles per ASTM D4644
- Two stainless mesh drums, removable
- 20 rpm rotation with timer-controlled cycle
- Partially submerged drums — water tanks with line
- Compact bench-top — 18 kg, plug & play
- Compliant with ASTM D4644 & ISRM Suggested Method

Main Components

Front view — annotated diagram



Mesh Drums

Two stainless drums — easy removal & cleaning

Water Tanks

Two tanks with marked water line — partial fill

Drive Motor

230 VAC, 20 rpm constant rotation

Timer Knob

10-minute cycle setpoint — auto-stop

Coupling & Locking Pins

Easy assembly between drum and motor

Emergency Stop

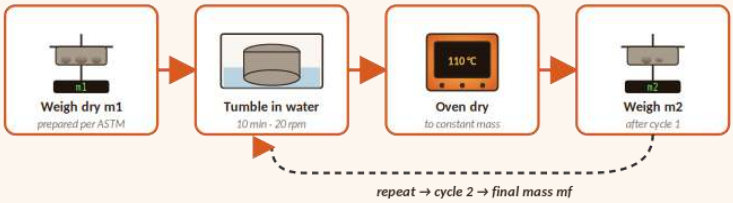
Immediate halt of rotation, mushroom button

Measurement Principle

Slake durability test — ASTM D4644

Slake durability cycle & classification

ASTM D4644 / ISRM Suggested Method



Slake Durability Index

$$Id2 = mf / m1 \times 100$$

m1 = initial dry mass · mf = final dry mass
reported as % retained after 2 cycles

Durability classification (ISRM)

Id2 (%)	Durability class
0 – 25	very low
25 – 50	low
50 – 75	medium
75 – 90	high
90 – 95	very high
95 – 100	extremely high

How the test works

- 10 rock fragments weighed dry — m1
- Loaded in mesh drums, partially submerged
- 10 min rotation at 20 rpm (cycle 1)
- Recovered, oven-dried & re-weighed
- Second wetting–rotation–drying cycle
- Id2 = mass retained after 2 cycles, in %

Technical Specifications

Test method	Slake durability — ASTM D4644	**Output**	Index Id2 (% retained)
Standards	ASTM D4644, ISRM Suggested Method	**Total weight**	18 kg
Test cycle	Two desiccation–imbibition cycles	**Dimensions**	680 × 275 × 175 mm
Rotation speed	20 rpm	**Operating range**	5 – 40 °C, indoor use
Cycle duration	10 minutes per cycle	**Power supply**	110 – 230 VAC, 50/60 Hz
Drum capacity	Two stainless mesh drums (removable)	**Safety**	E-stop + locking pins on drums

Applications

Where the SDIM delivers value

Tunnelling & TBM

Weathering forecast for tunnels and underground excavations in shales and mudstones

Mining

Waste-rock characterisation and slope stability for open-pit mining

Civil Engineering

Site investigation in weak sedimentary rocks — embankments, foundations

Quarrying & Aggregates

Aggregate durability check for road, railway and dam construction

Geomechanics R&D

Weathering and disintegration studies of weak rocks in research labs

Field & Lab Use

Routine QC of cuttings and core samples in service laboratories

Get in Touch

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HIGH PRESSURE LABORATORY INSTRUMENTS

Load Frame Rock Compression Test Systems Portfolio

From educational benchtop testers
to research-grade dynamic triaxial systems

GEOLAB

300 kN · 70 Mpa . Ambient T

Educational Rock Compression Tester — entry-level benchtop for universities & training labs.

ROCKTEST

1,000 kN · 70 MPa · 150°C

Industrial workhorse — uniaxial, triaxial, permeability in one frame.

MECATEST 3000

3,000 kN · 70 MPa · 150°C

Premium system for high-strength rock up to Ø 160 mm cores.

GEOTEST

1,000–2,000 kN · 70/140/210 MPa

Research-grade static + dynamic triaxial with AE and hydraulic fracturing.

GEOTEST EXPRESS

1,000–2,000 kN · 70/140/210 MPa

Production-oriented box-frame with automated cell lifting for fast throughput.

LOAD FRAME FIXTURES

HOEK · QRC · UTC · Polyaxial

Shared accessories library — interchangeable fixtures across the entire range.

Versatile · Rigorous · Traceable — from Ø 1" cores to Ø 160 mm plugs, 300 kN to 3,000 kN

Floxlab SAS · Vinci Technologies Group · Made in France

POSITIONING

Product Positioning Matrix

Axial load capacity vs. application profile

AXIAL LOAD CAPACITY →

3,000 kN *Industrial*	**MECATEST 3000**	*High-capacity · Ø up to 160 mm*
1-2,000 kN *Research*	**GEOTEST / EXPRESS**	*Dynamic regime · 70/140/210 MPa*
1,000 kN *Industrial*	**ROCKTEST**	*Industrial workhorse*
300 kN *Educational*	**GEOLAB**	*Benchtop · universities*

APPLICATION PROFILE: Education & Training → QA/Industrial → R&D Standard → R&D Advanced + AE/HF → Dynamic Research

Each platform is optimised for a specific application profile — from student training to dynamic geomechanics research. All systems share common fixtures (HOEK, QRC, UTC cells, Brazilian jaws, polyaxial) and run the same Floxlab GEOTEST control software.

CAPABILITIES

Test Capabilities Comparison

What each platform can measure — standard ✓, optional ○, not available —

Test / Capability	GEOLAB	ROCKTEST	MECATEST	GEOTEST	EXPRESS
Uniaxial Compression (UCS)	✓	✓	✓	✓	✓
Triaxial Compression	✓	✓	✓	✓	✓
Indirect Tension (Brazilian)	✓	✓	✓	○	○
Point Load Strength Index	✓	—	—	—	—
Acoustic Velocity (P, S1, S2)	✓	✓	✓	✓	✓
Strain gauges / Deformation sensors	✓	✓	✓	✓	✓
Liquid Permeability	—	✓	✓	✓	✓
Pore Pressure Control	—	✓	✓	✓	✓
High-Temperature (150 °C)	—	✓	✓	✓	✓
Dynamic / Cyclic Loading	—	—	—	✓	✓
Acoustic Emission (AE)	—	—	—	✓	✓
Hydraulic Fracturing	—	—	—	✓	✓
Electrical Resistivity	—	—	—	✓	✓
Polyaxial (σ1≠σ2≠σ3)	—	✓	—	✓	—

✓ Standard ○ Optional module — Not available

EDUCATIONAL

GEOLAB

Servo-controlled 300 kN benchtop rock compression tester — ASTM compliant

KEY SPECIFICATIONS

300 kN
Max Axial Load

70 MPa
Confining Pressure

592 MPa
Stress on 1" sample

Ø 1"/1.5"
Sample Diameter

POSITIONING

Entry-level platform for universities, geotechnical schools and training labs. Compact, servo-controlled, ASTM-certified and fully modular — students perform five different rock tests on a single frame.

FIVE TESTS — ONE FRAME

Triaxial Compression

Failure envelope, cohesion, friction angle — ASTM D7012.

Compatible with HOEK cell

Uniaxial Compression (UCS)

UCS, Young's modulus, Poisson's ratio — ASTM D7012.

Acoustic Velocity

P-wave, S1 & S2 under triaxial conditions — ASTM D2845.

Brazilian Indirect Tension

Tensile strength — ASTM D3967.

Point Load Strength Index

Rapid field-applicable index — ASTM D5731.

Modular Fixtures

Configure progressively as your curriculum grows.

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INDUSTRIAL

ROCKTEST

1,000 kN servo-controlled compression frame with automated confining pressure

KEY SPECIFICATIONS

1,000 kN
Axial Load

70 MPa
Confining Pressure

150 °C
Max Temperature

Ø up to 54.7mm
Sample diameter

POSITIONING

Rock compression system for both uniaxial and triaxial testing. Fixed crosshead on four stiff columns delivers extreme rigidity. High-frequency servo-valve provides precise flow regulation. Automated multi-stage triaxial tests eliminate operator variability.

FSIX MEASUREMENT FAMILIES

Triaxial Compression

UCS, triaxial strength, Mohr-Coulomb envelope, E and v.

Compatible with HOEK cell , Quick Release Cell and Universal cell

Uniaxial Compression (UCS)

UCS, Young's modulus, Poisson's ratio — ASTM D7012.

Acoustic velocity

P, S1 & S2 waves, dynamic moduli — 1 MHz, ASTM D2845.

Brazilian Indirect Tension

Tensile strength — ASTM D3967 / ISRM.

Permeability

Liquid permeability 0.01 mD – 1 Darcy, pore pressure control.

Polyaxial (σ1≠σ2≠σ3)

Three independent principal stresses via polyaxial fixture.

PREMIUM

MECATEST 3000

The 3,000 kN reference for high-strength rock and oversized cores

KEY SPECIFICATIONS

3,000 kN
Max Load

70 MPa
Confining Pressure

150 °C
Max Temperature

Ø 54.7 to 160 mm
Max Specimen

POSITIONING

Heavy-duty four-column frame minimises compliance errors — critical for accurate elastic modulus. Compatible with specimens from Ø 54.7 mm up to Ø 160 mm: NX, HQ and oversized industry-standard sizes.

FIVE MEASUREMENT FAMILIES

Triaxial Compression

UCS, triaxial strength, Mohr-Coulomb envelope, E and v.

Compatible with HOEK cell , Quick Release Cell and Universal cell

Uniaxial Compression (UCS)

UCS, Young's modulus, Poisson's ratio — ASTM D7012.

Acoustic velocity

P, S1 & S2 waves, dynamic moduli — 1 MHz, ASTM D2845.

Brazilian Indirect Tension

Tensile strength — ASTM D3967 / ISRM.

Permeability

Liquid permeability 0.01 mD – 1 Darcy, pore pressure control.

High temperature

high-temperature capability with 150 °C heating mantle.

RESEARCH

GEOTEST

Research-grade dynamic triaxial system — static & dynamic regimes

KEY SPECIFICATIONS

1–2,000 kN
Axial Load

70-210 MPa
Confining (max)

Static
+ Dynamic regime

4-column
Open frame

POSITIONING

High stiffness 4-column load frame (1,000 or 2,000 kN) with balanced triaxial cell. Ultra-high-speed control for dynamic waveforms at cyclic frequencies. Programmable sinusoidal, triangular and rectangular signals for fatigue testing.

ADVANCED MEASUREMENT MODULES

Acoustic Emission (AE)
Real-time microcracking events — damage mapping, failure location.

Hydraulic Fracturing
Breakdown pressure, fracture propagation and closure.

Electrical Resistivity
Tracks saturation and fluid transport during loading.

Liquid Permeability
Steady-state & transient — 0.01 mD to 1 Darcy range.

Acoustic Velocity (P & S)
Vp, Vs1, Vs2 throughout loading — dynamic moduli.

Polyaxial (σ1≠σ2≠σ3)
Three independent principal stresses via polyaxial fixture.

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PRODUCTION

GEOTEST EXPRESS

All GEOTEST capabilities in a box-frame design with automated cell lifting

KEY SPECIFICATIONS

1–2,000 kN
Axial Load

70-210 MPa
Confining (max)

Box-Frame
Enclosed design

Auto-Lift
Cell handling

POSITIONING

Box-type rigid frame offers enhanced safety shielding and greater stiffness than open 4-column designs. Automated push-button cell lifting accelerates turn-around and reduces operator fatigue. Optimised for high-volume labs running repetitive characterisation campaigns.

KEY DIFFERENTIATORS

Box-Type Rigid Frame

Enclosed structure with safety shielding and greater stiffness.

Push-Button Cell Lifting

Automated system — faster turn-around, reduced operator fatigue.

Same Test Capabilities

All GEOTEST modules: AE, HF, permeability, acoustic, resistivity.

Production Throughput

Optimised for high-volume core plug characterisation.

Cell Ratings

70 / 140 / 210 MPa · diameters 1"–55 mm or 55–100 mm.

Materials

Stainless steel or Inconel wetted parts.

SHARED LIBRARY

Triaxial Cells & Test Fixtures

Interchangeable across GEOLAB · ROCKTEST · MECATEST · GEOTEST

HOEK Cell

Ø 42 – 54.7 mm (Type 2) · Ø 63.5 – 100 mm (Type 3) · 70 MPa · ambient.
GEOLAB · ROCKTEST · MECATEST

QRC Triaxial Cell

Ø 38.1 – 54.7 mm · 70 MPa · 150 °C · 3× radial LVDTs + 1 axial · quick-release.
ROCKTEST · MECATEST

UTC Universal Cell

Ø 55 – 100 mm full-diameter plugs · 70 MPa · 150 °C · acoustic-velocity compatible.
ROCKTEST · MECATEST

Balanced Triaxial

Ø 1"–55 mm or 55–100 mm · 70 / 140 / 210 MPa · stainless or Inconel · balanced piston.
GEOTEST · GEOTEST EXPRESS

TEST FIXTURES

UCP — Uniaxial Compression

LVDT + circumferential extensometer. 100 mm or 160 mm platens.
UCS, E, v.

ITB — Brazilian Tension

Diametral jaws with spherical bearing. Ø 54.7 / 63.5 / 76.2 / 85 / 100 / 150 mm.

Polyaxial Fixture

Three independent σ1 ≠ σ2 ≠ σ3 via flat jacks. AE + acoustics + HF option.

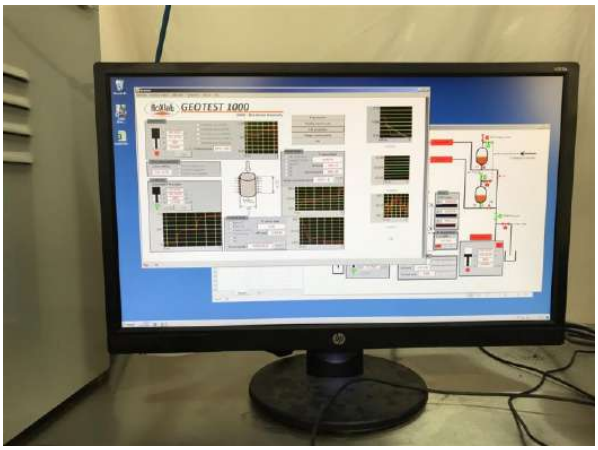
Triaxial Cell Trolley

Mobile lifting + ergonomic worktable for mount/dismount. Lockable casters.

CONTROL & SUPERVISION

Floxlab GEOTEST Software

One proprietary software — every system in the portfolio



KEY BENEFITS

- **Learn it once, deploy it everywhere**
- Eliminate operator variability via pre-programmed test sequences
- Repeatable multi-stage triaxial protocols
- Automated professional PDF report per test
- Reduced training burden — single interface for all frames
- Full traceability: raw data + set-points + computed parameters

01

Synoptic Overview

Live system status at a glance — every component color-coded.

02

Measurement Display

Real-time load, stress, strain and velocity readouts.

03

Trend Curves

Live graphical curves — stress-strain, volumetric, Mohr envelope.

04

Set-Point Control

Enter or adjust target values live during the test.

05

Macro Commands

Program automated stress & strain paths — multi-stage.

06

Excel Reports

Export professional test reports with one click.

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COMPLIANCE & MARKETS

Standards & Target Sectors

Internationally recognised methods · served industries

INTERNATIONAL STANDARDS

ASTM D7012

Compressive strength and elastic moduli of rock

API RP 40

Rock permeabilities

ASTM D2845

Laboratory determination of acoustic wave velocities

ASTM D3967

Splitting tensile strength — Brazilian test

ASTM D5731

Point Load Strength Index of rock

ISRM SM

Full suite of ISRM Suggested Methods

TARGET SECTORS

Oil & Gas

Reservoir geomechanics, wellbore stability, hydraulic fracturing design, core analysis.

Mining

Ore body characterisation, pillar design, slope stability, underground excavation.

Geothermal

Thermo-hydro-mechanical characterisation, EGS reservoir design, caprock integrity.

Civil & Geotech

Tunnel design, dam foundations, slope stability, seismic response of rock masses.

CCS / Carbon

Caprock integrity, injectivity, fracture onset, long-term monitoring via AE.

Academic & Research

Fracture mechanics, fatigue, constitutive models, method development.

GET IN TOUCH

Your partner for rock mechanics *& geomechanics testing*

Made in France · Vinci Technologies Group

Versatile · Rigorous · Traceable

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GEOTEST *Express*

- Triaxial testing of rock samples as per ASTM & ISRM specifications
- Capable of performing complete triaxial test cycle – from initialization to completion – including multi-stage testing procedures quickly and effortless
- Doubles the number of tests achievable per day
- Significantly shortens preparation time between the tests
- Axial load up to 2,000 kN
- Up to 210 MPa cell pressure capacity

OVERVIEW

The GEOTEST EXPRESS Rock Triaxial Testing Systems, is engineered to deliver unmatched precision, reliability and efficiency in rock mechanic's research. Built upon decades of technical refinement, the system embodies a highly mature design that has evolved though successive engineering iterations to achieve optimal structural and operational performance. Combined with streamlined manufacturing processes, the GEOTEST EXPRESS stands as a benchmark for engineering excellence, testing efficiency, and cost-effective performance in the field of rock characterization.

The FLOXLAB GEOTEST EXPRESS is a closed-loop, digitally servo-controlled triaxial testing apparatus designed for high-precision execution of triaxial and unconfined compression tests on rock specimens. The system enables accurate control of stress and strain parameters, ensuring repeatable and reliable results under various loading conditions. In addition to conventional triaxial applications, it is engineered to perform permeability evaluation, hydraulic fracturing, acoustic velocity, acoustic emission and electrical resistivity measurements, and other advanced rock mechanics investigations requiring precise load, pressure, and deformation control

Triaxial cell

Sample Mounted

Cell Base Inserted into Load Frame

Cell Wall Lowered Ready for Testing

An automatic hydraulic lift and sliding base are integrated into the GEOTEST EXPRESS system to provide rapid and effortless specimen setup—far more efficient than traditional triaxial configurations. The triaxial cell can be fully assembled or disassembled at the push of a single button, eliminating the need for bolts or nuts and significantly reducing preparation time, allowing operators to focus on testing rather than setup.

Constructed from high-grade stainless steel, the triaxial cell is designed to accommodate cylindrical specimens up to 55 mm in diameter, with an available upgrade for larger specimens up to 100 mm. The standard unit features a rigid loading piston combined with a low-friction graphite seal, ensuring smooth and stable operation.

The self-contained cell wall design allows the wall to be automatically lowered and securely locked once the specimen is prepared, simplifying handling and improving safety. The configuration includes an internal load cell, embedded instrumentation, and reinforced frame assemblies for enhanced precision in deformation modulus and post-failure behavior measurements.

The standard GEOTEST EXPRESS configuration incorporates a servo-valve-controlled confining pressure intensifier to control confining pressures. The intensifier is housed within a robust metal cabinet equipped with casters, a 20-liter fluid reservoir, ensuring mobility and operational convenience. Pressure gauge provides real-time verification of confining pressures, while quick-connect fittings simplify fluid line connections and reservoir maintenance. The pressure intensifier integrates a pressure transducer and LVDT, enabling servo control based on pressure, fluid volume, or any other user-defined parameter. This setup allows execution of complex testing protocols such as stress/strain path analysis, rock compressibility determination, permeability testing, and hydraulic fracturing

The GEOTEST EXPRESS operates through FLOXLAB's integrated digital signal conditioner and controller, combined with the advanced GEOTEST's software. Triaxial testing is streamlined through direct programmable control of test parameters—stress, strain, and others—automatically adjusted to specimen geometry.

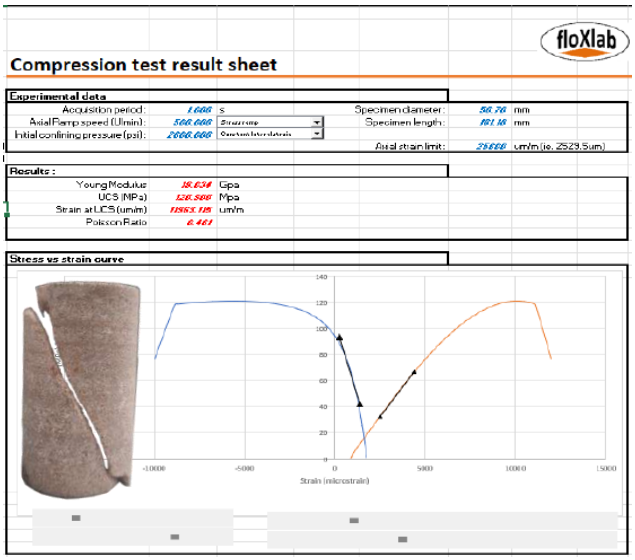
All test parameters are continuously computed and instantly available for display, graphing, or closed-loop control. The software also supports custom user-defined variables and multi-sensor averaging, offering extensive flexibility for advanced experimental configurations and ensuring accurate, consistent test results.

The system design eliminates the need for complex and time-consuming pre-calculations when configuring test programs, allowing operators to focus entirely on the material's mechanical response rather than on hardware setup or signal management.

FLOXLAB's network-ready architecture enables seamless data monitoring, sharing, and control with the flexibility to display or export test parameters in any preferred unit system, even when combining mixed measurement units. At the core of the GEOTEST EXPRESS lies an embedded microprocessor that ensures uninterrupted test execution, maintaining full operational capability even in the event of a host computer failure.

The controller features automatic dynamic control mode switching between connected transducers and computed parameters, enabling smooth, bump-less transitions during testing. It also performs signal conditioning for all connected transducers, applying real-time linearization through high-order polynomial calibration. The digital control loop delivers the responsiveness required for precise load regulation in brittle materials.

Test example



The GEOTEST EXPRESS system enables multi-stage triaxial testing with precision and operational simplicity. The following example illustrates a multistage triaxial test performed to determine the residual strength of a rock specimen under varying confining pressures.

The test was conducted on a single Berea Sandstone sample with a diameter of 50 mm and a height of 100 mm, instrumented with one axial deformation sensor and one diametral sensor to capture detailed strain measurements.

Three confining pressure levels were applied sequentially: 20 MPa, 50 MPa, and 100 MPa. Each stage was automatically terminated by the software once the Poisson's ratio reached a threshold of 0.5, indicating the onset of significant lateral deformation.

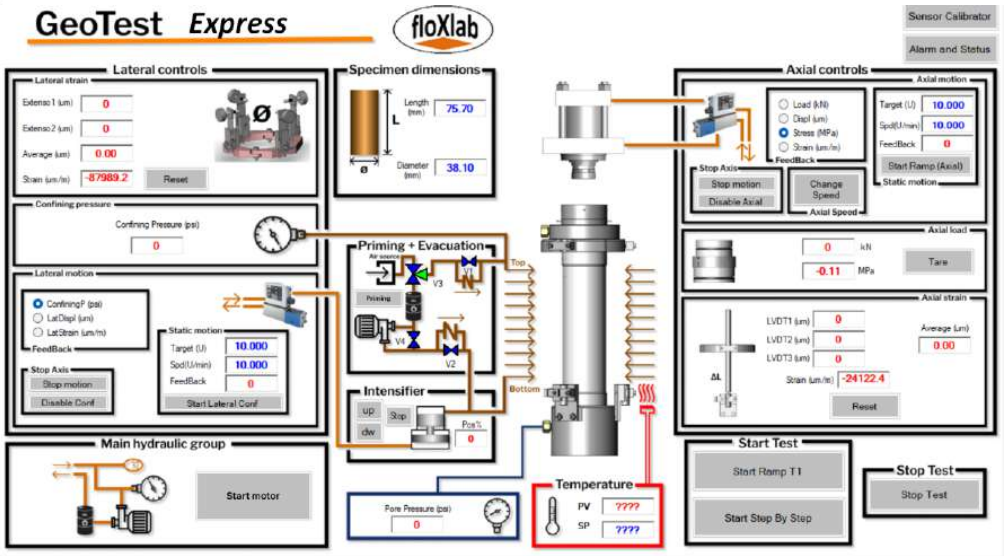
During the final stage, the confining pressure of 100MPa was maintained constant while control was switched to radial strain mode to induce large post-peak deformations while preventing specimen rupture. A high-stiffness loading frame was employed to ensure system stability and accurate post-failure response measurement.

When the deviator stress dropped by more than 25% of the peak value, the system automatically transitioned to frame displacement control, stabilizing the test and maintaining sensor alignment.

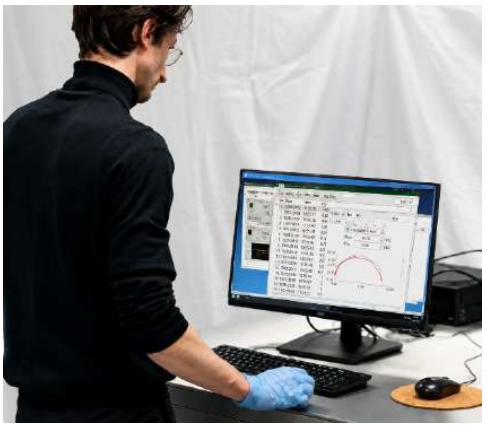
The specimen was then strained at 1 mm/min for 0.25 minutes, and the corresponding deviator stress was recorded as the residual strength for that confining pressure. The confining pressure was subsequently reduced to 50 MPa, and the same procedure was repeated, followed by testing at 20 MPa.

This example demonstrates the robust control precision and automation capabilities of the GEOTEST EXPRESS, allowing complex multistage triaxial tests to be executed efficiently with consistent, repeatable, and high-resolution data acquisition across all loading conditions.

Supervision station



The GEOTEST EXPRESS represents an optimal solution for triaxial testing in both research and commercial rock mechanics laboratories, combining precision, safety, and efficiency in a single integrated platform. Its automated locking triaxial cell, along with automatic cell filling and drainage, minimizes test preparation time while ensuring a secure and streamlined setup process.
Designed for flexibility, the FLOXLAB GEOTEST EXPRESS can accommodate specimens up to 100 mm (4 inches) in diameter, making it suitable for a broad range of geological materials and testing conditions.



Key features include:

- Direct measurement of axial and lateral strain directly on the specimen for high-accuracy deformation data
- LVDT-based instrumentation for reliable, user-friendly operation
- Simplified test preparation and execution, allowing effortless setup and consistent performance stress.

GEOTEST *Express*

A - Axial Load:

1,000 kN
2,000 kN
Other upon request

B – Frame Stiffness:

1,000kN: 3 GN/mm
2,000kN: 4.5 GN/mm

C – Confining pressure:

70 MPa
140 MPa
210 MPa

D – Specimen size:

Up to: 55 mm
Up to: 100 mm

E – Pore pressure:

70 MPa
140 MPa
210 MPa

F – Regime:

Static
Dynamic

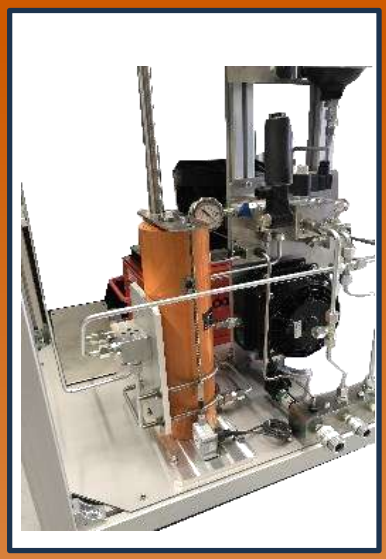
GEOTEST *Express - components*

TRIAXIAL CELL

The triaxial cell is a high-pressure vessel designed for precise confinement and axial loading under static and dynamic testing conditions. It features an automated locking system with an integrated hydraulic lift, enabling fast, bolt-free specimen installation and ensuring accurate, repeatable test setup.

Key features include:

- Pressure ratings of 70, 140 or 210 MPa
- Two cell sizes for specimens up to 55mm or 100mm
- Wetted parts in stainless steel or Inconel



CONFINING PRESSURE INTENSIFIER

The confining pressure intensifier is a high-precision, servo-controlled pressure system designed to apply and maintain stable confining pressure during triaxial testing.

It provides rapid pressure ramping, accurate closed-loop control, and excellent pressure stability for both static and dynamic test conditions.

Key features:

- Servo-valve-controlled operation in pressure or displacement mode
- Confining pressure ratings of 70, 140, 210MPa.
- Wetted parts in stainless steel

GEOTEST *Express - components*

PORE PRESSURE PUMP

The GEOTEST EXPRESS pore pressure pump is a high-precision, electro-mechanical unit designed to apply and regulate pore pressure with high accuracy during triaxial testing. It enables stable pressure control, rapid response, and precise measurement for reliable drained and undrained test conditions.

Available configurations:

- Operate in pressure or flow-rate control mode
- Working pressure up to 70 MPa,140 MPa, 210 MPa
- Flow rate up to 60 cc/min
- Wetted parts stainless steel, Hastelloy

ACOUSTIC VELOCITY FIXTURE

The ultrasonic velocity system is an integrated measurement module designed to determine P- and S-wave velocities in rock specimens during triaxial testing.

It provides high-resolution, synchronized ultrasonic acquisition under load and pressure, enabling continuous monitoring of dynamic elasticity parameters.

Key features

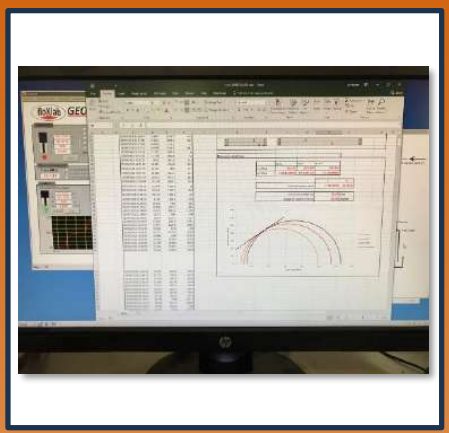
- In-vessel-P- and S1-S2-wave ultrasonic measurement at 1MHz
- Operates up to 120°C under triaxial stress conditions

GEOTEST *Express - components*

HEATING JACKET

The heating jacket is a precision-controlled thermal system designed to uniformly heat rock specimens during triaxial testing.
It ensures stable and homogeneous temperature distribution under pressure, enabling accurate simulation of in-situ thermal conditions.
Key feature includes:

- Operating range up to 150 °C (standard) or 200°C (high-temperature option)



GEOTEST SOFTWARE

The GEOTEST software is an advanced analysis platform designed for automated processing and interpretation of triaxial test data.

It provides precise calculation of mechanical parameters, real-time visualization, and standardized reporting to ensure accurate and repeatable test interpretation.

Key features include:

- Automated analysis of stress-strain, strength, creep and petrophysical properties
- Integrated interpretations of acoustic velocity, acoustic emission and damage evolution

GEOTEST *Express - components*

ACOUSTIC EMISSION

The acoustic emission system is a high-sensitivity monitoring module designed to detect and locate microcracking and fracture events during triaxial testing. It provides real-time, high-frequency data acquisition and advanced signal processing for accurate damage evolution and failure analysis.

Key features include:

- Six lateral AE sensors – full radial coverage
- Signal amplification – 40 dB, 32–1000 kHz filters
- High-resolution acquisition – 16-bit, 10 MHz, 8 channels
- Precise event location – ~2 mm accuracy
- Real-time fracture reconstruction – live morphology mapping

HYDRAULIC FRACTURING

The hydraulic fracturing system is a precision-controlled module designed to initiate and propagate fractures under controlled pressure conditions within rock specimens.

It enables accurate regulation of injection pressure and flow, with synchronized data acquisition for detailed fracture initiation and propagation analysis.

Key features include:

- For specimens 50-100mm in diameter
- Borehole diameter: 6.35-mm
- Wetted parts in stainless steel or Inconel

GEOTEST *Express - components*

ROCK PERMEABILITY

The permeability system is a high-precision module designed to measure fluid flow through rock specimens under controlled stress and pressure conditions.

It provides accurate permeability determination using the Darcy's law method, fully synchronized with triaxial loading and pore pressure control.

Key features:

- Permeability range: 0.01 mD to 10 Darcy
- Pressure: up to 70 MPa

ELECTRICAL RESISTIVITY

The electrical resistivity system is an integrated measurement module designed to evaluate the electrical properties of rock specimens under triaxial stress conditions. It supports both two-point and four-point measurement configurations, providing precise, synchronized resistivity data correlated with mechanical loading and microstructural evolution.

HYDRAULIC POWER UNIT

The hydraulic power unit is a high-efficiency system providing stable, low-noise hydraulic flow for precision servo-controlled testing. Two versions are available: one optimized for static testing and a second designed to support both static and dynamic loading modes with enhanced flow and response capacity.

- Static version:
  Constant pressure, constant flow pump
  Flow: up to 5 lpm
  Reservoir fluid: 20 Liters
- Static & Dynamic version:
  Constant pressure, variable flow pump
  Flow: up to 20 lpm
  Reservoir fluid: 100 Liters
  Frequency up to 10 Hz

floXlab

GEOTEST *EXPRESS*

Manufacturer:
Floxlab
23 Rue du Port
92000 NANTERRE
FRANCE
contact@floxlab.com
phone: +33 (0) 1 81 93 12 85
+33 (0) 1 41 37 04 76

Visit:
www.floxlab.com

SCAN ME

GEOTEST *Express*

GEOTEST - ROCK TRIAXIAL COMPRESSION TEST SYSTEM

SCAN ME

ASTM

D7012
D7070
D5084

LOAD CAPACITY

1,000 KN
2,000 KN
Other upon request

CELL PRESSURE

70 MPa
140 MPa
210 MPa

CELL DIAMETER

D1: Up to 55mm
D2: Up to 100mm

ROCK MECHANICS TESTERS

LOAD-FRAME TRIAXIAL SYSTEMS

GEOTEST - components

LOAD FRAME

The hydraulic compression frame, built with four high-stiffness columns, ensures maximum rigidity and alignment accuracy while applying precise axial loads to specimens mounted in a triaxial cell. A servo-controlled hydraulic actuator, integrated in the upper crosshead provides great loading capacity. The frame can be operated under both static and dynamic testing conditions.

KEY FEATURES

- Servo-valve-controlled axial actuator which operates in force, stress, displacement and strain control)
- Four high-stiffness column frame with 1,000 or 2,000kN capacity

TRIAXIAL CELL

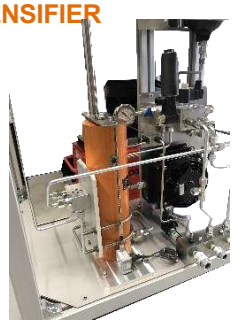
The triaxial cell is a high-pressure vessel designed to provide precise confinement and axial loading for triaxial and unconfined compression tests.

The cell body is lowered and locked into position by turning a nut on the cell base until it is completely screwed, and the complete assembly is then aligned under the loading piston.

KEY FEATURES

- Pressure ratings of 70, 140 or 210 MPa
- Two cell sizes for specimens up to 55mm or 100mm
- Wetted parts in stainless steel or Inconel

CONFINING PRESSURE INTENSIFIER



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KEY FEATURES

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- Confining pressure ratings of 70, 140, 210MPa.
- Wetted parts in stainless steel

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The pore pressure pump is a high-precision, servo-controlled unit designed to apply and regulate pore pressure with high accuracy during triaxial testing.

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KEY FEATURES

- Operate in pressure or flow-rate control mode
- Working pressure up to 70 MPa,140 MPa, 210 MPa
- Flow rate up to 60 cc/min
- Wetted parts stainless steel, Hastelloy

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GEOTEST - components

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It provides high-resolution, synchronized ultrasonic acquisition under load and pressure, enabling continuous monitoring of dynamic elasticity

KEY FEATURES

- In-vessel-P- and S1-S2-wave ultrasonic measurement at 1MHz
- Operates up to 120°C under triaxial stress conditions

HEATING JACKET

The heating jacket is a precision-controlled thermal system designed to uniformly heat rock specimens during triaxial testing.

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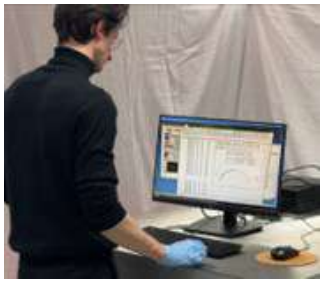
KEY FEATURES

- Operating range up to 150 °C (standard) or 200°C (high-temperature option)

GEOTEST SOFTWARE



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GEOTEST - components

HYDRAULIC FRACTURING

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It enables accurate regulation of injection pressure and flow, with synchronized data acquisition for detailed fracture initiation and propagation analysis.

KEY FEATURES

- For specimens 50-100mm in diameter
- Borehole diameter: 6.35-mm
- Wetted parts in stainless steel or Inconel

PERMEABILITY

The permeability system is a high-precision module designed to measure fluid flow through rock specimens under controlled stress and pressure conditions.

It provides accurate permeability determination using the Darcy law method, fully synchronized with triaxial loading and pore pressure control.

KEY FEATURES

- Permeability range: 0.01 mD to 10 Darcy
- Pressure: up to 70 MPa

ELECTRICAL RESISTIVITY

The electrical resistivity system is an integrated measurement module designed to evaluate the electrical properties of rock specimens under triaxial stress conditions.
It supports both two-point and four-point measurement configurations, providing precise, synchronized resistivity data correlated with mechanical loading and microstructural evolution.

KEY FEATURES

- 2-point resistivity with two axial electrodes
- Upgradeable to 4-point with two lateral and two axial electrodes
- LCR meter (12Hz -10kHz)

HYDRAULIC POWER UNIT

The hydraulic power unit is a high-efficiency system providing stable, low-noise hydraulic flow for precision servo-controlled testing.

Two versions are available: one optimized for static testing and a second designed to support both static and dynamic loading modes with enhanced flow and response capacity.

KEY FEATURES

- Static version:
  Constant pressure, constant flow pump
  Flow: up to 5 lpm
  Reservoir fluid: 20 Liters
- Statiic & Dynamic version:
  Constant pressure, variable flow pump
  Flow: up to 20 lpm
  Reservoir fluid: 100 Liters
  Frequency up to 10 Hz

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MECATEST

3,000 kN Rock Uniaxial & Triaxial Compression Testing System

Servo-controlled compression testing with uniaxial, triaxial, acoustic velocity and permeability capabilities — engineered for demanding geomechanics laboratories.

3,000 kN	70 MPa	0.01 – 1 darcy	1 MHz
MAX LOAD CAPACITY	CONFINING PRESSURE	PERMEABILITY	ACOUSTIC FREQUENCY

MADE IN FRANCE · ORIGIN: FRANCE

Floxlab.com

The mechanical core 02

Comprehensive rock testing — from unconfined compression to acoustic velocity — delivered in a single integrated servo-hydraulic platform with proprietary Floxlab control software.

Load Frame

Servo-hydraulic compression frame rated at 3,000 kN. Four-column design for extreme rigidity, front-door protection and fast-displacement actuator.

Test Capabilities

Uniaxial & triaxial compression, indirect tension (Brazilian), acoustic velocity (P/S waves), strain measurements and liquid permeability.

Digital Control

Proprietary Floxlab software. Pre-programmed stress/strain paths, real-time display, automated test execution and professional PDF reports.

Compression Frame & Hydraulic Power Pack

Servo-Controlled Compression Frame

Load capacity	**3,000 kN**
Piston stroke	**50 mm**
Loading speed	**0.0005 – 10 mm/min**
Dimensions	**1.8 × 1.8 × 1.0 m**
Frame weight	**1,500 kg**
Control modes	**Load / Displacement**
Servo valve	**High-frequency precision**
Height adjust	**6-shim platen set**

Hydraulic Power Pack

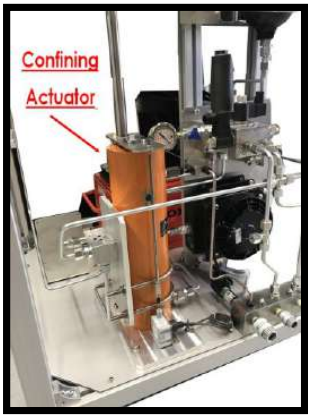
Pump flow	**0.65 LPM HP / 7 LPM LP**
Max pressure	**35 MPa (350 bar)**
Pump type	**Radial piston**
Oil tank	**10 liters**
Motor power	**2 HP (1.5 kW)**
Hydraulic hoses	**10 meters**
Pressure filter	**3 microns**
Power supply	**230 VAC, 1-Ph, 50/60 Hz**

Included: 25 L hydraulic oil & spare filter · Ethernet interface to data acquisition computer

Confining Pressure Intensifier

Working pressure	**70 MPa**
Pressure accuracy	**0.25% FS**
Actuator volume	**250 cc**
Volume accuracy	**0.25% FS**
Wetted parts	**Stainless steel**
Control modes	**Pressure / Displacement**
Fluid reservoir	**20 L · fill & drain**

Fills the triaxial cell with confining fluid automatically and pressurizes it with high precision. A linear transducer monitors confining oil volume in real time.



One frame, every test 03

All the measurements a modern geomechanics laboratory needs — uniaxial, triaxial, Brazilian, acoustic and permeability — in a single integrated servo-controlled system.

1. **Uniaxial Compressive Strength**
   UCS, Young's modulus E, Poisson's ratio v, stress–strain curve
2. **Triaxial Compression**
   Shear strength, cohesion, friction angle, failure envelope
3. **Indirect Tensile (Brazilian)**
   Brazilian tensile strength per ASTM D3967
4. **Acoustic Velocity (P & S)**
   Vp, Vs1, Vs2 and dynamic elastic moduli
5. **Liquid Permeability**
   0.01 md – 1 Darcy via Darcy's Law
6. **Pore Volume Compressibility**
   Drained conditions with pore pressure control
7. **Strain Gauge Measurements**
   Axial & radial strain, Poisson's ratio in-situ
8. **Thermo-mechanical Testing**
   Up to 150 °C with UTC cell & heating mantle

Triaxial & Acoustic Cells

HOEK Cells — Type 2 & 3

Type 2: Ø 54.7 mm (NX) & 63.5 mm (HQ)
Type 3: Ø 76.2 / 85 / 100 mm
Length 2× Ø · hydraulic confining · integrated strain gauges · spherical hardened platens.

UTC Universal Triaxial Cells — Type 2 & 3

70 MPa (10,000 psi) · up to 150 °C ·
Type 2: Ø 54.7 – 63.5 mm
Type 3: Ø 76.2 – 100 mm ·
stainless wetted parts · 1/8" connections.
Accessories: diametral extensometer, axial LVDT, calibrator, trolley.

Acoustic Velocity Fixture (AVF)

ASTM D2845 · 1 MHz · P, S1 & S2 waves.
Yields Vp, Vs, dynamic E, v and bulk/shear moduli.
Platens: 54.7 / 63.5 / 76.2 / 85 / 100 mm.

Integration: The AVF fits seamlessly with both HOEK cells and the UTC Universal Triaxial Cells — enabling combined mechanical and acoustic characterization on the same specimen under confining pressure.

Complete Measurement Suite

Dedicated fixtures and modules for full mechanical and hydraulic characterization — all driven by the integrated Floxlab software.

UCP — Uniaxial

UCS, E, v determination. Axial LVDT + circumferential extensometer. Direct servo control. Platens 100 mm & 160 mm.

ITB — Brazilian

Indirect tensile strength via diametral compression. Precision jaws with spherical bearing. Jaw sizes 54.7 – 150 mm.

Strain Gauges (XY)

100 XY gauges (350 Ω) per pack. Axial + radial per ASTM D7012. 4-channel control box. Complete prep kit included.

Pore Pressure Pump

70 MPa · 2 × 15 cc dual cylinder · 0.0001 – 30 cc/min. Constant pressure / flow / volume modes. Drained triaxial ready.

LP-700 Permeameter

0.01 md – 1 Darcy · water or oil · 70 MPa. Upstream/downstream + differential sensors. Independent back-pressure regulation.

Software & Reporting

Floxlab proprietary software. Automated UCS, E, v, shear envelope. Professional PDF reports for every test.

Why Choose MECATEST

Versatile Platform

A single frame runs uniaxial, triaxial, Brazilian and acoustic tests — no retooling required.

Automated Paths

Pre-programmed stress and strain paths for reproducible, operator-independent results.

Unmatched Rigidity

Four-column stiff frame minimizes compliance errors — critical for accurate property determination.

Full Digital Control

High-frequency servo-valve with load and displacement modes for precise regulation at any rate.

Wide Specimen Range

From 54.7 mm to 160 mm diameter — NX, HQ and larger industry-standard sizes.

Integrated Reporting

UCS, E, v, shear envelope automatically calculated — professional PDF reports in one click.

STANDARDS: ASTM D7012 · ASTM D3148 · ASTM D2664 · ASTM D2845 · ASTM D3967 · ISRM

HEADQUARTERS

Floxlab
Nanterre, France

GET IN TOUCH

Floxlab.com
Contact your regional
Business Development Manager

MADE IN FRANCE

Floxlab
NANTERRE, FRANCE

ROCK MECHANICS TESTING SYSTEM

ROCKTEST

1,000 kN Uniaxial & Triaxial Compression Testing System for comprehensive geomechanical characterization of reservoir rocks

1,000 kN	70 MPa	200°C	54.7 mm
AXIAL LOAD	CONFINING PRESSURE	MAX TEMPERATURE	MAX SPECIMEN Ø

Servo-controlled · Fully automated · Multi-stage capable
Suitable for all rock types — from soft sandstone to hard crystalline formations

SYSTEM DESCRIPTION

PRECISION ROCK COMPRESSION TESTING

The ROCKTEST is a servo-controlled compression system engineered for both uniaxial and triaxial rock testing. It simultaneously controls axial load, confining pressure, and deformation via pre-programmed stress and strain paths — eliminating operator variability and enabling fully repeatable multi-stage protocols.

1,000	70	200
kN AXIAL LOAD	MPa CONFINING	°C MAX TEMP

COMPRESSION FRAME

Servo-Controlled Load Frame

- Fixed crosshead on four stiff columns — extreme rigidity
- Integrated servo-controlled actuator
- Load control or displacement control mode
- High-frequency servo-valve for precise flow regulation
- Front door safety shield against specimen ejection
- 6-shim set for adjustable lower platen height

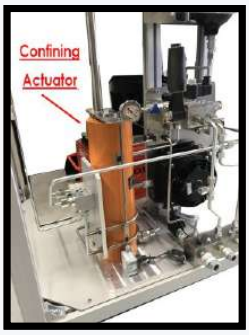
Load Capacity	**500 kN or 1,000 kN**
Piston Stroke	**100 mm**
Loading Speed	**0.0005 – 10 mm/min**
Dimensions	**1.5 × 1.5 × 1 m**
Weight	**1,000 kg**
Control Modes	**Load / Displacement**

CONFINING SYSTEM

Automated Confining Pressure Intensifier

- Automatically fills triaxial cell with confining fluid
- Pressurizes & controls confining fluid precisely
- Linear transducer monitors confining oil volume
- Pressure mode or constant displacement mode
- 20-liter fluid reservoir for fill / drain operations
- Metal cabinet on casters — mobile & compact

Working Pressure	**70 MPa**
Pressure Accuracy	**0.25% FS**
Actuator Volume	**250 cc**
Volume Accuracy	**0.25% FS**
Wetted Parts	**Stainless Steel**
Dry Air Required	**100 psi**



LOAD FRAME SELECTION GUIDE

Achievable stress (MPa) per load level and specimen diameter — select the appropriate frame capacity for your target stress regime.

Load ↓ / Dia →	19 mm	25.4 mm	38.1 mm	50.8 mm	54.7 mm	75 mm	101.6 mm
100 kN	353	197	88	49	42	23	12
200 kN	705	395	175	99	85	45	25
500 kN	1,763	987	439	247	212	113	62
1,000 kN	3,527	1,974	877	493	425	226	123

UNIAXIAL TESTS

- Unconfined Compressive Strength (UCS)
- Axial & radial strain
- Modulus of elasticity (Young's modulus)
- Poisson's ratio

TRIAXIAL TESTS

- Triaxial compression strength
- Stress-strain curves under confinement
- Shear strength envelope (Mohr-Coulomb)
- Cohesion & angle of internal friction

SPECIALIZED TESTS

- Brazilian indirect tensile strength
- Acoustic P & S wave velocity
- Steady-state liquid permeability
- High-temperature testing up to 200°C

INTEGRATED SOFTWARE & AUTOMATION

Real-time display — synoptic view of all measurements · component status monitoring · live trend charts

Automated control — macro-driven tests with pre-programmed stress & strain paths · set-point entry

Multi-stage protocols — complex stress paths with full repeatability · eliminates operator variability

Report generation — automated test reports generated at end of each test

TRIAXIAL CELL OPTIONS

1 HOEK Cell

Standard triaxial cell for NX core testing. Determines shear strength parameters and elastic properties from soft sandstone to hard crystalline formations.

Specimen Dia.	**42 – 54.7 mm**
Confining Pressure	**70 MPa**
Strain measurement	**Axial & radial gauges**
Acoustic velocity	**P & S waves**
Seal kits included	**5 kits**

2 QRC High-Temp Triaxial Cell

Quick-release cell reproducing reservoir conditions up to 70 MPa and 150°C with 3 pressure-compensated LVDTs for direct radial strain measurement.

Specimen Dia.	**38.1 – 54.7 mm**
Confining Pressure	**70 MPa**
Temperature	**Ambient – 200°C**
Radial strain	**3× pressure-comp. LVDTs**
Axial strain	**1× vertical LVDT**

3 UTC Universal Triaxial Cell

Designed for full-diameter plugs up to 100 mm. Delivers strength, elastic moduli, velocities and thermal effects in a single test run.

Specimen Dia.	**55 – 100 mm**
Confining Pressure	**70 MPa**
Temperature	**Ambient – 200°C**
Diametral sensor	**DE-55, 0.5% FS**
Axial sensor	**ASL-55, 0.25% FS**

FIXTURE OPTIONS

1 Uniaxial Compression Platen

For unconfined compression tests per ASTM D7012. Includes circumferential extensometer (55 mm) and LVDT for axial deformation.

Specimen dia.	**Up to 55 mm**
Radial deformation	**Circumferential Ext.**
Axial deformation	**LVDT**
Standard	**ASTM D7012**

2 Strain Gauges Package

XY biaxial gauges bonded directly on specimen — eliminates machine compliance errors. Monitors microcrack onset through strain curve non-linearity.

Gauge type	**XY biaxial**
Resistance	**350 Ohm**
Quantity	**100 gauges**
Bridge circuit	**Wheatstone**

3 Acoustic Velocity Platens

Compatible with HOEK cell. Measures P, S1 & S2 wave velocities at multiple stress levels — computes dynamic elastic moduli and detects microcrack initiation.

Waves measured	**P, S1, S2**
Center frequency	**1 MHz**
Feedthroughs	**6 coaxial**
Operating temp.	**Room – 120°C**

5 Brazilian Indirect Tensile Test

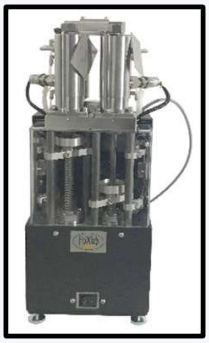
Diametrical loading between curved jaws — no special sample preparation. Critical for borehole stability and fracturing design.

Available dia.	**42 – 76.2 mm**
Standards	**ASTM D3967 / ISRM**
Integration	**ROCKTEST load frame**

6 Pore Pressure Syringe Pump

Regulates pore pressure precisely. Essential for computing effective stress, Biot's coefficient and pore compressibility.

Working pressure	**70 MPa**
Pump volume	**2 × 15 cc**
Flow range	**0.0001 – 30 cc/min**
Control modes	**Const. P / Q / V**



7 LP-700 Liquid Permeameter

Steady-state Darcy flow permeability from 0.01 mD to 1 Darcy with dual DP transducers. Quantifies stress-dependent permeability.

Permeability range	**0.01 mD – 1 Darcy**
Fluid	**Water or oil**
Max pressure	**70 MPa**
Pressure accuracy	**0.2% FS**

COMPLETE GEOMECHANICAL SOLUTION

The ROCKTEST integrates seamlessly with FLOXLAB' full portfolio — Acoustic Velocity System, True Triaxial System,... — providing an end-to-end solution for reservoir characterization. All instruments share common software philosophy: real-time monitoring, pre-programmed test paths, and automated reporting.

STANDARDS ASTM D7012 · ASTM D3967 · ISRM · ISO

CONTACT US

Floxlab
Nanterre, France
www.floxlab.com

Specifications subject to change without notice.
Custom configurations available on request.

floXlab · Nanterre, France

GEOLAB

Educational Rock Compression Tester

300 kN	592 MPa	70 MPa	5 Tests
Max Axial Load	Axial Stress (1")	Confining Pressure	In One System

TEST CAPABILITIES

- **Uniaxial & Triaxial Compression**
  ASTM D2664 · D7012
- **Acoustic Velocity (P, S1, S2)**
  ASTM D2845
- **Brazilian Indirect Tension**
  ASTM D3967
- **Point Load Strength Index**
  ASTM D5731
- **Servo-controlled · 2 modes**
  Load / Displacement

KEY SPECIFICATIONS

Axial Load	300 kN
Axial Stress	592 MPa (1")
Confining P.	70 MPa
Piston Stroke	50 mm
Hydraulic P.	20 MPa
Motor Power	1.5 kW
Frame Weight	60 kg

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ABOUT THE GEOLAB

One compact system. Five essential tests.

The GEOLAB is a servo-controlled compression testing apparatus designed for universities, research centres and technical institutes. It performs uniaxial and triaxial experiments on rock specimens, determining critical geomechanical parameters rapidly and reliably.

- **Triaxial Compression** — *ASTM D2664 · D7012*
- **Uniaxial Compression** — *ASTM D7012*
- **Acoustic Velocity** — *ASTM D2845*
- **Brazilian Tension** — *ASTM D3967*
- **Point Load Strength** — *ASTM D5731*

Technical Specifications

Max Axial Load	300 kN	Hydraulic Max Pressure	20 MPa
Axial Stress (1" sample)	592 MPa	Pump Flow	0.1 - 1 LPM
Axial Stress (1.5" sample)	263 MPa	Motor Power	1.5 kW (230 VAC)
Confining Pressure	70 MPa	Frame Dimensions	1.0 × 1.5 × 0.3 m
Sample Diameter	Up to 1.5"	Frame Weight	60 kg
Piston Stroke	50 mm		
Control Modes	Load / Displacement		

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MODULAR SYSTEM

Expand your lab's capabilities at any time

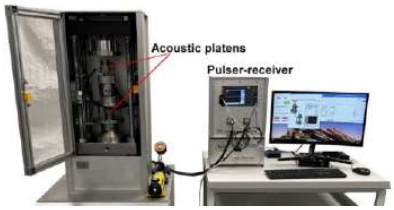
Each fixture integrates seamlessly with the GEOLAB compression frame and GEOTEST supervision software.

OPTION 1 — Triaxial HOEK Cell

ASTM D2664 · D7012

Axial load at confining pressure. Axial & radial strains via gauges. 1" & 1.5" Ø specimens.

OPTION 2 — Acoustic Velocity Platens



ASTM D2845

P-wave, S1 & S2 wave propagation under triaxial conditions. Dynamic elastic constants.

OPTION 3 — Uniaxial Compression Platens

ASTM D7012

UCS, Young's modulus & Poisson's ratio. Strain gauge compatible. Multiple diameters.

OPTION 4 — Brazilian Tension Fixture

ASTM D3967

Indirect tensile strength via diametrical compression. Precision jaws. Ø 54.7 mm.

OPTION 5 — Point Load Fixture

ASTM D5731

Point Load Strength Index (Is). Two conical platens for cores, blocks or fragments.

HYDRAULICS — Hydraulic Power Pack

Integrated unit

Gear pump, 10 L reservoir, 20 MPa max, 10-micron filter. 1.5 kW — 230 VAC.

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GEOTEST 1000 SOFTWARE

Supervision, Control & Reporting

The proprietary floXlab GEOLAB software provides an icon-driven interface guiding users through every test stage. Connected via Ethernet, it delivers real-time data acquisition, graphical display, automated test sequences and professional report generation.

Live Synoptic
Full system status overview

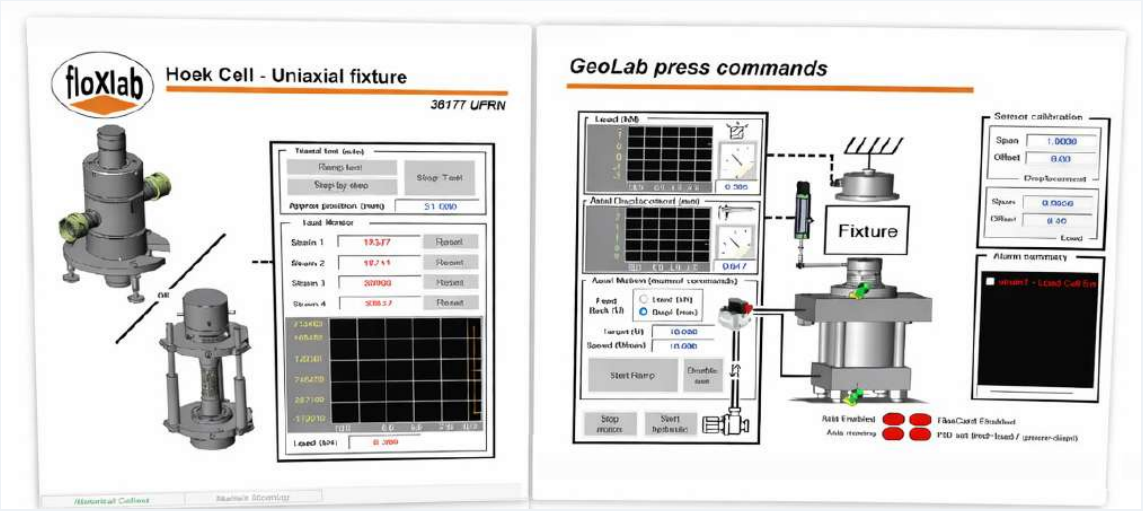
Real-time Data
Load, stress, strain & displacement

Trend Curves
Live graphical plots throughout test

Set Point Control
Enter and adjust parameters live

Macro Commands
Program automated test sequences

Report Generation
Export professional test reports



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floXlab

Your supplier of high-pressure laboratory instruments

and advanced geotechnical testing equipment

SHEARTEST

Automated Rock Direct Shear Testing System

ASTM D 5607

ISRM

ROCK MECHANICS TESTERS • DIRECT SHEAR SYSTEMS

SHEARTEST SERIES

Direct Shear Apparatus

KEY CAPABILITIES

- Versatile direct-shear system for rock specimens
- Conventional, incremental and residual shear tests
- Closed-loop, servo-controlled hydraulic system
- Simultaneous application of normal and shear forces
- Real-time force and displacement data acquisition
- Determines cohesion (c) and friction angle (Ø)
- Customizable load capacity and specimen size
- Complies with ASTM D 5607 and ISRM standards

SHEARTEST 300
Direct Shear Apparatus

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PURPOSE & OPERATING MODES

/ 03

PURPOSE

Determines the shear strength parameters of rock specimens:

Cohesion (c)	**Friction angle (Ø)**	**Peak shear strength**	**Residual shear strength**

STANDARDS

ASTM D 5607

Standard Test Method for Performing Laboratory Direct Shear Strength Tests of Rock Specimens Under Constant Normal Force

ISRM

International Society for Rock Mechanics — Suggested Methods for determining the shear strength of rock joints

OPERATING MODES

CNL — **Constant Normal Load**

Applies a constant normal stress while shearing progresses.

CNS — **Constant Normal Stiffness**

Normal stress varies proportionally with normal displacement.

CND — **Constant Normal Displacement**

Maintains a fixed normal displacement during shear.

+ constant, incremental or ramped shear loads / displacements

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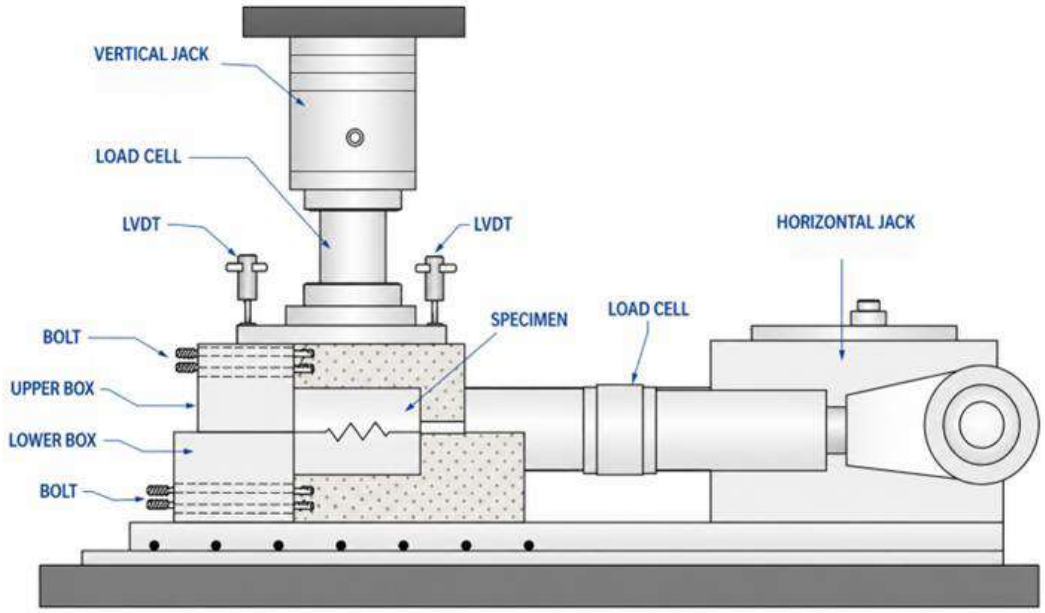
KEY FEATURES

/ 04

Cross-section view of the SHEARTEST direct shear apparatus



TECHNICAL FEATURES

- Servo-controlled hydraulic jacks (normal & shear)
- Normal and shear load cells — 0.05% full-scale precision
- Normal and shear LVDT transducers — 0.5 µm resolution
- Specimen shear upper and lower box

- Normal load reaction frame — high rigidity
- Hydraulic power unit — 21 MPa max pressure
- Specimen extruder
- Computer control & data acquisition station

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TYPICAL TEST PROCEDURES

/ 05

01 CONVENTIONAL SHEAR TEST

Applies a constant normal load while the specimen is sheared at a controlled displacement rate. The resulting shear stress–displacement curve reveals the material's peak shear strength, from which cohesion (c) and friction angle (Ø) are derived.

Application: *Essential for designing slopes, foundations and retaining structures.*

02 INCREMENTAL SHEAR TEST

Applies shear load in controlled increments (e.g. 20 kPa per step), maintaining each level for a defined duration to observe creep, relaxation and stiffness evolution. Precise step management and long-term monitoring.

Application: *Ideal for studying progressive failure and time-dependent behavior — natural slopes, underground excavations.*

03 RESIDUAL SHEAR TEST

After reaching peak strength, shearing continues over large displacements, allowing asperities and interlocks to wear away. Accurately measures the point where shear stress stabilizes — the residual shear strength.

Application: *Crucial for evaluating post-failure or long-term stability in reactivated landslides and sheared rock joints.*

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SHEAR STRENGTH DETERMINATION

/ 06

The SHEARTEST measures shear stress under different normal stresses to derive the rock's fundamental shear strength parameters.

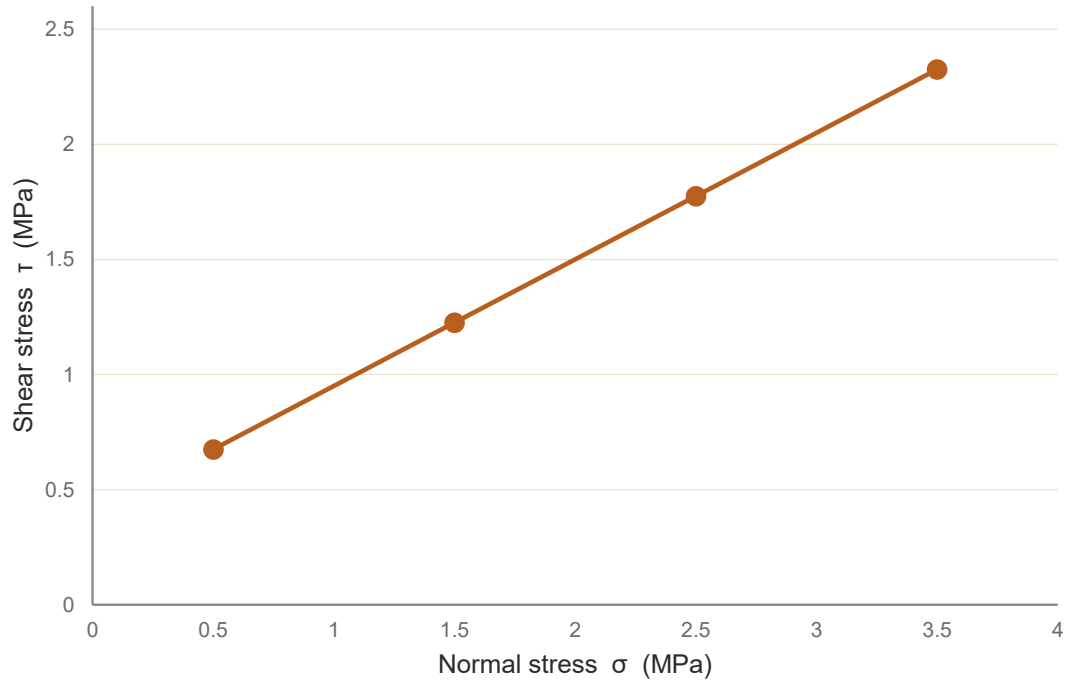
STEP 1 — Peak Shear Stress

Apply constant normal stresses **(N_1, N_2, N_3)** on identical specimens and shear them at a controlled rate.
→ Record the shear stress vs. shear displacement curves and extract the peak shear stress for each test.

STEP 2 — Cohesion & Friction Angle

Plot peak shear stresses against the corresponding normal stresses.
→ **c** (cohesion) = y-intercept **Ø** (friction angle) = slope of the line

Mohr–Coulomb failure criterion: $\tau = c + \sigma \cdot \tan(Ø)$



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SHEARTEST MODELS

/ 07

Four standard models available, each customizable to specific project needs.

MODEL	SHEAR LOAD (kN)	NORMAL LOAD (kN)	SPECIMEN DIAM / SIDES (mm)	SPECIMEN HEIGHT (mm)	WEIGHT (kg)
SHEARTEST 200-10	200	10	150	150	400
SHEARTEST 100-50	100	50	150	150	500
SHEARTEST 500-300	500	300	150	150	1,250
SHEARTEST 1000-500-L	1,000	500	300 × 300	100	2,000

COMMON SPECIFICATIONS — ALL MODELS

Standard	**ASTM D 5607, ISRM**	Max. shear displacement	**± 50 mm**
Max. normal displacement	**50 – 100 mm**	Power supply	**230 VAC, 1-Ph, 50/60 Hz**
Required air pressure	**100 psi**	Precision (load cells)	**0.05% of full scale**
LVDT resolution	**0.5 µm**	Hydraulic max. pressure	**21 MPa**

SUPERVISION, CONTROL & REPORTING

/ 08

SOFTWARE CAPABILITIES

Synoptic view	Live visualization of the complete test system
Component status	Real-time monitoring of actuators and sensors
Measurements display	Continuous reading of forces and displacements
Trends display	Real-time curves during the test
Set-point entry	Direct control of target values
Automated macros	Pre-programmed test sequences
Professional reports	Automatic generation of test reports

INTELLIGENT DATA ANALYSIS

Automatic calculation of shear strength parameters:

$Ø_a$	$Ø^b$	$Ø_r$	C_a	C
apparent friction angle	basic friction angle	residual friction angle	apparent cohesion	cohesion

Graphs of peak and residual strength vs. normal stress are plotted from combined results across all specimens.

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GET IN TOUCH

We look forward to discussing your project.

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Your supplier of high-pressure laboratory instruments

and advanced geotechnical testing equipment

HYDRATEST

Gas Hydrate Triaxial

Compression Test System

Triaxial testing of sediments containing methane hydrates under extreme low-temperature and high-pressure conditions.

ROCK MECHANICS TESTERS • GAS HYDRATE TRIAXIAL SYSTEM

What is HYDRATEST?

- Servo-controlled triaxial testing system for gas hydrate-bearing sediments
- Operates under high pressure and sub-zero (below freezing) temperatures
- Investigates mechanical properties of Methane Hydrate-Bearing Sediments (MHBS)
- Simulates in-situ conditions: temperature, pore & confining pressure, hydrate saturation
- Full hydrate formation and dissociation cycles
- Accurate measurement of Young's modulus, cohesion, internal friction angle
- Automated control and data acquisition via Floxlab proprietary software

KEY SPECIFICATIONS

100 kN

Axial Load Capacity

70 MPa

Max Confining & Pore Pressure

−10 → +60 °C

Operating Temperature

50 mm

Specimen Diameter

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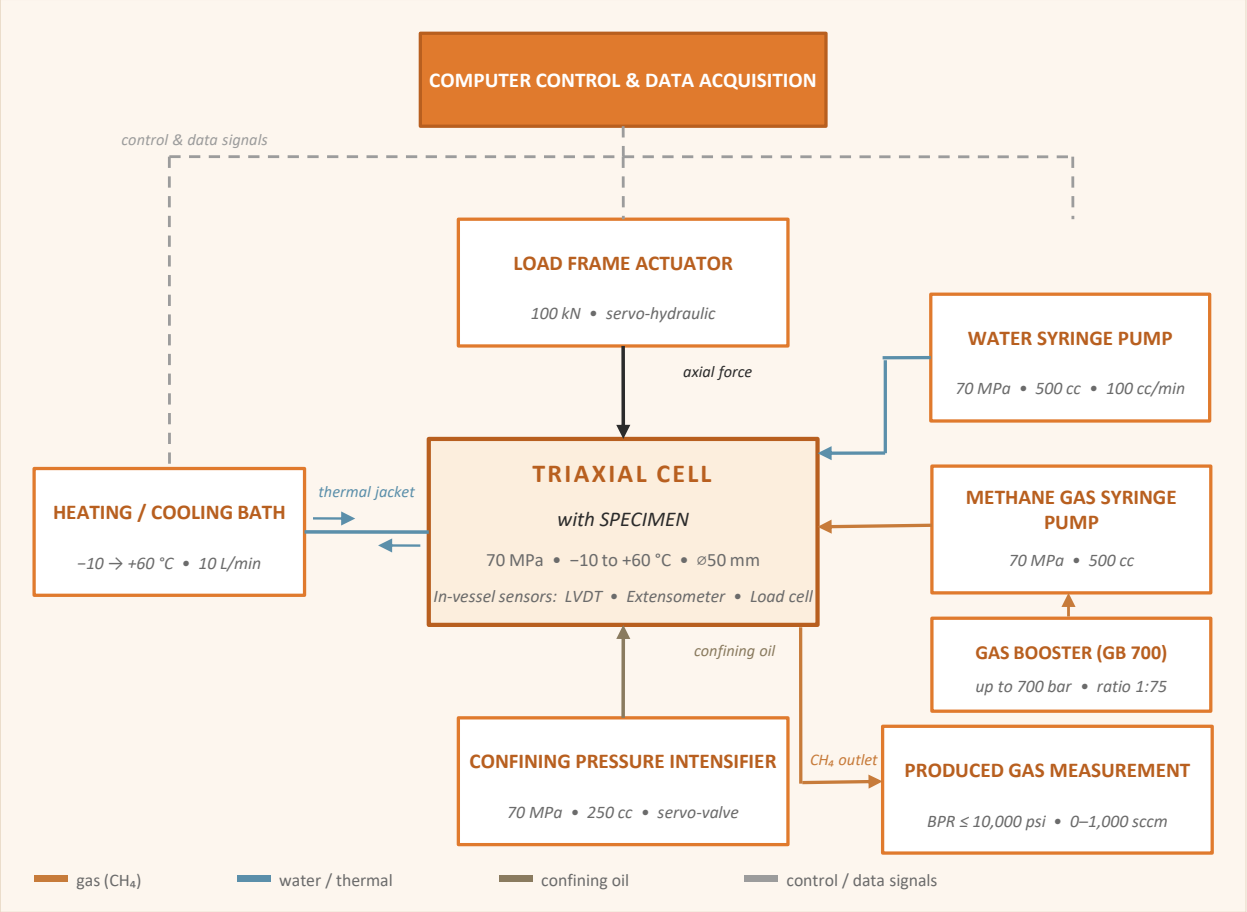
SYSTEM BLOCK DIAGRAM

/ 03



TEST PRINCIPLE

1. Sand specimen initially saturated with 10% water, sealed in a Teflon sleeve
2. Placed in triaxial cell; water injected by syringe pump until target saturation
3. Methane injected at controlled flow rate under confining pressure
4. Constant pore pressure for 24 h → CH_4 dissolution in pore water
5. Temperature lowered into hydrate-stability range → MH formation
6. Axial load applied; strain, force, pore pressure recorded
7. Temperature raised → MH dissociation; released CH_4 volume measured

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TESTS, RESULTS & SCOPE OF SUPPLY

/ 04

TESTS PERFORMED

- Triaxial tests on gas hydrate sediment specimens
- Hydrate formation tests
- Hydrate dissociation tests
- Drained & undrained compression tests
- Creep & strength characterization of MHBS
- Controlled cooling, heating & thermal cycling

MEASURED RESULTS

- Young's modulus
- Poisson's ratio
- Mohr circle envelope
- Axial stress & strain
- Diametral strain
- Pore pressure
- Confining pressure
- Specimen temperature
- Water pressure & volume
- Produced CH_4 gas volume

Complete HYDRATEST system

Deep-sea conditions | **Cryogenic capability** | **Full automation**

SCOPE OF SUPPLY

- Servo-controlled hydraulic load frame (100 kN)
- High-pressure triaxial loading cell
- In-vessel axial & diametral deformation sensors
- In-vessel strain-gauge load cell
- Thermostatic bath with cooling / heating jacket
- Confining pressure intensifier
- Water syringe pump
- Methane gas syringe pump
- Produced gas measurement unit (BPR + flowmeter)
- Gas booster (up to 700 bar)
- Computer workstation with proprietary Floxlab software

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COMPONENTS & SPECIFICATIONS

/ 05

LOADING SYSTEM	
Servo-Hydraulic Load Frame	100 kN • stiffness 70 kN/mm • piston stroke 50 mm
Triaxial Cell	100 kN axial • 70 MPa • −10 to +60 °C • ⌀50 mm specimen

PRESSURE & FLUID CONTROL	
Confining Pressure Intensifier	70 MPa • accuracy 0.25% FS • 250 cc • 20-litre reservoir
Water Syringe Pump	70 MPa • 500 cc • flow 0.0001–100 cc/min
Methane Gas Syringe Pump	70 MPa • 500 cc • flow 0.0001–100 cc/min

IN-VESSEL INSTRUMENTATION	
Diametral Extensometer	range 2.5 mm • linearity 0.3% FS • −10 to +60 °C
Axial LVDT Transducer	±5 mm • linearity 0.15% FS • 3 LVDTs at 120°
Strain-Gauged Load Cell	100 kN • accuracy ±0.5% • sensitivity ≈ 2 mV/V

THERMAL & GAS MANAGEMENT	
Thermostatic Bath & Cooling Jacket	−10 to +60 °C • resolution 0.1 °C • 10 L/min • 4.5 L
Produced Gas Measurement Unit	BPR up to 10,000 psi • 0–1,000 sccm • stainless steel
Gas Booster (GB 700)	inlet 15–200 bar • outlet up to 700 bar • ratio 1:75

CONTROL & ACQUISITION	
Floxlab Proprietary Software	real-time monitoring • automated sequences • synchronized logging • standardized reports

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

PRODUCT BROCHURE · 2026

LOAD FRAME TRIAXIAL CELLS

HOEK · Quick Release · Universal · True Triaxial

HOEK	QUICK RELEASE	UNIVERSAL	TRUE TRIAXIAL
Self-contained	*Fast load/unload*	*Versatile HP cell*	*3-axis independent*
Ø 21.5 – 101.6 mm 70 MPa · ASTM D7012	Ø 21.5 – 54 mm (NX) 70 / 140 MPa	70 / 140 MPa / 150 °C Ø 21.5 – 100 mm	σx, σy, σz independent Up to 689 MPa

ASTM D7012 · ASTM D2845 · ASTM D2664

KEY CAPABILITIES

- Triaxial compression tests on rock specimens
- Confining pressure up to 140 MPa (20,000 psi)
- Temperature up to 200 °C with heating mantle
- Young's modulus & Poisson's ratio
- P-wave & S-wave acoustic velocities
- Axial, radial & circumferential strains
- Rock permeability (Darcy method)
- Hydraulic fracturing & AE monitoring

www.floxlab.com

High-pressure triaxial testing for rock mechanics

Floxlab designs and manufactures four families of triaxial cells covering the full range of specimen sizes, confining pressures and stress geometries — from self-contained HOEK cells to fully independent 3-axis true triaxial systems.

140 MPa	200 °C	101.6 mm
CONFINING PRESSURE	TEMPERATURE	SPECIMEN Ø
Up to 20,000 psi depending on cell type	With heating mantle and PID controller	From 21.5 mm (EX) to 4" (101.6 mm)

MEASUREMENTS & CAPABILITIES

- Shear strength under varying confining pressures
- Internal friction angle & cohesion intercept
- Young's modulus & Poisson's ratio
- Dynamic elastic constants
- P-wave and S1/S2 shear wave velocities
- Axial, radial & circumferential strains
- Rock permeability (Darcy method)
- Acoustic emission & fracture monitoring

FOUR TRIAXIAL CELL FAMILIES

HOEK	**Self-contained**	ASTM-compliant · Ø 21.5 to 101.6 mm · 70 MPa · Removable sleeve
QRC	**Quick Release Cell**	Fast loading · Integrated LVDTs · 70 / 140 MPa
UTC	**Universal**	70 / 140 MPa + 150 °C · Teflon sleeve · Modular sensors
TTC	**True Triaxial**	Independent σx / σy / σz · Cubic specimens · Up to 689 MPa

COMMON STANDARDS

ASTM D7012	triaxial compression of intact rock specimens
ASTM D2845	ultrasonic velocities (P and S waves)

Product Family 01

HOEK Cell

Self-contained triaxial compression cell

DESCRIPTION

The HOEK Cell performs triaxial compression tests on rock cores. It isolates the specimen from the confining fluid via a dedicated sleeve, and delivers key data on rock strength and elasticity: shear strength, internal friction angle, cohesion intercept, Young's modulus and Poisson's ratio.

The structure consists of a hollow steel body with screw-on end caps, two high-resistance spherically-seated loading pistons, and a protective polyurethane sleeve (Viton for high-temperature use).

KEY FEATURES

- Standard: ASTM D7012
- Confining pressure: 70 MPa (10,000 psi)
- Specimen diameter: 21.5 to 101.6 mm (4")
- Specimen length: twice the diameter
- Wetted parts: stainless steel
- Confining port: 3/8 inch
- Easy operation · models for all sizes
- High-pressure, robust design

THREE TYPES BY SPECIMEN SIZE

TYPE 1	TYPE 2	TYPE 3
21.5 – 38.1 mm	**42 – 63.5 mm**	**76.2 – 101.6 mm**
21.5 mm 25.4 mm (1") 30.1 mm 38.1 mm (1.5")	42 mm (BX) 47.6 mm 54.7 mm (NX) 63.5 mm (HQ)	76.2 mm (HX) 85 mm 101.6 mm (4")

CELL VARIANTS

Acoustic — TAC

Platens transmit P and S1/S2 waves for acoustic velocities & dynamic elastic constants. ASTM D2845 · 1 MHz · 70 MPa.

Heated HOEK Cell

Heating mantle reproduces reservoir temperatures up to 150 °C with homogeneous isothermal profile and digital PID control.

Product Family 02

Quick Release Cell

Streamlined testing with integrated instrumentation

DESCRIPTION

The QRC Cell is a Quick Release triaxial cell designed for streamlined testing of rock specimens from 21.5 mm (EX) to 54 mm (NX). The rock sample, encapsulated in heat-shrinkable tubing with top and bottom platens, is positioned using a guiding tool.

Three pressure-compensated lateral LVDTs, positioned by pneumatic jacks, measure diametral strains in step mode. Two averaging vertical LVDTs measure axial strain. The cell integrates into a complete test stand with high-pressure pumps, external axial actuator, signal conditioning and live stress–strain display.

Complete QRC system on trolley

KEY FEATURES

- Max confining pressure: 70 / 140 MPa
- Temperature: ambient (up to 150 °C with heating mantle)
- Specimen diameter: 21.5 mm to 54 mm (NX)
- Specimen height: twice the diameter
- Strain: 3 diametral LVDTs + 2 averaging axial LVDTs
- Connections: 1/8" and 1/4" HP
- Wetted parts: stainless steel

WHY CHOOSE QRC

01

FAST SETUP

Heat-shrinkable sleeve and guiding tool for streamlined specimen loading and unloading.

02

INTEGRATED LVDTS

Pressure-compensated lateral and axial LVDTs for accurate real-time strain measurement.

03

LIVE CURVES

Signal conditioning electronics display stress–strain curves during the test.

04

MOBILE PLATFORM

Trolley allows easy installation and positioning within the load frame.

Product Family 03

Universal Triaxial Cell

High-pressure, high-temperature, fully modular

DESCRIPTION

The UTC Cell applies both axial and radial compressive forces to cylindrical rock samples, enclosed in a Teflon sleeve between hardened steel end platens and submerged in pressurized oil.

The top cap includes electrical and coaxial feedthroughs for integration of internal measurement instruments — axial/radial deformation sensors, ultrasonic platens, specialized transducers. An optional heating unit enables controlled temperature testing up to 150 °C.

FOUR CONFIGURATIONS

MODEL	MAX PRESSURE	SPECIMEN Ø	NOTES
UTC-70-NX	70 MPa	21.5 – 54 mm (NX)	Standard temp.
UTC-70-100	70 MPa	63.5 – 100 mm	Large specimens
UTC-140-NX	140 MPa	21.5 – 54 mm (NX)	Extra HP
UTC-140-100	140 MPa	63.5 – 100 mm	Full range HP

All configurations: temperature up to 150 °C (optional), Teflon sleeve, stainless steel wetted parts. Hastelloy option available for aggressive fluids.

INSTRUMENTATION & SENSORS

AXIAL LVDT	DIAMETRAL EXT.	LOAD CELLS	CALIBRATORS
In-vessel axial displacement with high resolution.	In-vessel radial strain around the specimen.	In-vessel load cells for precise force measurement.	Dedicated calibrators for LVDT, extensometer, load cell.

Product Family 04

True Triaxial Cell

Independent 3-axis stress on cubic specimens

DESCRIPTION

Specifically engineered for testing cubic rock specimens, the TTC provides fully independent control of the three principal stresses along X, Y and Z axes — enabling accurate reproduction of complex anisotropic stress states representative of in-situ geological conditions.

WORKING PRINCIPLE

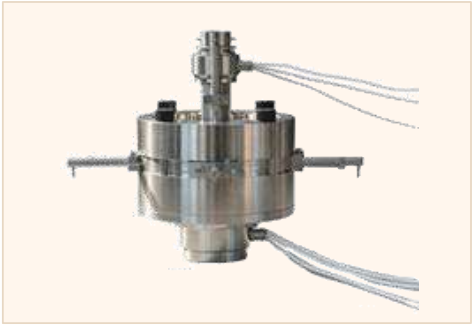
σz (axial): servo-controlled load frame + upper Z platen
σx, σy (lateral): independent hydraulic pumps, symmetric platen pairs
Deformation: LVDTs along each principal axis — full strain tensor

KEY SPECIFICATIONS

- X & Y stress: up to 70 MPa (independent)
- Z stress: up to 689 MPa (type 1) / 400 MPa (type 2)
- Z-axis load required: up to 1,000 kN
- Specimen (type 1): 1.5" × 1.5" × 3"
- Specimen (type 2): 50 × 50 × 100 mm
- Optional temperature control up to 120 °C

ADVANCED TESTING — FRACTURING & AE

The full TTC cell can be equipped with acoustic velocity transducers, acoustic emission sensors on the four lateral sides, and a hydraulic fracturing injector. This configuration enables real-time monitoring of fracture initiation and propagation while applying stress and injecting fracturing fluids.



KEY BENEFITS

Independent 3-axis stress · Anisotropic stress measurement · **Cubic samples** · Temperature up to 120 °C · **Acoustic velocity** · Fracture fluid testing & AE monitoring

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

GET IN TOUCH

Thank you for your interest in Floxlab

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Triaxial Cells · HOEK · QRC · UTC · TTC

ROCK MECHANICS • LABORATORY EQUIPMENT

Load Frame Fixtures

UCS · ITB · PLF

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

The Floxlab Load Frame Fixtures range provides complete solutions for characterising the mechanical behaviour of rock specimens under uniaxial compression, indirect tension and point load. Each fixture mounts on any standardised load frame and is engineered for precise, ASTM-compliant testing in laboratory and field conditions.

FIXTURE CATEGORIES

UCS	ITB	PLF
Uniaxial Compression	**Indirect Tensile (Brazilian)**	**Point Load Fixture**
Compression platens & deformation sensors for unconfined rock compression tests.	Brazilian test fixture with precision loading jaws and dedicated 250 kN load cell.	Quick field and lab rock classification through the point load index Is(50).
Ø up to 150 mm **800 MPa max stress** **ASTM D7012 · D7070**	**Ø 42 to 150 mm** **250 kN load cell** **ASTM D3967**	**Ø 25.4 to 101.6 mm** **100 kN capacity** **ASTM D5731**

STANDARDS & COMPLIANCE ASTM D7012 • ASTM D7070 • ASTM D5731 • ASTM D3967

Compatible with GEOLAB, ROCKTEST and MECATEST load frames — engineered in France.

23 rue du Port, 92000 Nanterre — France | +33 (0)1 81 93 12 85 | contact@floxlab.com | www.floxlab.com

UCS — Uniaxial Compression

Platens & deformation sensors for unconfined rock compression tests

UCS Uniaxial Compression Platens

ASTM D7012 · D7070 compliant

Versatile uniaxial compression platens that mount on any load frame to perform unconfined rock compression tests and determine compressive strength. High platen stiffness minimises deflection when testing high-strength rocks. The lower platen is fixed for stable specimen support; the upper platen includes a spherical seat to guarantee perfect alignment with the specimen surface. The rock sample is wedged between two parallel platens and loaded progressively until failure.

KEY FEATURES

- Standards: ASTM D7012, ASTM D7070
- Compression load stress up to 800 MPa
- Wetted parts in stainless steel
- Platen sets: up to 150 mm (6")
- Compatible with any standardised load frame

800 MPa	150 mm	Multiple Platens	Stainless steel
Max compression stress	Max specimen Ø	Platen sizes	Wetted parts

UCS Axial & Circumferential Deformation Sensors

LVDT + circumferential extensometer

UCS deformation sensors measure axial and lateral specimen deformation during uniaxial compression tests. A circumferential extensometer measures radial strain, while axial deformation is recorded by a Linear Variable Differential Transformer (LVDT). Sensor outputs enable full stress-strain curves — including post-failure behaviour — and calculation of Young's modulus and Poisson's ratio.

KEY FEATURES

- Sensor types: LVDT (axial) + circumferential extensometer
- Ranges: up to 55 / 100 / 150 mm
- Strain-controlled testing via direct servo control
- Ethernet connection to PC for real-time display

ITB & PLF Fixtures

Indirect tensile (Brazilian) testing and Point Load rock classification

ITB-250 Standard Indirect Tensile Fixture

Brazilian test — ASTM D3967 compliant

The ITB fixture evaluates the tensile strength of cylindrical specimens by applying uniform diametrical line compression — the Brazilian test method. The specimen is compressed between two precision-machined cylindrical loading jaws, inducing indirect tensile stress. The apparatus includes precision loading jaws and a spherical bearing for proper alignment. Two models are available: a standard version for specimens up to 76 mm and an extended version up to 150 mm.

KEY FEATURES

- Standard: ASTM D3967 — Brazilian test
- Type 1 jaws: 42 · 47.6 · 54.7 · 63.5 · 76.2 mm
- Type 2 jaws: 54.7 · 63.5 · 76.2 · 85 · 100 · 150 mm
- Dedicated 250 kN load cell
- Includes spherical bearing for alignment

250 kN	Ø 150 mm	2 types	D3967
Dedicated load cell	Max specimen	Standard / Extended	ASTM compliant

PLF-100 Point Load Fixture

Rock classification — ASTM D5731

The PLF-100 enables quick quality control on core samples. It determines the uncorrected point load strength index (Is), which is converted to the standardised Is(50) for a 50 mm specimen — used for rock strength classification and to estimate Uniaxial Compressive Strength without extensive sample preparation. Also evaluates the rock anisotropy index Ia(50).

KEY FEATURES

- Standard: ASTM D5731 — Point load test
- Compression load capacity: 100 kN
- Specimen diameter: 25.4 to 101.6 mm (1" to 4")
- Conical platens, stainless steel wetted parts

Capabilities & Contact

Measurements, compatible load frames and how to reach us

MEASUREMENTS & CAPABILITIES

Unconfined Compressive Strength
Full stress-strain curve — including post-failure

Young's modulus & Poisson's ratio
From axial and radial strain measurements

Indirect tensile strength
Brazilian test on cylindrical specimens

Point load index Is(50)
Rock strength classification & anisotropy

COMPATIBLE LOAD FRAMES

GEOLAB Standard compression load frame

ROCKTEST Servo-controlled high-capacity frame

MECATEST Mechanical testing frame

Any standardised load frame Mounts directly on existing lab equipment

CONTACT US

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PRODUCT RANGE BROCHURE

Pump-Actuated Rock Mechanics Testing Systems

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

THE COMPLETE RANGE

PREPEAK **TRILAB** **ROCLAB** **AVS 700** **TRUTEST**

ROCK MECHANICS • TRIAXIAL SYSTEMS • ACOUSTIC & PETROPHYSICAL MEASUREMENTS

www.floxlab.com

THE FLOXLAB PORTFOLIO

Product Range at a Glance

Five complementary systems covering the full spectrum of rock-mechanics testing.

PREPEAK

Pre-Failure Triaxial Rock Compression Tester

Pump-actuated triaxial system for pre-failure stress loading — keeps the rock intact for precise, well-controlled stress states.

70 MPa	445 kN
Max pressure	Max axial load

TRILAB

Triaxial Rock Compression Tester — ASTM D7012

Versatile triaxial system with pressure-balanced deviatoric piston for complete rock-mechanics characterization including failure behaviour.

100 MPa	2,500 kN
Max pressure	Max axial load

ROCLAB

Automated Pore Volume Compressibility System

Fully automated system for hydrostatic, triaxial and uniaxial-strain pore-volume compressibility measurements under reservoir conditions.

100 MPa	150 °C
Max pressure	Max temperature

AVS 700

Acoustic Velocity System

High-precision system measuring P-, S1- and S2-wave velocities and 2/4-point electrical resistivity of saturated core samples.

70 MPa	1 MHz
Triaxial pressure	Ultrasonic freq.

TRUTEST

True Triaxial Rock Compression Test System

Independent control of σx, σy, σz on cubic specimens via six hydraulic actuators driven by three syringe pumps for full 3D stress paths.

100 MPa	0.5 µm
Max stress / axis	LVDT resolution

CHOOSE THE RIGHT TOOL

System Positioning

Which Floxlab system fits your testing objective?

PREPEAK

WHEN TO CHOOSE

Pre-failure studies needing stable, well-controlled stress without rock failure

KEY APPLICATIONS

- Creep & long-term deformation
- Stress-dependent porosity & permeability
- Acoustic velocity (Vp/Vs)
- Electrical resistivity
- Reservoir depletion simulation

TRILAB

WHEN TO CHOOSE

Full mechanical characterization including failure & post-failure (ASTM D7012)

KEY APPLICATIONS

- Triaxial compressive strength
- Elastic modulus & Poisson's ratio
- Residual strength & softening
- Fracture initiation & AE
- Hydraulic fracturing

ROCLAB

WHEN TO CHOOSE

Pore-volume compressibility under realistic reservoir stress paths

KEY APPLICATIONS

- Hydrostatic compressibility
- Triaxial compressibility
- Uniaxial strain (PPD / CPP)
- Pore & bulk compressibility
- Fully automated test sequences

AVS 700

WHEN TO CHOOSE

Standalone acoustic & petrophysical measurements on saturated cores

KEY APPLICATIONS

- P, S1 & S2 wave velocities
- Dynamic elastic constants
- Young's, Shear & Bulk modulus
- Formation Factor (FF = R_o/Rw)
- 2-point & 4-point resistivity

TRUTEST

WHEN TO CHOOSE

True triaxial loading on cubic specimens — independent σx, σy, σz for full 3D paths

KEY APPLICATIONS

- Independent X, Y, Z stress
- True triaxial strength
- Anisotropic deformation
- Wellbore stability tests
- Hydraulic fracturing 3D / AE 2D-3D

FLOXLAB SYSTEM

PREPEAK

Pre-Failure Triaxial Rock Compression Tester

PREPEAK — Pump-actuated triaxial cell with control workstation and syringe-pump skid

KEY DIFFERENTIATORS

- Pump-actuated triaxial design — built-in hydraulic piston
- Optimized for pre-failure loading — rock stays intact
- Independent radial & axial confining pressures
- Enables acoustic, petrophysical and mechanical studies
- Fully customizable — Hastelloy option for corrosive fluids

KEY SPECIFICATIONS

70 MPa Axial / Confining / Pore	**445 kN** Max axial load
150 °C Max temperature	**54.7 mm** Specimen diameter

APPLICATIONS

Creep • Stress-dependent porosity & permeability • Acoustic velocity • Electrical resistivity • Reservoir depletion

FLOXLAB SYSTEM

TRILAB

Triaxial Rock Compression Tester — ASTM D7012 compliant

TRILAB — Pressure-balanced triaxial cell with integrated control & acquisition station

KEY DIFFERENTIATORS

- Pressure-balanced deviatoric piston
- Full failure & post-failure
- ASTM D7012-compliant stress paths
- Multi-physics integration

FOUR MODEL VARIANTS

Model	Axial load	Pressure	Spec Ø
TRILAB 1000 / 70	1,000 kN	70 MPa	≤ 54.7 mm
TRILAB 1000 / 100	1,000 kN	100 MPa	≤ 54.7 mm
TRILAB 2500 / 70	2,500 kN	70 MPa	54.7–100 mm
TRILAB 2500 / 100	2,500 kN	100 MPa	54.7–100 mm

APPLICATIONS

Compressive strength • Elastic modulus • Poisson's ratio • Residual strength • Fracture initiation • Hydraulic fracturing + AE

FLOXLAB SYSTEM

ROCLAB

Automated Pore Volume Compressibility System

ROCLAB — Automated reservoir-condition compressibility test bench

THREE TEST GEOMETRIES

HYDROSTATIC

Effective stress test
Simulated reservoir stress
Pore & bulk compressibility

TRIAXIAL

Varying radial or axial stress
Pore & bulk compressibility
in 3D stress state

UNIAXIAL STRAIN

Pore Pressure Depletion
Constant Pore Pressure
Zero radial-strain condition

APPLICATIONS

Reservoir compaction • Pore-volume reduction • Subsidence studies • Depletion simulation • Effective-stress calibration

FLOXLAB SYSTEM

AVS 700

Acoustic Velocity System

AVS 700 — Standalone acoustic & petrophysical bench for saturated core samples

KEY DIFFERENTIATORS

- P, S1 & S2 wave travel-time measurement
- 2-point and 4-point brine-saturated resistivity
- Dedicated acoustic & petrophysical standalone system
- Dynamic elastic constants + Formation Factor
- Compatible with PREPEAK / TRILAB / ROCLAB ecosystem

KEY SPECIFICATIONS

70 MPa Triaxial pressure	**1 MHz** Ultrasonic freq.
120 °C Max temperature	**12 Hz–10 kHz** LCR frequency range

APPLICATIONS

Seismic property calibration • Dynamic elastic moduli • Formation evaluation • Microcrack analysis • Anisotropy characterization

FLOXLAB SYSTEM

TRUTEST

True Triaxial Rock Compression Test System

TRUTEST — True triaxial cell with six hydraulic actuators and three syringe-pump units

KEY DIFFERENTIATORS

- Independent control of σx, σy, σz on cubic specimens
- Six hydraulic actuators in three opposing pairs (X, Y, Z)
- Three syringe pumps — one per axis pair
- Closed-loop servo stress control, parasitic-free loading
- Optional acoustic velocity, AE, hydraulic fracturing

KEY SPECIFICATIONS

100 MPa Max stress / axis	**0.5 µm** LVDT resolution
100^3–300^3 mm Cubic specimens	**6 actuators** 3 axis-pairs

APPLICATIONS

3D stress reproduction • Anisotropic deformation • Wellbore stability • Hydraulic fracturing • 2D / 3D Acoustic Emission

AT-A-GLANCE SIDE-BY-SIDE

Technical Comparison

Specifications side-by-side — all five systems

Parameter	PREPEAK	TRILAB	ROCLAB	AVS 700	TRUTEST
Test type	Pre-failure triaxial	Failure triaxial	Pore compressibility	Acoustic + resistivity	True triaxial
Max axial load	445 kN	1,000–2,500 kN	—	—	—
Max pressure (axial / conf. / pore)	70 MPa	70 or 100 MPa	100 MPa	70 MPa	100 MPa / axis
Max temperature	150 °C	150 °C	150 °C	120 °C	150 °C
Specimen geometry	Ø 54.7 mm cyl.	Ø ≤ 100 mm cyl.	1" / 1.5" cyl.	1" / 1.5" / 30 mm cyl.	100^3 / 200^3 / 300^3 mm cubes
Standards	—	ASTM D7012	—	—	—
Wetted parts	SS / Hastelloy	SS / Hastelloy / Inconel	SS / Hastelloy	SS / Hastelloy	Stainless steel
Key output	Stable stress paths, Vp/Vs, permeability	Strength, elastic moduli, fracture	Pore & bulk compressibility	Dynamic moduli, Formation Factor	True 3D stress–strain, AE 3D

All five systems share the same pump technology, workstation philosophy and optional test modules where applicable.

ONE PLATFORM, FIVE SYSTEMS

Common Ecosystem

Shared pump technology, workstation and optional test modules across the entire range. Once an operator is trained on one system, the others are immediately familiar.

AUTOMATED SYRINGE PUMPS

- Independent axial / confining / pore control
- Modes: pressure, force, displacement, strain, flow
- Working pressure up to 70 or 100 MPa
- Volume 175 to 250 cc
- Flow range 0.0001 to 60 cc/min

SUPERVISION & REPORTING

- Synoptic live display, pump & heating control
- Real-time mechanical & petrophysical acquisition
- Automatic property calculation
- Standardized reporting
- Full data archiving and traceability

SIX OPTIONAL TEST MODULES

CREEP & DEFORMATION

In-vessel LVDTs and extensometer for long-term strain measurement

PERMEABILITY

LP-700 module — Darcy law, range 0.01 mD to 10 Darcy

ELECTRICAL RESISTIVITY

2-point / 4-point measurement, LCR meter 12 Hz – 10 kHz

ACOUSTIC VELOCITY

P, S1 & S2 waves at 1 MHz, operation up to 120 °C

ACOUSTIC EMISSION

Six lateral sensors, 16-bit / 10 MHz, ~2 mm location accuracy

HYDRAULIC FRACTURING

Ø 6.35 mm boreholes with real-time AE tracking

GET IN TOUCH

Contact Us

Discover our complete range of rock-mechanics testing systems

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Sales & technical enquiries welcome

FLOXLAB

Rock Mechanics • Triaxial Systems • Acoustic & Petrophysical Measurements • Custom Solutions

GLOBAL PRESENCE

Floxlab supplies high-pressure laboratory instruments worldwide

floXlab

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

TRILAB

Triaxial Rock Compression Tester

A versatile, ASTM D7012-compliant triaxial system for complete rock-mechanics characterization — independent control of axial stress, confining pressure and pore pressure to reproduce realistic underground conditions.

ROCK STRENGTH • FAILURE TESTING • ASTM D7012

FLOXLAB

Overview

A versatile triaxial system for complete rock-mechanics characterization.

2,500 kN
Maximum axial load (top model)

100 MPa
Pressure capacity (top model)

150 °C
Operating temperature

100 mm
Max. specimen diameter

KEY FEATURES

Reproduces a realistic 3D stress environment
Independent control of axial stress, confining pressure and pore pressure reproduces underground stress conditions with high accuracy.

Full mechanical characterization
Triaxial compressive strength, elastic modulus, Poisson's ratio, deformation behaviour and post-failure response.

Fracture & long-term studies
Fracture initiation, microcrack evolution, creep and long-term compaction.

Multi-physics integration
Combines hydraulic and acoustic measurements to reveal how stress influences fluid flow, pore structure and seismic properties.

Hydraulic fracturing with Acoustic Emission
High-resolution view of fracture initiation, propagation and damage evolution.

Testing Capabilities

Full characterization of rock mechanical, petrophysical and fracture behaviour — ASTM D7012 compliant.

Strength & Deformation

ASTM D7012 COMPLIANT

- **Pre-failure stress–strain**
  Elastic modulus, onset of non-linearity, microcrack initiation
- **Triaxial compressive strength**
  Maximum deviatoric stress under controlled confining pressure
- **Residual stress & creep**
  Post-failure load-bearing capacity, strain softening, time-dependent strain

Petrophysical Properties

STRESS-DEPENDENT RESPONSE

- **Rock compressibility & porosity**
  Stress-induced volume reduction and pore-throat closure
- **Stress-dependent permeability**
  Anisotropic flow in the deforming pore network
- **Acoustic velocity & electrical resistivity**
  Microcrack closure, anisotropy development, pore-structure evolution

Damage & Fractures

AE & HYDRAULIC FRACTURING

- **Acoustic Emission (AE)**
  Microcrack initiation and damage evolution during loading
- **Hydraulic fracturing AE**
  Borehole pressurization, fracture initiation and propagation tracking

Model Variants

Four configurations to match your test-load and pressure requirements.

ENTRY LEVEL

TRILAB 1000 / 70 MPa

AXIAL LOAD	1,000 kN
PRESSURE	70 MPa
SPECIMEN Ø	≤ 54.7 mm

HIGH PRESSURE

TRILAB 1000 / 100 MPa

AXIAL LOAD	1,000 kN
PRESSURE	100 MPa
SPECIMEN Ø	≤ 54.7 mm

HIGH LOAD

TRILAB 2500 / 70 MPa

AXIAL LOAD	2,500 kN
PRESSURE	70 MPa
SPECIMEN Ø	54.7 – 100 mm

FLAGSHIP

TRILAB 2500 / 100 MPa

AXIAL LOAD	2,500 kN
PRESSURE	100 MPa
SPECIMEN Ø	54.7 – 100 mm

All models share identical scope of supply, cell architecture and optional test modules · Ambient to 150 °C · Hastelloy / Inconel option available

Get in Touch

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

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ROCK STRENGTH • FAILURE TESTING • ASTM D7012

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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

FLOXLAB

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.

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ROCK MECHANICS • TRIAXIAL SYSTEMS • CUSTOM SOLUTIONS

floXlab

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

ROCLAB

Automated Pore Volume Compressibility System

A fully-automated triaxial system that determines hydrostatic, triaxial and uniaxial-strain pore volume compressibility of rock specimens — under independently-controlled axial, confining and pore pressures up to 100 MPa.

PORE COMPRESSIBILITY • RESERVOIR SIMULATION • AUTOMATED TESTING

FLOXLAB

Overview

Fully-automated pore volume compressibility under simulated reservoir conditions.

100 MPa
Axial / Confining / Pore pressure

150 °C
Operating temperature

1.5"
Specimen diameter (1" / 1.5")

4"
Maximum specimen length

WHAT ROCLAB DELIVERS

DETERMINES

- Hydrostatic pore volume compressibility
- Triaxial pore volume compressibility
- Uniaxial-strain pore volume compressibility

MEASURES

- Radial & axial strains
- Pore volume change
- Bulk compressibility

BUILT FOR

- Reservoir-depletion simulation
- Constant-pore-pressure tests
- Stainless steel / Hastelloy wetted parts

Test Methods

Three stress-state methodologies for pore & bulk compressibility under simulated reservoir conditions.

Hydrostatic

EQUAL STRESS IN ALL DIRECTIONS

- **Effective Stress Test**
  Constant pore pressure, varying hydrostatic stress
- **Simulated Reservoir Stress**
  Varying pore pressure, constant hydrostatic stress
- **Outputs: pore & bulk compressibility**
  Reference baseline under isotropic loading

Triaxial

INDEPENDENT AXIAL AND RADIAL STRESSES

- **Effective Stress Test**
  Varying radial or axial stress at constant pore pressure
- **Simulated Reservoir**
  Varying pore pressure at constant axial & radial stress
- **Outputs: pore & bulk compressibility in 3D stress state**
  Realistic anisotropic reservoir conditions

Uniaxial Strain

ZERO-RADIAL-STRAIN DEPLETION

- **Pore Pressure Depletion (PPD)**
  Varying pore pressure at constant axial pressure
- **Constant Pore Pressure (CPP)**
  Varying axial pressure at constant pore pressure
- **Condition: zero radial strain — confining pressure auto-adjusted**
  Simulates in-situ reservoir compaction

System Architecture

Modular hydraulic architecture with independently-controlled pressure circuits and unified workstation.

01 Heated Pressure Vessel

Applies axial stress, confining and pore pressure to the rock specimen with precise temperature control. Quick-release endcap, electrical heating mantle, integrated platens.

02 In-Vessel Instrumentation

Radial and axial strain sensors, pore-volume and pressure transducers — direct measurement of the specimen response under simulated stress.

03 Axial Pressure Pump

Servo-controlled syringe pump generating axial stress with high accuracy and stable flow throughout all test phases.

04 Confining Pressure Pump

Independently regulates the confining pressure — automated adjustment for zero-radial-strain conditions in uniaxial-strain mode.

05 Pore Pressure Pump

Controls pore-fluid pressure and flow rate independently from confining and axial circuits — for fully decoupled stress states.

06 Control & Reporting Station

Synoptic display with live status, fully automated test sequences, real-time acquisition, automatic compressibility calculation and report generation.

Get in Touch

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

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AVS 700

Acoustic Velocity System

A high-pressure laboratory system for compressional and shear-wave velocity measurement coupled with brine-saturated core resistivity — for dynamic elastic constants, formation factor and acoustic impedance under simulated reservoir conditions.

ACOUSTIC VELOCITY • RESISTIVITY • ELASTIC CONSTANTS

FLOXLAB

Overview

Acoustic & resistivity measurements under simulated reservoir conditions.

70 MPa

Axial / Confining / Pore pressure

120 °C

Operating temperature

1.5"

Specimen diameter (1" / 1.5" / 30 mm)

4"

Maximum specimen length

WHAT AVS 700 DELIVERS

MEASURES

- P, S1 & S2 wave travel time
- 2-point & 4-point brine-saturated core resistivity
- Pressure, temperature, frequency

DETERMINES

- Compressional & shear acoustic velocities (Vp, Vs1, Vs2)
- Dynamic elastic constants
- Formation Factor & acoustic impedance

BUILT FOR

- Reservoir characterization
- Multi-physics petrophysical studies
- Stainless steel / Hastelloy wetted parts

Measurement Principles

Two coupled measurement physics on the same core sample under controlled stress and temperature.

Acoustic Velocity Principle

PULSER / RECEIVER + PIEZOELECTRIC PLATENS

- **Compressional & shear waves**
  P, S1 and S2 waves propagated through the core sample.
- **Acoustic velocities**
  Vp, Vs1, Vs2 calculated from the measured travel times.
- **Dynamic elastic constants**
  Poisson's ratio, Young's modulus, bulk and shear modulus, Lamé's constant, compressibility, acoustic impedance.

VELOCITY

$$V = L / t$$

Velocity = Length / Travel time

Three propagation modes: P, S1, S2

Resistivity Principle

LCR METER · 2-POINT & 4-POINT CONFIGURATIONS

- **Brine-saturated core resistivity**
  Measure R_o vs pressure, temperature and frequency (12 Hz – 10 kHz).
- **4-point configuration**
  Two axial current electrodes (i_1, i_2) and two lateral voltage electrodes (v_1, v_2) reduce contact resistance errors.

FORMATION FACTOR

$$FF = R_o / Rw$$

Brine-saturated core / Brine resistivity

LCR meter: 12 Hz – 10 kHz

System Architecture

Integrated HP/HT vessel, acoustic and resistivity instrumentation, manual pressurization and unified control station.

01 HP / HT Pressure Vessel

Stainless-steel triaxial vessel with isolated piston, temperature probe and core inlet/outlet — operating up to 70 MPa and 120 °C. Heater and cooling jacket optional.

02 Acoustic Platens

Isolated platens with P, S1, S2 piezoelectric transducers and dedicated acoustic feedthrough — for compressional and dual-shear-wave propagation through the sleeved core.

03 Resistivity Platens (option)

Electrically-isolated electrodes for 2-point or 4-point configuration — two axial current and two lateral voltage electrodes for accurate, low-error measurements.

04 Pulser / Receiver

High-speed generator and oscilloscope acquisition for travel-time determination of P, S1 and S2 waveforms.

05 Pumps & Brine Accumulator

Manual axial and confining pumps with brine piston accumulator — independent control of axial, confining and pore pressure.

06 Computer Station & Software

Synoptic display and acquisition control. Computes Vp, Vs1, Vs2, dynamic elastic constants, R_o and Formation Factor with full report generation.

Get in Touch

Speak to our specialists about your application — every AVS 700 system is configured to your research.

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ACOUSTIC VELOCITY • RESISTIVITY • ELASTIC CONSTANTS

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

FLOXLAB

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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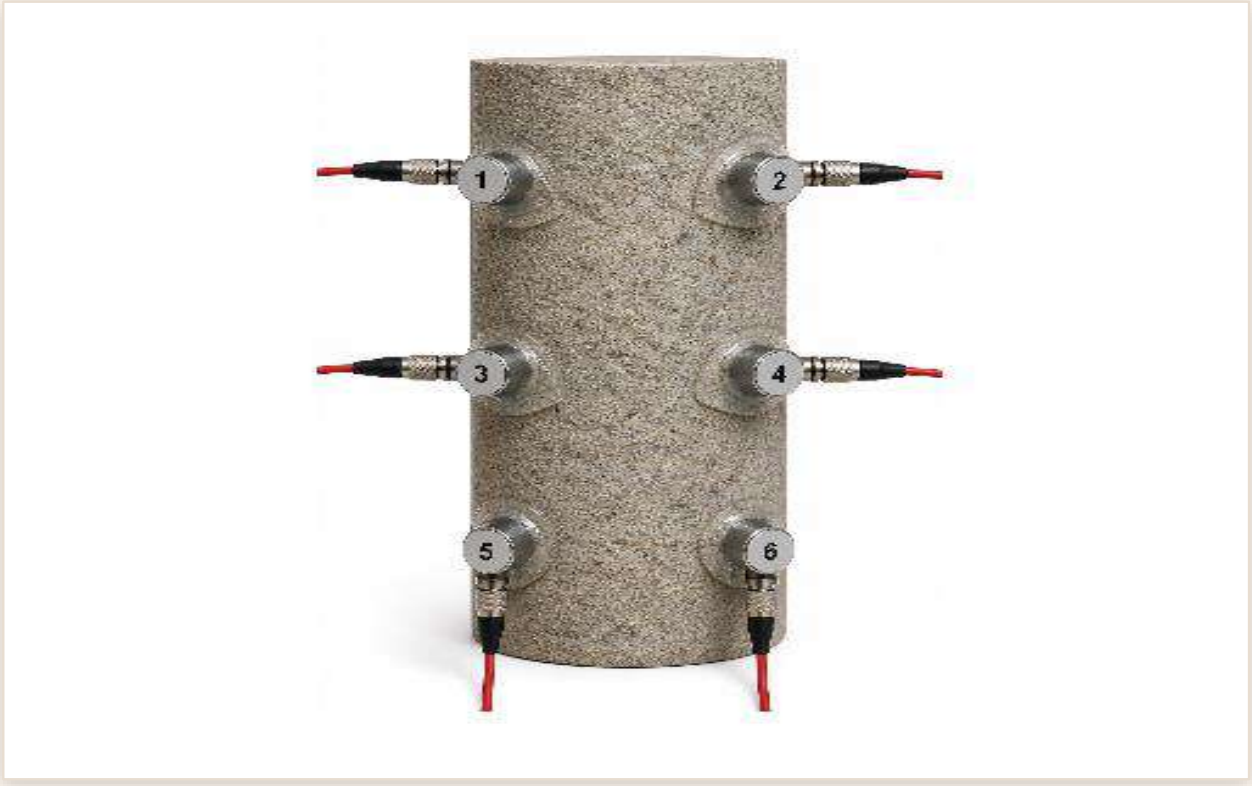
TRUE TRIAXIAL • ROCK MECHANICS • 3D STRESS PATHS

PRODUCT BROCHURE

AE MONITORING SYSTEM

Acoustic Emission Sensors & Software



How sensors reveal cracks, direction and fracture shape — inside solid rock

ROCK MECHANICS | HYDRAULIC FRACTURING | DAMAGE MONITORING

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Rocks speak — and we listen.

Acoustic Emission (AE) monitoring captures the bursts of sound released by every microcrack inside a stressed rock — and pinpoints exactly where each one forms.

1 Squeeze a rock — and it cracks.

Long before the rock breaks in two, thousands of tiny cracks open inside it. Each is invisible to the eye — but each releases a tiny burst of sound.

2 Tiny sensors hear every click.

Highly sensitive sensors are mounted around the rock surface. They pick up these micro-bursts — called Acoustic Emissions — like a stethoscope hears a heartbeat.

> ***Every "click" tells us a microcrack just formed — and where it formed.***

Pinpointing each crack

How do we know exactly WHERE each crack is?

A

Many sensors, one click

An array of sensors is placed around the rock. When a crack opens, each sensor hears the click at a slightly different moment.

B

Time tells distance

Sound travels at a known speed in rock. A small time difference between sensors means the source is closer to one than the other.

C

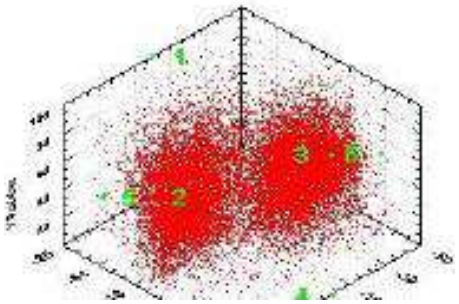
Triangulation

By comparing arrival times across all sensors, the computer pinpoints the crack — accurate to about 2 millimetres.

THE RESULT

A 3D map of every crack, as it happens.

A 3D map showing every crack — its location, timing and strength — as the test unfolds. Like watching a thunderstorm form, but inside a solid rock.



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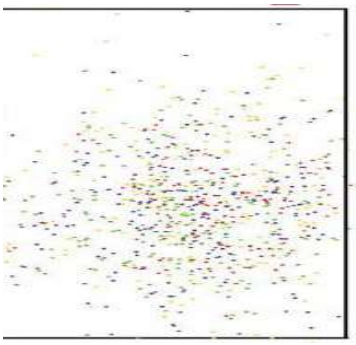
Watching a fracture form — in three stages

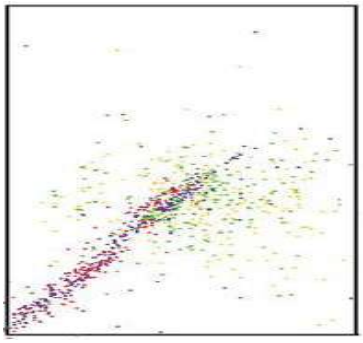
As the load increases, the AE pattern tells the story of the fracture.

1 Scattered



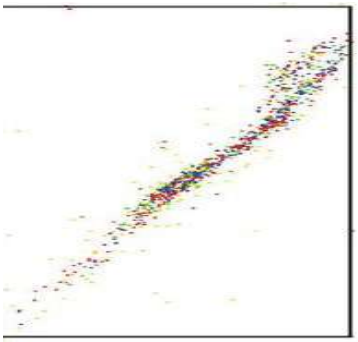
Random microcracks appear throughout the rock. No clear pattern yet — early damage.

2 Lining up



Cracks begin clustering along a diagonal plane. A fault is being born.

3 Fault formed



Cracks now align tightly along a single plane — the fault has cut through the rock.

✓ Confirmed

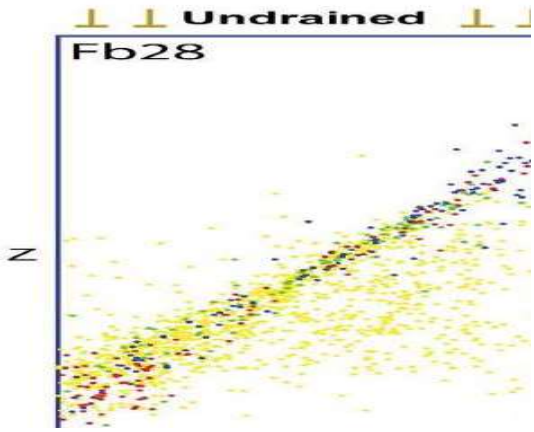
Cut the rock open: the real fracture matches exactly where the sensors said it was.

The AE map predicts the fracture before the rock breaks — and matches it perfectly afterwards.

Reading fracture direction & shape

Each fracture has its own signature — and the AE pattern reveals it.

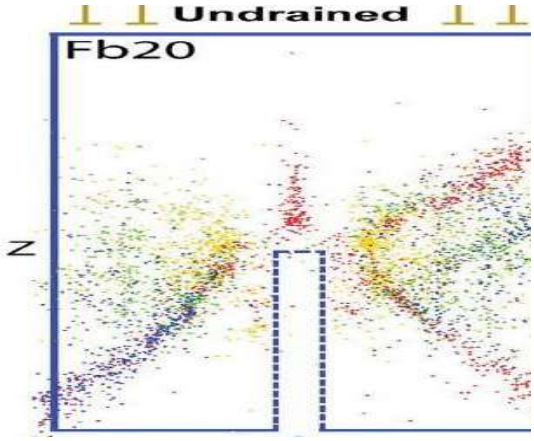
CASE 1 A simple diagonal fault



AE map **Real fracture**

Cracks line up along one straight plane — telling us a single, clean fault formed at a specific angle.

CASE 2 A complex branching fracture



AE map **Real fracture**

Cracks fan out from the centre — multiple branches form a network. The AE map captures the whole shape.

Why this matters

From the laboratory to real-world energy and earth-science applications.

PREDICT before it breaks

AE activity ramps up sharply just before a rock fails — giving an early warning of catastrophic failure.

UNDERSTAND fracture mechanics

Direction, shape and timing of cracks reveal HOW a rock breaks — vital for designing safer tunnels, dams and wells.

DESIGN energy resources

Used in oil & gas, geothermal, CO_2 storage and mining — wherever fluids are injected into rock or stress is applied underground.

VALIDATE engineering models

Real lab data on fracture initiation and growth lets engineers calibrate computer simulations of real rock formations.

AE turns the inside of a rock into a window —

making the invisible visible.

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Inside the Floxlab AE Monitoring System

An array of high-sensitivity AE sensors and a dedicated software suite — designed to detect and locate microcracking in real time during rock testing.

HARDWARE • Array of AE sensors

- Lateral high-sensitivity AE sensor array
- Full radial coverage around the rock specimen
- Resonant response at 300 kHz, range 125–750 kHz
- Compact miniature design (8 mm OD × 8 mm H)
- Stainless-steel case, ceramic face, BNC connector
- Operating temperature up to 177 °C
- Mounts around cylindrical or cubic samples

FLOXLAB AE SOFTWARE

- Real-time acquisition and post-processing
- 16-bit · 10 MHz · 8-channel high-resolution acquisition
- 1D / 2D / 3D source localization (~2 mm accuracy)
- Live fracture morphology mapping
- Waveform & time-frequency analysis (FFT, wavelets)
- Automatic / manual filtering with alarms & triggers
- Direct export to Word & Excel · remote monitoring

AE SENSORS — KEY SPECIFICATIONS

Medium-frequency resonant miniature sensors

OPERATING FREQUENCY RANGE
125 – 750 kHz

RESONANT FREQUENCY
300 kHz (V/µbar) / 140 kHz (V/m/s)

PEAK SENSITIVITY
62 dB Ref V/(m/s) · −72 dB Ref V/µbar

DIRECTIONALITY
± 1.5 dB

DIMENSIONS
8 mm OD × 8 mm H

WEIGHT
2 g (8 g with cable & connector)

TEMPERATURE RANGE
−65 °C to +177 °C

MATERIALS
Stainless steel · ceramic face · BNC

Additional features: 40 dB amplification · 32–1000 kHz programmable filters · 500 g shock limit · Enclosed crystal for RFI/EMI immunity · NIST calibration certificate

HIGH-RESOLUTION ACQUISITION • 16-bit • 10 MHz sampling • 8 channels • 40 dB amplification • 32–1000 kHz filters

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CONTACT US

Compatible Floxlab test systems

The AE Monitoring System is fully integrated with Floxlab rock-mechanics platforms — for triaxial compression and hydraulic fracturing tests.

FRACLAB

Hydraulic Fracture Test System

Triaxial compression with integrated hydraulic fracturing — for cylindrical specimens under high pressure and elevated temperature.

GEOTEST

Rock Triaxial Compression Test

Load-frame triaxial system with cell pressures up to 210 MPa and load capacity up to 2,000 kN, for cylindrical rock specimens.

TRUTEST

True-Triaxial Test System

True-triaxial platform applying independent stresses on three axes — for cubic rock specimens and complex stress paths.

GET IN TOUCH

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FLOXLAB | ROCK MECHANICS TESTERS

AVS

Acoustic Velocity System

Measurement of P, S_1 and S_2 acoustic velocities and determination of dynamic elastic constants on rock specimens

COMPLIANT WITH **ASTM D2845**

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System overview

FLOXLAB | ROCK MECHANICS TESTERS

A turnkey ultrasonic measurement package for determining compressional and shear wave velocities in rock specimens — under ambient, uniaxial or triaxial stress.

KEY FEATURES

- **P, S_1 and S_2 wave velocity measurement**

  Compressional and shear wave acquisition at 1 MHz.

- **Dynamic elastic constants computation**

  Young's modulus, Poisson's ratio, shear, bulk and Lamé parameters.

- **Compatible with Floxlab acoustic cells**

  Also accepts the end-user's own acoustic transducers.

- **Complete turnkey package**

  Pulser/receiver, acoustic platens, switch box, cables, acquisition and analysis software.

- **ASTM D2845 compliant**

  Standard methodology for ultrasonic velocity laboratory testing of rock.

- **Ambient or stress-loaded operation**

  Operable under ambient, uniaxial and triaxial confining conditions.

STANDARD

ASTM D2845

Laboratory ultrasonic velocity testing of rock

FREQUENCY

1 MHz

P, S1 and S2 transducers integrated in acoustic platens

Package composition

All components delivered ready-to-use — installation, training and commissioning available on request.

01

Pulser / Receiver

Ultrasonic transducer excitation and waveform signal display.

02

Acoustic platens

Two platens with integrated P, S_1 and S_2 transducers at 1 MHz.

03

Switch box

PC-controlled Tx / Rx channel switching for P, S_1, S_2 selection.

04

Cables & accessories

Complete wiring, acoustic coupling gel and toolbox.

05

Acquisition software

Automated control of gain / range / delay and curve saving.

06

Analysis software

Determination of V_P, V_{S1}, V_{S2} and elastic constants computation.

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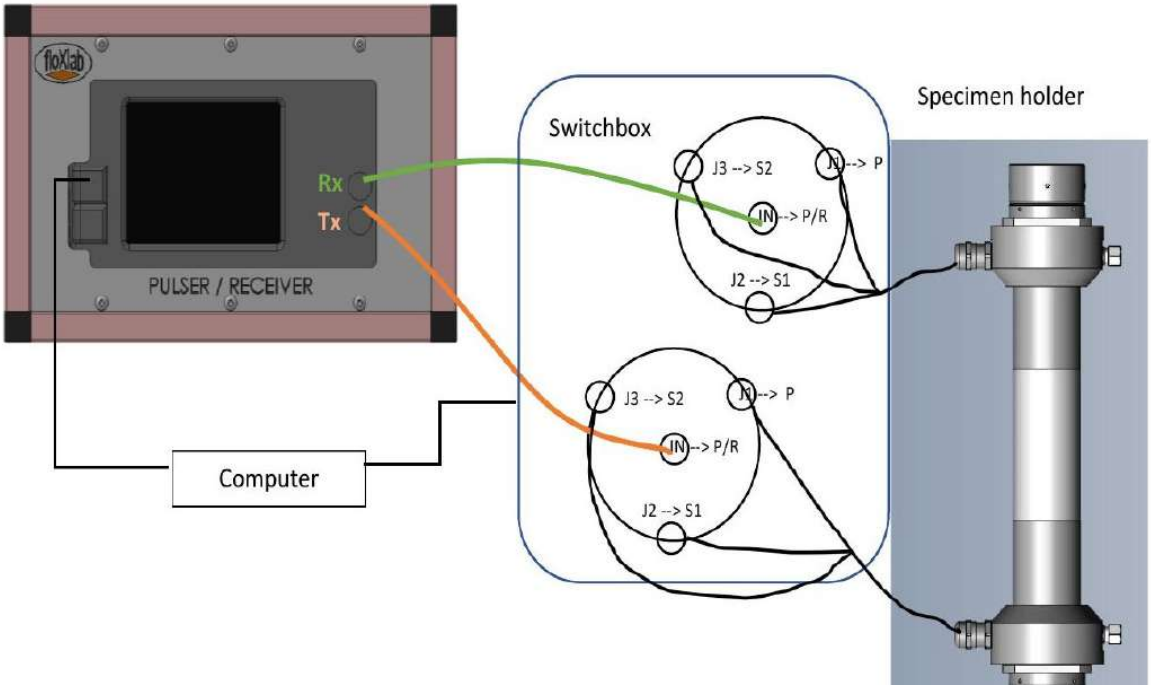
System architecture

Wiring scheme : pulser/receiver ↔ switch box ↔ specimen holder



KEY POINTS

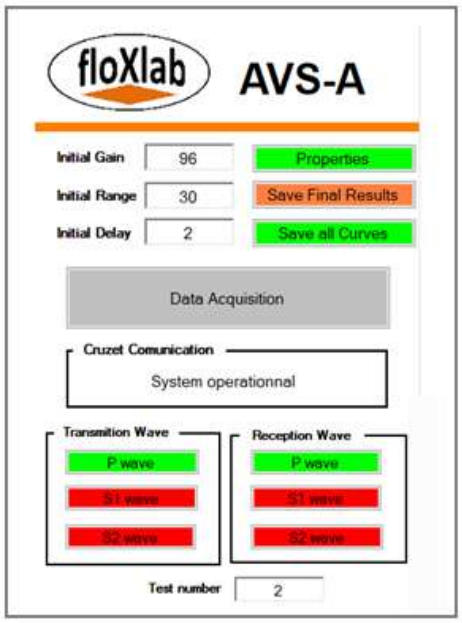
- **Tx (orange)** Emission channel to transmitter transducer
- **Rx (green)** Reception channel from receiver transducer
- **RJ45 control** Switch box driven via RJ45 — P / S_1 / S_2 selection by software
- **USB link** Pulser/receiver connected to PC via USB

Software & acquisition

FLOXLAB | ROCK MECHANICS TESTERS

APPLILAB acquisition and processing interface

APPLILAB INTERFACE



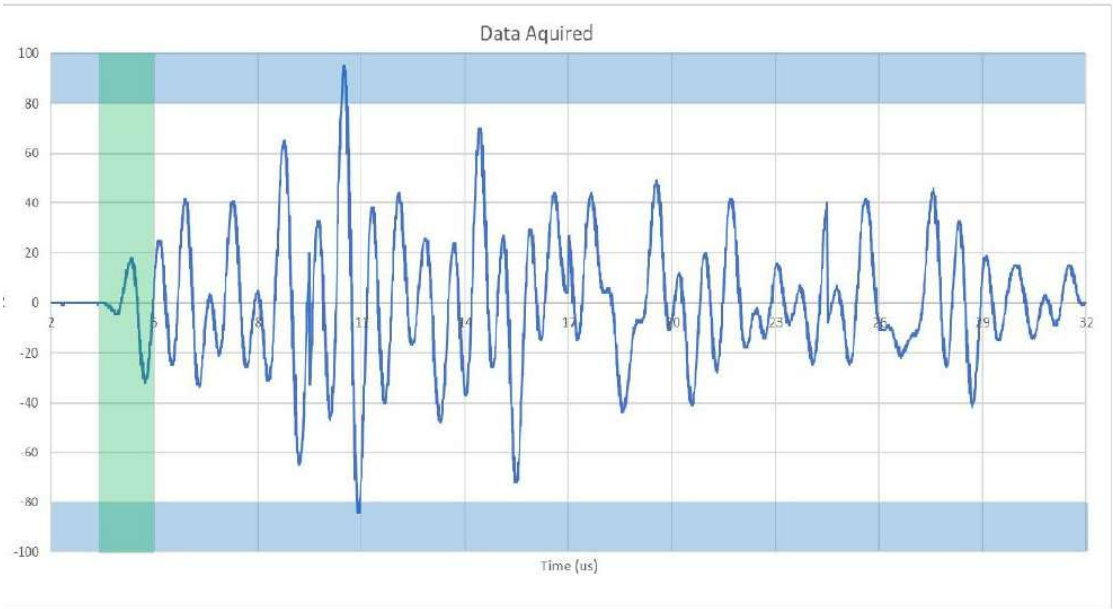
ACQUISITION PARAMETERS

- **Gain (dB)** — Signal amplitude in 80–100 % range
- **Range (µs)** — Temporal acquisition window
- **Delay (µs)** — Window start offset
- **Wave type** — P, S_1 or S_2 selection

SOFTWARE FUNCTIONS

- Manual or automated acquisition
- Curve and final result saving
- Switch-box communication
- Real-time signal visualisation

ACQUIRED SIGNAL EXAMPLE



Measurement & calibration

FLOXLAB | ROCK MECHANICS TESTERS

Acoustic velocity test on rock core specimen — step-by-step procedure

MEASUREMENT PROCEDURE

1 Specimen preparation

Machining as per ASTM D4543 — flat parallel surfaces, saturation control.

2 Coupling gel

Apply acoustic coupling gel to both faces of the specimen.

3 Positioning

Centre the specimen between the platens.

4 Holding

Heat-shrink tubing or Hoek cell to hold the assembly.

5 Acquisition

Launch software, select wave type (P, S_1, S_2), tune gain / range / delay.

6 Analysis

Time-of-flight selection, automatic computation of velocities and elastic constants.

CALIBRATION PROCEDURE

A TOF measurement (no specimen)

Press platens together with coupling gel; measure TOF of P, S_1, S_2 waves.

B Enter the time shift

Report values into result sheet — correction is subtracted automatically.

C Product validation

Compare data on a copper reference plug with factory calibration data.

D Gel renewal

Renew acoustic coupling gel between transducer and bottom platen monthly.

Data interpretation & specs

FLOXLAB | ROCK MECHANICS TESTERS

Automatic computation of dynamic elastic constants from V_P, V_S and bulk density (isotropic specimens).

DYNAMIC ELASTIC CONSTANTS

E	**Young's modulus** Unit : Pa	ν	**Poisson's ratio** Unit : —	μ	**Shear modulus** Unit : Pa
K	**Bulk modulus** Unit : Pa	λ	**Lamé's constant** Unit : Pa	k	**Compressibility** Unit : Pa^{-1}

ACOUSTIC VELOCITY RESULT SHEET

TECHNICAL SPECIFICATIONS

Standard	ASTM D2845
Resonance frequency	1 MHz
Measurement modes	Compressional (P) and shear (S_1, S_2) waves
Pulser / Receiver	340 × 235 × 360 mm
Power supply	100–240 VAC, 50–60 Hz
Ingress protection	IP53
Operating temperature	5 °C to 40 °C (ambient)

Contact us

FLOXLAB | ROCK MECHANICS TESTERS

Get in touch with our team

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PRODUCT BROCHURE

Floxlab Sensors

High-Precision Instrumentation for Rock Mechanics

CE-Series circumferential extensometer mounted on a rock specimen

Strain • Displacement • Load measurement under triaxial conditions

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ABOUT FLOXLAB

Engineered for the lab

Sensors built for rock mechanics & geotechnical testing

Founded near Paris, France, Floxlab specialises in the design and manufacture of sensors and instrumentation dedicated to rock mechanics and geotechnical laboratories. Our extensometers, LVDT sensors, in-vessel load cells and reference calibrators are used worldwide for uniaxial and triaxial compression testing — operating reliably under high pressures, high temperatures and demanding fluid environments.

UP TO 200 °C	±0.02 % FS	UP TO 2000 kN
Operating temperature for in-vessel use	Calibrator accuracy class	Load measurement capacity

PRODUCT RANGE AT A GLANCE

CE-Series	*Circumferential extensometer*	Direct circumferential strain measurement on cylindrical specimens via custom roller chains. Diameters from 21.5 to 100 mm.
DE-Series	*Diametral extensometer*	Two orthogonal diametral strains, individual or averaged. Three sizes: DE-55, DE-75, DE-100.
ASL-Series	*Axial strain LVDT*	Three vertically adjustable rods mounted between loading platens. ASL-55 (±2.5 mm) and ASL-100 (±5 mm).
Load Cell	*In-vessel strain-gauged*	Sealed load cell for placement directly inside triaxial pressure vessels. Capacities up to 2000 kN (higher if required).
Calibrators	*Reference standards*	Load-cell calibrator (±0.02% FS) plus CEC and ALC calibrators for circumferential / axial transducers.
Electronics	*Conditioning & acquisition*	Optional signal conditioning electronics and real-time data-acquisition software for any test setup.

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CE-Series

Circumferential extensometer — uniaxial & triaxial compression

CE on rock specimen

DESCRIPTION

- Measures average change in circumference directly on the specimen
- High-precision custom roller chain mounts the extensometer
- Circumferential change monitored with strain gauges
- Self-supported on the sample with integral springs
- Mechanical adjustment to set output to zero
- Breakaway device protects sensor on specimen rupture
- Operates inside the vessel — high-P° / high-T° oil environments

KEY FEATURES

Model	**CE**
Linearity	**0.5 % F.S**
Circumferential range	**4 mm**
Operating temp.	**up to 200 °C**
Bridge	**Wheatstone strain-gauge**

CHAIN RANGE

21.5 mm EX core	25.4 mm 1”	30.1 mm AX core
38.1 mm 1.5”	42.0 mm BX core	54.7 mm NX core
63.5 mm HQ core	76.2 mm HX core	100 mm Large core

BENEFITS

- Easy set-up — self-supported on the sample
- Direct, repeatable circumferential reading
- Triaxial cell or uniaxial compression
- Wide specimen range via interchangeable chains
- Breakaway protection on rupture

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DE & ASL Series

Diametral extensometers and axial strain LVDT sensors

DE-SERIES

Diametral extensometer

For triaxial compression — three standard sizes

- Two orthogonal diametral strains
- Self-supporting via four pressing screws
- Cantilever strain-gauged beams

ASL-SERIES

Axial strain LVDT sensor

Three rods mounted on the loading platen

- Three vertically adjustable measurement rods
- Detects non-uniform specimen behaviour
- Custom manufactured to specimen dimensions

MODEL COMPARISON

Model	Specimen Ø	Range	Linearity	Op. temp.
DE-55	25 – 55 mm	5 mm	0.5 % FS	200 °C
DE-75	55 – 75 mm	5 mm	0.5 % FS	200 °C
DE-100	75 – 100 mm	5 mm	0.5 % FS	200 °C
ASL-55	55 – 100 mm	± 2.5 mm	0.25 % FS	200 °C
ASL-100	100 – 200 mm	± 5 mm	0.25 % FS	200 °C

- *All models compatible with strain-gauge or LVDT signal-conditioning electronics. Custom diameters available on request.*

Load Cells, Calibrators & Electronics

IN-VESSEL LOAD CELL

Strain-gauged in-vessel device

0 – 2000 kN +	2 mV/V	0.5
Capacity	Output	Class

- Mineral & synthetic oil compatible
- Eliminates seal-friction errors

LOAD CELL CALIBRATOR

Reference calibration press

1000 kN	±0.02 % FS	170 kg
Capacity	Accuracy	Weight

- On-site calibration capability
- Adjustable mounting bracket

CEC & ALC Calibrators

Reference calibrators for circumferential extensometers (CEC) and axial / diametral LVDT transducers (ALC)

- Resolution: 0.001 mm
- Digital micrometer with high repeatability
- Custom built to suit each transducer family

ELECTRONICS

- Optional signal conditioning
- Bridge-completion + amplification
- Plug-and-play integration

ACQUISITION SOFTWARE

- Real-time display of all channels
- Custom dashboards per setup
- Data export & report generation

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GET IN TOUCH

Let's discuss your application

APPLICATIONS

- **Triaxial compression**
  of intact and fractured rock cores
- **High-pressure testing**
  in confined oil-filled vessels
- **Calibration services**
  for transducers and load cells
- **Uniaxial compression**
  with circumferential / axial strain
- **High-temperature tests**
  up to 200 °C
- **Custom configurations**
  for non-standard specimen sizes

CONTACT

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ROCK MECHANICS • GEOTECHNICAL TESTING EQUIPMENT

HYDROSTATIC ULTRASONIC COREHOLDER

HUC SERIES

Rock-mechanics testing system for ultrasonic and permeability studies of porous media.

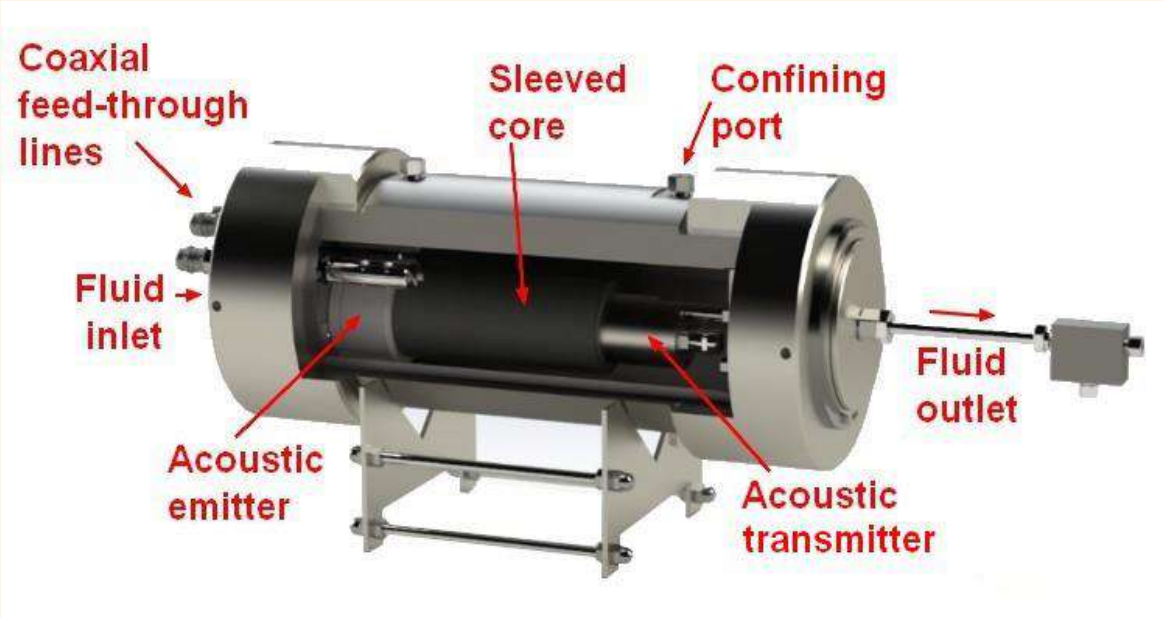
P · S1 · S2
ULTRASONIC WAVES

70 MPa
CONFINING PRESSURE

120 °C
OPERATING TEMPERATURE

OVERVIEW & TEST PROCEDURE

From core loading to ultrasonic and permeability measurement



1

CORE LOADING

Cylindrical sample placed in a Viton sleeve between a fixed acoustic emitter and a floating acoustic receiver. Confining fluid is introduced via the external pump.

2

ULTRASONIC VELOCITY

The pulser excites a piezoelectric transducer; P, S1 and S2 waves propagate through the sample and are recorded by the receiving transducer for velocity calculation.

3

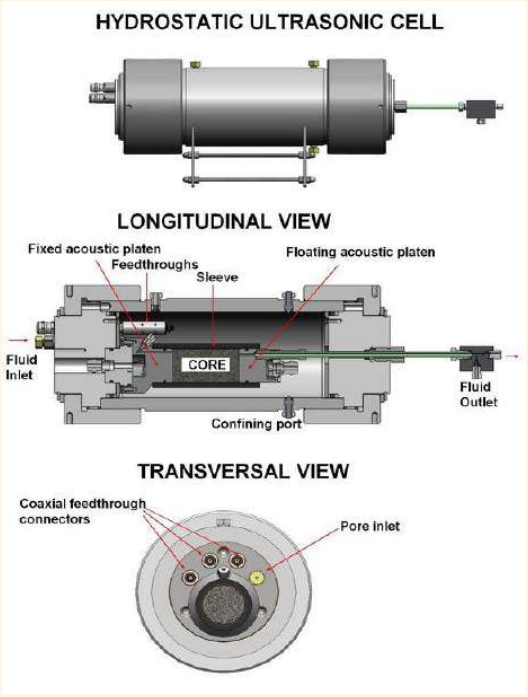
PERMEABILITY

Pore fluid is injected at constant flow rate through the core. The pressure drop across the sample is monitored and permeability calculated by Darcy's law.

CELL DESIGN & SPECIFICATIONS

Internal architecture and standard configuration of the HUC Series

INTERNAL ARCHITECTURE



TECHNICAL SPECIFICATIONS

Confining pressure	**70 MPa (10,000 psi)**
Temperature range	**Ambient → 120 °C**
Acoustic waves	**P · S1 · S2**
Frequency	**1 MHz**
Specimen diameter	**1.5 in (1 in optional)**
Specimen length	**3 in (other on request)**
Wetted parts	**Stainless steel (Hastelloy)**
Pore inlet / outlet	**1 / 1**
Port fittings	**1/8 inch**
Hydraulic fluid	**Silicone oil**

WHAT YOU MEASURE

- Compressional (Vp) and shear (Vs1, Vs2) wave velocities
- Dynamic elastic constants — Young's, bulk, shear, Poisson
- Rock permeability via Darcy's method
- Anisotropy assessment from S1 / S2 separation

KEY FEATURES

- True hydrostatic confining (equal radial & axial)
- Stainless steel build · Hastelloy option
- Floxlab proprietary acquisition software
- Integrated P, S1 and S2 acoustic sensors
- Coaxial feedthroughs for in-vessel signals
- Accommodates a variety of core sizes

GET IN TOUCH

Discover how the HUC Series can support your laboratory.

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FAMILY TWO

Reservoir Stimulation

Advanced systems for proppant characterisation, hydraulic fracture conductivity and acid-fracture testing — supporting unconventional reservoir research and well stimulation engineering.

TECHNICAL BROCHURE

PCT

Proppant Crush Tester

Compliant with ISO 13503-2 · API RP56 · RP58 · RP60

20,000	300	2,000	100
psi	kN	psi/min	kg
Max pressure	*Press stress*	*Loading rate*	*Total weight*

OVERVIEW

Key Points

- **Dedicated to proppant crush-resistance analysis**
- Fully automated — rapid, accurate and reproducible
- ISO 13503-2 & API RP56/58/60 compliant
- Max crush pressure 20,000 psi (300 kN press stress)
- Controlled piston displacement up to 2,000 psi/min
- Servo-controlled load frame with real-time feedback
- Precision control for improved test consistency
- **Compact benchtop design — total weight 100 kg**

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TEST PRINCIPLE

How the PCT Works

The crush test evaluates proppant strength at different closure stresses. Crushed material is the weight percentage of particles smaller than the specified range.

01 — SAMPLE PREP

Proppant sieved at target mesh (12/18, 18/30, 30/50) and filled at 1.22 cm^3/cm^2 in the crush cell.

02 — LOADING

Uniform loading rate up to 2,000 psi/min until the target stress level is reached.

03 — HOLD

Target closure stress maintained for 2 minutes under servo-controlled pressure.

04 — ANALYSIS

Sample re-sieved for 15 minutes; percentage of crushed fines calculated and reported.

MAIN COMPONENTS

Scope of Supply

The PCT system is delivered complete and ready to operate.

1. Proppant Crush Cell
2. Laboratory Press
3. Data Acquisition Station
4. Electronic Balance
5. Sieve Shaker

SPECIFICATIONS

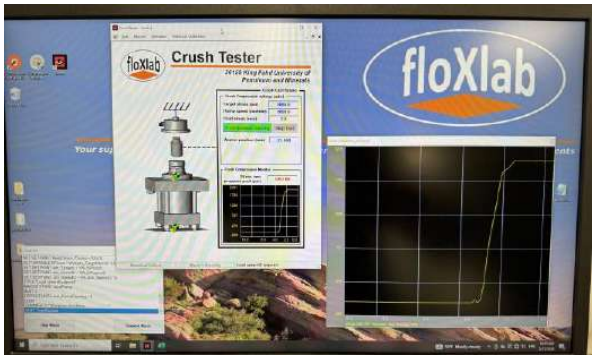
Press & Crush Cell

Complete technical data for the PCT proppant crush tester.

SPECIFICATION	VALUE
Applicable standards	**ISO 13503-2 · API RP56/58/60 · IEC 61010-1**
Max. crush pressure	**20,000 psi**
Press stress	**300 kN**
Loading rate	**Up to 2,000 psi/min**
Crush cell inside diameter	**2.0 in (50.8 mm)**
Crush cell outside diameter	**3.5 in (89 mm)**
Piston height	**3.5 in (89 mm)**
Wetted parts material	**Stainless steel**
Operating temperature	**Ambient (5 °C to 40 °C)**
Power supply	**110–230 VAC · 50/60 Hz · 1000 W**
Total weight	**100 kg**

SOFTWARE & OPERATION

Applilab — Intuitive Control



SOFTWARE CAPABILITIES

- System initialization with fault check
- Real-time pressure display and plotting
- Selectable units: psi, bar or MPa
- Automated pressure ramp-up (2,000 psi/min)
- 2-minute hold phase (per ISO 13503-2)
- Automatic unloading phase
- Emergency stop and reset controls
- Error code reporting and diagnostics

OPTIONAL ACCESSORIES

Complement Your PCT

Dedicated laboratory equipment essential for ISO 13503-2 compliance.

SIEVE SHAKER

Required to assess proppant particle size distribution before and after the crush test — allows retrieval of particles of a defined size.

Simultaneous ops	**Up to 5**
Mesh sizes	**4 to 200 US**
Sieve height	**50 mm (2 in)**
Sieve diameter	**200 mm (8 in)**
Stack capacity	**7 levels**
Power	**110 / 220 VAC · 50/60 Hz**

ELECTRONIC BALANCE

High-precision digital balance required to weigh proppant samples before and after the crush test.

Weighing range	**600 g**
Accuracy	**0.001 g**
Display	**Digital**
Format	**Compact benchtop**
Power	**110–220 VAC · 50/60 Hz**
Compliance	**ISO 13503-2 ready**

GET IN TOUCH

Thank you for your interest

in our Proppant Crush Tester

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PROPPANT CONDUCTIVITY SYSTEM

PCM 1000

Automated fracture conductivity measurement
under high closure stress

ISO 13503-5 | API RP 56 | API RP 58

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Overview

The PCM 1000 measures proppant pack and fracture conductivities under reservoir-representative pressures and temperatures. Its automated test sequences deliver rapid, accurate and reproducible data — fully compliant with ISO 13503-5 and API RP 56 & 58.

PURPOSE

- Measures proppant pack and fracture conductivities
- Operates under high closure stress and high temperature
- Compatible with brine or gas (N_2) as test fluid

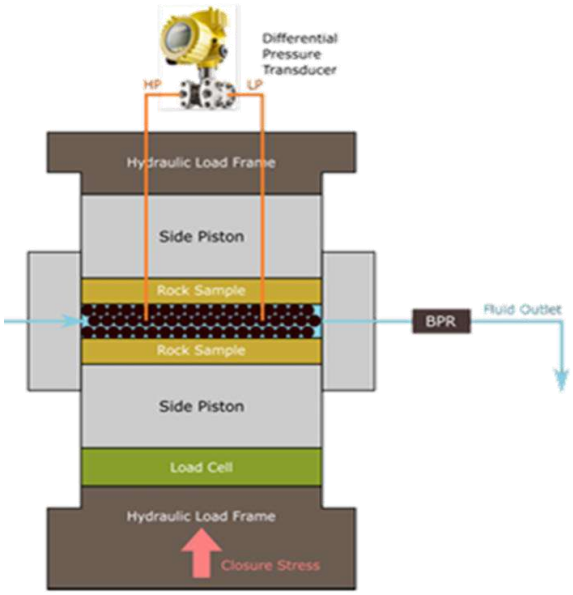
KEY BENEFITS

- Fully automated test sequences
- Rapid, accurate, reproducible data
- Closure stress up to 20,000 psi
- ISO 13503-5 / API RP 56 & 58 compliant

MEASURED PARAMETERS

- Closure pressure
- Flow pressure & temperature
- Pressure drop (ΔP)
- Brine flow & gas flow
- Pack width

HOW IT WORKS — TEST CELL SCHEMATIC



Operating principle

A proppant pack is placed between two Ohio sandstone slabs and held in an API conductivity cell under controlled closure stress. Pre-heated, degassed brine — or nitrogen for compressible-fluid tests — is injected through the pack. Permeability and conductivity are derived from the differential pressure (ΔP) measured across the pack via Darcy's law.

Test Protocol

Proppant pack conductivity measurement procedure

1. Place two Ohio sandstone slabs between the steel platens of the API conductivity cell.
2. Position the proppant pack between the sandstone slabs.
3. Install the cell in the hydraulic compression frame and apply closure stress (1,000 – 20,000 psi).
4. Heat the cell to target reservoir temperature (up to 177 °C / 350 °F).
5. Pre-heat and degas the brine before injection.
6. Inject brine through the pack at controlled flow rate (up to 1,000 psi).
7. Monitor differential pressure (ΔP) across the proppant pack in real time.
8. Compute permeability and conductivity using Darcy's law.
9. Repeat at increasing closure pressures — conductivity decreases with stress due to proppant crushing and embedment.

TEST CONDITIONS

Closure pressure	Temperature	Injection pressure	Test fluid
1,000 – 20,000 psi	ambient – 177 °C	up to 1,000 psi	Pre-heated degassed brine / N_2

PARAMETERS ASSESSED

Proppant concentration ◆ Proppant geometry ◆ Proppant uniformity ◆ Proppant transportability ◆ Proppant strength

Sample Preparation

Proppant Conductivity Cell — sample assembly for API conductivity testing

ASSEMBLY

The sample consists of a proppant bed placed between two Ohio sandstone slabs and covered by a metal shim. The assembled stack is then inserted into the API conductivity cell between two loading pistons. The shim ensures a uniform fracture face and protects the platens during compression.

STACK COMPONENTS

Metal shim

L × W × H : 7" × 1.5" × 1 mm

Ohio sandstone slab

L × W × H : 7" × 1.5" × 3/8"

Proppant bed

Test specimen — placed between slabs

Ohio sandstone slab

L × W × H : 7" × 1.5" × 3/8"

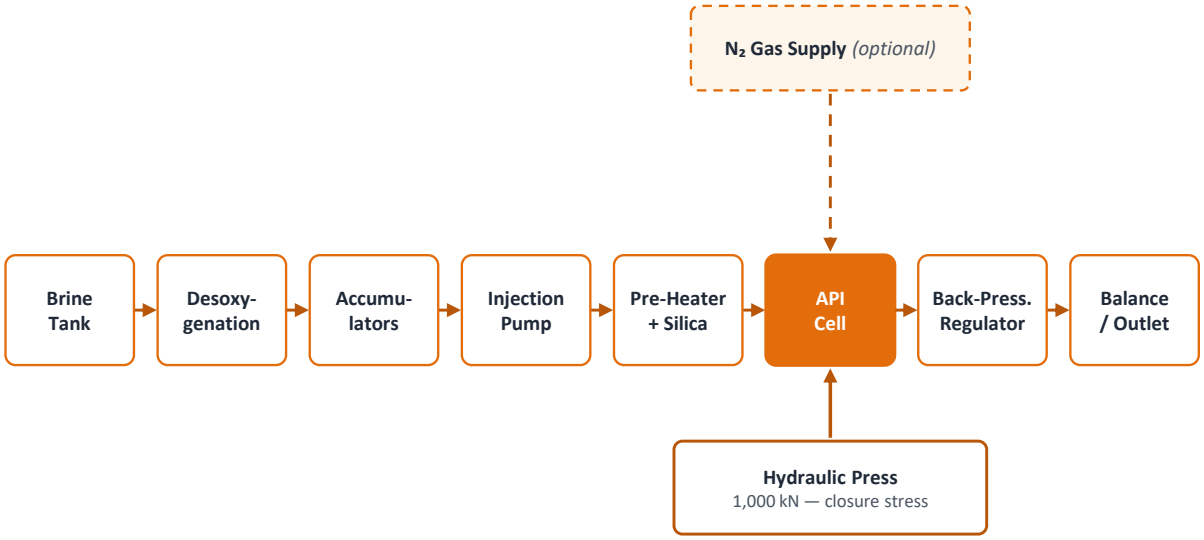
Metal shim

L × W × H : 7" × 1.5" × 1 mm

System Architecture

Main components and process flow diagram

SYSTEM BLOCK DIAGRAM



SENSORS AT API CELL · ΔP transducer · 4 LVDTs (fracture width) · Temperature probe · Cell-pressure transducer

MAIN COMPONENTS

- Injection pump
- Brine accumulators with desoxygenation
- Inline heater with silica column
- API conductivity cell with heating system
- Proppant pack width LVDT meter
- Hydraulic press (1,000 kN / 100 T)
- Back-pressure regulator
- Electronic balance
- P and ΔP transducers
- Gas flow line (optional, N_2)

PROCESS OVERVIEW

End-to-end view of the brine and gas circuits: from desoxygenation and accumulation, through the heater and silica column, to the API conductivity cell instrumented with LVDTs and pressure transducers, and on to the back-pressure regulator and electronic balance for accurate flow measurement.

20,000 psi
Max closure stress

177 °C
Max temperature

Conductivity Cells

PCC and SAC series — single and stacked cell configurations

PCC SERIES

Single-cell conductivity

SPECIFICATIONS

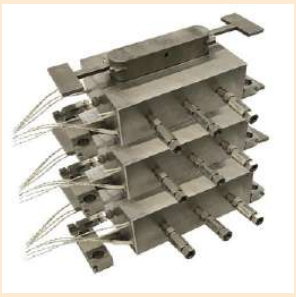
Standard	**ISO 13503-5**
Load capacity	**1,000 kN (100 T)**
Max closure stress	**20,000 psi**
Max pore pressure	**1,000 psi**
Temperature	**ambient – 177 °C**
Pack thickness	**± 0.001 in**
Specimen	**7 × 1.5 × 3/8 in**
Wetted parts	**Stainless steel**
N_2 / Air	**2,000 / 100 psi**

KEY ELEMENTS

- Heated steel platens — precise temperature
- Thermocouple monitoring
- Two 3/8-inch Ohio sandstone slabs
- Metal shim
- 3 pressure taps for monitoring
- 4 LVDTs measuring fracture width

SAC SERIES

Stacked multi-cell assembly



SPECIFICATIONS

Standard	**ISO 13503-5**
Load capacity	**1,000 kN (100 T)**
Max closure stress	**20,000 psi**
Max pore pressure	**1,000 psi**
Temperature	**ambient – 177 °C**
Pack thickness	**± 0.001 in**
Specimen	**5 × 1.5 × 3/8 in**
Stacking	**Up to 2 or 3 cells**
N_2 / Air	**2,000 / 100 psi**

KEY ELEMENTS

- Heated steel platens (per cell)
- Dedicated thermocouple per cell
- Two 3/8-inch Ohio sandstone slabs
- Metal shim
- 3 pressure taps per cell
- Shared piston — simultaneous testing

Press, Pump & Instrumentation

Hydraulic press, axial pump, accumulators, BPR and full sensor suite

Hydraulic Press

Max compression
1,000 kN (100 T)
Closure pressure
up to 20,000 psi
Horizontal clear.
325 mm
Vertical clear.
315 mm
Weight
750 kg

Injection Pump (CF3)

Max pressure
1,000 psi
Volume
2 × 40 cc
Flow rate
0.0001 – 80 cc/min
Wetted parts
Stainless steel
Power
110-220 VAC, 50/60 Hz

Back-Pressure Regulator

Working pressure
1,000 psi
Wetted parts
Stainless steel
Function
Outlet pressure control
Integration
In-line on brine return
Maintenance
Field-serviceable

INSTRUMENTATION

- Cell pressure transducer: 0–1,000 psi (0.15%)
- Low ΔP transducer: 0–0.9 psi (0.025%)
- Mid ΔP transducer: 0–9 psi (0.025%)
- Gas ΔP transducer: 0–150 psi
- N_2 mass flow controller: 0–2,000 cc/min
- Temperature probe on conductivity cell
- Electronic balance: 0–2,500 g (0.01 g)
- Floxlab data acquisition & control software

ACCESSORIES

Electronic balance
Precision weighing for proppant sample preparation.

Vacuum pump
Air evacuation from fluid lines prior to test start.

Sleeve shaker
Mechanical sieving for particle-size distribution.

Floating piston accumulators
3,000 psi · 1,000 cc · stainless steel

floXlab

CONTACT US

High-Pressure Laboratory Instruments
Geotechnical Testing Equipment

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Thank you for your interest in Floxlab products

ACID FRACTURE CONDUCTIVITY METER

ACM 3000

Laboratory system for carbonate formation acid fracturing simulation

20,000 psi	3,000 psi	1,000 psi	177°C
Max closure stress	*Max fracture pressure*	*Max acid pressure*	*temperature*

ACM 3000 — Complete acid fracturing laboratory system

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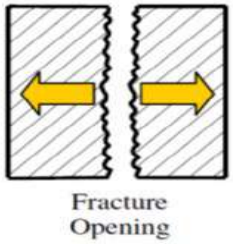
How Acid Fracturing Works

In carbonate reservoirs, acid fracturing is used in place of conventional propped fracturing to create permanent conductive flow paths. The ACM 3000 reproduces the three phases of the process under realistic in-situ conditions of stress, temperature and flow.

1

HYDRAULIC FRACTURING

Fracture opening

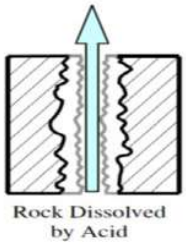


High-pressure fluid creates a fracture in the carbonate rock formation, opening a pathway for acid injection.

2

ACID ETCHING

Rock dissolved by acid

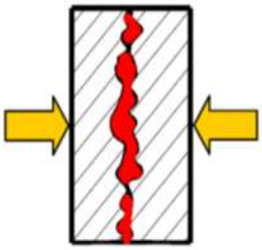


Acid is injected through the fracture and reacts with the carbonate rock, creating irregular etched surfaces along the fracture walls.

3

FRACTURE CONDUCTIVITY

Fracture closing



Under closure stress, the etched asperities keep the fracture open, creating permanent conductive channels for hydrocarbon flow.

The ACM 3000 reproduces all three phases under realistic in-situ conditions.

THE SYSTEM CAN BE CONFIGURED FOR

Acid etching experiments — hot-acid circulation through coated carbonate slabs to generate realistic etched patterns.
Short-term & long-term conductivity experiments — measure K·wf via Darcy's law, study creep and proppant embedment over time.

Why Choose the ACM 3000

Carbonate stimulation requires more than a generic conductivity rig. The ACM 3000 is purpose-built to reproduce every phase of acid fracturing on real rock — from hot-acid etching with realistic leak-off to long-duration conductivity testing under closure stress.

Faithful Simulation

Acid fracturing reproduced on real carbonate samples under in-situ conditions.

Acid Etching

Realistic etched fracture surfaces generated by hot-acid circulation.

Short & Long Term

Both rapid evaluations and four-stage in-situ duration tests supported.

Realistic Conditions

Stress, temperature and flow all controlled to match downhole environments.

Propped or Unpropped

Flexible — test acid-etched fractures with or without proppant placement.

Leak-off Monitoring

Fluid loss measured continuously during the etching phase via dedicated balance.

REAL RESULTS — CARBONATE SLAB FACE

Comparison of a carbonate slab face before and after acid etching in the ACM 3000. The system produces irregular, realistic etched patterns — not idealised channels — matching the geometry of a real downhole etched fracture.

Slab face before acid etching

Slab face after acid etching

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Three Test Protocols

The ACM 3000 supports a full acid-fracturing workflow — from generating realistic etched surfaces to evaluating fracture conductivity over short and long durations under closure stress.

A — ACID ETCHING

Hot-acid circulation

Generate realistic acid-etched fracture surfaces.

STEPS

1. Prepare two coated carbonate slabs (1.5" × 3.5")
2. Mount the silicone-sleeved slabs in the cell, spaced by a 3 mm gap (no axial load)
3. Fill acid tank; set pre-heater to target temperature (up to 175 °C)
4. Start membrane pump — circulate acid through the fracture (up to 1 L/min at 1,000 psi)
5. Monitor fluid leak-off and cell temperature during the etching phase
6. Collect spent acid; disassemble and record the etching pattern

DURATION
variable

B — SHORT-TERM

Fast conductivity evaluation

Evaluate how variables affect conductivity of an acid-etched fracture under short exposure.

STEPS

1. Mount the silicone-coated stack of acid-etched slabs inside the cell
2. Install cell on the hydraulic press; set cell & leak-off pressures and temperature
3. Apply closure stress (ramped up to target, max 20,000 psi)
4. Inject test fluid — brine (2% KCl) or N_2 gas — at controlled rate
5. Record flow rate, ΔP, cell pressure and temperature
6. Compute K·wf via Darcy's law at several conditions

PARAMETERS
fracture conductivity via Darcy's law using brine (2% KCl) or N_2

C — LONG-TERM

Four-stage in-situ simulation

Realistic long-term simulation: fluid loss, embedment and flow-back in four stages.

STEPS

1. Stage 1 — Static fluid loss: hold at 500 psi initial closure, monitor leak-off
2. Stage 2 — Shut-in: ramp to final stress and temperature, hold ~12 h
3. Stage 3 — Flow-back: inject brine at the maximum sand-free flow rate
4. Stage 4 — Conductivity measurement: compute K·wf via Darcy's law
5. Record creep deformation and proppant embedment throughout
6. Repeat with different proppant sizes and concentrations

PARAMETERS
creep, embedment, proppant size & concentration

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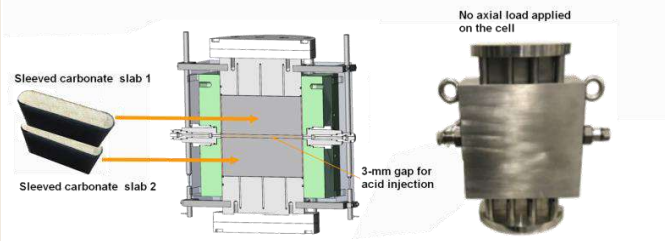
Specimen Preparation

The ACM 3000 uses real carbonate slabs sleeved in silicone to enforce one-dimensional acid attack. Once etched, the same slabs are stacked and re-mounted for conductivity testing — preserving the etched geometry from the first phase to the second.

STEP 1 · ACID ETCHING



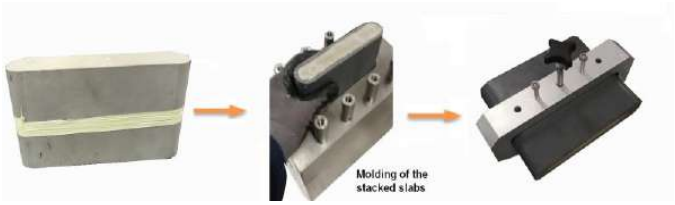
Process

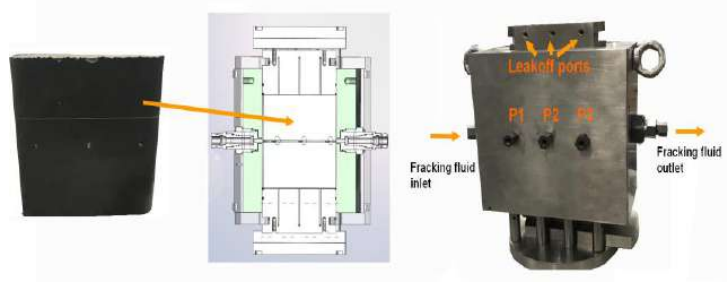
Two carbonate slabs (7" × 1.5" × 3") are silicone-sleeved in a dedicated mold
The sleeve confines acid attack to a controlled face area — replicating the geometry of a real fracture wall.

Specimen dimensions
Length: 7 in · Width: 1.5 in · Height: 2×3.5 in

Etching gap: 3 mm between sleeved slabs (no axial load applied during etching).

STEP 2 · FRACTURE CONDUCTIVITY





Process

Two carbonate slabs are stacked with or without proppants between the acid-etched faces, then silicone-coated in a mold.

Holes are precisely created in the sleeve at exact dimensions using a dedicated tool to allow controlled fluid flow. The specimen is then mounted in the cell.

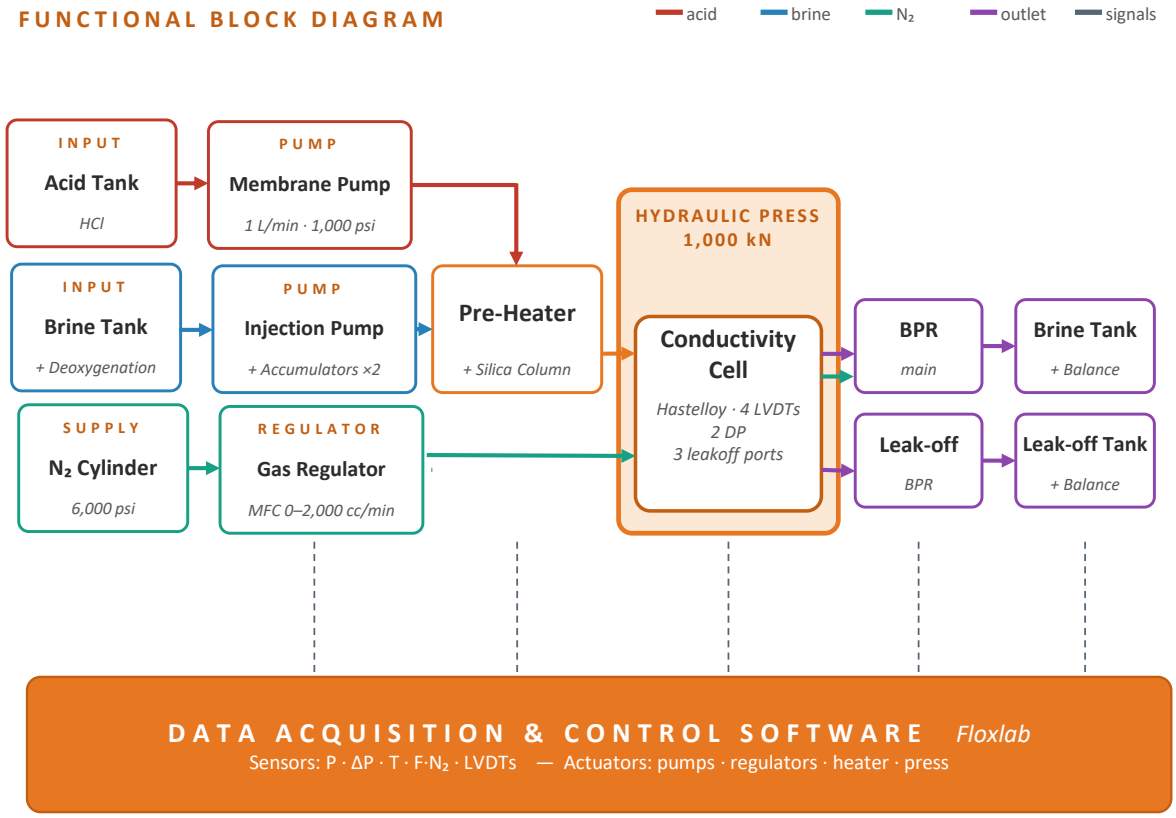
After applying closure stress and setting temperature and fluid pressure, fluids such as brine (2% KCl) or nitrogen are injected at constant pressure while the pressure drop across the specimen is measured. Fracture conductivity is determined using Darcy's law during short exposure.

Specimen dimensions
Length: 7 in · Width: 1.5 in · Height: 7.5 in

System Architecture

Functional block diagram showing how fluids, gas and signals flow through the ACM 3000. Three input lines (acid, brine, N_2) converge on the heated Hastelloy conductivity cell mounted in the hydraulic press; two outlet paths return to weighed collection tanks for mass-balance accounting.

FUNCTIONAL BLOCK DIAGRAM



MAIN COMPONENTS

FLUIDS & PUMPS

- Brine injection pump + accumulators ×2
- Brine deoxygenation column
- Acid membrane pump (1 L/min · 1,000 psi)
- N_2 regulator + mass flow controller

CORE TEST SECTION

- Inline pre-heater + silica column
- Heated fracture conductivity cell
- Hydraulic press (1,000 kN)
- 4 LVDTs + 3 P-taps + thermocouple

OUTLETS & CONTROL

- Main back-pressure regulator
- Leak-off back-pressure regulator
- Two electronic balances (0.01 g)
- Floxlab DAQ & control software

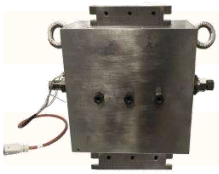
Technical Specifications

Engineered for laboratories simulating acid fracturing in carbonate formations under realistic in-situ conditions — Hastelloy wetted parts ensure full chemical compatibility with reservoir acids.

20,000 psi	3,000 psi	1,000 psi	177 °C
Max closure stress	Max fracture pressure	Max acid pressure	Max temperature

ACC Series — Acid Fracture Cell

Designed for carbonate acid-frac simulation



Max temperature	**177 °C (350 °F)**
Fluid pressure	**up to 3,000 psi**
Closure stress	**up to 20,000 psi**
Sample length	**7 in**
Sample width	**1.5 in**
Sample height	**2 × 3.5 in**
Wetted parts	**Hastelloy**
Cell features	**4 LVDTs · 3 P-taps · heated**

Hydraulic Press & Servo Pump

1,000 kN compression frame · stiff & compact

Compression	**1,000 kN**
Closure pressure	**20,000 psi**
Press weight	**500 kg**
Pump pressure	**10,000 psi**
Pump volume	**250 cc**
Pump flow	**0.0001–50 cc/min**

ACCUMULATORS, INJECTION PUMP & BPR

Floating piston accumulators: 10,000 psi · 1,000 cc · stainless steel · 20 kg.
Injection pump (CF model): 3,000 psi · 2 × 40 cc · 0.0001–80 cc/min · stainless steel.
Back-pressure regulator: 3,000 psi · stainless steel.

INSTRUMENTATION

- Cell pressure transducer: 0–3,000 psi (0.15%)
- ΔP transducers: 0–0.9 psi & 0–9 psi (0.025%)
- Gas ΔP transducer: 0–150 psi
- N_2 mass flow controller: 0–2,000 cc/min
- Two electronic balances: 0–2,500 g (0.01 g)
- Floxlab data acquisition & control software

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Get in Touch

We are happy to discuss your acid-fracturing testing requirements.

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Thank you for your interest in the ACM 3000

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PRODUCT BROCHURE

Geomechanics & Reservoir Testing Equipment

FCM-1000

FRACTURE CONDUCTIVITY METER

Laboratory system for short-term and long-term fracture conductivity testing under realistic in-situ conditions of stress, temperature and flow.

1,000 psi	20,000 psi	177 °C
MAX FRACTURE PRESSURE	MAX CLOSURE STRESS	MAX TEMPERATURE

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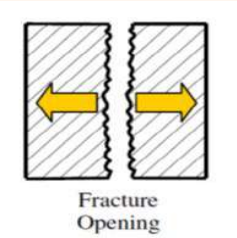
Hydraulic fracturing principle

FCM-1000 | Fracture Conductivity Meter

Hydraulic fracturing creates conductive pathways in tight rock formations to enable hydrocarbon extraction. The FCM-1000 reproduces the three sequential phases of this process under realistic in-situ conditions of stress, temperature and flow.

1

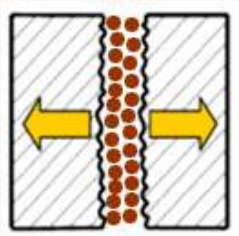


HYDRAULIC FRACTURING

Fracture opening

Fracturing fluids are injected into the well at high pumping rate, creating fractures in the rock formation.

2

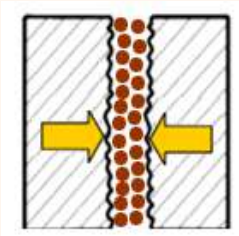


PROPPANT PLACEMENT

Artificial fracture generation

A proppant-laden fluid is injected, carrying particles into the fractures where they are deposited along the rock faces.

3



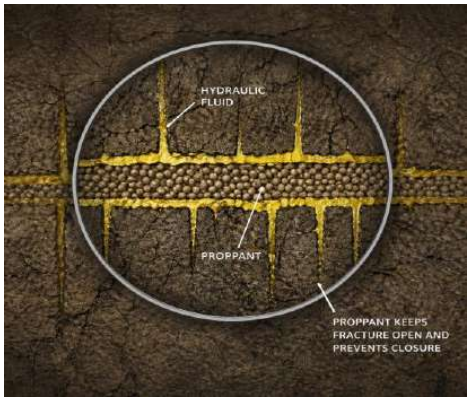
FRACTURE CONDUCTIVITY

Fracture closing

Under closure stress, proppants keep the fracture open, creating permanent conductive channels for hydrocarbon flow.

WHAT THE FCM-1000 REPRODUCES

The FCM-1000 simulates each of the three phases above — fracture opening, proppant placement and fracture closing — at full reservoir conditions, enabling accurate measurement of fracture conductivity for both unpropped and propped configurations.



Overview & key features

FCM-1000 | Fracture Conductivity Meter

The FCM-1000 is a fully automated laboratory system designed to evaluate fracture conductivity under realistic down-hole conditions. It supports both unpropped and propped configurations and performs short-term and long-term test sequences with continuous data acquisition.

KEY CHARACTERISTICS

- Accurate short-term and long-term conductivity measurements
- Realistic down-hole conditions — stress, temperature, fluid flow
- Tests with brine or nitrogen gas as flowing fluid
- Unpropped and propped fracture configurations
- Simulates fluid leak-off and fracturing fluid damage
- Evaluates proppant type, concentration and embedment
- Assesses creep deformation under high closure stress
- Fully automated apparatus with data acquisition station
- Real-time Darcy's law conductivity calculation

KEY SPECIFICATIONS

Load capacity	**1,000 kN (100 tons)**
Max closure stress	**20,000 psi**
Max pore pressure	**1,000 psi**
Max temperature	**up to 177 °C (350 °F)**
Wetted parts	**Stainless steel (Hastelloy option)**

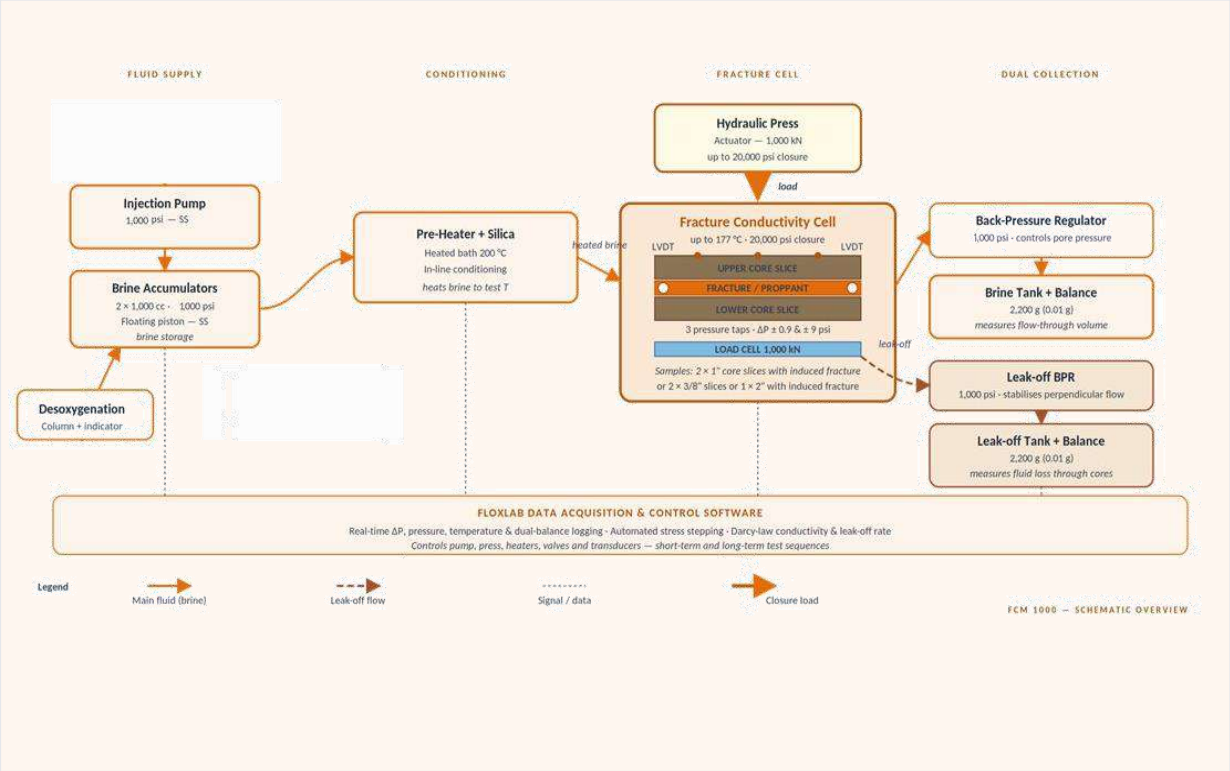
MEASURED & CALCULATED DATA

- Closure stress, pore pressure, sample T°
- Pressure drop, liquid & N_2 gas flow rates
- Liquid weight, leak-off weight
- Conductivities & leak-off rate (computed)

APPLICATIONS

Hydraulic fracturing studies · Proppant qualification & selection · Fracturing fluid damage evaluation · Reservoir characterization · Geothermal & unconventional resources

The FCM-1000 integrates fluid supply, conditioning, fracture cell loading and dual collection in a single automated system, controlled by Floxlab's data acquisition software.



SYSTEM COMPONENTS

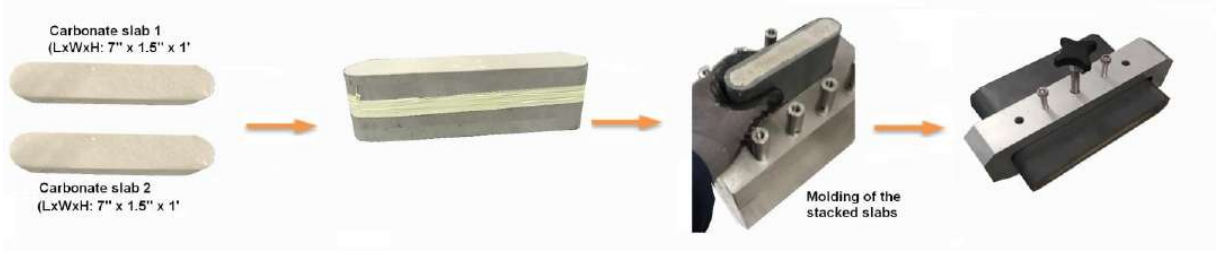
- Injection pump
- Two fluid accumulators
- Brine deoxygenation system
- Inline heater and silica column
- Fracture conductivity cell
- Heating system
- Hydraulic press (1,000 kN)
- Instrumentation (P, ΔP, T, F-N_2)
- Two back-pressure regulators
- Two electronic balances
- Valves and plumbing system
- Data acquisition control station

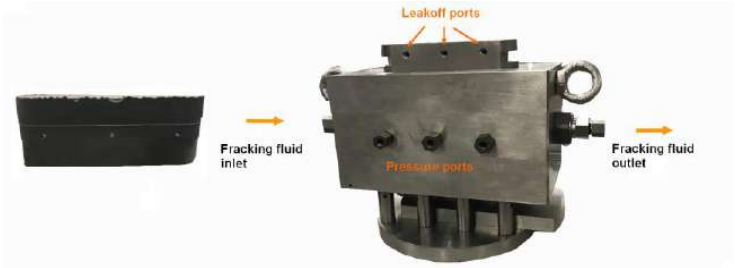
Fracture conductivity protocols

FCM-1000 | Fracture Conductivity Meter

The FCM-1000 supports two complementary test protocols. Sample preparation is shared across both: two stacked rock slabs are silicone-coated in a mold, then mounted in the conductivity cell.

SAMPLE PREPARATION





A SHORT-TERM

Fast conductivity evaluation

Evaluates how variables affect fracture conductivity under short exposure.

STEPS

1. Mount silicone-coated stack of slabs inside the cell
2. Install cell on the hydraulic press, set cell & leak-off pressures, set temperature
3. Apply closure stress, ramped up to target (max 20,000 psi)
4. Inject test fluid — brine (2% KCl) or N_2 gas — at controlled rate
5. Record flow rate, ΔP, cell pressure, temperature
6. Compute conductivity (K·wf) via Darcy's law at multiple conditions

PARAMETERS STUDIED

Conductivity using brine (2% KCl) or nitrogen via Darcy's law.

B LONG-TERM

Four-stage in-situ simulation

Realistic long-term simulation with fluid loss, embedment and flow-back.

STEPS

1. Stage 1 — Static fluid loss: hold at 500 psi initial closure, monitor leak-off
2. Stage 2 — Shut-in: ramp to final stress and temperature, hold ~12 h, valves closed
3. Stage 3 — Flow-back: inject brine at maximum sand-free rate; stop on proppant detection
4. Stage 4 — Conductivity measurement: compute K·wf via Darcy's law
5. Record creep deformation and proppant embedment throughout
6. Repeat with different proppant sizes and concentrations

PARAMETERS STUDIED

Creep deformation, proppant embedment and proppant size effects.

Fracture conductivity cell

FCM-1000 | Fracture Conductivity Meter

The conductivity cell is the heart of the FCM-1000 — a heated stainless-steel chamber housing the rock sample, equipped with leak-off ports, pressure taps, LVDTs and flow inserts.

Conductivity cell — front view

KEY ELEMENTS

- Heated cell body for precise temperature control
- Thermocouple monitoring
- 3 pressure taps for pressure monitoring
- 2 loading platens with 3 leak-off ports
- 2 stands for etching tests
- 4 LVDTs measuring fracture width at various stresses
- 2 flow inserts for conductivity
- Sample: Two 1-inch-thick rock slabs stacked on top of each other.

SPECIFICATIONS

Max temperature	**177 °C (350 °F)**	Fluid pressure	**up to 1,000 psi**
Closure stress	**up to 20,000 psi**	Sample length	**7 inches**
Sample width	**1.5 inches**	Sample height	**2 × 1 inch**
Wetted parts	**Stainless steel (HC option)**	Configuration	**2-slab fracture cell**

Press, pumps & instrumentation

FCM-1000 | Fracture Conductivity Meter

Precise loading and metering are essential for repeatable measurements. The FCM-1000 combines a stiff hydraulic press, high-pressure servo pumps, floating-piston accumulators and high-resolution instrumentation, all coordinated by Floxlab's control software.

HYDRAULIC PRESS

Applies precise closure stress in a stiff, compact frame with automated ramping and constant-pressure cycles.

- Compression: 1,000 kN (100 t)
- Closure: up to 20,000 psi
- Weight: 500 kg

AXIAL PRESSURE PUMP

Max pressure 10,000 psi · Volume 250 cc · Flow 0.001–50 cc/min · SS wetted parts · 40 kg · 110–220 VAC

INJECTION PUMP — CF MODEL

Dual-cylinder servo pump for ultra-precise metering of brine or test fluids during conductivity measurement.

- Pressure: 1,000 psi
- Volume: 2 × 40 cc
- Flow: 0.0001–80 cc/min

FLOATING-PISTON ACCUMULATORS

Max pressure 1,000 psi · Volume 1,000 cc · SS wetted parts · 20 kg · Back-pressure regulator: 1,000 psi

INSTRUMENTATION & DATA ACQUISITION

- Cell pressure transducer: 0–1,000 psi (0.15%)
- Low ΔP transducer: 0–0.9 psi (0.025%)
- Mid ΔP transducer: 0–9 psi (0.025%)
- Gas ΔP transducer: 0–150 psi
- N_2 mass flow controller: 0–2,000 cc/min
- Temperature probe on conductivity cell
- Two electronic balances: 0–2,500 g (0.01 g)
- Floxlab data acquisition & control software

CONTACT US

Thank you for your interest in the FCM-1000 Fracture Conductivity Meter.

Get in touch — our engineers will be glad to discuss your testing needs.

FLOXLAB

Geomechanics & reservoir testing equipment

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FRACLAB

Hydraulic Fracture Test System

Rock-mechanics testing platform for hydraulic fracturing, triaxial compression and acoustic emission monitoring under high pressure and elevated temperature.

ROCK MECHANICS | HYDRAULIC FRACTURING | AE MONITORING

AT A GLANCE

Confining pressure	**70 MPa**
Axial stress	**424 MPa**
Pore / fracturing	**70 MPa**
Temperature	**150 °C**
Specimen ø	**54.7 mm**
AE channels	**6 lateral, 16-bit**
Pumps	**4 servo-controlled**
Standards	**ASTM-compliant**

PRODUCT BROCHURE

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System Overview

A complete platform for rock-mechanics and hydraulic-fracture testing

The FRACLAB system performs hydraulic fracture experiments with microseismic activity monitoring under various triaxial stress states and elevated temperatures. The unified platform combines a high-pressure triaxial cell, four servo-controlled syringe pumps, an 8-channel acoustic emission monitoring module and a real-time supervision station — delivering full mechanical, hydraulic and microseismic characterization of rock specimens in a single, automated experiment.

KEY CAPABILITIES

- Hydraulic fracturing under triaxial stress
- Breakdown pressure & tensile-strength measurement
- Rock triaxial compression test (UCS / CTC)
- Rock compressibility & permeability tests
- Pore-pressure regulation (drained & undrained)
- Axial & radial strain monitoring (LVDTs + extensometer)
- Acoustic Emission (AE) event localization
- Real-time fracture morphology reconstruction
- Fully automated, servo-controlled testing
- Standardized report generation

70	424	150
MPa	MPa	°C
Confining	Axial	Temperature

ENGINEERED FOR PRECISION

A pressure-balanced triaxial design isolates the deviatoric piston from confining pressure, delivering parasitic-free axial-stress measurement and ASTM-compliant stress paths — essential for accurate strength, compressibility and fracture-initiation results.

Three Possible Tests

One platform — three complementary measurement modes

FRACLAB combines three coordinated test modes that share the same triaxial cell, instrumentation and control software. Tests can be run independently or sequenced in a single experiment to extract a complete mechanical, hydraulic and microseismic dataset from one specimen.

01 BREAKDOWN PRESSURE

Hydraulic fracturing experiment on a specimen drilled with an axial borehole. Fracturing fluid is injected at constant flow rate until breakdown occurs; tensile strength and frac-coefficient are then computed from the pressure–time curve.

MEASUREMENTS

Fracturing-fluid pressure • Fracturing-fluid flow rate • Pore pressure • Axial & radial stress • Temperature

02 AE MONITORING

Detection and localization of microcracking and fracture events under triaxial loading using six lateral acoustic-emission sensors. Real-time 3D event localization reconstructs the fracture morphology as damage accumulates.

MEASUREMENTS

AE activity & hit counts • AE energy & amplitude • Event duration • Hypocenter localization (≈ 2 mm) • Fracture morphology

03 STRESS-STRAIN

Triaxial compression test with precise measurement of axial and radial strain under controlled confining and pore pressure. Delivers full mechanical characterization including elastic moduli, strength envelope and post-peak behaviour.

MEASUREMENTS

Axial strain (3 LVDTs) • Radial strain (2 extensometers) • Axial load (in-vessel cell) • Confining pressure • Temperature

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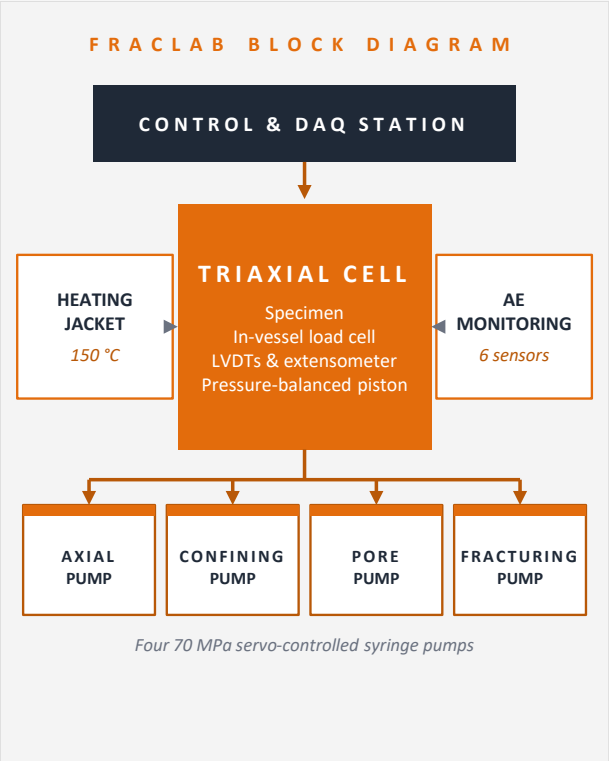
Main Components

Ten core modules forming the FRACLAB platform



System block diagram — main signal & fluid paths

1. **Triaxial cell**
2. **In-vessel load cell**
3. **Axial & diametral strain sensors**
4. **Acoustic Emission monitoring system**
5. **Heating jacket**
6. **Triaxial cell hydraulic lift**
7. **Axial pressure pump**
8. **Confining pressure pump**
9. **Pore pressure pump**
10. **Fracturing fluid pump**

\+ *Computer control & data-acquisition station*

INTEGRATED ARCHITECTURE

MECHANICAL LOADING

A hydraulically powered loading frame applies axial stress through an in-vessel piston, while the cell base supports the triaxial chamber. A motorized hydraulic lift opens and closes the cell for rapid specimen change.

FLUID CONTROL

Four independent BT-series syringe pumps regulate confining, axial, pore and fracturing-fluid pressures up to 70 MPa with sub-mL/min resolution, supporting drained, undrained and reactive-fluid protocols.

INSTRUMENTATION

Axial LVDTs, a diametral extensometer, an in-vessel load cell, six AE sensors and dual feedthrough connectors deliver simultaneous mechanical, hydraulic and microseismic data acquisition.

Pressure-Balanced Deviatoric Piston

Independent control of axial and confining stress, free of parasitic forces

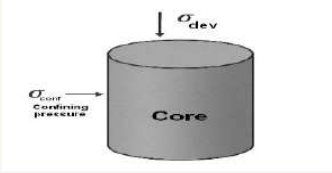
FRACLAB uses a pressure-balanced deviatoric triaxial cell engineered to apply axial stress (σ_{axial}) and confining stress ($\sigma_{confining}$) independently — while preventing the confining pressure from influencing the measured axial load. This design is the cornerstone of accurate stress-path testing.

HOW IT WORKS

The cell incorporates a pressure-balanced piston, where the confining pressure acts on equal and opposing surface areas. As a result, no parasitic force is transmitted to the load train.

Only the applied axial stress contributes to the deviatoric stress (σ_{dev}), allowing precise and independent control of σdev and σconfining throughout the experiment — even at high confining pressure.

$$\text{Axial stress} = \sigma = \underbrace{\sigma_{dev}}_{\text{Deviatoric stress}}$$



Cell components — assembled & cross-section views

BENEFITS OF THE PRESSURE-BALANCED DESIGN

ASTM-COMPLIANT

Stress paths follow ASTM-recognized triaxial-test protocols, ensuring traceable, comparable results.

ACCURATE STRENGTH

Strength measurements are free of confining-pressure bias, giving true peak and residual values.

CLEAN RESPONSE

Residual-stress response is uncontaminated by parasitic loading — essential for fracture-mechanics studies.

Hydraulic Fracturing & Acoustic Emission

High-frequency monitoring of fracture initiation and propagation

FRACLAB couples a high-pressure hydraulic-fracture injection circuit with a high-sensitivity AE module to detect and locate microcracking and fracture events during triaxial testing. Real-time, high-frequency data acquisition delivers a complete picture of damage evolution — from the first microcrack to full breakdown.

HYDRAULIC FRACTURING SYSTEM

Specimen with axial borehole

PURPOSE

Hydraulic-fracturing and wellbore-stability tests under triaxial stress; measures breakdown pressure and fracture-initiation behaviour.

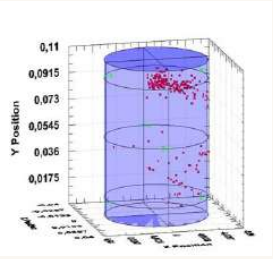
PRINCIPLE

Fluid pressure rises inside the borehole until tensile strength is exceeded — peak pressure equals breakdown pressure. After propagation, pressure decays toward pore pressure.

INJECTION CONFIGURATION

- Integrated injection platen connected to a pre-drilled axial borehole
- Dedicated fracturing-fluid pump (70 MPa, servo-controlled)
- Fluid delivered at constant rate until tensile fracture initiates
- Compatible with the Acoustic Emission (AE) monitoring system

AE MONITORING SYSTEM



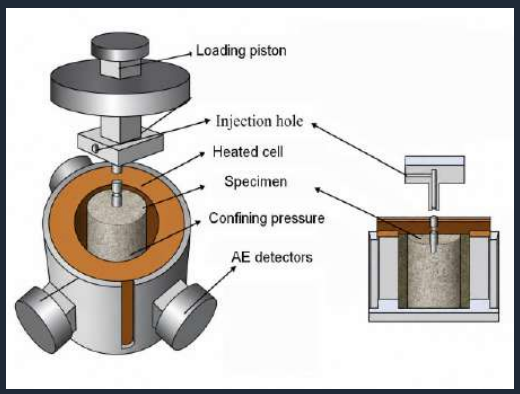
Real-time 3D event localization

KEY SPECIFICATIONS

Sensors	**6 lateral, full radial**
Sensitivity	**62 dB ref V/(m/s)**
Frequency	**125 – 750 kHz**
Resonant	**140 kHz**
Acquisition	**16-bit, 10 MHz, 8 ch**
Location	**≈ 2 mm accuracy**

CAPABILITIES

- Signal amplification: 40 dB (32 – 1000 kHz filters)
- Operating temperature range: −65 to 177 °C
- Real-time fracture-morphology reconstruction
- 2D & 3D event-localization software included



AE TRANSDUCERS — FULL RADIAL COVERAGE

Six AE detectors are mounted laterally around the heated cell, providing full radial coverage of the specimen. The pressure-balanced cell design and an injection channel through the loading piston allow simultaneous fluid injection and microseismic monitoring during the fracture experiment — an essential combination for characterizing crack initiation, propagation paths and post-breakdown behaviour.

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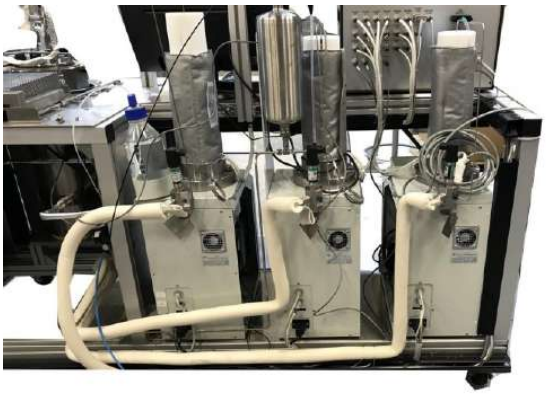
Four High-Pressure Syringe Pumps

BT-series, servo-controlled, 70 MPa rated

Four servo-controlled syringe pumps regulate confining, axial, pore and fracturing-fluid pressures with high accuracy in closed-loop control. Each pump is independently programmable and shares a common Ethernet-based data-logging architecture, enabling synchronized control of all four fluid lines from the supervision station.



BT-series syringe pumps installed on the FRACLAB platform

COMMON FEATURES

- Working pressure: 70 MPa (10,000 psi)
- Volume: 250 cc per pump
- Flow rate: 0.0001 to 60 cc/min
- Stainless-steel wetted parts
- Integrated touch-screen panel
- Ethernet data logging
- Ambient & high-temperature operation
- Closed-loop servo control

AXIAL PRESSURE PUMP

Constant-force mode

Controls the axial load applied on the specimen via the in-vessel piston, enabling load-controlled or strain-controlled compression tests.

CONFINING PRESSURE PUMP

Constant-pressure mode

Applies confining pressure on the jacketed specimen up to 70 MPa, with closed-loop regulation independent from axial loading.

PORE PRESSURE PUMP

Drained / undrained tests

Regulates pore pressure and pore-fluid flow rate, supporting drained, undrained and constant-flow Darcy permeability protocols.

FRACTURING FLUID PUMP

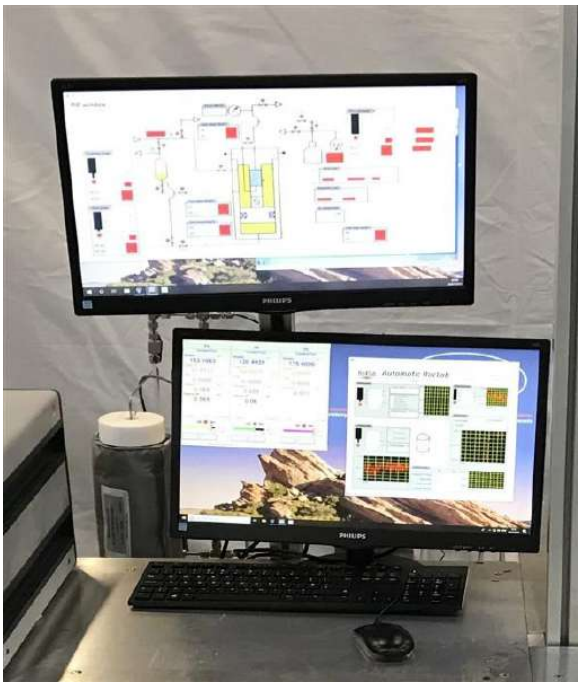
Constant-flow injection

Injects fracturing fluid at a precise constant flow rate into the specimen borehole until tensile breakdown — the heart of the hydro-frac test.

Supervision, Control & Reporting Station

A unified workstation for the complete FRACLAB experiment

The FRACLAB control station integrates pump regulation, heating control, instrumentation acquisition and report generation into a single touch-friendly software environment. Operators monitor every parameter on a synoptic display, trigger automated test sequences and obtain a standardized report at the end of each experiment.



Dual-screen control station — synoptic + acquisition

CONTROL

- Synoptic display with live component status
- Independent pump control & sequencing
- Heating control (ambient to 150 °C)
- Programmable test sequences & safety interlocks

REAL-TIME ACQUISITION

- Radial & axial strains (LVDTs, extensometer)
- Axial stress & confining pressure
- Pore / back pressure & differential pressure
- Pore flow rate, temperature, AE signals

PROCESSING & REPORTING

- Automatic property calculation (E, v, UCS, strength)
- Standardized PDF report generation
- Full data archiving with metadata
- CSV / TDMS export for further analysis

AUTOMATED EXPERIMENT WORKFLOW

1	2	3	4	5
MOUNT	**CONDITION**	**LOAD**	**FRACTURE / TEST**	**REPORT**
Specimen jacketed and instrumented	Pore pressure & temperature stabilized	Confining + axial stress applied	Injection or compression sequence	Auto data processing & PDF report

Typical Applications

Where FRACLAB delivers value

FRACLAB is the ideal platform for advanced rock-mechanics research in academic, energy and geotechnical sectors. Its combination of triaxial loading, hydraulic-fracture injection and acoustic-emission monitoring makes it equally well suited to fundamental research and applied engineering studies.

Oil & Gas

UNCONVENTIONAL RESERVOIRS

Characterization of shale, tight sandstone and carbonate formations: breakdown pressure, fracture propagation and proppant effectiveness.

CO_2 / H_2

GEOLOGICAL STORAGE

CO_2 and hydrogen underground storage studies: caprock integrity, fracturing under reactive fluids, long-term containment assessment.

EGS

GEOTHERMAL ENERGY

Enhanced Geothermal Systems: fracture-network generation, thermo-hydro-mechanical coupling, reservoir-stimulation studies.

Fundamental

ROCK MECHANICS RESEARCH

Studies of damage evolution, fracture toughness, acoustic-emission signatures and failure mechanisms in intact and fractured rock.

Infrastructure

CIVIL & MINING ENGINEERING

Rock-strength characterization for tunnelling, dam foundations, deep excavations and rock-slope stability analyses.

Long-term storage

NUCLEAR WASTE DISPOSAL

Evaluation of host-rock fracture behaviour, sealing capacity and long-term integrity for deep geological repositories.

FROM LABORATORY RESEARCH TO INDUSTRIAL DEPLOYMENT

Whether you are a university group studying fracture initiation, an energy operator screening reservoir candidates, or an engineering firm validating rock-strength assumptions for a major project, FRACLAB delivers laboratory-grade data with the speed and traceability required for modern geomechanical decision-making.

CONTACT US

We're happy to discuss your application and customize the FRACLAB platform to your needs.

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ROCK MECHANICS TESTERS • HYDRAULIC FRACTURING • TRIAXIAL SYSTEMS

floXlab

PRODUCT BROCHURE

RCP TESTER

Resin-Coated Proppant Testing System

High-pressure laboratory instruments
& advanced geotechnical testing equipment

250 kN AXIAL LOAD	**70 MPa** CONFINING
175 °C TEMP. MAX	**Ø 50 mm** SPECIMEN

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OVERVIEW

RCP Tester at a glance

The Floxlab RCP Tester is an integrated bench for resin-coated proppant qualification. It cures specimens under realistic closure stress and temperature, then characterises their mechanical strength under unconfined and triaxial compression — all on the same load frame.

01
Curing under stress

Cures resin-coated proppant (RCP) samples under varying axial loads and temperatures, using a dedicated flow-through curing cell.

02
Strength assessment

Measures unconfined and triaxial compression strengths of cured RCP specimens using a purpose-built proppant triaxial cell.

KEY SPECIFICATIONS

SPECIMEN DIAMETER

up to 2" (50 mm)

L = 2 × diameter

AXIAL LOAD CAPACITY

250 kN compression

load or displacement control

CONFINING PRESSURE

70 MPa 10,000 psi

servo-valve regulated

TEMPERATURE RANGE

up to 175 °C

ambient to 175 °C

APPLICATIONS

- Hydraulic fracturing R&D
- Proppant qualification & batch control
- Resin coating performance studies
- UCS and triaxial strength characterisation

Resin-coated proppant specimen

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ARCHITECTURE

System components

The RCP Tester is delivered as a complete, integrated system. The eight subsystems below work together to take a proppant specimen from curing to mechanical characterisation under controlled stress and temperature.

1. **Hydraulic Power Pack**
2. **Load Frame**
3. **Axial Actuator (servo-valve)**
4. **Load Cell (up to 250 kN)**
5. **Flow-Through Curing Cell**
6. **Proppant Triaxial Cell**
7. **Confining Pressure Intensifier**
8. **Computer / Data Acquisition Station**

Integrated RCP Tester unit

FULLY INTEGRATED

Single load frame, two test cells

Curing and triaxial testing share the same hydraulic supply and acquisition chain — for repeatable, traceable workflows from prep to report.

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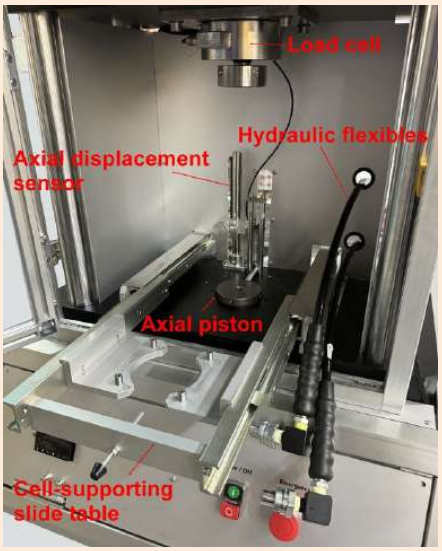
MECHANICS & POWER

Load frame & hydraulic supply

01 · LOAD FRAME

Function

- Applies accurate axial stress during compressive strength tests
- Operates in load-control or axial-displacement mode
- Compatible with both triaxial and curing cells
- Stationary crosshead fixed to the base plate by four columns
- Hydraulic actuator integrated in the lower section of the frame
- Rapid piston displacement with precise loading capacity



Load frame cell work area (annotated)

Cell Work Area

- Sliding table to support the test cell
- Load cell up to 250 kN
- Axial displacement sensor
- Two hydraulic hoses for confining pressure

02 · HYDRAULIC POWER PACK

Functions

- Supplies hydraulic fluid to the axial and confining actuators via servo-valves
- Built around a variable-speed, constant-pressure gear pump
- Low-noise, stable hydraulic operation
- Supports load-control and displacement-control modes

PUMP FLOW	MAX PRESSURE
0.1–1 LPM	20 MPa
PUMP TYPE	**OIL TANK**
Gear pump	10 L

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STAGE 1 · CURING

Flow-through curing cell

Cures resin-coated proppant packs at high temperature and variable closure stress, before unconfined compressive strength testing. The cell allows fracturing-fluid leak-off monitoring during closure application.

KEY FEATURES

- Chamber with upper and lower hardened steel platens
- Applies axial compression to simulate closure pressure on the proppant pack
- Monitors fracturing-fluid leak-off during closure application
- Fluid ports in the platens enable fluids to flow from the specimen
- Heating mantle delivers a uniform temperature from ambient up to 177 °C
- Includes a specimen extractor for easy removal of the cured sample

Curing cell

Sample extractor

Curing cell with heater

WORKFLOW

From raw RCP to test specimen

1 Load RCP – 2 Apply closure stress – 3 Cure at temperature – 4 Extract specimen

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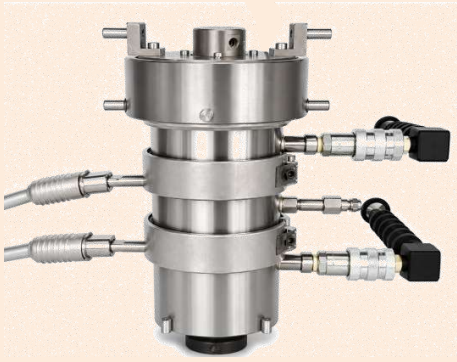
STAGE 2 · STRENGTH

Proppant triaxial cell

An enclosure for testing cylindrical resin-coated proppant specimens under combined axial and radial compression. The triaxial cell applies circumferential confining pressure simultaneously with axial load to reproduce realistic stress states.

DESIGN HIGHLIGHTS

- Specimen encased in a Viton sleeve between hardened steel endcaps
- Complete assembly submerged in oil under confining pressure
- Top pore-fluid port at the upper platen for fracturing-fluid expulsion during compression
- Low-friction loading piston designed specifically for triaxial testing
- Heating mantle for controlled temperature conditions during testing



Proppant triaxial cell

Proppant triaxial cell with heater

SPECIFICATIONS

AXIAL LOAD	CONFINING	TEMPERATURE	SPECIMEN
250 kN	70 MPa	175 °C	Ø50 mm

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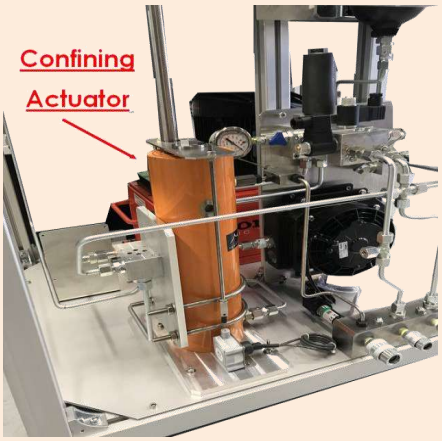
PRESSURE & CONTROL

Confining intensifier · software

01 · CONFINING INTENSIFIER

Function

- Provides pressurised fluid to the confining chamber of the triaxial cell
- Fills, pressurises, regulates and drains the confining fluid
- Servo-valve-controlled hydraulic actuator
- Linear transducer measures confining-oil volume in the actuator
- Housed in a metal cabinet on casters for easy mobility
- Operates in pressure-control or constant-displacement mode



Confining pressure intensifier

02 · COMPUTER STATION & SOFTWARE

Visualisation

Synoptic view, component status, real-time measurements & trend graphs.

Acquisition

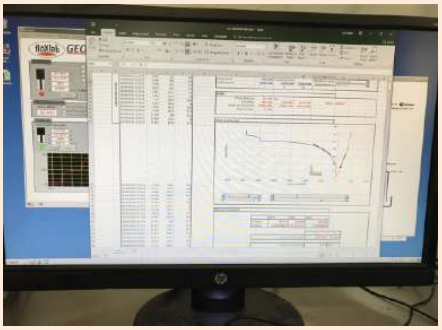
Continuous data logging with high temporal resolution for downstream analysis.

Test setup

Set-points entered manually or via macro commands for automated test runs.

Reporting

Automated report generation, ready to share with QC teams and customers.



Synoptic & trend monitoring

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LET'S TALK

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Whether you have a project, a custom-build need, or a technical question — our team is happy to help.

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PRODUCT BROCHURE

Rotating Disk Reactor

RDR-350

High-pressure, high-temperature study of reaction kinetics and mass transfer between a fluid and a solid surface.

RDR-350 | Floxlab geotechnical & laboratory testing equipment

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01 • OVERVIEW

How the rotating disk reactor works

Reaction kinetics & mass transfer under HP / HT conditions

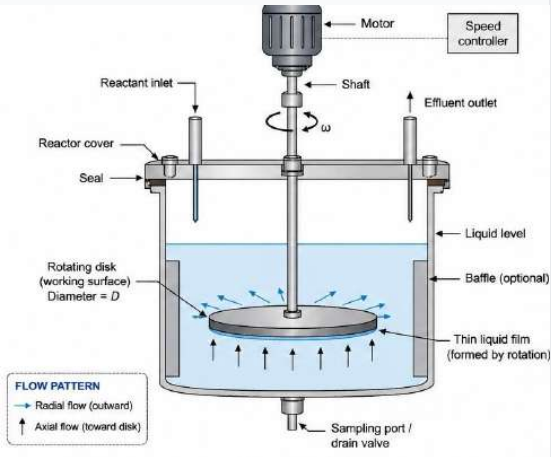
The RDR-350 investigates reaction kinetics and mass transfer between a fluid (acid solution) and a solid surface (carbonate disk) under high-pressure and high-temperature conditions. Carbonate disks are placed inside a reaction vessel and rotated while the mineral dissolution rate in the acid is monitored.

KEY CAPABILITIES

- Acid–rock reactions
- Controllable mass-transfer rate
- Up to 5,000 psi & 250 °C
- Hastelloy wetted parts
- Semi-automated apparatus

WORKING PRINCIPLE

Operating sequence



Working principle of the rotating disk reactor

Carbonate disks ready for the RDR test

1. The motor rotates the disk at a controlled angular speed (ω, rpm).
2. Liquid is fed into the reactor through the reactant inlet.
3. Centrifugal force spreads the liquid across the disk into a thin film.
4. Fluid flows radially outward along the disk surface.
5. Bulk fluid moves axially toward the disk, renewing the film.
6. Reaction occurs at the solid–liquid interface on the disk.
7. Reacted fluid leaves the reactor through the effluent outlet.

02 • PURPOSE

What the apparatus is designed for

Critical parameters for modeling acidizing processes in petroleum reservoirs

The RDR-350 is designed to study reactions between fluid and solid surface under high-pressure, high-temperature operating conditions. It is used to determine:

1

Mineral dissolution rate

Dissolution rate of minerals contained in carbonate rock in acid (calcite or dolomite).

2

Mass-transfer coefficient

Determination of the mass-transfer coefficient k_m between the bulk fluid and the disk surface.

3

Mass flux rate

Mass flux rate J — diffusion coefficient describing transport of reactant to the surface.

4

Reaction rate

Reaction rate r representing the surface kinetics between acid and rock.

5

Operating-condition effects

Effects of temperature, rotation speed, and fluid properties on overall reaction behaviour.

03 • KINETICS & MASS TRANSFER

What controls the dissolution rate

The phenomena governing the rotating disk reactor

OVERALL REACTION RATE 01

$$r = J \cdot A = k_m \cdot A \cdot (Cb - Cs)$$

r represents how fast the rock dissolves or reacts with the acid. The reaction rate increases with higher mass transfer k_m, larger surface area A and a larger concentration gradient.

MASS FLUX TO THE DISK SURFACE 02

$$J = k_m \cdot (Cb - Cs)$$

J is the number of reactant molecules arriving at the disk surface per unit time. Cb is the bulk concentration, Cs the surface concentration. A greater concentration difference means more molecules reach the surface.

MASS-TRANSFER COEFFICIENT 03

$$k_m = 0.62 \cdot D^{2/3} \cdot \nu^{-1/6} \cdot \omega^{1/2}$$

Levich equation. k_m describes how easily molecules move from the liquid to the rock surface. Rotation improves the mass-transfer rate, scaling with the square root of rotation speed ω ($k_m \propto \omega^{1/2}$).

ACID DISSOLUTION OF CARBONATE 04

$$Ca^{2+} / Mg^{2+} \rightarrow \text{measured vs. time}$$

The dissolution rate is measured by analysing dissolved Ca^{2+} or Mg^{2+} ions in the fluid over time using atomic spectroscopy. Concentration evolution gives the reaction rate directly.

04 • MAIN COMPONENTS

Subsystems delivered with the RDR-350

An integrated, ready-to-use HP / HT testing system

01

Reaction Vessel

Hastelloy HP/HT vessel where the acid–rock reaction occurs. Holds the rotating spindle, embedded heating cartridges, cooling jacket, gas and acid inlets, sample outlet, burst disc, pressure transducer and temperature probe.

02

Transfer Vessel

Hastelloy HP/HT reservoir storing the test fluid before injection. Embedded heating and cooling jacket maintain isothermal conditions. Connected to the reaction vessel via the N_2 pressurisation circuit.

03

Chiller

Provides cold water to the reaction and transfer vessels for rapid heat transfer. Temperature range −15 to 40 °C with stability ±0.2 °C. 230 VAC / 50 Hz.

04

Fraction Collector

Model 2110, 80 polypropylene tubes; time- or drop-based collection. Programmable from front panel or remotely. 24 × 33 × 25 cm footprint.

05

N_2 Gas Booster

Compresses and transfers low-pressure N_2 up to 5,000 psi into the HP vessels. Manual valves, air regulator, filter, high-pressure tubing and fittings.

06

Data Acquisition

PC workstation with Floxlab supervision software controlling test duration, rotation speed, temperature, pressure and automatic sampling at user-defined intervals.

05 • SPECIFICATIONS

Technical data & typical applications

Performance envelope and where the RDR-350 is used

KEY FEATURES & BENEFITS

Maximum pressure	5,000 psi
Maximum temperature	Ambient → 250 °C
Reaction vessel volume	500 cc
Transfer vessel volume	500 cc
Sample disk diameter	1.5 in (3.81 cm)
Sample disk thickness	1 in (2.54 cm)
Disk rotational speed	100 – 2,000 rpm
Wetted-part material	Hastelloy
Required N_2 pressure	2,000 psi
Required air pressure	150 psi, dry
Power supply	110 – 220 VAC, 50/60 Hz
Internal vessel diameter	75 mm

TYPICAL APPLICATIONS

Petroleum Engineering
Acid–rock reactions for well-stimulation and carbonate dissolution studies.

Reaction Kinetics
Rate constants and reaction-rate measurements for fluid–solid systems.

Mass-Transfer Studies
Mass-transfer coefficient and boundary-layer quantification.

Corrosion & Dissolution
Corrosion of metals; dissolution of rocks and minerals.

Scale & Precipitation
Precipitation, scale formation and inhibitor effectiveness.

Electrochemistry & Biofilms
Electrodeposition; biomass and biofilm growth on surfaces.

Rapid, accurate and reproducible data — small test-fluid volume, semi-automated apparatus.

TEST PROCEDURE

- Mount 1.5 in carbonate disk on rotating spindle
- Seal reaction vessel; heat to test temperature
- Load test fluid into transfer vessel; preheat
- Pressurise system with N_2 to working pressure
- Push fluid into reaction vessel using N_2
- Start disk rotation at preset speed
- Collect fluid samples at preset intervals
- Measure Ca^{2+} / Mg^{2+} by atomic absorption
- Plot reaction rate vs ω → identify regime
- Repeat at varying ω, T, concentration → rate law

GET IN TOUCH

Let's talk about your project

Floxlab — Laboratory & geotechnical testing equipment

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FLOXLAB CELLS

FOR RESERVOIR STIMULATION EXPERIMENTS

Conductivity · Curing · Crush · Triaxial

Laboratory testing cells for proppant evaluation and fracture conductivity studies

STANDARDS	PRESSURE	TEMPERATURE
API RP 56/58/60	**20,000 psi**	**177 °C**
ISO 13503	*max closure*	*max operating*

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PRODUCT PORTFOLIO

A complete range of laboratory cells for hydraulic fracturing studies

CONDUCTIVITY & CURING CELLS

AC-series
API Conductivity Cell — single, API RP 56/58

SAC-series
Multi-Stack API Conductivity — 2 or 3 cells, shared pump

FCC-series
Fracture Conductivity Cell — large slab, short & long-term

ACC-series
Acid Fracture Conductivity — Hastelloy, carbonate formations

FTC-series
Flow-Through Curing Cell — resin-coated proppant curing

FLC-series
Fluid Loss Curing Cell — RCP conditioning, parallel cells

CRUSH & TRIAXIAL CELLS

CC-series
Proppant Crush Cell — ISO 13503-2, API RP 60

PTC-series
Proppant Triaxial Cell — UCS & confined compression

COMMON FEATURES

- Fully API / ISO compliant
- Stainless steel or Hastelloy wetted parts
- High-pressure & high-temperature operation
- Compatible with brine, nitrogen, acid, fracturing fluids
- Modular accessories (heaters, jackets, extruders)

THE FAMILY AT A GLANCE

AC

FCC

FTC

CC

PTC

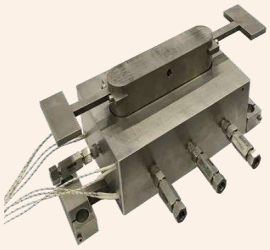
FLC

API CONDUCTIVITY CELLS

Single and stacked API conductivity cells for proppant pack permeability testing

AC-SERIES — API CONDUCTIVITY CELL

Single API conductivity cell for proppant pack permeability and conductivity



KEY FEATURES

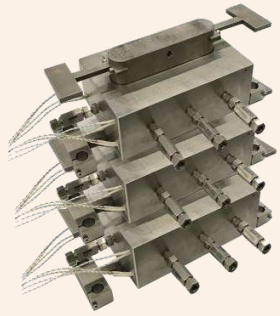
- API RP 56 & RP 58 compliant
- Reservoir-representative pressure & temperature
- Heated end-plates with thermocouple monitoring
- Three-port pressure-tap design for ΔP measurement
- Compatible with brine, gas (N_2) and other fluids
- Stainless steel construction (Hastelloy option)
- Designed for use with the PCM-1000 system

KEY SPECIFICATIONS

Standard	API RP 56 & 58
Closure pressure	up to 20,000 psi
Temperature	ambient to 175 °C
Pore pressure	up to 1,000 psi
Sample size	7" × 1.5" × 1"
Wetted parts	Stainless steel
Pressure taps	3 (ΔP)
Sand screen	Integrated

SAC-SERIES — MULTI-STACK API CELL

Stacked API conductivity cells sharing a single hydraulic pump and pressure source



KEY FEATURES

- Stacked configuration: 2 or 3 cells in one column
- Single hydraulic pump drives all cells simultaneously
- Reduces footprint and accelerates testing throughput
- Identical closure conditions across all cells
- ISO 13503-5 & API RP 56/58 compliant
- Independent flow paths for each cell
- Stainless steel — Hastelloy option for corrosive fluids

KEY SPECIFICATIONS

Standard	ISO 13503-5
Capacity	2 or 3 cells
Closure pressure	up to 20,000 psi
Temperature	ambient to 175 °C
Pore pressure	up to 1,000 psi
Sample / cell	7" × 1.5" × 1"
Wetted parts	Stainless steel
Pump	Shared, indep. flow

FRACTURE CONDUCTIVITY CELLS

Long-term and acid fracture conductivity testing on rock slabs

FCC-SERIES — FRACTURE CONDUCTIVITY CELL

Short-term and long-term tests on large rock slabs

KEY FEATURES

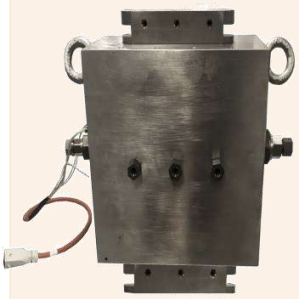
- Designed for use with the FCM-1000 system
- Heated end-plates with precise temperature control
- Two loading pistons with leakoff ports
- Two inlets/outlets for fluid flow
- 4 LVDTs measure fracture width at multiple positions
- 3 inline pressure taps for ΔP measurement
- Sample: two stacked rock slabs (1.5" × 7" x 1" each)

KEY SPECIFICATIONS

Standard	API methods
Max temperature	175 °C
Closure stress	up to 20,000 psi
Pore pressure	up to 1,000 psi
Sample type	Two stacked slabs
Sample size	7" × 1.5" × 2"
LVDTs	4 (fracture width)
Wetted parts	SS / Hastelloy

ACC-SERIES — ACID FRACTURE CELL

Hastelloy cell for simulating acid fracturing in carbonate formations



KEY FEATURES

- Designed for use with the ACM-3000 acid fracture system
- Acid etching and conductivity in a single cell
- Hastelloy construction — resistant to hot acid environments
- Two loading pistons with leakoff ports
- Two inlets/outlets for acid and brine circulation
- 4 LVDTs measure fracture width at multiple positions
- 3 inline pressure taps for ΔP measurement
- Sample: two stacked rock slabs (1.5" × 7" x 3.5" each)

KEY SPECIFICATIONS

Application	Carbonate acid frac
Max temperature	175 °C
Closure stress	up to 20,000 psi
Acid pressure	up to 1,000 psi
Frac. pressure	up to 3,000 psi
Sample size	7" × 1.5" × 7"
Wetted parts	Hastelloy
LVDTs	4 (fracture width)

CURING CELLS

Resin-coated proppant curing under elevated temperature and closure stress

FTC-SERIES — FLOW-THROUGH CURING CELL

Cures RCP plugs at high temperature and variable closure stress

KEY FEATURES

- Designed for use with the RCP tester
- Cures resin-coated proppant plugs at high temperatures
- Bonded steel platens for variable closure stress
- Sample chamber with hardened upper and lower platens
- Fluid ports in platens enable leak-off monitoring
- Heating mantle maintains temperature up to 175 °C
- Extension connector for sample removal after curing

KEY SPECIFICATIONS

Sample diameter	up to 2" (L=2×Ø)
Closure pressure	up to 10,000 psi
Temperature	up to 175 °C
Wetted parts	Stainless steel
Heating	External mantle
Application	RCP curing
Output	Plug for UCS test
Compatibility	RCP Tester

FLC-SERIES — FLUID LOSS CURING CELL

RCP conditioning under closure stress and temperature (API RP 60)

KEY FEATURES

- Engineered to precondition resin-coated proppant packs
- Operates under elevated temperature and closure stress
- Prepares plugs prior to UCS testing
- Floating piston accumulator — N_2-charged closure
- Removable cap with leak-off port and sand screen
- Run 3 to 6 cells concurrently in oven or with mantle
- Compliant with API RP 60

KEY SPECIFICATIONS

Standard	API RP 60
Closure pressure	up to 10,000 psi
Temperature	up to 175 °C
Pack diameters	1" / 1.5" / 2"
Pack length	up to 4"
Models	FLC 25 / 38 / 50
Wetted parts	Stainless steel
Operation	3–6 cells in parallel

CRUSH & TRIAXIAL CELLS

Crush-resistance evaluation and triaxial compression on proppant samples

CC-SERIES — PROPPANT CRUSH CELL

Crush-resistance evaluation per ISO 13503-2 and API RP 56/58/60

KEY FEATURES

- Designed for use with the PCT apparatus
- ISO 13503-2 and API RP 56 / 58 / 60 compliant
- Cylindrical chamber with upper and lower platens
- Filled at 1.22 cm^3/cm^2 with sieved proppant
- Withstands crush pressures up to 20,000 psi
- Compatible with mesh sizes 12/18, 18/30, 30/50
- Stainless steel — fast loading/unloading

KEY SPECIFICATIONS

Standard	ISO 13503-2 / RP 60
Max crush press.	20,000 psi
Press stress	300 kN
Inside diameter	2.5" (64 mm)
Outside diameter	3.5" (89 mm)
Piston height	3.5" (89 mm)
Loading rate	≤ 2,000 psi/min
Wetted parts	Stainless steel

PTC-SERIES — PROPPANT TRIAXIAL CELL

Unconfined and confined compression on resin-coated proppant plugs

KEY FEATURES

- Designed for use with the RCP tester
- Sample assembly submerged in oil under confining pressure
- Low-friction loading piston for triaxial testing
- Heating mantle for controlled temperature
- Specimen up to 2" Ø (length = 2 × Ø)

KEY SPECIFICATIONS

Application	UCS & triaxial
Specimen Ø	up to 2" (50 mm)
Specimen length	2 × Ø
Axial load	up to 250 kN
Confining press.	up to 10,000 psi
Temperature	ambient to 175 °C
Heating	External mantle
Compatibility	RCP Tester

PRODUCT RANGE — SUMMARY

Comparison of the eight Floxlab cell families at a glance

Cell	Application	Standard	Max stress	Max temp.	Wetted parts
AC-series	API conductivity (single)	API RP 56/58	20,000 psi	175 °C	Stainless steel
SAC-series	API conductivity (stack)	ISO 13503-5	20,000 psi	175 °C	Stainless steel
FCC-series	Fracture conductivity	API methods	20,000 psi	175 °C	SS / Hastelloy
ACC-series	Acid fracture conductivity	API methods	20,000 psi	175 °C	Hastelloy
FTC-series	RCP curing under stress	Internal	10,000 psi	175 °C	Stainless steel
CC-series	Proppant crush resistance	ISO 13503-2 / RP 60	20,000 psi	ambient	Stainless steel
FLC-series	RCP fluid loss & curing	API RP 60	10,000 psi	175 °C	Stainless steel
PTC-series	Proppant triaxial / UCS	Internal	10,000 psi	175 °C	Stainless steel

ENGINEERED IN FRANCE · USED WORLDWIDE

- All cells are operated with Floxlab's matching test apparatus (PCM-1000, FCM-1000, ACM-3000, RCP Tester, PCT press).
- Optional accessories include heating mantles, ovens, hydraulic pumps, LVDTs, thermocouples and pressure sensors.
- Custom configurations and OEM versions available on request — contact our engineering team for a tailored quote.

GET IN TOUCH

We look forward to your inquiries

Contact us

Talk to our engineering team about your reservoir stimulation testing needs

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Thank you for your interest in Floxlab cells.

FAMILY THREE

High-Pressure Pumps

The Floxlab signature line — high-pressure syringe pumps, pressure controllers and automatic valves engineered for the most demanding fluid-handling applications in research and industry.

HIGH-PRESSURE PUMPS

Syringe Pumps · Continuous Flow · Pressure Controllers · H_2 / CO_2 Solutions

40,000 psi	160 °C	Pulse-free	SS / Hast.
Max pressure	*Heating option*	*Flow output*	*Wetted parts*

OVERVIEW

Pump Product Range

A complete ecosystem for every flow and pressure challenge

01 **SYRINGE PUMPS**
High-pressure precision flow
CF · BTSP / BTDP · BFSP / BFDP · PV

02 **PRESSURE CONTROLLERS**
Confining & back-pressure
ACP · ACP-150 · ABPR

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

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CF-series

Continuous Flow Pump — pulse-free, unlimited flow output

CF pump (front view)

CF pump (rear view)

DUAL-PISTON WORKING PRINCIPLE

The Floxlab CF Series delivers unparalleled accuracy and repeatability, providing critical pulse-free, high-pressure flow metering. Dual motor-driven pistons employ a unique pre-pressurization step — one cylinder dispenses fluid while its counterpart rapidly refills and pre-pressurizes, ensuring a seamless, pulse-free transition.

CF-SERIES SPECIFICATIONS

Model	Pressure (psi)	Volume (ml)	Max Flow (ml/min)
CF 3	3,000	2 × 40	80
CF 6	6,000	2 × 32	55
CF 12	12,000	2 × 15	30
CF 15	15,000	2 × 12	25
CF 20	20,000	2 × 10	15
CF 30	30,000	2 × 5	5

APPLICATIONS Core flooding · EOR · Chromatography · Analytical dispensing · Process calibration

BTSP-series

Benchtop High-Pressure Single Syringe Pumps

BTSP pump

BTSP with cooling jacket

BTSP with heating mantle

The BTSP series provides ultra-precise, pulse-free fluid flow control for both inorganic fluids (e.g., brine, solvents) and organic fluids (e.g., hydrocarbons, microbial solutions). It delivers controlled pressure, flow rate, and volume with capacities up to 40,000 psi, and supports both constant-pressure and constant-flow modes. A high-precision pressure transducer enables real-time monitoring, while two manual isolation valves regulate inlet and outlet flow. The system includes data acquisition and control software for monitoring and analysis.

STANDARD MODELS

Model	Vol (ml)	P (psi)	Q (ml/min)
BTSP 20-40	20	40,000	7.5
BTSP 50-30	50	30,000	20
BTSP 125-20	125	20,000	30
BTSP 175-15	175	15,000	30
BTSP 250-10	250	10,000	60
BTSP 500-5	500	5,000	130
BTSP 1000	1,000	1,875	250

EXTENDED MODELS

Model	Vol (ml)	P (psi)	Q (ml/min)
BTSP 150-30	150	30,000	20
BTSP 250-20	250	20,000	35
BTSP 300-15	300	15,000	40
BTSP 500-10	500	10,000	70
BTSP 1000-5	1,000	5,000	130

OPTIONS Touch-screen · Heating mantle · Cooling jacket · Mixer · Hastelloy

BTDP-series

Benchtop High-Pressure Dual Syringe Pumps

BTDP pump

BTSP with Heating mantles

BTDP with mixers

The BTDP series combines two BTSP pump modules, enhancing system capabilities. Equipped with a pair of pneumatic powered three-way valves for both tank inlet and outlet delivery, the dual pump provides uninterrupted, continuous fluid flow across a comprehensive range of both pressure and temperature conditions. All functionalities and optional features inherent to the BTSP series pumps remain accessible as both individual pump modules can still operate autonomously.

STANDARD MODELS

Model	Vol (ml)	P (psi)	Q (ml/min)
BTDP 20-40	2 x 20	40,000	7.5
BTDP 50-30	2 x 50	30,000	20
BTDP 125-20	2 x 125	20,000	30
BTDP 175-15	2 x 175	15,000	30
BTDP 250-10	2 x 250	10,000	60
BTDP 500-5	2 x 500	5,000	130
BTDP 1000	2 x 1,000	1,875	250

EXTENDED MODELS

Model	Vol (ml)	P (psi)	Q (ml/min)
BTDP 150-30	2 x 150	30,000	20
BTDP 250-20	2 x 250	20,000	35
BTDP 300-15	2 x 300	15,000	40
BTDP 500-10	2 x 500	10,000	70
BTDP 1000-5	2 x 1,000	5,000	130

BTDP = 2 × BTSP with 3-way valves **OPTIONS** Touch-screen · Heating mantle · Cooling jacket · Mixer · Hastelloy

ENERGY TRANSITION

H_2 & CO_2 Liquid Pumps

Specialized syringe pumps for hydrogen and liquid CO_2 applications

Floxlab BTSP pumps can be specially configured for hydrogen (H_2) and liquid CO_2 service — critical fluids for green hydrogen research, CCS/CCUS (carbon capture & storage), and enhanced oil recovery. Custom thermal jackets, Hastelloy wetted parts, and high-pressure ratings guarantee safe and accurate handling of these challenging fluids.

H_2 — HYDROGEN SERVICE

BTSP 500-5 H_2 — Hydrogen application

- Pressure up to 10,000+ psi
- Specialized seals & gaskets
- SS 316 wetted materials
- Low-permeation design
- Safety interlocks & leak detection

Green H_2 · Fuel cells · Electrolyzers · Storage

CO_2 — LIQUID CO_2 SERVICE

BTSP CO_2 pump with cooling bath

- Cooling jacket (sub-ambient)
- Liquid CO_2 state maintained
- Supercritical CO_2 ($scCO_2$) capable
- Thermally insulated cylinder
- High-pressure (up to 10,000 psi)

CCS / CCUS · $scCO_2$ chemistry · CO_2 EOR · Storage

BFSP / BFDP-series

Bench-Floor Syringe Pumps — large volume & mobility

BFSP / BFDP pumps

BENCH-FLOOR SYRINGE PUMPS

LARGE VOLUME

Bench-floor configurations for applications requiring large volumetric capacities (500 to 1,000 ml) with pressure up to 25,000 psi.

KEY FEATURES

- Sturdy chassis with 4 heavy-duty casters
- BFDP dual version with 3-way valves
- Touch-screen control panel
- Heating mantle up to 150 °C
- SS or Hastelloy wetted parts

BFSP / BFDP SPECIFICATIONS

Model	Volume (ml)	Pressure (psi)	Max Flow (ml/min)
BFSP 500-15	500	15,000	40
BFSP 1000-15	1,000	15,000	80
BFSP 500-25	500	25,000	50
BFDP 500-15	2 × 500	15,000	40
BFDP 1000-15	2 × 1,000	15,000	80
BFDP 500-25	2 × 500	25,000	50

COMMON FEATURES

Shared Features

Common across all Floxlab syringe and continuous-flow pumps

Touch-screen control panel — computer-independent operation

Fluid stirrer

01

FLEXIBLE CONTROL

Modes: time, pressure, flow rate, volume, or trigger events

02

TOUCH-SCREEN PANEL

Intuitive front-panel interface for computer-independent operation

03

DELIVER OR RECEIVE

Bidirectional operation: deliver or receive fluid with equal precision

04

FLUID STIRRER

Optional integrated stirrer for homogenized fluid handling

05

WETTED MATERIALS

High-grade stainless steel standard · Hastelloy for corrosive fluids

06

THERMAL OPTIONS

Heating mantle up to 150 °C · Cooling jacket for sub-ambient Temp.

EVERY FLOXLAB PUMP: Ready-to-use · Data acquisition software · System supervision · Advanced analytics

PV-series & Pharmacia

Pressure Volume pumps and liquid metering solutions

PV-SERIES — *Pressure Volume Pump*

PV-series pump

FEATURES

- Single cylinder configuration
- Ambient temperature operation
- Stainless steel wetted parts
- Supervision software included
- Ethernet connection for data logging
- Horizontal / vertical position

Model	P (psi)	Vol (ml)	Q (ml/min)
PV 200	600	200	70
PV 500	225	500	150

Water pore volume change · Pressure control · Soil studies

PHARMACIA — *Liquid Metering Pump*

Pharmacia liquid metering pump

FEATURES

- Dual-piston antiphase architecture
- Quasi-continuous flow output
- Automatic switchover valve
- Constant flow OR constant pressure modes
- Stainless steel wetted parts
- Computer control via dedicated software

Model	P (psi)	Vol (ml)	Q (ml/min)
Pharmacia	300	2 × 15	20

Solvent injection · Liquid continuous flow

PRESSURE CONTROLLERS

ACP · ACP-150 · ABPR

Dedicated systems for confining, pore and back-pressure regulation

ACP-series

Automated confining pressure

- Servo-controlled confining
- Compatible with triaxial cells
- Closed-loop PID control
- Pressure ramp & hold modes
- High accuracy & repeatability

ACP-150 series

Pressure & temperature controller

- Combined P + T regulation
- Operating temp up to 150 °C
- Reservoir condition simulation
- Heating mantle with PID
- Safety interlocks included

ABPR-series

Automated back-pressure regulator

- Precise pore/outlet pressure
- Maintains downstream conditions
- Pneumatic dome BPR design
- Pressure 10,000 to 20,000 psi
- Gas and liquid service

APPLICATIONS

Floxlab pumps power a wide range of laboratory and industrial systems

H_2 PERMEAMETER
Hydrogen flow studies

CHEMISTRY & PROCESS
Heavy feedstock Pilot plant

FRACLAB
Hydraulic fracturing

SECTORS: Rock Mechanics · Reservoir Engineering · H_2 & CCUS · Hydraulic Fracturing · Petrophysics · Chemistry & Process

GET IN TOUCH

Request a quotation

or technical consultation for any pump model

FLOXLAB — HIGH-PRESSURE PUMPS

Syringe Pumps · H_2 / CO_2 Solutions · Pressure Controllers · Custom Solutions

HEADQUARTERS

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floXlab

TECHNICAL BROCHURE

AUTO-VALVE

S E R I E S

Solenoid-actuated pneumatic valves · High-temperature, high-pressure

Up to 30,000 psi | **Up to 160 °C** | **SS / Hastelloy**

OVERVIEW

Auto-Valve Series — Key facts

DESIGN HIGHLIGHTS

- **Solenoid-actuated pneumatic valves**
- Computer-controlled via solenoids
- Corrosion-resistant construction
- **No volume or pressure change during cycle**
- Two configurations: ON/OFF & 3-way 4-pos

TECHNICAL SPECS

PRESSURE
5,000 – 30,000 psi

TEMPERATURE
80 °C / HT 160 °C

WETTED PARTS
Stainless Steel / Hastelloy

SEALS
Viton (std) · PU on 30K

AIR SUPPLY
80–115 psi pneumatic

KEY BENEFITS

Why engineers choose Floxlab Auto-Valves

Computer-Controlled
Remote, repeatable solenoid actuation.

Pneumatic Actuation
Fast response with 80–115 psi supply.

High Pressure
Proven from 5K up to 30K psi.

High Temperature
HT option rated to 160 °C.

Corrosion Resistant
SS or Hastelloy wetted parts.

Constant Volume
No volume/pressure change in cycle.

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ON/OFF Valves

Single valve configuration — pressure families from 5K to 30K psi

CONFIGURATION

TYPE
Single valve, ON/OFF

ACTUATION
Pneumatic, solenoid-piloted

AIR SUPPLY
80–115 psi

SEAL
Viton (std) · PU on 30K

APPLICATION
Ideal for isolation, shut-off and on/off control in high-pressure lines. Computer-controlled via solenoids with fast, clean pneumatic actuation.

PRESSURE FAMILIES

5,000 psi
1/4" LOK
80/160 °C
SS / Hast.

10,000 psi
1/8" LP
80/160 °C
SS / Hast.

10K psi HF
1/4" SLP
80/160 °C
High flow

20,000 psi
1/4" HP
80/160 °C
SS / Hast.

30,000 psi
1/4" HP
40 °C · PU
SS / Hast.

COMPLETE MODEL LIST

Model	Pressure	Temp	Wetted	Cv	Int. Vol.	Connection	Dimensions
SS05-AT	5,000 psi	80 °C	SS	0.10	0.50 cc	1/4" LOK	5.1 × 10.6 cm
SS05-HT	5,000 psi	160 °C	SS	0.10	0.50 cc	1/4" LOK	5.1 × 10.6 cm
SH05-AT	5,000 psi	80 °C	Hastelloy	0.10	0.50 cc	1/4" LOK	5.1 × 10.6 cm
SH05-HT	5,000 psi	160 °C	Hastelloy	0.10	0.50 cc	1/4" LOK	5.1 × 10.6 cm
SS10-AT	10,000 psi	80 °C	SS	0.055	0.11 cc	1/8" LP	5.1 × 6.8 cm
SS10-HT	10,000 psi	160 °C	SS	0.055	0.11 cc	1/8" LP	5.1 × 6.8 cm
SH10-AT	10,000 psi	80 °C	Hastelloy	0.055	0.11 cc	1/8" LP	5.1 × 6.8 cm
SH10-HT	10,000 psi	160 °C	Hastelloy	0.055	0.11 cc	1/8" LP	5.1 × 6.8 cm
SS10HF-AT	10,000 HF	80 °C	SS	0.085	0.44 cc	1/4" SLP	5.7 × 8.9 cm
SS10HF-HT	10,000 HF	160 °C	SS	0.085	0.44 cc	1/4" SLP	5.7 × 8.9 cm
SH10HF-AT	10,000 HF	80 °C	Hastelloy	0.085	0.44 cc	1/4" SLP	5.7 × 8.9 cm
SH10HF-HT	10,000 HF	160 °C	Hastelloy	0.085	0.44 cc	1/4" SLP	5.7 × 8.9 cm
SS20-AT	20,000 psi	80 °C	SS	0.05	0.22 cc	1/4" HP	5.7 × 8.0 cm
SS20-HT	20,000 psi	160 °C	SS	0.05	0.22 cc	1/4" HP	5.7 × 8.0 cm
SH20-AT	20,000 psi	80 °C	Hastelloy	0.05	0.22 cc	1/4" HP	5.7 × 8.0 cm
SH20-HT	20,000 psi	160 °C	Hastelloy	0.05	0.22 cc	1/4" HP	5.7 × 8.0 cm
SS30-AT	30,000 psi	40 °C	SS / PU	0.05	0.30 cc	1/4" HP	6.8 × 10.0 cm
SH30-AT	30,000 psi	40 °C	Hast./PU	0.05	0.30 cc	1/4" HP	6.8 × 10.0 cm

Nomenclature: S = Single · S = Stainless · H = Hastelloy · 05/10/20/30 = pressure × 1,000 psi · HF = High Flow · AT/HT = Ambient/High Temp

4-Position Valves

Double-valve assembly for fluid routing and switching applications

CONFIGURATION

TYPE
Double valve, 3-way 4-pos

ACTUATION
Solenoid-piloted pneumatic

AIR SUPPLY
80–115 psi

SEAL
Viton (std) · PU on 30K

APPLICATION

Dual-valve configuration with three ports and four switching positions. Ideal for fluid routing, directional switching and multi-line control.

PRESSURE FAMILIES

5,000 psi
1/4" LOK
80/160 °C
SS / Hast.

10,000 psi
1/8" LP
80/160 °C
SS / Hast.

10K psi HF
1/4" SLP
80/160 °C
High flow

20,000 psi
1/4" HP
80/160 °C
SS / Hast.

30,000 psi
1/4" HP
40 °C · PU
SS / Hast.

COMPLETE MODEL LIST

Model	Pressure	Temp	Wetted	Cv	Int. Vol.	Connection	Dimensions
DS05-AT	5,000 psi	80 °C	SS	0.10	0.95 cc	1/4" LOK	5.1 × 15.9 cm
DS05-HT	5,000 psi	160 °C	SS	0.10	0.95 cc	1/4" LOK	5.1 × 15.9 cm
DH05-AT	5,000 psi	80 °C	Hastelloy	0.10	0.95 cc	1/4" LOK	5.1 × 15.9 cm
DH05-HT	5,000 psi	160 °C	Hastelloy	0.10	0.95 cc	1/4" LOK	5.1 × 15.9 cm
DS10-AT	10,000 psi	80 °C	SS	0.055	0.31 cc	1/8" LP	5.1 × 12.0 cm
DS10-HT	10,000 psi	160 °C	SS	0.055	0.31 cc	1/8" LP	5.1 × 12.0 cm
DH10-AT	10,000 psi	80 °C	Hastelloy	0.055	0.31 cc	1/8" LP	5.1 × 12.0 cm
DH10-HT	10,000 psi	160 °C	Hastelloy	0.055	0.31 cc	1/8" LP	5.1 × 12.0 cm
DS10HF-AT	10,000 HF	80 °C	SS	0.085	0.74 cc	1/4" SLP	5.7 × 15.2 cm
DS10HF-HT	10,000 HF	160 °C	SS	0.085	0.74 cc	1/4" SLP	5.7 × 15.2 cm
DH10HF-AT	10,000 HF	80 °C	Hastelloy	0.085	0.74 cc	1/4" SLP	5.7 × 15.2 cm
DH10HF-HT	10,000 HF	160 °C	Hastelloy	0.085	0.74 cc	1/4" SLP	5.7 × 15.2 cm
DS20-AT	20,000 psi	80 °C	SS	0.05	0.62 cc	1/4" HP	5.7 × 14.4 cm
DS20-HT	20,000 psi	160 °C	SS	0.05	0.62 cc	1/4" HP	5.7 × 14.4 cm
DH20-AT	20,000 psi	80 °C	Hastelloy	0.05	0.62 cc	1/4" HP	5.7 × 14.4 cm
DH20-HT	20,000 psi	160 °C	Hastelloy	0.05	0.62 cc	1/4" HP	5.7 × 14.4 cm
DS30-AT	30,000 psi	40 °C	SS / PU	0.05	0.70 cc	1/4" HP	6.8 × 17.2 cm
DH30-AT	30,000 psi	40 °C	Hast./PU	0.05	0.70 cc	1/4" HP	6.8 × 17.2 cm

Nomenclature: D = Double (3-way 4-pos) · S = Stainless · H = Hastelloy · 05/10/20/30 = pressure × 1,000 psi · HF = High Flow

REFERENCES & CONTACT

Nomenclature, Accessories & Contact

NOMENCLATURE — HOW TO READ A REFERENCE

S	S	10	HF	AT
Valve Type	**Wetted Material**	**Pressure**	**Flow Option**	**Temperature**
S = Single D = Double	S = Stainless H = Hastelloy	05 · 10 · 20 · 30 (×1,000 psi)	— standard HF = High Flow	AT = 80 °C HT = 160 °C

EXAMPLE **SS10HF-HT** → *Single · Stainless · 10,000 psi · High Flow · 160 °C*

MANIFOLDS & ACCESSORIES

Solenoid manifold bases — quoted separately

2-Station	2-Station	4-Station	4-Station
AMBIENT	HIGH TEMP	AMBIENT	HIGH TEMP

Also available: *Replaceable Viton seal kits — single valve & dual valve*

GET IN TOUCH

Let's build your high-pressure solution

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