



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

Self-contained

Ø 21.5 – 101.6 mm
70 MPa · ASTM D7012

QUICK RELEASE

Fast load/unload

Ø 21.5 – 54 mm (NX)
70 / 140 MPa

UNIVERSAL

Versatile HP cell

70 / 140 MPa / 150 °C
Ø 21.5 – 100 mm

TRUE TRIAXIAL

3-axis independent

$\sigma_x, \sigma_y, \sigma_z$ 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

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

CONFINING PRESSURE

Up to 20,000 psi
depending on cell type

200 °C

TEMPERATURE

With heating mantle
and PID controller

101.6 mm

SPECIMEN Ø

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 $\sigma_x / \sigma_y / \sigma_z$ · 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

σ_z (axial): servo-controlled load frame + upper Z platen

σ_x, σ_y (lateral): independent hydraulic pumps, symmetric platen pairs

Deformation: LVDTs along each principal axis — full strain tensor

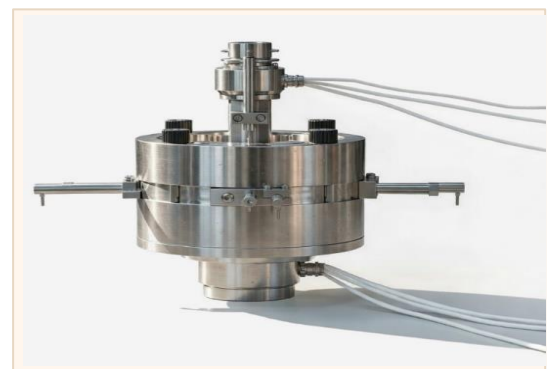


KEY SPECIFICATIONS

- 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



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GET IN TOUCH

Thank you for your interest in FloXlab

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