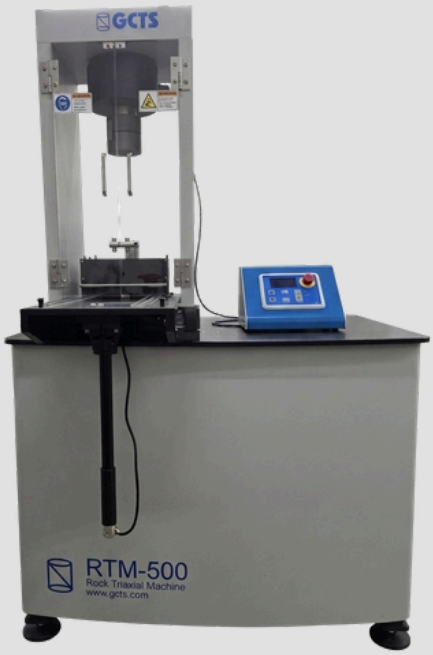
GCTS TESTING SYSTEMS

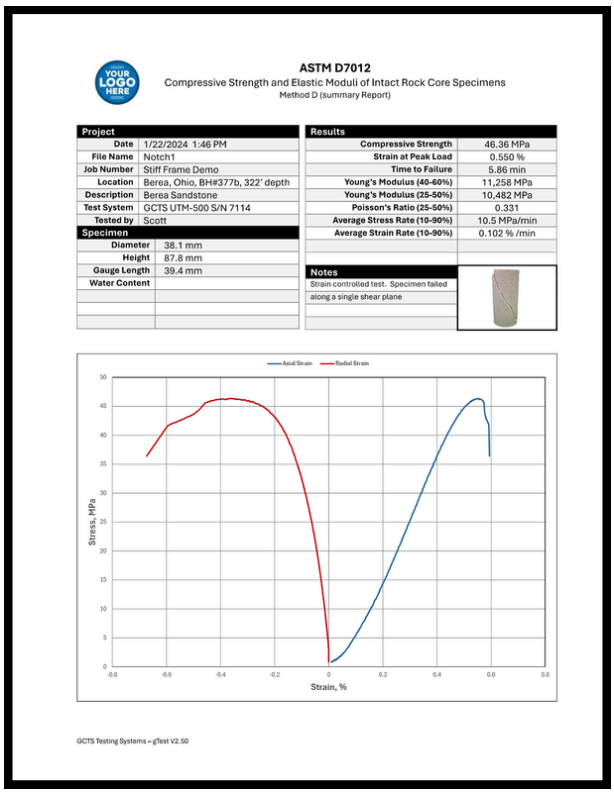
Rock Triaxial Machine (RTM-500)

EXCEEDING TODAY'S STANDARDS, READY FOR TOMORROW'S CHALLENGES

- Compact, cost-effective design for precise triaxial and unconfined testing
- Stiff 500 kN frame with load- and deformation-controlled modes
- Integrated pressure/volume controller delivering confining pressures up to 10,000 psi (70 MPa)
- Broad compatibility with QTRX Quick Triaxial and standard Hoek cells



Automatic Reports



ASTM D7012
Compressive Strength and Elastic Moduli of Intact Rock Core Specimens
Method D (summary Report)

Project	
Date	1/22/2024 1:46 PM
File Name	Notch1
Job Number	Stiff Frame Demo
Location	Berea, Ohio, BH#377b, 322' depth
Description	Berea Sandstone
Test System	GCTS UTM-500 S/N 7114
Tested by	Scott
Specimen	
Diameter	38.1 mm
Height	87.8 mm
Gauge Length	39.4 mm
Water Content	

Results	
Compressive Strength	46.36 MPa
Strain at Peak Load	0.550 %
Time to Failure	5.86 min
Young's Modulus (40-60%)	11,258 MPa
Young's Modulus (25-50%)	10,482 MPa
Poisson's Ratio (25-50%)	0.331
Average Stress Rate (10-90%)	10.5 MPa/min
Average Strain Rate (10-90%)	0.102 % /min

Notes
Strain controlled test. Specimen failed along a single shear plane

GCTS Testing Systems – gTest V2.50

System Specifications	
Load Capacity	500 kN (112,500 lbs)
Confining Pressure	70 MPa (10,000 psi)
Maximum Specimen Size	Ø63.5 mm (2.5 in)
Stiffness	1 MN/mm (5,705,000 lbs/in)
Weight	675 kg (1,500 lbs.)
Dimensions	105 x 86 x 168 cm (41 x 34 x 66 in)

Electrical Specifications	
Resolution	24-Bit
8 Analog Inputs	Accepts load cells, pressure transducers, strain gauges, DC deformation sensors, etc.
Sampling Rate	1,000 Hz simultaneous samples (1 MHz oversampling)
Power Requirements	208-230 V 50/60 Hz 1 phase @ 13.8 A

PRODUCT ADVANTAGES

Compact and Cost-Effective Advanced Testing:

- Delivers precise triaxial and unconfined compression in an economical, space-efficient design.

Stiff Load Frame With Versatile Control

- 1 MN/mm (5,705,000 lbs/in) stiff frame minimizes compliance for accurate results.
- Supports both stress- and strain-controlled modes for diverse stress/strain path tests.

Confining Pressure to 70 MPa (10,000 psi):

- Integrated controller simulates deep in-situ conditions reliably.
- Provides precise control of confining stress. Includes automated multi-stage triaxial testing.

Broad cell compatibility and research applicability:

- Works with GCTS QTRX Quick Triaxial Cell and standard Hoek cells. Ideal for studies of rock strength, deformability, and failure mechanisms.

GCTS QUICK TRIAXIAL CELLS VS HOEK CELLS

Quick Triaxial Cell (QTRX)

- Enables fast “drop-in” setup for rock cores while providing direct measurements of radial strains through cell wall and precise external axial strains.
- Includes four high-accuracy deformation sensors, dedicated platens, and reusable membranes for enhanced measurement capability and reliable triaxial results at confining pressures to 70 MPa (10,000 psi).

Hoek Cell

- Offers fast “drop-in” setup for rock cores to minimize preparation time.
- Provides the same core pressure (70 MPa / 10,000 psi) at a lower cost, ideal when strain measurement is not required.
- Includes dedicated platens and reusable membranes.
- Available optional strain gages to precisely measure on-specimen axial and radial strains.

DON’T SEE WHAT YOU NEED? LET OUR ENGINEERS SOLVE THAT

Rock Triaxial Machine (RTM-500)

PARTICULARLY WELL-SUITED FOR:

- **New University Laboratories and Classrooms** – Plug-and-play setup requires minimal installation and space; 500 kN axial capacity supports essential tests such as unconfined compression, triaxial strength, and elastic modulus determination. Ideal for hands-on student instruction, undergraduate projects, and entry-level research with reliable, user-friendly controls.
- **Mining and Geotechnical Research** – Accurate assessment of rock behavior under varying confinement, including post-failure analysis for brittle materials.
- **Commercial Laboratories** – Supports data collection for tunnel design, slope stability, and foundation evaluation.

PORE PRESSURE OPTION:

Pore pressure measurement and control can be easily integrated using a GCTS ePVC (electromechanical Pressure/Volume Controller) at the time of order or added in the future. This upgrade enables effective stress testing, permeability evaluation, and saturated-condition simulations, delivering enhanced insights into fluid-influenced rock performance with seamless system compatibility and no major reconfiguration.

Quote Now!