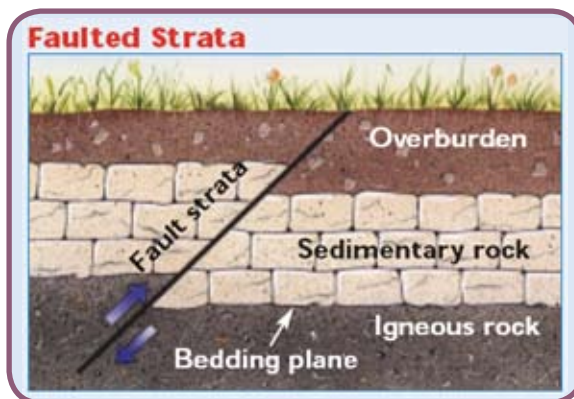


Rock Mechanics



70 Triaxial and Permeability 77 Strength

Rock mechanics is the theoretical and applied science of the mechanical behaviour of rock; in particular the response of rock to changes in stress distribution, both below and adjacent to a structure or excavation.



Carrying out complex and expensive in-situ tests to determine rock engineering parameters is generally uneconomical in all but the largest construction projects. By comparison, laboratory testing, combined with simple yet efficient field test equipment, offers an effective and reliable alternative.

Our range of rock testing equipment has therefore been developed to help you identify, prepare and accurately and reliably test rock samples using industry standard testing techniques.

70 Rock Mechanics - Triaxial and Permeability

Sample Preparation

Core Drill

Cores may be cut from regular or irregular samples of rock or other material for end preparation prior to strength testing. Side guards and a drain tray provide protection against water spray and a sliding front allows access to the specimen clamp. The clamp provides maximum orientation for securing irregular block samples.

Specification	
Dimensions (l x w x h)	500 x 500 x 1160 mm
Drill head travel	630 mm
Drill speeds	350 and 900 rpm
Weight	80 kg

Ordering Information

EL70-0095/01 Core Drill. Supplied complete with 2 x NX Core Barrel. For 220–240 V AC, 50 Hz, 1ph.



EL70-0095/01 Core Drill



EL70-0250/01 GSP210/250 Core Trimmer/Cut-off Machine

GSP210/250 Core Trimmer/ Cut-off Machine

This unit, designed for use in Rock Mechanics, can also be used in mineralogy, ceramics and refractory sample preparation. Cores in excess of 140 mm length and cubes up to 100 mm square can also be prepared.

Specification	
Dimensions (l x w x h)	406 x 915 x 760 mm
Two vices supplied	1– Regular and Irregular samples up to 70 x 125 mm 1– V-vice cores up to 57 mm diameter x 140 mm long
Blade capacity	200 mm
Rated power	750 W
Weight	118 kg

Ordering Information

EL70-0250/01 GSP210/250 Core Trimmer/Cut-off Machine. Supplied complete with coolant recirculation pump/tank unit and 1 each diamond set cutting disc and double faced cup wheel.
For 220 – 240 V AC, 50 Hz, 1 ph.

70 Rock Mechanics - Triaxial and Permeability

ELE-Hoek Cells

- ◆ For use with pressures up to 70 MPa
- ◆ Fast and effective specimen handling
- ◆ Accessories for permeability testing

The ELE-Hoek cells in this section have been designed to accept the nominal NX core size as specified in International Standards.

The basic cell comprises a steel body and two steel end caps which are screwed to the body of the cell when in use. The body incorporates two self-sealing couplings; one for connecting to the hydraulic pressure system, the other for de-airing the cell chamber and for the attachment of pressure measurement devices if required. Hardened and ground spherical steel pistons and two jackets of the same diameter as the specimen are supplied.

Ordering Information

EL70-1710 Hoek Cell NX (55 mm). Supplied complete with 2 jackets and 1 pair of load spreader pads. Weight 14.5 kg.

EL70-1712 Spare NX (55mm) jacket



EL70-2725 Specimen Extruder

ELE-Hoek Cell Specimen Extruder

Ordering Information

EL70-2725 Specimen Extruder. Extrudes the specimen from its jacket without the need to drain the confining fluid. Incorporates a rack and pinion mechanism mounted in a steel body, with adjustable back plate. Supplied with NX extruder adaptor set. Weight 11 kg.



EL70-1710 Hoek Cell NX

70 Rock Mechanics - Triaxial and Permeability

Triaxial Testing

This machine incorporates the Advanced Digital Readout (ADR) Microprocessor System. The ADR is designed to minimise data entry during normal testing procedures and is fully described in the Concrete section.

These machines are specially adapted for use with ELE Hoek Triaxial Cells and feature fixed upper and lower platens with locations to centralise the triaxial cell assembly for maximum stability.

ELE-Hoek Cell ADR 2000 Compression Machine

- ◆ High stability load frame
- ◆ Calibration accuracy satisfies BS EN ISO 7500-1, ASTM E4

Specification	
Dimensions (l x w x h)	520 x 700 x 1300 mm
Capacity	2000 kN
Ram travel	50 mm
Display	ADR Digital Readout
Platen diameter	178 mm
Accuracy	Better than $\pm 1\%$ over upper 90% of working range
Rated power	1350 W
Weight	600 kg

Ordering Information

EL70-2620/01 ELE-Hoek Cell ADR 2000 Compression Machine supplied complete with digital readout, power pack, special upper and lower platens and gates. For 220 – 240 V AC, 50 - 60 Hz, 1 ph.



EL70-2620/01 ELE-Hoek Cell ADR 2000 Compression Machine

Hydraulic Constant Pressure Systems

Successful triaxial tests on rock specimens require a means of providing a constant confining pressure. The hand operated system provides an accurate pressure that can be applied quickly and effectively to the ELE-Hoek Cells.

Hand-operated Pressure System



EL70-5000 Hand-operated Pressure System

Specification	
Pump	Single piston
Maximum pressure	70 MPa
Gauge	300 mm diameter scale marked 0-70 MN/m ²
Weight	14.8 kg

Ordering Information

EL70-5000 Hand-operated Pressure System

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Permeability of Rock

Investigating the permeability or flow of water through rock subjected to high confining pressures is often necessary. The capacity of a rock mass at depth to transmit or yield water is of particular importance when designing deep structures such as tunnels.

Permeability end caps used with ELE-Hoek Cells and constant pressure systems are a cost-effective solution suited to investigating the permeability of rock at high confining pressures in the laboratory.

To collect and measure the water which permeates through the rock specimen, a suitable burette such as EL25-4540 is recommended. Each permeability end cap incorporates a tubing connector which accepts standard 6 mm tubing, EL26-1926, used to connect the cell to the pressure system and burette.

Permeability End Caps

Supplied as a pair complete with spacer (distance) block.

Ordering Information

EL70-1750 Permeability End Caps NX. Weight 6.2 kg.

Accessories

10 ml Burette see EL25-4540

Nylon Opaque Tubing (per metre) see EL26-1926



ELE Oil/Water Constant Pressure Systems

- ◆ Sealed oil reservoir
- ◆ Continuous constant pressure control

The ELE oil/water constant pressure system provides continuous variable pressure. The machine features a clear hydraulic/water interface reservoir, and digital pressure gauge range 0-3500 kPa.

Specification	
Dimensions (l x w x h)	240 x 400 x 500 mm
Maximum pressure	3500 kPa
Usable oil capacity	1 litre
Weight	12 kg

Ordering Information

EL70-5130/01 PressureTest 3500 complete with 2 litres of oil and digital pressure gauge.
For 220 – 240 V AC, 50 – 60 Hz, 1 ph.



77 Rock Mechanics - Strength

Point-Load Strength Test

Digital Point-Load Test Apparatus

EN DD ENV 1997-2, ASTM D-5731

Originally developed at Imperial College, London, the apparatus comprises a two-column fixed crosshead frame and a hand operated hydraulic jack.

Pressure applied by the jack extends the piston carrying the lower conical point. The upper point is fixed to the crosshead with a scale mounted on the frame to provide specimen diameter information for use in point load strength index calculations.

Pressure is indicated directly on the digital readout unit. Loads up to 55 kN can be applied to specimens as large as 101.6 mm in diameter.

The apparatus is supplied complete with heavy-duty face mask.

Specification	
Capacity	55 kN
Maximum sample size	101.6 mm
Load range	0 to 55 kN x 0.001 kN
Weight	25 kg

Ordering Information

EL77-0115 Digital Point-Load Test Apparatus



EL77-0115 Digital Point-Load Test Apparatus

