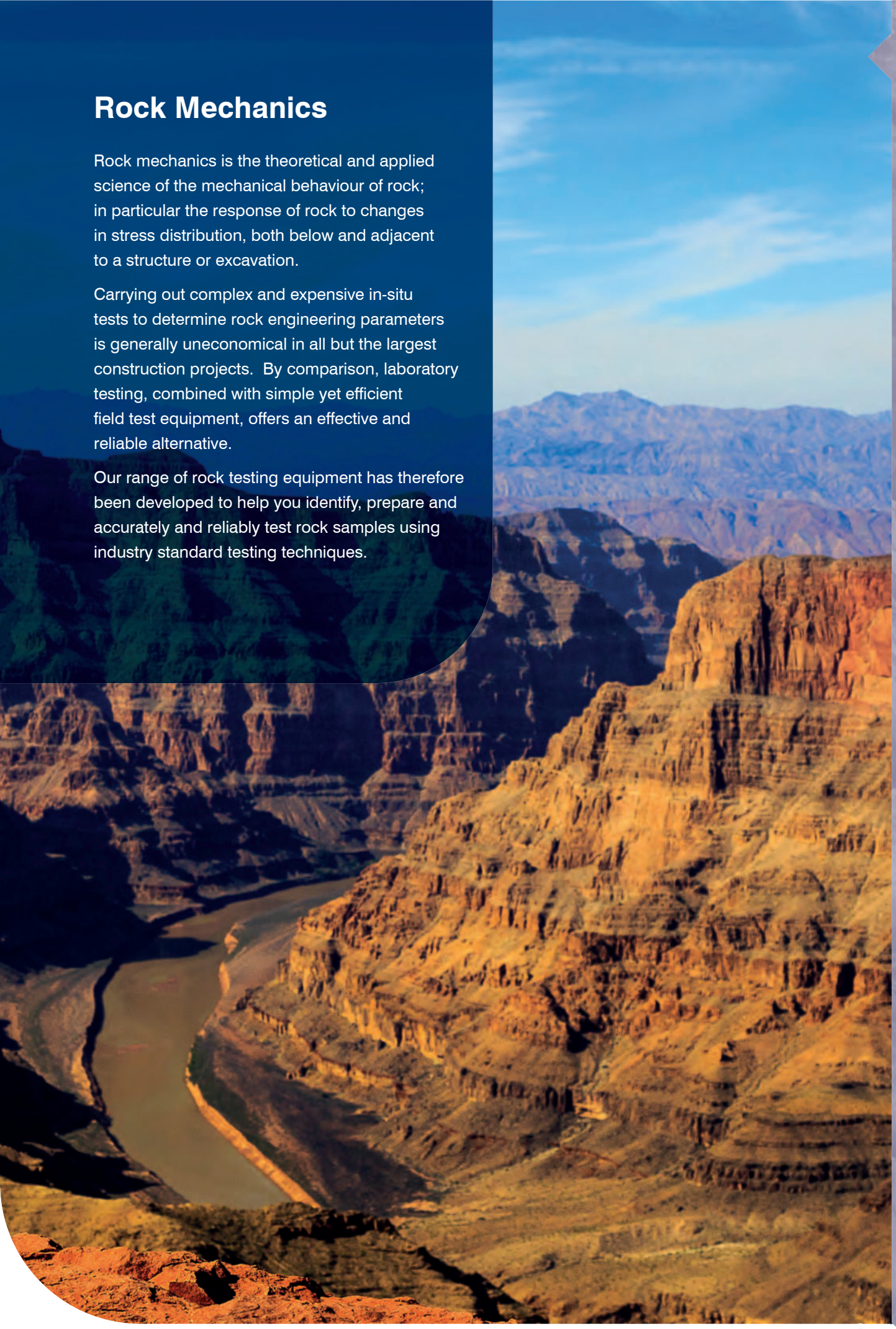
Rock Mechanics

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.

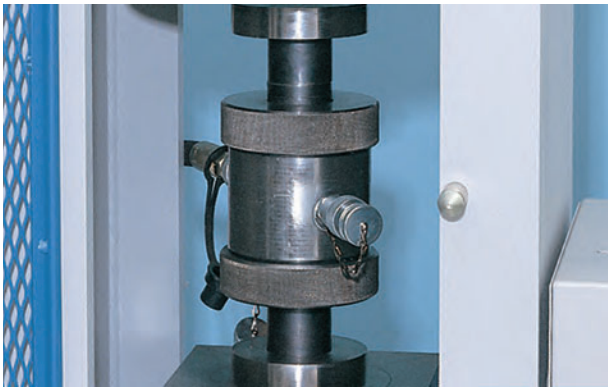
Our range of rock testing equipment has therefore been developed to help you identify, prepare and accurately and reliably test rock samples using industry standard testing techniques.



Triaxial & Permeability

ELE-Hoek Cell ADR Touch 2000 Compression Machine

Product Code: 70-2630/01



Product Standards:

BS EN ISO 7500-1, ASTM E4.

This machine incorporates the ADR Touch Microprocessor System. The ADR is designed to minimise data entry during normal testing procedures. These machines are specially adapted for use with ELE-Hoek Triaxial Cells and feature ixed upper and lower platens with locations to centralise the triaxial cell assembly for maximum stability.

- High stability load frame
- Calibration accuracy satis ies BS EN ISO 7500-1, ASTM E4

Further Information:

Supplied complete with digital readout, power pack, special upper and lower platens and gates.
For 220-240 V AC, 50-60 Hz, 1 ph.

Specifications	
Power Supply	220-240 V AC, 50-60 Hz, 1 ph
Dimensions L x W x H (mm)	520 x 700 x 1300
Capacity (kN)	2000
Ram Travel (mm)	50
Display	ADR Digital Readout
Platen Dia (mm)	178
Accuracy	Better than ± 1% over upper 90% of working range
Rated Power (W)	1350
Weight (kg)	600

Pressure Test 3500 Oil/Water Constant Pressure System with Digital Pressure Gauge

Product Code: 70-5130/01

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.

- Sealed oil reservoir
- Continuous constant pressure control

Further Information:

Complete with 2 litres of oil and digital pressure gauge. For 220-240 V AC, 50-60 Hz, 1 ph.

Specifications	
Power Supply	220-240 V AC, 50-60 Hz, 1 ph
Dimensions L x W x H (mm)	240 x 400 x 500
Max Pressure	3500 kPa
Usable Oil Capacity (L)	1
Weight (kg)	12

Permeability Test with Pressure Test 3500 Pressure System.

Hoek Cells

ELE-Hoek Cell NX

Product Code: 70-1710

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.

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

Further Information:
Supplied complete with 2 jackets and 1 pair of load spreader pads.

Specifications	
Weight (kg)	14.5
Dia (mm)	54.74

Accessories:

Standard Distance Piece 20 mm depth (37-4980)

Support Assembly (81-0094)

Pair Load Spreader Pads (70-2651)

Specimen Extruder (70-2725)

NX Jacket 55 mm (70-1712)

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 NX (One Pair) supplied with Distance Block

Product Code: 70-1750

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 25-4540 is recommended. Each permeability end cap incorporates a tubing connector which accepts standard 6 mm tubing, 26-1926, used to connect the cell to the pressure system and burette.

Specifications	
Weight (kg)	6.2

Accessories:

10 ml Burette (25-4540)

Nylon Tubing

Product Code: 26-1926

6 mm outside diameter x 4 mm inside diameter. For use up to a pressure of 3500 kPa. Priced per metre.

Triaxial & Permeability

Specimen Extruder Bench Mounting Frame for extruding specimens from Hoek Cells

Product Code: 70-2725

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.

Specifications	
Weight (kg)	11

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 complete with Pressure Gauge & Flexible Hose

Product Code: 70-5000

Specifications	
Pump	Single piston
Max Pressure	70 mPa
Gauge	250 mm dia scale marked 0-70 MN/m²
Weight (kg)	14.8

Sample Preparation

Rock Core Drill supplied with 2 x NX Core Drill Bits

Product Code: 70-0095/01

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.

Further Information:

Supplied complete with 2 x NX Core Barrel.

Specifications	
Power Supply	220-240 V AC, 50 Hz, 1 ph
Dimensions L x W x H (mm)	500 x 500 x 1160
Drill Head Travel (mm)	630
Drill Speeds (mm)	350 and 900 rpm
Weight (kg)	80

Accessories:

1 inch Core Drill Bit (70-0125)

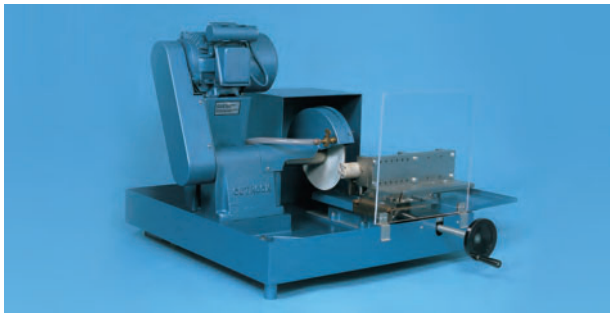
1.5 inch Core Drill Bit (70-0165)

NX Core Drill Bit (70-0195)

HQ Size Core Drill Bit (70-0095)

GSP210/250 Core Trimmer & Cut-Off Machine

Product Code: 70-0250/01 & 70-0250/06



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.

Further Information:

Supplied complete with coolant recirculation pump/tank unit and 1 each diamond set cutting disc and double faced cup wheel.

Specifications	
Dimensions L x W x H (mm)	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 dia x 140 mm long
Blade Capacity (mm)	200
Rated Power (W)	750
Weight (kg)	118
Blade Speed (rpm)	2800
Product Code	**Power Supply**
70-0250/01	220-240 V AC, 50 Hz, 1 ph
70-0250/06	220-240 V AC, 60 Hz, 1 ph

Spares/Consumables:

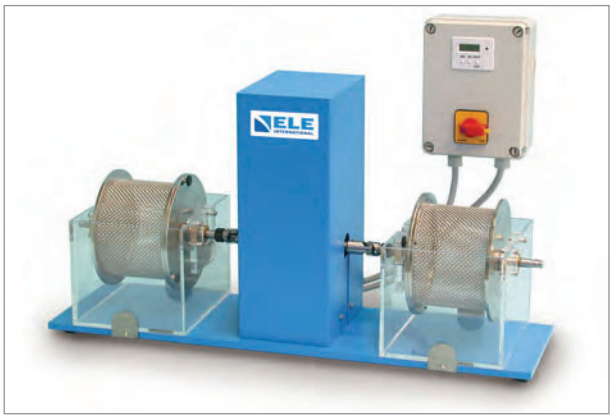
Coolant Recirculation Pump Unit and Tank (70-0310/01)

200 mm diameter Diamond Abrasive Cutting Disc (70-0270)

Double faced Cup Wheel (70-0290)

Slake Durability Apparatus

Product Code: 77-0510/01



Product Standards:

ASTM 04644

This equipment has been developed to assess the durability of rock to weakening and disintegration when subjected to the simulated effects of climatic slaking. The rock samples are dried and then submitted to wear stress inside a drum which is rotated in water. The test is repeated and the wear is given by the loss of weight in the sample.

The system incorporates a motor drive unit mounted on a baseplate which revolves two (or up to four) Stainless Steel drums manufactured from 2 mm mesh, 140 mm diameter x 100 mm long. The tanks are filled with water to a level 20 mm below the drum axis. A digital timer automatically stops the motor after the pre-set time. The equipment is supplied complete with two drums with tanks.

Specifications	
Power Supply	230 V AC, 50 Hz, 1 ph
Dimensions L x W x H (mm)	350 x 740 x 300
Weight (kg)	30 (approx)

Precision Core & Beam Grinder

Product Code: 70-0260/01

- Precision grinding of cores and beams.
- Eliminates the need for capping.
- Preferred technique.
- Environmentally friendly.
- 3 phase.
- Complete with 1 set of abrasive grinding discs.

Accessories:

Diamond Segment Grinding Discs (Set of 8) (70-0260/12)

Strength

Point-Load Strength Test

Digital Point-Load Test Apparatus

Product Code: 77-0115

Product Standards:

EN DD ENV 1997-2, ASTM D5731

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.

Specifications	
Capacity (kN)	55
Max Sample Size (mm)	101.6
Weight (kg)	25
Dimensions L x W x H (mm)	530 x 400 x 720

Spares/Consumables:

Set of Cones for Digital Point-Load Tester (77-0115/10)

Set of 2 Conical Points and 1 set of Seals (77-0115/K)

Stand-alone Display (77-0115/13)

Point Holder (77-0115/14)

Rock Classification Hammer

Product Code: 77-0470

Product Standards:

ASTM D5873, EN 12504-2, ASTM C805

This lightweight and portable impact hammer is used for rock classification tests. The hammer is similar to a device used for many years for strength classification tests of mass concrete. Cylindrical cores, usually NW size, are held in a horizontal position and the hammer mechanism impacted against the core to obtain rebound readings. A series of readings is taken along the length of the core to get the average rebound number.

Specifications	
Body	Aluminium; with indicator scale
Accuracy	Within 15%
Weight (kg)	1.4

Accessories:

NW Rock Cradle (77-0480)

NW Rock Cradle

Product Code: 77-0480

Product Standards:

ASTM D5873

The Rock Cradle is used to hold cores in place during rock classification test procedures. The cradle incorporates a guide for positioning the hammer to allow for a series of readings along the length of the core.

Specifications	
Construction	All metal; treated for rust resistance
Core Size	NW specimens
Weight (kg)	9.1

Hoek Triaxial Cell

Standard(s)	BS EN 1997-2	
Product Code	**Product**	**Qty**
70-2630/01	ELE-Hoek Cell ADR Touch 2000 Compression Machine	1
70-1710	ELE-Hoek Cell NX 54.74 mm dia	1
70-1712	Spare Jacket NX Size	2
70-2725	Specimen Extruder Bench Mounting Frame for extruding specimens from ELE-Hoek Cells	1
70-5000	Hand Operated Pressure System complete with Pressure Gauge and Flexible Hose	1
70-1750	Pair of Permeability End Caps NX supplied with Distance Block	1
25-4540	10 ml Burette Single Tube Drainage	2
26-1926	Nylon Tubing 6 mm outside dia 3500 kPa	4
70-5130/01	Pressure Test 3500 Oil/Water Constant Pressure System with Digital Pressure Gauge	1

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