ELE International

IF IT'S WORTH BUILDING, IT'S WORTH TESTING

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ADR Touch
ELE
International
CLOSE GATE
BEFORE
OPERATING
MACHINE

ELE International
Contents

This brochure outlines some of the major items of the ELE International product range, for full details of accessories and other products contact ELE or visit our website: www.ele.com

ELE International
The Company

ELE International is a highly experienced company supplying construction materials testing solutions worldwide. Strategically located facilities in the UK and USA, supported by regional offices with ELE associates located in People's Republic of China, Middle East and Singapore, provide high quality products and service to end users and local distributors.

This brochure features some of the major items in the ELE International product range; for full details of accessories and other products contact ELE or visit our website www.ele.com.

Customer Service

The satisfactory completion and ongoing performance of any civil engineering project is dependent on quality control tests being undertaken.

- ELE equipment meets latest standards, ensuring that performance specifications are achieved with confidence
- Large stockholding enabling laboratories to be supplied and operational with minimum of delay

Demonstration Laboratory

The ELE headquarters include a purpose-designed demonstration laboratory facility. Both new and existing products are installed in this area, enabling products to be evaluated for performance and compliance to various testing standards. This laboratory is also used for on-site training in setting up and equipment operation.

ISO 9001 Quality Assurance

ELE has a rigorous quality assurance system in operation, with third party certification to ISO9001:2008, throughout the company to ensure customers' requirements are met. The approval covers the design, development, procurement and warehousing of quality control testing equipment for the construction materials testing market. Established procedures are used to check each stage of manufacture as well as packing, shipping and accounts.

ELE International
Product Capabilities

Geotechnical Engineering

- Soil mechanics
- Foundation design
- Sampling, analysis and classification of soil
- Permeability
- Consolidation
- Triaxial
- Direct shear
- Site investigation and in-situ tests

Concrete Technology

- Construction strength and quality
- Strength of concrete
- Fresh concrete
- Cement analysis
- Aggregate classification
- Mix design
- Non destructive testing
- Sample preparation

Asphalt Technology

- Design and testing of bituminous mixtures
- Analysis of bituminous materials
- Pavement, coring, surface regularity and flexure
- Temperature and density

Soil Testing
Compaction

Automatic Compaction of Soils

The time and effort required to prepare specimens for compaction studies and other test methods can often be costly and time-consuming. The use of an automatic, mechanical compactor will show considerable cost benefits over hand compaction methods. Two models meeting the requirements of BS and ASTM are available.

Automatic Compactor

BS1377, EN DD ENV 1997-2, 1924; ASTM D558, D560, D698, D1557; AASHTO T99, T134, T135, T136, T180

- Pre-set blow pattern ensures even compaction
- Solid state controls for reliability and ease of maintenance
- Automatic re-setting of counter after completion of blow pattern

These machines automatically compact specimens eliminating the laborious hand compaction method. The height and weight of the rammer is adjustable to suit test requirements. An automatic blow pattern ensures optimum compaction for each layer of soil. The rammer travels across the mould and the table rotates the mould in equal steps on a base that is extremely stable. The number of blows per layer can be set at the beginning of the test.

Specification

Dimensions (L x W x H)	430 x 240 x 1400 mm	
Rammer	BS/EN	Circular faced, 50 mm dia, adjustable to 2.5 or 4.5 kg weight
	ASTM	Circular faced 2 in (50.8 mm) dia. Adjustable to 5.5 lb (2.5 kg) or 10 lb (4.5 kg) weight
Drop	BS/EN	Adjustable to 300 mm or 450 mm.
	ASTM	Adjustable to 12 in (305 mm) or 18 in (455 mm)
Weight	98 kg	

Ordering Information

EL24-9090/01 Automatic Soil Compactor, BS/EN for 220-240 V AC, 50 Hz 1 ph.

EL25-9095/01 Automatic Soil Compactor, ASTM for 220-240 V AC, 50 Hz 1 ph.

Accessories

EL24-9000 Standard Compaction Mould, BS.

EL24-9198 BS CBR Mould Body.

EL24-9200 BS CBR Extension Collar.

EL24-9060 Proctor Compaction Mould ASTM.

EL24-9066 ASTM Compaction Mould.

EL24-9090 series Automatic Soil Compactor with accessory mould.

Soil Testing
CBR

California Bearing Ratio

The California Bearing Ratio test, or CBR as it is usually termed, is an empirical test first developed in California, USA for estimating the bearing value of highway sub bases and subgrades. The test follows a standardised procedure and there is little difference between EN/BS and ASTM tests.

Load and Penetration

A range of accessories is available enabling options to collect and analyse data with the ELE CBR-Test 50.

1. Mechanical, using standard Load Rings and Penetration Dial Gauges.
2. Electronic Load Transducers and Displacement Transducers in conjunction with the ELE DSU (DataSystem Unit).

CBR-Test 50 Machine

BS1377, 1924; EN 13286-47; ASTM D 1883; AASHTO T193

- Single speed machine (BS/EN and ASTM)
- Rapid platen adjustment
- Options for mechanical or electronic measurement

Designed for performing laboratory CBR tests to BS 1377 and ASTM D1833, this bench mounting machine comprises a twin column frame incorporating a motorised drive system. A single speed is provided to satisfy both BS and ASTM standards. Rapid adjustment of the platen is provided which enables daylight to be taken up quickly and also close control of application of a seating load.

Ordering Information

EL24-9150 series CBR-Test 50. 50 kN Load Frame complete with stabilising bar.

EL24-9150/01 for 220-240 V AC, 50 Hz 1 ph.

EL24-9150/02 for 110-120 V AC, 60 Hz 1 ph.

DSU (Data System Unit)

BS1377: Part 4, Part 5, Part 7, ASTM D1883 D2435 D2850 D3080 D3668,AASHTO T-193 T-216 T-245 T-296, EN 12697-34

- 4 channel automatic control and data-logging unit
- For performing CBR, Marshall, Unconfined Compression, Direct and Residual Shear, One-Dimensional Consolidation and Unconsolidated Undrained tests
- LAN communication now supported – run multiple DSUs on the same network, with remote access

Ordering Information

EL27-1300/01 DSU 220-240 V AC, 50/60 Hz 1 ph.

EL27-1300/02 DSU 110-120 V AC, 50/60 Hz 1 ph.

Soil Testing
CBR

Multiplex 50 Machines

A versatile 50 kN capacity machine for performing laboratory CBR, Marshall and Quick Undrained Triaxial tests.

- Fully variable speed range 0.5 to 50 mm/min
- Mechanical or Electronic measurement
- Large on-board LED screen display

Ordering Information

EL25-3700/01 Multiplex 50, mechanical load frame supplied complete with CBR stabilising bar for 220-240 V AC, 50/60 Hz 1 ph.

Penetration and Measurement

Ordering Information

EL24-9182 Penetration Piston with 1.935 mm² (3 in²) area foot of case-hardened steel. Designed to fit all ELE load rings. Weight 3.7 kg.

EL24-9183 Penetration Piston as EL24-9182 but with a coarse stem adjustment. This piston is particularly useful for in-situ testing.

EL24-8184 Penetration/Swell Dial Gauge, ASTM 1 in travel x 0.0005 in divisions. Complete with rack extensions and chisel edge anvil. Weight 220 g.

EL24-9186 Penetration Dial Gauge BS 25 mm travel x 0.01 mm divisions. Complete with rack extensions and chisel edge anvil. Weight 220 g.

EL24-9188 Bracket and Adaptor dual purpose mounting bracket for CBR penetration dial gauges. Allows gauge to be fixed to penetration piston or load ring. Weight 300 g.

Soil Testing
Consolidation

One Dimensional Consolidation

The One-Dimensional Consolidation test is used to determine the consolidation characteristics of soils of low permeability. Tests are carried out on specimens prepared from undisturbed samples. Data obtained from these tests, together with classification data and a knowledge of the soils loading history, enables estimates to be made of the behaviour of foundations under load.

Consolidation Apparatus

BS 1377; EN DD ENV 1997-2; ASTM D2435, D4546; AASHTO T216

- High capacity- 8800 kPa on 50 mm diameter specimens using 11.1 beam ratio
- Triple beam ratio, 9:1, 10:1, 11:1
- Compact unit ensures maximum space saving

The ELE Oedometer is rigidly constructed to ensure minimum frame distortion. The frame is designed to load the specimen through a yoke assembly and one of three alternative beam ratios. The beam is fitted with a counterbalance weight and beam support jack.

The cell platform will accept the complete range of ELE consolidation cells and is fitted with a central spigot to ensure accurate centring of the cell under the loading yoke. Dimensions without hanger: 711 x 203 x 508 mm (L x W x H). Weight 22 kg.

Ordering Information

EL25-0402 Consolidation Frame supplied without dial gauge and weights.

Consolidation Cells

BS 1377; EN DD ENV 1997-2; ASTM D2435, D4546; AASHTO T216

- Fixed ring type
- Integral water reservoir
- Choice of three sample sizes

The ELE fixed ring consolidation cells are manufactured from corrosion-resistant materials and conform to the requirements of the relevant standards. An integral water reservoir is incorporated in the cell which allows the specimen to be inundated when required. All cells are supplied complete with upper and lower porous disc, pressure pad and cutting (specimen) ring.

Typical Loading

The table below shows typical loading of cells giving unit stress when used with EL25-0402 Consolidation Frame.

Cell model no.	EL25-0455	EL25-0479	EL25-0503
Application	High pressure	ASTM	BS
Specimen dia	50 mm	2.5 inch	75 mm
Specimen area	1963 mm²	4.909 inch²	4418 mm²
Beam ratio	10:1	10:1	9:1
Load	1 kg	1.55 kg	1 kg
Stress	50 kPa	1,000 lb/ft²	20 kPa
Typical max stress	8 MPa	103,200 lb/ft²	3.2 MPa
Stress for 1 kg	50 kPa	645 lb/ft²	20 kPa

Consolidation Cells Ordering Information

Nominal sample diameter	50 mm	2.5 inch	75 mm
Consolidation Cell complete	EL25-0455	EL25-0479	EL25-0503
Calibration disc	EL25-0461	EL25-0485	EL25-0509

Accessories

EL25-0440 Dial gauge, 10 mm travel x 0.002 mm div.

EL25-0445 Dial gauge, 0.5 in. travel x 0.0001 in. div.

EL25-0408 Set of weights 100 kg comprising, 9 x 10 kg, 1 x 5 kg, 2 x 2 kg, 1 x 1 kg.

Soil Testing
Soil Strength (Triaxial)

The ELE designed and manufactured Tritest 50 load frames are the most modern of their kind available to the discerning test laboratory. Each machine incorporates the latest microprocessor control systems, clear on-board screen displays and a range of other high quality features.

Specification

Dimensions (L x W x H)	500 x 500 x 1470 mm
Maximum vertical clearance	910 mm
Horizontal clearance	364 mm
Platen diameter	133 mm
Platen travel	100 mm
Platen speed range	0.00001 to 9.99999 mm/min
Rapid approach speed	25 mm/minute
Weight	140 kg

Digital Tritest 50

BS 1377-7,-8 1924-2, ASTM D2850 D4767, AASHTO T296 T297

- Microprocessor control
- Large on-board LED screen display
- Direct entry via a touch sensitive keyboard
- Rapid approach and return to datum of platen
- Fully variable speed, 0.00001 to 9.99999 mm/min
- Samples up to 100 mm diameter

This 50 kN capacity machine, designed primarily for triaxial testing of soil specimens up to 100 mm diameter x 200 mm long, comprises a rigid twin column construction with an integral fully variable microprocessor controlled drive unit and LCD display with a touch sensitive keyboard. The machine is normally bench mounted for ease of installation and operation.

The use of a microprocessor controlled drive system and keyboard entry provides the Digital Tritest 50 with a wide variety of features which include pause and speed reset during test. A robustly constructed steel case houses the motor drive system with careful attention being given to the prevention of ingress of water or grit. All operating controls are mounted on the front panel of the machine which is angled and recessed to prevent physical and environmental damage.

Ordering Information

EL25-3518/01 Digital Tritest 50 complete with RS 232C interface for 220 - 240 V AC, 50 - 60 Hz, 1 ph.

Soil Testing
Soil Strength (Triaxial)

The measurement of total stress or effective stress requires the use of different procedures and therefore different accessories and equipment.

Total stresses are normally measured in a triaxial cell where the sample is subjected to an all round confining pressure (3). A load is then applied (1) through a piston onto a pressure pad.The sample is confined in a rubber membrane and no drainage in to or out of the specimen is allowed. Pore water pressures are not normally measured and the undrained test is often referred to as the QU-TXL test. An extension of the QU test is the unconsolidated undrained test (UU). This is similar to the QU test but is run at a slower rate in order to measure pore water pressure.

Effective stresses when measured in a triaxial cell are more complex in their nature. Numerous parameters may be measured including back pressure, pore water pressure and volume change. From these values various engineering properties can be calculated. Effective stress tests are usually referred to as consolidated drained applicable to sands and either the CU or CD test is applicable to clays. There are many special test variations within these basic test groupings.

With the growing demand for automated testing, ELE International offer the DataSystem 7.2 suite of geotechnical data acquisition, analysis and reporting software, providing significant efficiency benefits in high volume testing laboratories.

Programs available for Triaxial, Permeability Consolidation, Direct/Residual Shear and CBR tests

- Now supports Ethernet communications
- Programs available for Triaxial, Permeability Consolidation, Direct/Residual Shear and CBR tests
- Full support for Windows 7 and MS Word 2007/2010
- Accurate and repeatable test procedures
- 24 hour unsupervised logging
- Eliminate the possibility of errors while taking manual readings
- Tests are run with step-by-step instructions selectable between BS and ASTM/AASHTO standards
- Automatic report generation in accordance with the above standards
- Real-time graphical outputs to both screen and printer as required

The ELE Geotechnical Software package (DS7), in conjunction with the GDU and a range of transducers, are the two central components required to create a modern turnkey soil testing system. Being fully modular it can be adapted to a wide range of soil testing laboratory configurations.

Ordering Information

27-1500/01	GDU 8 Channel Data Acquisition Unit 220-240 V, 50/60 Hz 1 ph.
27-1500/02	GDU 8 Channel Data Acquisition Unit 100-120 V, 60 Hz 1 ph.
27-1505	8 Channel Expansion Analogue Input Module.

For further information and specifications of equipment and additional items that may be required please contact ELE.

Soil Testing
Soil Strength (Direct Shear)

Direct/Residual Shear Apparatus

BS 1377; EN DD ENV 1997-2; ASTM D3080

- Microprocessor control
- Large on-board LED screen display
- Direct entry via a touch sensitive keyboard
- Rapid approach and return to start datum
- Fully variable speed, 0.00001 to 9.99999 mm/minute

The ELE Shear Apparatus accepts specimens 60 mm, 100 mm square or 2.5 inches in diameter. The use of a microprocessor controlled drive system and keyboard entry provides the apparatus with a wide range of features which include pause and speed reset during test, operator programming of speed and control functions, self test diagnostics and many other features. A return to start datum provides a positive means of reversing the shearbox when either preparing for a new test or continuing with residual testing procedures. Safety travel limit switches are fitted as standard.

Supplied complete with carriage, loading hanger and 10:1 lever loading device.

Specification

Dimensions (L x W x H)	1140 x 275 x 1260 mm
Speed range: **Standard speeds** **Fast forward/reverse**	 0.00001 to 9.99999 mm 100 mm per minute
Weight	82 kg

Ordering Information

EL26-2114 series Digital Direct/Residual Shear Apparatus. Supplied without shearbox, load ring, vertical and horizontal dial gauges.

Accessories

EL78-0060 Load ring 2.0 kN capacity.

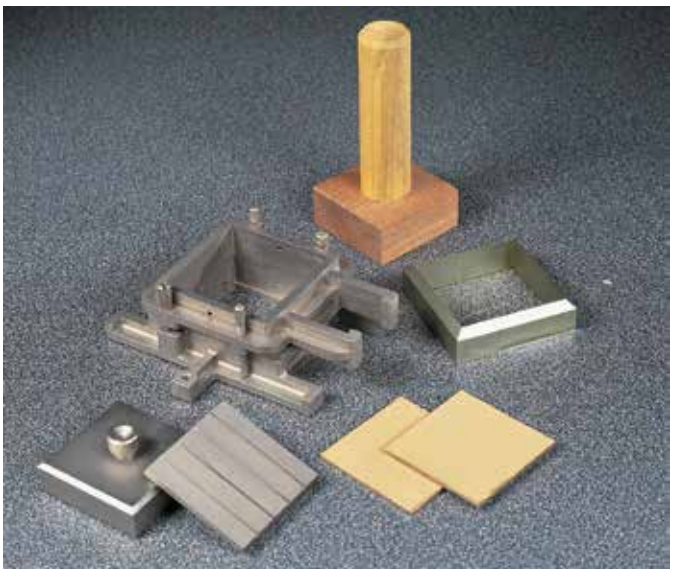
EL78-0160 Load ring 3.0 kN capacity.

EL78-0260 Load ring 4.5 kN capacity.

EL25-0440 Vertical dial gauge 10 mm travel x 0.002 mm div.

EL83-5456 Horizontal dial gauge 10 mm travel x 0.01 mm div.

EL26-2132 Set of weights 50 kg comprising, 4 x 10 kg, 1 x 5 kg, 2 x 2 kg, 1 x 1 kg.



Shear Box Assemblies

BS 1377; EN DD ENV 1997-2; ASTM D3080

All shearbox assemblies are supplied complete with 2 porous plates, 1 retaining plate and a loading pad.

	EL26-2181	EL26-2197	EL26-2213
Specimen area	60x60 mm	100x100 mm	2.5 inch dia
Specimen thickness	25 mm	25 mm	1 inch
Weight	2 kg	5.2 kg	2.8 kg
Relevant standard	BS 1377	BS 1377	ASTM D3080

Concrete Testing
Compression Machines

ADR Touch 1500, 2000 and 3000 kN Compression Machines

The ADR Touch range of 1500, 2000 and 3000 kN capacity compression machines have been designed to meet the need for reliable and consistent testing.

The load frame is a welded steel fabrication carrying the ball-seated upper platen. Positively located on the loading ram which is protected from debris by a flexible cover, the lower platen is marked for the centring of cube and cylinder specimens. Self-centring lower platens for cube location are supplied as standard on EN machines and are available as an optional extra on the standard machine.

Standard Compression Testing Machines

36-0720/01

- 1560 kN/350 000 lbf capacity
- Calibration accuracy to BS EN ISO 7500-1; ASTM E4
- Efficient hydraulic power packs
- Economic machines ideal for site use

The 1500 range of compression machines has been designed to meet the need for a simple, economic and reliable means of testing concrete.

Specimen Capacity

The dimensions of the frame allow the testing of cylinders up to 320 mm long x 160 mm diameter, and cubes 150 or 100 mm square. Kerbs and flagstones may also be tested on the ADR machine as well as 150 mm and 100 mm square section beams to ASTM C78, using the optional 100 kN flexural frames which are connected to the power pack.

Load Indication

The ADR Touch digital readout is a microprocessor controlled instrument, which is fitted as standard to all digital machines in the range. Load can be displayed in kN, lbf or kgf as selected by the operator.

- 36-3090/01
- 2000 kN/450 000 lbf capacity
- Tests 150 and 100 mm concrete cubes or cylinders up to 320 x 160 mm diameter
- Supplied with Windows® download software as standard

Incorporating the ADR Touch digital readout, the machines are designed to test cubes and cylinders in accordance with most International Standards. Supplied fitted for cylinder testing with safety gates. When used for cube testing, appropriate distance pieces according to the size of specimen to be tested are required and must be ordered separately.

Ordering Information

EL36-0720/01 ADR Touch 1500 Compression Machine with Digital Readout.
For 220-240 V AC, 50-60 Hz 1 ph.

EL36-3090/01 ADR Touch 2000 Standard Compression Machine with Digital Readout.
For 220-240 V AC, 50-60 Hz 1 ph.

Machines are supplied ready for testing cylinders 300 x 150 mm diameter. Distance pieces for testing other sizes of samples are available as optional accessories; contact ELE for further information.

Concrete Testing
Compression Machines

ADR Touch 2000 and 3000 BS/EN Compression Machines

- Machines to meet the requirements of EN 12390-3, -4, -5, 12504-1, 1354, 1521, 3161, 1338, 772-6, 13286-41 BS 3892-3, 187, 6717
- Alpha-numeric keypad for data entry
- Calibration accuracy to BS EN ISO 7500-1; ASTM E4
- Automatic loading cycle
- 2 gigabyte on-board memory for test results
- Wide range of accessories

The ADR Touch range of 2000 kN and 3000 kN capacity compression machines has been designed to meet the need for reliable and consistent testing. The load frame is a welded steel fabrication carrying the ball-seated upper platen. Positively located on the loading ram, which is protected from debris by a flexible cover, the lower platen is marked for the centring of cube and cylinder specimens. Self-centring lower platens for cube location are supplied as standard on EN machines and are available as an optional extra on the standard machine. The two machines for cube testing to EN standards are assembled and aligned using a special compression frame stability tester.

The dimensions of the frame allow the testing of concrete cylinders up to 320 mm long x 160 mm diameter, 150 and 100 mm square cubes, and on EN/BS machines, 200 mm square cubes. Kerbs and flagstones may also be tested on ADR machines as well as 150 mm and 100 mm square section beams to ASTM C78 using the optional 100 kN flexural frames which are connected to the power pack.

Ordering Information

EL36-3280/01 ADR Touch 2000 BS EN Compression Machine with Digital Readout and Self Centring Platens. For 220-240 V AC, 50-60 Hz 1 ph.

EL36-3321/01 ADR Touch 3000 BS EN Compression Machine with Digital Readout and Self Centring Platens. For 220-240 V AC, 50-60 Hz 1 ph.

A wide range of optional accessories are available for this series of machines. Contact ELE for further information.

ELE International has a policy of continuous product review to ensure compliance to the relevant testing standards.

The latest product information can be found on the ELE e-commerce system at www.ele.com.

We recommend that you take a few minutes to register for access to this fully integrated and advanced facility for:

- Placing and tracking orders anytime 24/7
- Receiving mailings on special offers and new products
- Expanded product specifications
- Downloading available product datasheets

Concrete Testing
Compression Machines

The ADR-Auto V2.0 Range

Whilst delivering all of the features and reputation of the established ADR-Auto V2.0 range with its 20 year design history, the new and improved user interface provides a high quality platform for testing that will enhance the performance of our compression machines. New, sophisticated electronics further the benefits of a closed-loop operation in testing concrete and cement/mortar samples, satisfying the requirements of Quality Control Managers, Laboratory Managers and Technicians alike. ADR-Auto V2.0 2000 Standard is supplied complete with safety gates ready for testing 300 x 150 mm diameter cylinders.

ADR-Auto V2.0 2000 Standard

- Meets requirements of AS 1012:Part 9
- Tests 150 and 100 mm cubes and cylinders up to 320 x 160 mm diameter
- Options to test mortar cubes and concrete beams to ASTM C109 and C78
- Supplied with Windows download software as standard

The ADR-Auto V2.0 2000 Standard is supplied complete with safety gates ready for testing 300 x 150 mm diameter cylinders. When used for cube testing, distance pieces of the appropriate size must be ordered separately.

Ordering Information

EL36-4125 series ADR-Auto 2000 Standard Compression Machine.

EL36-4125/01 for 220 – 240 V AC, 50 Hz, 1 ph.

EL36-4125/02 for 110 – 120 V AC, 60 Hz, 1 ph.

ADR-Auto V2.0 2000 and 3000 EN

- EN 12390-3, -4, -5, 12504-1, 1354, 1521,13161, 1338, 772-1, -6, 13286-41
- Tests 200, 150 and 100 mm cubes and cylinders up to 320 x 160 mm diameter

The ADR-Auto V2.0 2000 BS EN is supplied complete with self-centring lower platen and safety gates fitted with interlock switches ready for testing 300 x 150 mm diameter cylinders. When used for cube testing, distance pieces (EN) of the appropriate size must be ordered separately.

Ordering Information

EL36-4150/01 ADR-Auto V2.0 2000 BS Compression Machine. For 220 – 240 V AC, 50 Hz, 1 ph.

EL36-4165/01 ADR-Auto V2.0 3000 BS EN Compression Machine. For 220 – 240 V AC, 50 Hz, 1 ph.

Concrete Testing
Accessories

Distance Pieces

Distance pieces are used to reduce the amount of vertical space between the upper platen and the top surface of the specimen.

Two versions are offered, both of which have a maximum load capacity of 3000 kN and are for use with fixed head load frames.

Standard size distance pieces have a nominal diameter of 180 mm. EN distance pieces are nominally 220 mm diameter in accordance with the standard specification.

Effective Depth	Standard	EN 12390-3. -4
	Distance pieces	Distance pieces
20 mm	EL37-4980	EL37-5110
50 mm	EL37-5000	EL37-5120
60 mm	EL37-5020	EL37-5140
80 mm	EL37-5050	EL37-5170
100 mm	EL37-5100	EL37-5180

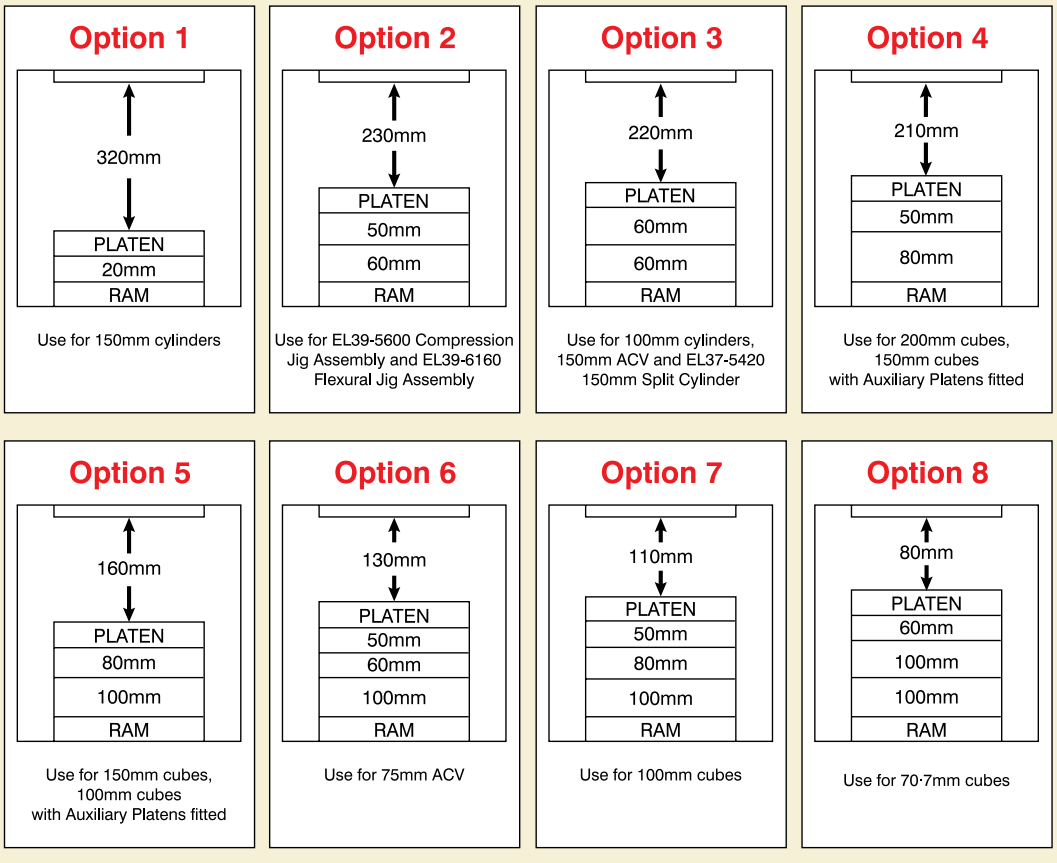
Rectangular Platens

Two versions are available, one for 2000 kN capacity machines the other for 3000 kN capacity machines. The assemblies are supplied complete with all the necessary fittings including: EL37-4860 BS/EN specification platens measuring 445 x 250 x 75 mm thick, extended length safety gates and roller assemblies for the platens.

Ordering Information

EL37-4830 BS Block Platens & Platen Handling Assembly for 2000 kN & 3000 kN BS Frames.

Recommended Distance Piece Arrangements



Concrete Testing
Flexural Frames

The flexural and transverse strength of concrete is of interest to engineers for many reasons. Movement of structures which may be induced by temperature changes, ground vibrations, cyclic loading and many other external influences, will set up internal stresses within a concrete member.

There is no clearly defined relationship between compressive and flexural strength. Generally it can be assumed for most purposes that flexural strength of normal concrete is about 10% of the compressive strength achieved in the same concrete.

Lower loads are used to test concrete in flexure, however, the shape and size of test specimens is such that larger and often heavy specimens can be difficult to handle. ELE has designed the range of machines offered to provide for ease of specimen positioning and subsequent testing, including low strength compression tests using optional ball seating assemblies.

Flexural Testing Machines

Ordering Information

EL37-6130 100 kN Flexural (Beams) Frame.
Supplied without specimen bearers.

Accessories

EL37-6135 series 100 kN Flexural Fitting Kit ADR Auto.

EL37-6135/01 for 220 – 240 V AC, 50 Hz, 1 ph.

EL37-6135/02 for 110 – 120 V AC, 60 Hz, 1 ph.

EL37-6138 100 kN Flexural Fitting Kit ADR.

EL37-6131 EN Specimen Bearer Assembly comprising 2 self-aligning upper bearers, 1 self-aligning and 1 fixed lower bearer. Roller bearers are 38 mm diameter x 160 mm long. Suitable for 3 or 4 point flexural testing of beams.

EL37-6132 ASTM C78 Specimen Bearer Assembly comprising 2 self-aligning upper bearers, 1 self-aligning and 1 fixed lower bearer; case-hardened, 38 mm diameter x 160 mm long.

EL37-6133 Ball Seating Assembly comprising a ball seating assembly with 150 mm diameter platen and a lower platen 150 mm diameter x 16 mm thick. Suitable for testing low-strength specimens.

Specification

Dimensions (L x W x H)	380 x 505 x 845 mm
Vertical clearance with bearers	164 mm
Throat clearance	95 mm
Ram travel	75 mm
Weight	146 kg

Ordering Information

EL37-6140 100 kN Flexural/Transverse (Flags) Frame.
Supplied without specimen bearers.

Accessories

EL37-6135 Flexural Fitting Kit for ADR Auto compression machines.

EL37-6138 Flexural Fitting Kit for ADR compression machines.

EL37-6330 Specimen Bearer Assembly EN 12390-5 1521 13161 772-6. Comprising 2 self-aligning upper roller bearers, 1 self-aligning and 1 fixed lower roller bearer. Roller bearers are 38 mm dia x 320 mm long.

EL37-6362 Upper Bearer and Pair of Self-aligning Lower Steel Bearers for transverse testing of flags to BS 7263.

EL37-6364 Upper Bearer and Pair of Self-aligning Lower Steel Bearers for transverse testing of flags to BS 7263.

Specification

Dimensions (L x W x H)	380 x 505 x 845 mm
Vertical clearance with bearers	164 mm
Throat clearance	95 mm
Ram travel	75 mm
Weight	146 kg

Cement Testing
Sample Preparation

The results of strength testing of cement are dependent on the method and the quality of equipment used. A standard system for strength testing is based on compressive strength of mortar prisms.

The correct mixing sequence and homogenity of mix is important for consistent, repeatable test results. Mixers should be powerful enough not to be affected by the mix constituents; so designed to ensure that the mixer action and blade does not break down individual sand particles and preferably provides automatic mixing cycles.

Specification

Dimensions (L x W x H)	530 x 350 x 580 mm	
Speeds (rpm) **Low** **High**	Paddle 140 ±5 285 ±10	Mixing Head 62 ±5 125 ±10
Rated power	180 W	
Bowl capacity	5 litres (approx)	
Weight	54 kg	

Automatic/Manual 5 litre nominal capacity Mortar Mixer

EN 196-1, 196-3, 413-2, 459-2, 1744-1, 13279-2, 1015-2, ISO 679

- Microprocessor control
- Choice of automatic mixing cycles
- Sand and water dispenser as standard

This mixer is designed to mix mortars and cement pastes to the requirements of the above standards. The mixing paddle has a planetary motion and is driven by a motor with a microprocessor based speed and program controller. The mixer can be operated either in an automatic or manual mode.

Ordering Information

EL39-0035/01 Automatic/Manual 5 litre nominal capacity Mortar Mixer complete with sand and water dispensers, bowl and paddle. For 220 – 240 V AC, 50 – 60 Hz, 1 ph.

Jolting Table

This machine consists of a mould table seated on a rotating cam driven at 60 revolutions per minute. The apparatus is supplied with separate mains switch box, push button start/stop control, and automatic stop control at end of test.

Ordering Information

EL39-1150/01 Jolting Table supplied without moulds. Weight 55 kg. For 220 – 240 V AC, 50 Hz, 1 ph.

EL39-1100 Three-gang Mould for 40.1 x 40 x 160 mm mortar prisms. Supplied with glass plate. Weight 12.2 kg.

EL39-1120 Feeding Hopper for EL39-1100 Mould.

EL39-1130 Scraper double-ended, used for spreading and levelling mortar in mould.

EL39-1170 Mortar Sand. Graded pack for 3 prisms. 1350 g pack.

Cement Testing
Strength Testing

ADR-Auto V2.0 250/25 Compression Machine

EN 196-1, 459-2, 1744-1, 1015-11, 13454-2ASTM C109

- 250 kN maximum capacity
- Calibration accuracy to BS EN ISO 7500-1; ASTM E4
- Automatic loading cycle
- 25 kN low capacity frame supplied as standard
- Tests a wide variety of specimen sizes
- Tests mortar, lime, cement and Fly Ash
- Complete with compression/flexural jigs and platen sets
- Supplied with Windows® download software as standard

The ADR-Auto V2.0 250/25 Machine provides consistent automatic testing of a wide range of specimens. The machine comprises a standard ELE 250/25 kN load frame and ADR-Auto V2.0 console and incorporates all the features included in the ADR-Auto series concrete testing machines.

As standard the machine is supplied with platens fitted to the load frame, compression jig with 40 mm and 50 mm/2 inch square platen sets and flexural jig for testing 40.1 x 40 x 160 mm prisms.

The availability of the 25 kN low capacity load frame as standard extends the test capability of the machine for low strength compression or flexural testing.

The automatic loading cycle is controlled by a closed loop microprocessor hydraulic system incorporated with the display in the ADR-Auto console attached to the load frame. A serial output port is built into the system, enabling test data to be stored in memory (up to 500 test results) for subsequent downloading to PC or suitable printer.

Specification

	250 kN frame	25 kN frame
Overall dimensions (mm) (L x W x H)	520 x 850 x 1255	520 x 850 x 1255
Max vertical clearance	230 mm	230 mm
Max horizontal clearance	225 mm	230 mm
Upper and lower platens	150 mm dia	150 mm dia
Max ram travel	15 mm	15 mm
Related power	1600 W	1600 W
Weight	700 kg	700 kg

Micro-processor Control Specification

Measurement units	kN, lbf or kgf - selectable
Accuracy	Better than ±1% over calibrated range
Display Backlit	LCD 105 x 31 mm (W x H)
Maximum load	Held until reset
Output	Serial RS 232C

Ordering Information

EL39-6160/01 ADR-Auto V2.0 250/25 Cement Machine c/w Compression and Flexural Jigs and Platen Sets.

For full details on the range of Cement testing equipment available from ELE please visit our website www.ele.com.

Los Angeles Abrasion Machine

EN 1097-2 ASTM C131, C535

- European and ASTM methods
- Revolution counter
- Safety cut-out
- Full width cover

The Los Angeles Machine comprises a heavy steel cylinder, rotated about its horizontal axis.

The cylinder incorporates a removable internal shelf. Two alternative shelf positions are provided, one for ASTM and one for the EN test method.

The ELE Los Angeles Machine's heavy duty steel cylinder is manufactured from structural steel plate conforming to S275 of EN 10025:1993.

The filling aperture is provided with a cover and a safety stop button is prominently positioned. The machine is fitted with a revolution counter and steel tray for specimen unloading. Supplied without abrasive charges, which should be ordered separately.

Ordering Information

EL42-5305/01 Los Angeles Abrasion Machine as specified. For 220 – 240 V AC, 50 Hz, 1 ph.

EL42-5310/01 Los Angeles Abrasion Machine with CE Safety Cabinet fitted with microswitches. For 220 – 240 V AC, 50 Hz, 1 ph.

Accessories

EL42-5300/10 Set of Abrasive Charges (ASTM).

EL42-5305/10 Set of Abrasive Charges (EN).

Aggregate Testing
Skid Resistance Testing

Specification

Dimensions (L x W x H)	695 x 295 x 695 mm
Volume	0.15 m3
Weight	30 kg

Pendulum Skid Resistance Tester

New

EN1097-8

- Designed for laboratory and on site road surface testing
- Low friction arm and lightweight pointer
- Supplied with 'F' scale for use with small slider set for 76 mm slide length (PSV test)
- Highly repeatable
- Supplied with carrying case

Applications

- Assessment of surface friction and skid resistance properties
- Testing of aggregates in the PSV (Polished Stone Value) test
- Testing of new road surface materials
- Testing of pedestrian pavements
- RTA (road traffic accidents)
- Litigation investigations

The Pendulum Skid Resistance Tester was originally designed in the 1940s in the USA, and further developed in the 1960s at the TRL (Transport Research Laboratory) for the testing of road surfaces.

The device measures the frictional resistance between a rubber slider mounted on the end of a pendulum arm and the surface to be tested. This provides road engineers with a method of checking the resistance of wet and dry surfaces to slipping and skidding, both in the laboratory and insitu.

It operates by a pendulum rotating about a spindle which is attached to a vertical pillar. At the end of the tubular arm a head of known mass is fitted with a rubber slider. The pendulum is released from a horizontal position so that it strikes the sample surface at a constant speed. The distance travelled by the head after hitting the sample is determined by the friction of the sample surface.

Ordering Information

42-6000 Pendulum Skid Resistance Tester.

Asphalt Testing
Mix Design

The use of automatic compaction will result in consistent and repeatable laboratory specimens. Testing laboratories and design consultants who use the Marshall method of mix design will benefit from automatic compaction apparatus, which releases staff for other work during the compaction process.

AutoComp 100-A

BS 598-107

- Fully automatic, simple to operate
- Built-in safety features
- Uniform compaction
- Automatic blow counter

This ruggedly constructed automatic compactor provides a consistent and even degree of compaction. The unit incorporates a compaction pedestal, comprising a laminated hardwood block secured to a concrete base by a 300 mm square x 25 mm thick steel plate. The mechanism lifts the 4535 g hammer and automatically releases it at the specified height of 457 mm.

The conveniently positioned control fascia panel comprises of a mains light, start and stop buttons and a direct-reading counter used to set the required number of blows. During operation the AutoComp 100-A automatically counts down to zero. Dual rammer pick-ups have been incorporated, reducing stress on the machine's internal mechanism.

Particular attention has been paid to operator safety by the inclusion of various in-built safety features.

Specification

Dimensions (L x W x H)	535 x 535 x 1880 mm
Compaction foot diameter	98.52 mm
Sliding weight	4535 g
Height of drop	457 mm
Weight	278 kg

Ordering Information

EL45-6600/01 AutoComp 100-A as specified.
For 220 – 240 V AC, 50 Hz, 1 ph.

Accessories

EL45-6310 Compaction Mould.

EL45-6462 Paper Discs.

EL45-6463 Steel Block.

Asphalt Testing
Gyratory Compaction

Specification

Stress	600 kPa nominal, 1000 kPa Max
Mixture types	Wet and Dry
Machine speed	30 rpm
Angle of gyration	0.2 to >2°
Electrical supply	220-240 V 50 Hz (16 amp)
Sample sizes	100 and 150 mm dia
Compressed air supply	7-10 bar, 350 L p/m
Dimensions (L x W x H)	1920 x 790 x 995

- High stability steel frame with low flex and distortion
- A 95 mm pneumatic cylinder
- Safety gates with interlock
- Specimen table
- Accurate stress control via high precision regulator
- High quality inverter for accurate speed control
- Specimen height measurement via linear potentiometer
- Highly durable wheels for ease of movement
- 16 bit control and data acquisition
- PC included

Gyratory Compactor

New

EN 12697-31, 10, ASTM D6925, SHRP M-002, AASHTO T312, inc. PC 220-240V 50Hz

- Configurable to comply with SHRP Superpave
- Both 150 mm and 100 mm moulds can be tested without any modification
- Automatic mould insertion and retraction
- Cold mix (emulsion) materials can be compacted, with fluid collection facility
- Data acquisition and control via host desktop PC
- Export compaction data to MS Excel(tm)
- UKAS traceable factory calibration
- Can accept moulds up to 300 mm in height

One of the best methods of laboratory compaction is considered to be Gyratory for not only the material's assessment of compactibility, but also the production of test samples. The method achieves this by the application of a vertical stress, typically 600 kPa via platens to a mass of asphaltic mixture inside a 100 or 150 mm diameter mould. Whilst platens are kept parallel and horizontal, the longitudinal axis of the mould is gyrated at a fixed angle to the vertical axis.

During the test process, the height of the specimen is measured automatically and the mixture density and void content are calculated.

Compaction data is displayed in real time (graphical and tabular) and is available for download to MS Excel(tm). The operator has the ability to choose whether to compact for a certain number of gyrations or until a target mixture density or void content is achieved.

Software

- User-friendly, intuitive and reliable Windows(tm) software
- 2 methods of compaction - no. of gyrations and target density
- User guided step-by-step through compaction
- Real-time display of current height, density and void content
- Software communicates with the gyratory compactor via USB interface
- Utilities are included for transducer check, diagnostic routines and calibration

Ordering Information

45-6750/01 Gyratory Compactor 220-240 V, 50 Hz.

45-6750/06 Gyratory Compactor 220-240 V, 60 Hz.

Asphalt Testing
Ignition Method

Specification

Max Temp (°C)	750
Dimensions: Internal (L x W x H)	350 x 450 x 220 mm
Dimensions: External (L x W x H)	775 x 600 x 980 mm
Type	Bench-top
Thermocouple type	K
Max power (W)	8000

Asphalt Binder Analyser

New

AASHTO T 308-10, ASTM D6307-10
and BSEN 12697-39:2012

- Designed to measure asphalt binder content by loss on ignition
- Avoids health, environmental and waste management issues
- Avoids the expense associated with older solvent extraction methods
- Reduced emissions due to high temperature afterburner
- Controlled via a multi-lingual touchscreen interface
- English, Spanish, French, Chinese, Italian and Russian language display. Other languages are available to order
- Automatic calculation of final sample weight and binder % result
- Adjustable aggregate correction factor
- Average test times from 20 mins for 6 mm aggregates, to 45 mins for 40 mm aggregates
- Permanent (dot-matrix) printed reports
- USB data output compatible with most spread sheets
- Easy naming, storage and recall of recipes that can be transferred between units
- Simplified menu structure with secure ‘Supervisor’ and ‘Operator’ settings
- Metal waste gas extraction pipe
- Factory fitted thermocouple access port, if temperature calibration is to be carried out
- Precise weight measurements, displayed to 0.1 g resolution
- Capacity for large sample sizes for more accurate results (max. sample is 4.5 kg)

Designed to measure the asphalt binder content of hot mix asphalt (HMA) using loss on ignition, in accordance with AASHTO T 308-10, ASTM D6307-10 and BSEN 12697-39:2012.

The integral microprocessor controlled weighing and calculation system is configurable to allow variations to the standard test method. Test result reports are available in both printed and software format. The high temperature afterburner minimises the production of noxious waste fumes. Supplied complete with 2 sets of sample baskets.

Ordering Information

46-6100/01 Asphalt Binder Analyser 220-240 V 50/60 Hz.

Asphalt Testing
Marshall Stability Testing

The accurate measurement of stability and flow of specimens tested in a load frame is important if consistent and representative results are to be achieved. The load frames and ancillary items listed have been designed to enable technicians to test specimens quickly and easily with confident recording of results.

Marshall Test 50

BS 598-107, EN 12697-34

- Geared screwjack and motor drive
- Precise speed
- Internal limit switch for both directions of travel
- Easy to use controls

This bench-mounting mechanical load frame is ruggedly constructed to encompass the strain and loads involved with the test. The unit is compact in size and can be quickly installed on a bench top, requiring only a power point. It has been designed for simple operation and is easy to clean, requiring minimum maintenance.

Specification

Dimensions (L x W x H)	550 x 400 x 870 mm
Rated power	373 W
Platen speed	50.8 mm per minute
Weight	65 kg

Ordering Information

EL45-6810/01 Marshall Test 50. Load frame, 50 kN capacity. Supplied without Breaking Head. For 220 – 240 V AC, 50 Hz, 1 ph.

EL45-6850 Breaking Head (Marshall) complete with gauge disc. Supplied without flow meter. Weight 9 kg.

EL45-6880 Flow Meter BS/EN. Dial gauge graduated 0.01 mm with 25 mm travel. Supplied with stem brake unit and flow meter pedestal. Weight 610 g.

EL45-6890 Flow Meter. Dial gauge graduated 0.001 inches with 1 inch travel. Supplied with stem brake unit and flow meter pedestal. Weight 610 g.

EL78-0860 50 kN Load Measuring Ring calibrated in compression.

DSU (Data System Unit)

BS1377: Part 4, Part 5, Part 7, ASTM D1883 D2435 D2850 D3080 D3668,AASHTO T-193 T-216 T-245 T-296, EN 12697-34

- 4 channel automatic control and data-logging unit
- For performing CBR, Marshall, Unconfined Compression, Direct and Residual Shear, One-Dimensional Consolidation and Unconsolidated Undrained tests
- LAN communication now supported – run multiple DSUs on the same network, with remote access

Ordering Information

EL27-1300/01 DSU 220-240 V AC, 50/60 Hz 1 ph.

EL27-1300/02 DSU 110-120 V AC, 50/60 Hz.

Bitumen Testing
Bitumen Ovens

Rolling Thin-Film Oven

New

ASTM D2872

- Double wall construction with high density thermal insulation
- Non-rusting grade 304 stainless steel interior
- Easy clean powder painted steel exterior
- Top mounted fan constructed with an air plenum
- Fitted with a squirrel-type fan blade for better uniformity of air and temperature distribution
- Equipped with air jet for blowing heating air into each bottle at its lowest point of travel
- Base mounted elements
- Vented to atmosphere
- Single front opening, side hinged door with positive quarter turn latching mechanism
- Double glazed window in door for viewing the test chamber

The Rolling Thin-Film Oven (RTFO) procedure provides simulated short term aged asphalt binder for physical property testing. Asphalt binder is exposed to elevated temperatures to simulate manufacturing and placement aging. The RTFO also provides a quantitative measure of the volatiles lost during the ageing process.

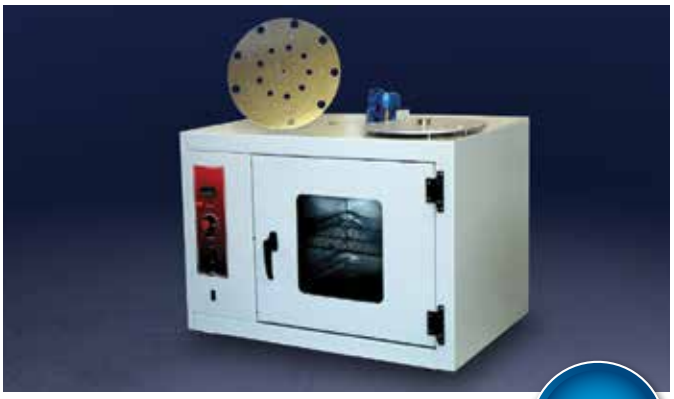
The control system comprises of a microprocessor digital controller and overheat thermostat with calibrated scale and tamper-proof lock.

Specification

Max Temp (°C)	163°C ± 1°C (preset)
Dimensions: Internal (L x W x H)	440 x 480 x 380 mm
Dimensions: External (L x W x H)	660 x 710 x 800 mm
Insulation	Double wall
Internal material	304 stainless steel
Max power (W)	1500

Ordering Information

46-4150/01 Rolling Thin-Film Oven 220-240 V, 50/60 Hz.



Loss on Heat/Thin-Film Oven

New

BS 2000, ASTMD6, D1754 & AASHTO T47, T179

- The exterior is constructed from sheet steel finished in an easy clean powder-coated paint
- Interior chamber is made from stainless steel
- The unit is well insulated and has a double glass door for viewing the test chamber
- The system is controlled by a microprocessor digital controller and overheat thermostat
- Calibrated scale and tamper-proof lock
- Temperature is controlled and pre-set at 163°C +/- 1°C
- Two rotating platforms of 13.5 inches diameter are supplied to perform both the tests

The Thin-Film Oven is used for determining the loss in mass of oil and asphaltic / bituminous compounds when heated with the loss on heating test method or the effect of heat and air on semi-solid asphaltic / bituminous materials with the Thin-Film Oven (TFOT) method.

Side mounted controls comprise

- Microprocessor digital control
- Independent overheat thermostat
- Mains switch
- On/Off switch for the turntable motor
- Indicator lamps

Specification

Max Temp (°C)	163
Dimensions: Internal (L x W x H)	460 x 520 x 380 mm
Dimensions: External (L x W x H)	630 x 870 x 570 mm
Insulation	Double wall
Internal material	304 stainless steel
Turntable speed (rpm)	5.5
Max power (W)	1500

Ordering Information

46-4100/01 Loss on Heat/Thin-Film Oven 220-240 V, 50/60 Hz.

General
Sieving

Hand sieving of a large number of samples can often be tedious and sometimes lead to inaccuracy of results. The following machines provide a wide choice of options for the busy laboratory.

ELE Sieve Shaker

The ELE sieve shaker is powered by an electromagnetic drive that has no rotating parts to wear making it maintenance free and extremely quiet in operation.

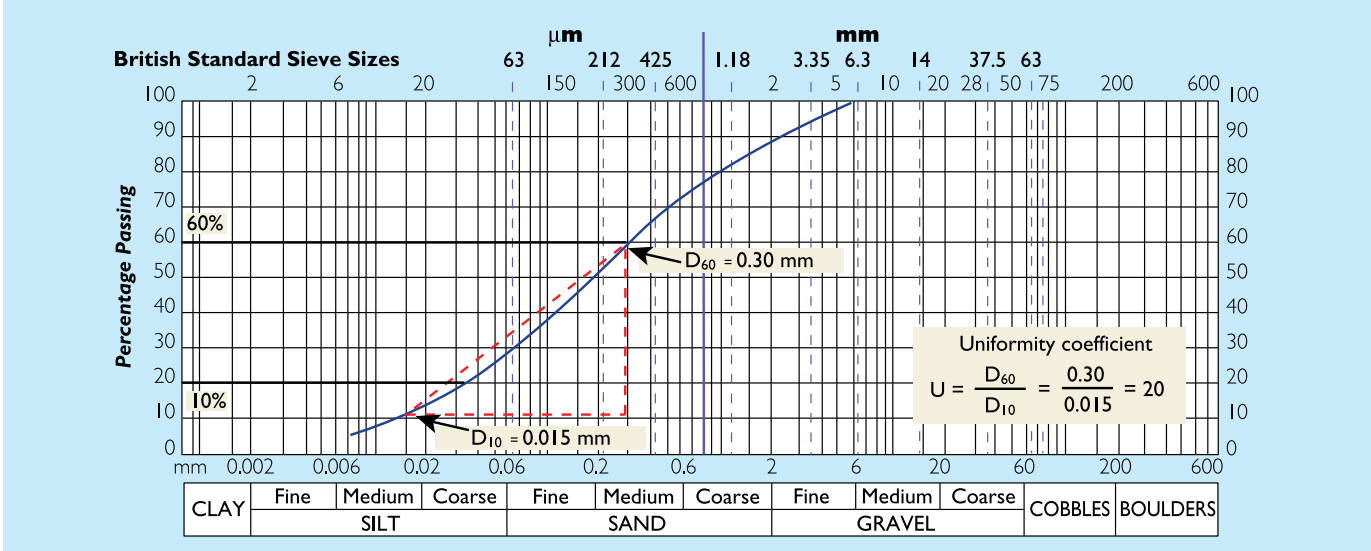
The unit features a triple Vertical-Lateral-Rotary vibrating action that moves the sample over the sieve producing faster, more efficient sieving, while the rapid vertical movements also help keep the apertures from blinding.

The shaker is ideal for laboratory or on-site use. It is robust, compact and sufficiently lightweight to be portable. The separate digital microprocessor controlled console unit incorporates a keypad for setting the sieving program and is isolated from any effects of vibration from the shaker.

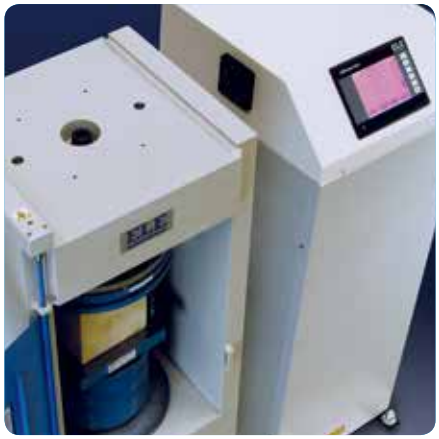
As standard the shaker includes, timer 0-999 minutes, adjustable vibration intensity and adjustable intermittent or continuous operation. The unit accepts up to ten 200 mm or 8 inch, full height, diameter sieves and lid and receiver, or up to six 300 mm or 12 inch diameter sieves and lid and receiver.

Ordering Information

EL80-0200/01 ELE Sieve Shaker complete as specified. Dimensions (L x W x H) 380 x 440 x 1085 mm. Weight 78 kg. For 220 – 240 V AC, 50 Hz 1 ph.



ELE International



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