Sampling, Consistency and Workability

The correct sampling and mixing of fresh concrete is important if test results are to be reliable. Most of the equipment necessary for efficient sampling and mixing is standard laboratory equipment detailed in the Laboratory Equipment section of this catalogue.

To ensure that concrete achieves its maximum possible strength and yet retains its ease of placing on site, it is essential that the design of the concrete mix, in relation to the water-cement ratio and workability, is closely controlled.

Slump Test

EN 12350-2; ASTM C143; AASHTO T119

- *Test is appropriate for concrete mixes of medium and high workability*

The test is carried out by filling the slump cone with freshly mixed concrete, which is tamped with a steel rod in three layers. The concrete is levelled off with the top of the slump cone, the cone removed, and the slump of the sample is immediately measured.

Ordering Information

EL34-0110 Slump Cone complying with EN 12350-2, ASTM C143 and AASHTO T119

EL34-0130 Tamping Rod. Steel, 600 mm long x 16 mm dia, hemispherical at both ends

EL34-0140 Steel Rule

EL34-0160 Base Plate

EL34-0180 Slump Cone Funnel

EL34-0192 Slump Test Set. BS and ASTM comprising slump cone, base plate, steel rule, tamping rod and funnel.

EL34-0110 Slump Cone

Accessory

Scoop see EL81-0220

K-slump Tester

Developed to determine the workability of fresh concrete and the degree of concrete compaction placed in formwork. The apparatus can be used for in-place measurements of concrete in test moulds and forms and may be correlated to the standard slump test. It is simple, economical to use and reduces testing time. No special calibration is required.

Ordering Information

EL34-0580 K-slump Tester. Weight 450 g.

EL34-0580 K-slump Tester

Tel: +44 (0) 1525 249 200 ◆ Fax: +44 (0) 1525 249 249 ◆ Email: ele@eleint.co.uk

Vebe Time

BS EN 12350-3

- *Test appropriate for concrete mixes of low and very low workability*

This method is a mechanised variation of the slump test and includes a determination of the workability of concrete. It is based on the principle of subjecting the concrete to vibration after removal of the slump cone. The assembly is mounted upon a small vibrating table operating at a fixed amplitude and frequency. The time to complete the required vibration gives an indication of the concrete workability.

Special Note: The consistometer must be operated from an electrical supply of 50 Hz in order to comply with the fixed test frequency specified.

Ordering Information

EL34-0300/01 Vibro Consistometer comprising vibrating table, container, slump cone, graduated rod and plate. For 220 – 240 V AC, 50 Hz, 1 ph.

Flow Table

BS EN 12350-5

- *Test appropriate for concrete mixes of high and very high workability*

This test will be of interest to those involved with concrete having a high workability. The test determines the flow index as an arithmetic mean of the diameter of the specimen after working on a flow table.

The apparatus consists of a mould, flow table, wooden tamper, metre rule and a float.

Ordering Information

EL34-0450 Apparatus for Determining Flow in Concrete comprising mould, flow table, tamper, metre rule, float and stopwatch.

EL34-0450 Apparatus for Determining Flow in Concrete

EL34-0300/01 Vibro Consistometer

Setting Time by Penetration Resistance

ASTM C403; AASHTO T197

This method covers the determination of setting time of the mortar fraction of concrete mixes and is only suitable on mortars with slump values greater than zero. The definition of the initial and final setting time is taken as the period from when water was first added to the mix until the measured penetration resistance is 500 lbf/in^2 and 4000 lbf/in^2 respectively.

Ordering Information

EL34-0810 Set of Needle Points. Stainless steel, 1, 1/2, 1/4, /10, 1/20 and 1/40 in^2 area (645, 323, 161, 65, 32 and 16 mm^2) with stainless steel adaptor for the smaller needles. Weight 160 g.

Proctor Penetrometer supplied without needle points see EL29-3925

Syringe for removing excess liquid from concrete specimen see EL82-2820

Concrete Mortar Penetrometer see EL38-2695

EL34-0810 Set of Needle Points

Air Entrainment

The determination of air content of freshly made concrete is detailed in EN 123450 and ASTM C236, where the importance of two main applications is highlighted. The primary purpose of entraining air in concrete is to give the required resistance to weathering. The use of chemical additives to increase the workability of concrete often requires an air content check to be made.

Precision Air Entrainment Meter

EN 12350-7; ASTM C231

- *7 litre capacity*
- *Shock-proof pressure gauge mounting*
- *Lightweight aluminum construction*
- *Heavy-duty plastic carrying case for easy transport to site*

The proper control of entrained air in concrete is recognized as one of the most important functions in modern concrete manufacture. For the concrete engineer, the ELE Precision Air Entrainment Meter offers an instrument for the testing and designing of concrete mixes.

The instrument is designed so that the operating parts form an integral unit. The container is rigid, thus providing an accurate device for the performance of unit weight testing. For convenience, the tare weight in grams is stamped on the bottom. When used with the supplied nomograph, the air meter provides quick and easy particle density and percent of free moisture in aggregate determinations.

The meter has a multi-range feature to accurately measure entrained air up to 22%.

The ELE Precision Air Entrainment Meter is supplied complete with straight edge, syringe and carrying case.

Specification	
Dimensions	248 x 345 mm (diameter x height)
Capacity	7 litres
Readings	Up to 22% entrained air
Accuracy	± 0.25% full scale
Aggregate size	50 mm maximum
Container	With tare weight stamped on bottom; 2-piece clamping device for positive seal
Pressure gauge	In shock-proof mounting
Weight	8.0 kg

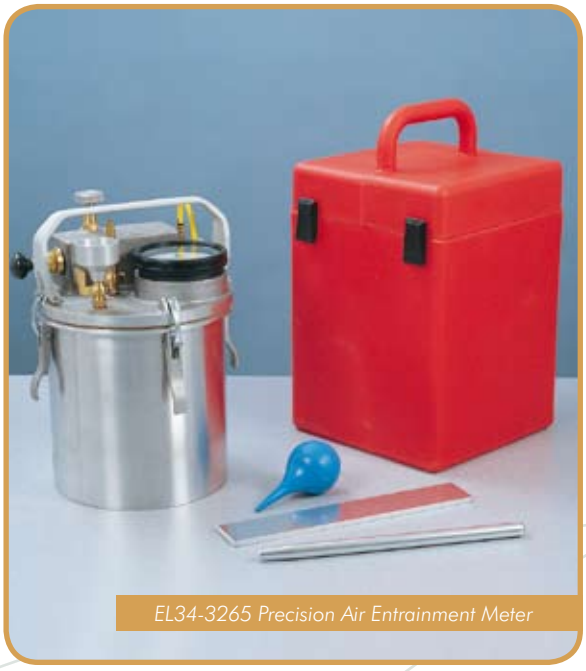
Ordering Information

EL34-3265 Precision Air Entrainment Meter, Type B

Accessories

Tamping Rod. Steel, 600 mm x 16 mm (length x diameter), see EL34-0130.

EL34-2910 Compacting Bar. Steel, 380 x 25 mm (length x square) tamping area, EN/BS. Weight 1.8 kg.



EL34-3265 Precision Air Entrainment Meter

Tel: +44 (0) 1525 249 200 ◆ Fax: +44 (0) 1525 249 249 ◆ Email: ele@eleint.co.uk

Mixing Equipment

The efficient mixing of concrete prior to moulding specimens in the laboratory for subsequent testing is essential if quality specimens are to be manufactured. The object of mixing is to coat the surface of all aggregate particles with cement paste, and bring the mix to a uniform condition. Pan or rotating drum mixers are suitable for the mixing of small quantities of concrete, which are generally used in a laboratory.

ELE Concrete Mixer

- *Portable and compact*
- *Tipping mechanism*
- *Adjustable blades*
- *Simple to clean and maintain*

It is essential that the mixing of fresh concrete for laboratory test samples is thorough and consistent. The ELE Concrete Mixer is ideally suited for this purpose. The mixer has been developed to give efficient mixing of both wet and dry materials. The mixing pan is removable and tilts for easy access to the pan and emptying on completion of the mixing operation. It is rotated by a turntable driven by a 1500 W, IP55 protected electric motor.

The mixer head lifts clear to provide maximum access to the pan and holds the mixing blades at a constant depth during the mixing operation. The blades are readily adjusted to suit the different types and volume of materials to be mixed.

Ordering Information

EL34-3540/01 ELE Concrete Mixer. 56/40 litre capacity. For 220 – 240 V AC, 50 Hz, 1 ph. Weight 245 kg.

Special Note: requires separate 20 A fused supply.

EL34-3540/01 ELE Concrete Mixer

EL34-3590/01 Tilting Drum Mixer

Tilting Drum Mixer

Ordering Information

EL34-3590/01 Tilting Drum Mixer. 120/90 litre mixing capacity. For 220 – 240 V AC, 50 Hz, 1 ph.

Moulding Equipment

Test procedures require that specimens are cast in a number of standard sizes convenient for compressive and flexural strength determination. The engineering tolerances specified for moulds are very stringent and the internal finish of the surface must be of a high order to comply with the recommendations laid down in many International Standards. Moulds must not deform during manufacture of concrete specimens if the specimen dimensions are to be maintained.

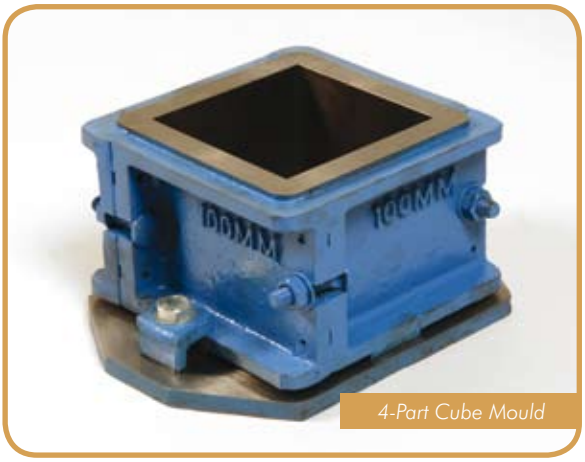
4-Part Cube Moulds
EN 12390-1, -2

Ordering Information

EL34-4520 100 mm Cube Mould. 4-part with clamp attached base plate. Weight 8.5 kg.

EL34-4570 150 mm Cube Mould. 4-part with clamp attached base plate. Weight 18 kg.

EL34-4620 200 mm Cube Mould. 4-part with clamp attached base plate. Weight 35 kg.



4-Part Cube Mould

Beam Moulds
EN 12390-1, -2

These beam moulds are designed to produce accurate specimens while avoiding distortion over the length of the mould.

Ordering Information

EL34-5003 Beam Mould. 100 x 100 x 500 mm complete with base plate. Weight 29 kg.

EL34-5053 Beam Mould. 150 x 150 x 750 mm complete with base plate. Weight 45 kg.

Cylinder Mould

Cylinder Moulds
EN 12390-1, -2

These beam moulds are designed to produce accurate specimens while avoiding distortion over the length of the mould.

Ordering Information

EL34-5210 Cylinder Mould. 100 mm diameter x 200 mm long, complete with base plate. Weight 16 kg.

EL34-5230 Cylinder Mould. 150 mm diameter x 150 mm long, complete with base plate. Weight 14 kg.

EL34-5260 Cylinder Mould. 150 mm diameter x 300 mm long, complete with base plate and locking ring. Weight 12 kg.

Accessories For All Moulds

Tamping Rod for tamping specimens to ASTM requirements see EL34-0130.

Compacting Bar for tamping specimens to EN requirements see EL34-2910.

Wire Brush see EL81-0705

Mould Oil see EL82-7341

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Compaction

The strength, durability and finish of concrete rely in part on the adequate compaction of the mix. An increasing number of contract specifications call for various forms of vibro-compacted concrete as a means to achieve a better and more consistent mixture. It should however be remembered that fluid mixes may segregate when vibrated in which case it may be more appropriate to compact using a tamping bar or rod during laboratory mix design.

The ELE vibrating table is a compact unit providing controlled vibro-compaction in the laboratory, using cube or cylinder moulding equipment.

Vibrating Table

EN 12350-6, -7, 12390-2, 13286-50, 1354

Vibrating table mounted on a steel stand, supplied with clamp assembly.

Specification	EL34-6250/01
Dimensions (table top)	600 x 400 mm
Maximum no. cube moulds	2 x 150 mm²
Clamp assembly	Single
Weight	60 kg

Ordering Information

EL34-6250/01 Vibrating Table. 3000 cycles per minute. For 220 – 240 V AC, 50 Hz, 1 ph.

Accessories

Compacting Bar, EN see EL34-2910

Tamping Rod for ASTM tests see EL34-0130

EL34-6250/01 Vibrating Table

Vibrating Poker

EN 12390-2 12350-6, -7

- *High amplitude and speed*
- *Flexible shaft for long life*

Used as an internal means of vibratory compaction. The poker is inserted into the concrete which is then compacted by the high frequency vibration action.

For use in either laboratory or site environments, the diameter of the vibrating tip must not exceed 25% of the smallest dimension of the specimen.

Specification		EL34-6431/01
Dimensions	Tip	22mm dia. x 250 mm long
	Shaft	2.0 m long
Speed		12,000 vibrations/min.
Overall dimensions		200 x 300 x 350 mm
Weight		7.0 kg

Ordering Information

EL34-6431/01 Vibrating Poker.
For 220 – 240 V AC, 50 – 60 Hz, 1 ph.

EL34-6431/01 Vibrating Poker

Curing of Specimens

The correct environment for curing concrete test specimens is important to achieve consistent and reproducible test results. Two primary factors must be taken into consideration to satisfy the requirements, namely to maintain a stable temperature and to prevent loss of moisture from the specimen.

A standard curing temperature of 20°C is usually specified and should be maintained at the required degree of accuracy. The use of water to prevent loss of moisture is the method most commonly used. In tropical climates a curing temperature of 25°C is often acceptable.

Large Curing Tank

EN 12390-2, ASTM C31, C192, AASHTO T23

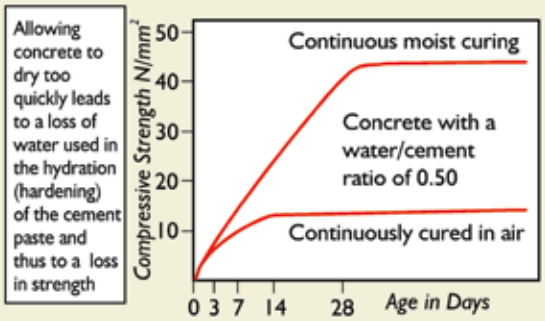
This curing tank is supplied complete with a submersible pump, immersion heater/thermostat unit and separate control panel. The tank includes a lower rack as standard and is designed to maintain the temperature at 20 ± 2°C, providing that the ambient temperature does not fall below 15°C or rise above 20°C.

Specification	
Internal dimensions	1040 x 1040 x 605 mm (l x w x h)
Capacity	650 litres
Rated power	2000 watt
Weight	60 kg

Ordering Information

EL34-6575/01 Large Curing Tank supplied as specified. For 220 – 240 V AC, 50 – 60 Hz, 1 ph.

EL34-6575/01 Large Curing Tank



Capping of Cylinders

When conducting a compressive strength test on a concrete cylinder it is important that the ends of the specimen are flat and parallel to each other. The trowelled face of a prepared concrete cylinder, or both ends of a concrete core, will require treatment to obtain these conditions.

Sulphur Compound Method

EN 12390-3

The sulphur compound method is a hot process and offers a considerable saving in time and labour over the mortar capping method. The method is virtually instant and the compound can often be recovered for further use.

Warning: The sulphur compound, when hot, will give off sulphur fumes, and therefore it is important that good ventilation, or preferably a fume cupboard, is available in the laboratory.

Ordering Information

EL34-6031 Cylinder Capping Frame comprising a vertical support, mounted on a steel base designed to accommodate both sizes of capping plates. Supplied complete with 100 mm and 150 mm capping plates. Weight 10 kg.

Accessories

EL34-6100 Flake Capping Compound supplied in 22 kg box.

EL34-6031 Cylinder Capping Frame

EL34-6122/01 Melting Pot

Melting Pot

This unit is suitable for melting wax and capping compound and comprises a metal container in a well-lagged steel jacket. A thermostatic control and stand-by heat switch are fitted. Supplied complete with lift-off cover.

Specification	
Dimensions (diameter x depth)	Internal 140 x 150 mm External 250 x 165 mm
Capacity	4.0 litres
Rated power	300 watt
Temperature range	50 to 300°C
Weight	7 kg

Ordering Information

EL34-6122/01 Melting Pot for 220 – 240 V AC, 50 - 60 Hz, 1 ph.

Density of Fresh and Hardened Concrete

The density of both fresh and hardened concrete is of interest to the engineer for numerous reasons including its effect on durability, strength and resistance to permeability.

Hardened concrete density is determined either by simple dimensional checks, followed by weighing and calculation, or by weight in air/water buoyancy methods.

Density of Hardened Concrete

EN 12390-7, 1097-6

The density of hardened concrete specimens such as cubes and cylinders can be quickly and accurately determined using a Buoyancy Balance.

Buoyancy Balance

The buoyancy balance system developed by ELE consists of a rigid support frame, incorporating a water tank mounted on a platform. The water tank has internal dimensions of 380 x 240 x 280 mm (l x w x h).

A mechanical lifting device is used to raise the water tank through the frame height immersing the specimen suspended below the balance. The balance supplied calculates the specific gravity of the sample automatically.

The balance may also be used as a standard weighing device, thus providing a versatile and comprehensive weighing system in the laboratory.

Ordering Information

EL34-8100/09 Buoyancy Balance. 15 kg x 0.5 g. Supplied with frame, water tank and suspension hook. For 110 – 240 V AC, 50 – 60 Hz, 1 ph.

Accessory

EL34-8105 Cradle for supporting cube and cylinders.

EL34-8105 Cradle

Density of Compacted Fresh Concrete

BS 812; EN 1097-3, 12350-6; ASTM C138

Bulk Density Measures

Manufactured from heavy gauge steel these bulk density measures comply with the requirements of either BS 812, EN 1097-3, 12350-6 or ASTM C138. All measures incorporate carrying handles as standard.

Ordering Information

EL34-2800 Set of 3 Bulk Density Measures comprising, 1 x 30 litre, 1 x 15 litre and 1 x 10 litre.

For other bulk density measures see Section 42.

Accessories

Compacting Bar for BS/EN tests see EL34-2910

Tamping Rod for ASTM tests see EL34-0130

EL34-8100/09 Buoyancy Balance

Tel: +44 (0) 1525 249 200 ◆ Fax: +44 (0) 1525 249 249 ◆ Email: ele@eleint.co.uk

Drying, Shrinkage and Moisture Movement

The apparatus has been designed and manufactured to the recommendations laid down in BS, EN and ASTM standards where tests are required on laboratory specimens, or on specimens taken from existing structures. The test procedure specifies a method for determining the change in length of a concrete or mortar sample brought about by a change in moisture content.

1 *Initial drying shrinkage:* the difference between the length of a moulded and cured specimen (under specified conditions), and its final (constant) length when dried.

2 *Drying shrinkage:* the difference between the length of a matured specimen cut from concrete and saturated, and its final (constant) length when dried.

3 *Moisture movement:* the difference between the constant length of a specimen when dried, and its length when subsequently saturated with water.

Measuring Equipment

EN 1367-4; ASTM C490

Ordering Information

EL34-8500 Drying, Shrinkage and Moisture Movement Apparatus conforming to the requirements of EN 1367-4 and ASTM C490 comprising a steel frame with an adjustable-height beam and a dial gauge with 0.002 mm divisions. Supplied with two calibration rods EN and ASTM. Weight 4.5 kg.

Spare

EL34-8505/10 Calibration Rod. 115/8 inch total length.

EL34-8500 Drying, Shrinkage and Mooisture Movement Apparatus

Prism Moulds and Inserts

Ordering Information

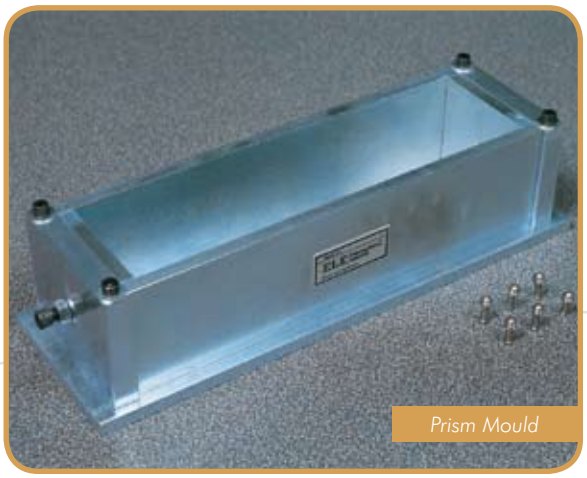
EL34-8538 Prism Mould for producing specimens 75 mm square x 254 mm gauge length to BS 812-123. The mould is made of steel and constructed so that the gauge length can be set within ± 2.54 mm limits. The overall length of the manufactured prism with steel inserts is 292 mm. Weight 6.5 kg.

EL34-8541 Steel Inserts for use with prism mould EL34-8538. Supplied in pack of 10. Weight 500 g.

EL34-8544 Two-gang Prism Mould to produce specimens 1 inch square x 11¼ inches long to ASTM C490. The mould is constructed so that the gauge length can be set within ± 0.1 inch limits. Weight 3 kg.

EL34-8547 Inserts for use with prism mould EL34-8544. Supplied in pack of 10. Weight 700 g.

Humidity Oven see EL39-1300/01



Prism Mould

EL34-8544 Two-gang Prism Mould

Surface Hardness

Surface hardness is used to measure the resistance of concrete to impact or penetration. From the measurements it is possible to obtain an estimation of the concrete strength and quality.

Concrete Test Hammer

EN 12504-2; ASTM C805

The method is based on the principle that the rebound of an elastic mass depends on the hardness of the surface which it strikes. The test is fast and is unlikely to cause damage to the concrete.

Ordering Information

EL35-1480 Concrete Test Hammer, Normal. The hammer is intended for testing the quality of concrete in finished structures such as buildings and bridges. Supplied complete with carrying case and carborundum stone, the hammer is suitable for testing concrete with compressive strengths of 10 to 70 N/mm^2.
Weight 1.4 kg.

EL35-1480 Concrete Test Hammer

Testing Anvil

The anvil is used to enable routine checks to be made on the operation of EL35-1480 hammer.

Ordering Information

EL35-1530 Testing Anvil. Weight 16 kg.

EL35-1530 Testing Anvil

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Pulse Velocity Measurement

The basic principle of this method of testing is that the velocity of an ultrasonic pulse through concrete is related to its density and elastic properties. Some care is necessary when testing, but an experienced operator may obtain a considerable amount of information about a concrete member. The advantage of this method is that the pulse passes through the complete thickness of the concrete so that the significant defects can be detected.

Applications

- *The measurement of concrete uniformity*
- *Determination of the presence or absence of voids, cracks and other imperfections*
- *Deterioration of the concrete which might have occurred due to age or through the action of fire, frost or chemical attack*
- *Measurement of layer thickness and elastic modulus*
- *Determination and monitoring of concrete strength*

Pundit

BS 1881-203, EN 12504-4; ASTM C597

- *Non-destructive strength testing*
- *Crack and void detection*
- *Measurement of layer thickness and elastic modulus*
- *Uniformity and deterioration of concrete*

The Pundit is a fully portable instrument for assessing the quality of concrete either in-situ or pre-cast, and complies with BS 1881-203, EN 12504-4 and ASTM C597.

It has been designed with site testing particularly in mind and is simple to operate, with a high order of accuracy and stability.

The majority of concrete testing will require transducers with a frequency of 54 kHz.

As standard, the unit is supplied with Windows® compatible software, enabling test results to be downloaded to PC. Data is presented in Excel (this needs to be resident on the PC).

Specification	
Dimensions (l x w x h)	160 x 250 x 100 mm
Time measurement	0.1 to 999.9 m sec
Ranges	0.1 to 999.9 m sec 1 to 9999 m sec
Accuracy	± 0.1 m sec
Transmitter, pulse	1.2 k V, 500 V or 250 V, 1.5 m sec
Power supply	Battery: Ni-Cad rechargeable Mains: 110 – 240 V AC, 50 – 60 Hz, 1 ph
Display	128 x 128 dot LCD with back lighting
Weight	8.2 kg

Ordering Information

EL35-2301/09 Pundit Plus Ultrasonic Concrete Tester complete with two 54 kHz transducers each with 3.6 metres of cable, coupling agent, carrying case and instruction manual. Weight 8.2 kg. For 110 – 240 V AC, 50 – 60 Hz, 1 ph.

Spare

EL35-2305 Coupling Agent. Thick grade.

EL35-2301/09 Pundit Plus Ultrasonic Concrete Tester

Crack Detection Microscope

Specifically designed for measuring crack width in concrete, this high definition microscope operates via an adjustable light source provided by high power batteries. Supplied in a pocket sized carrying case.

Specification	
Dimensions (l x w x h)	40 x 90 x 150 mm (in case)
Magnification	x 40
Measuring range	4 mm, 0.02 mm divs
Weight	550 g

Ordering Information

EL35-2505 Crack Detection Microscope

EL35-2505 Crack Detection Microscope

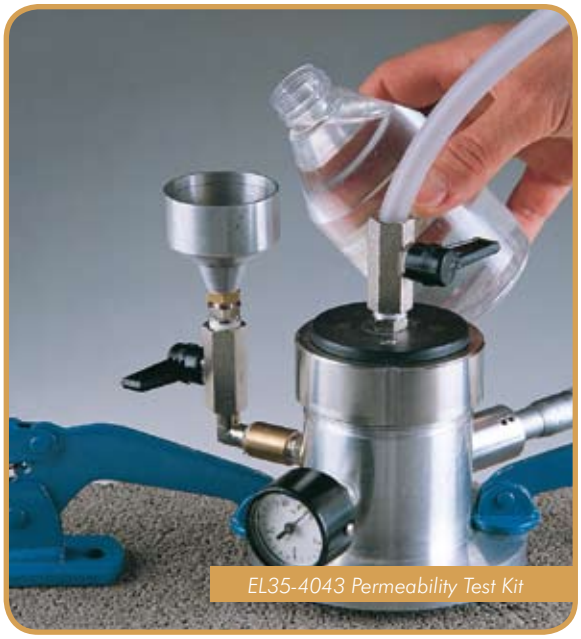
In-situ Water Permeability of Concrete

The Water Permeability Test Kit is a portable unit capable of measuring in-situ permeability. It has a dual measuring range of 0 – 1.5 bar or 0 – 6 bar.

Consisting of a sealed water reservoir and all necessary attachments, the unit is supplied complete in a carrying case. Dimensions 460 x 310 x 100 mm (l x w x h).

Ordering Information

EL35-4043 Permeability Test Kit. Weight 3 kg.



EL35-4043 Permeability Test Kit

Tel: +44 (0) 1525 249 200 ◆ Fax: +44 (0) 1525 249 249 ◆ Email: ele@eleint.co.uk

Compact 1500 Compression Machine

- *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 Compact 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 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.

ADR 1500 with Beam Testing Frame

ADR Digital Cube/Cylinder Testing Machines

- *Tests 150 and 100 mm cubes, or cylinders up to 320 x 160 mm diameter*
- *ADR digital readout in kN/lbf/kgf*
- *Supplied with Windows® download software as standard*

Fitted with the ADR digital readout, a technologically advanced microprocessor controlled instrument which is fully described in Section 37, the machines allow either cubes or cylinders to be tested in compression, and using optional flexural frames and accessories, concrete beams. The machines are supplied fitted for cylinder testing and are complete with motorised power pack and safety gates. ***When used for cube testing appropriate distance pieces must be ordered separately according to the size of specimen.***

Ordering Information

EL36-0716/01 ADR 1500 Compression Machine.
For 220 – 240 V AC, 50 - 60 Hz, 1 ph.

Accessories

Flexural Frames see Section 37

Printer see EL37-4859/01

ADR Digital Readout Specification see EL37-4855/09

Specification	ADR Machine
ADR machines - Overall dimensions (l x w x h)	430 x 600 x 1035 mm
Maximum vertical clearance of platens	340 mm
Horizontal clearance	295 mm
Upper and lower platen dimensions	222 mm diameter
Maximum ram travel	50 mm
Rated power	1350 W
Weight	350 kg

EL36-0716/01 ADR 1500 Compression Machine


EL37-4855/09 ADR Digital Readout Specification

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ADR 2000 and 3000 Compression Machines

- *2000 kN/450 000 lbf and 3000 kN/675 000 lbf capacity*
- *Three machine options*
- *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,*
- *All machines calibrated to BS EN ISO 7500-1; ASTM E4;*
- *ADR advanced digital readout*
- *High stability load frame*
- *Efficient hydraulic power pack*

The ADR 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.

Specimen Capacity

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.

Load Indication

The ADR advanced digital readout satisfies BS EN ISO 7500-1, ASTM E4, for calibrated accuracy and repeatability.

EL36-3276 ADR 2000 EN Compression Machine

EL36-3086/01 ADR 2000 Standard Compression Machine

36 Concrete - Compression Machines

Standard Cube/Cylinder Testing Machines

- *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 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.*

EL36-3086/01 ADR 2000 Standard Compression Machine

Ordering Information

EL36-3086/01 ADR 2000 Standard Compression Machine. 2000 kN capacity. For 220 – 240 V AC, 50 - 60 Hz, 1 ph.

Specification			
ADR Machine	ADR 2000 Standard	ADR 2000 EN	ADR 3000 EN
Overall dimensions (l x w x h)	410 x 630 x 1195 mm	450 x 780 x 1225 mm	630 x 820 x 1265 mm
Maximum vertical clearance	340 mm	340 mm	340 mm
Maximum horizontal clearance	320 mm	355 mm	310 mm
Upper platen dimensions	222 mm diameter	300 mm diameter	300 mm diameter
Lower platen dimensions	222 mm diameter	220 mm square	220 mm square
Maximum ram travel	50 mm	50 mm	50 mm
Rated power	1350 W	1350 W	1350 W
Weight	595 kg	875 kg	1360 kg

EN Compression Testing Machines

- *2000 kN and 3000 kN capacity*
- *Machines to meet the requirements of EN 2390-3, -4, -5, 12504-1, 1354, 1521, 3161, 1338, 772-6, 13286-41 BS 3892-3, 187, 6717,*
- *Tests 200, 150 and 100 mm concrete cubes and cylinders up to 320 x 160 mm diameter*
- *Load pacing facility fitted as standard*
- *Platen handling systems available which include BS 6073-1, EN 772-1 specification rectangular platens*
- *Supplied with Windows® download software*

Incorporating the ADR digital readout the machines are specifically designed to meet the EN Standard specification. Supplied as standard with a self-centring lower platen and safety gates fitted with interlock switches. *Appropriate EN distance pieces according to the size of specimen to be tested are required and must be ordered separately.*

Ordering Information

EL36-3276/01 ADR 2000 EN Compression Machine. 2000 kN capacity. For 220 – 240 V AC, 50 - 60 Hz, 1 ph.

EL36-3311/01 ADR 3000 EN Compression Machine. 3000 kN capacity, with digital readout and rapid approach pump. 220–240 V AC, 50 - 60 Hz, 1 ph.

Accessories for standard and EN machines

Distance Pieces see Section 37

Rectangular Platens see Section 37

Flexural Frames see Section 37

Printer see EL37-4859/01

ADR Digital Readout Specification see EL37-4855/09

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The ADR-Auto Range

- *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*
- *On-board memory for 500 test results*
- *Wide range of accessories*

The ADR-Auto Range of machines has been developed to satisfy the requirements for consistent high throughput testing of concrete samples.

These machines are ideally suited for on-site quality control and production laboratories.

The automatic loading cycle is controlled by the closed-loop microprocessor hydraulic system incorporated in the control console supplied with the loading frame.

Operation is straightforward, requiring the operator to depress the 'RUN' key after selecting sample size and loading rate. Standard data for a wide range of samples i.e. size, type, load rate, are programmed into the machine memory.

EL36-4120 series ADR-Auto 2000 Standard Compression Machine

Available in 2000 kN capacity the machines accept all standard accessories and flexural frames detailed in Section 37.

All control functions including alpha-numeric keypad and display are built into the hydraulic control console. The micro-processor software provides a series of self-test routines to check the operation of the system. A serial output port is built into the system enabling test data stored in memory to be downloaded to a PC or suitable printer. Windows® based download software is supplied as standard on all ELE digital machines.

Test procedures can be selected and displayed in kN, lbf or kgf engineering units.

Micro-processor Control Specification	
Measurement units Accuracy	kN, lbf or kgf – selectable 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

ADR-Auto 2000 Standard

- *2000 kN capacity*
- *Tests 150 and 100 mm cubes and cylinders up to 320 x 160 mm diameter*
- *Options to test and concrete beams to ASTM C78*
- *Supplied with Windows download software as standard*

ADR-Auto 2000 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

EL36-4120 series ADR-Auto 2000 Standard Compression Machine

EL36-4120/01 for 220 – 240 V AC, 50 Hz, 1 ph.

EL36-4120/02 for 110 – 120 V AC, 60 Hz, 1 ph.

ADR-Auto 2000 and 3000 EN

- *2000 and 3000 kN capacity*
- *Optional platen handling systems which include BS 6073-1, EN 772-1 specification rectangular platens*
- *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*
- *Tests 200, 150 and 100 mm cubes and cylinders up to 320 x 160 mm diameter*
- *Supplied with Windows® download software as standard*

EL36-4140/01 ADR-Auto 2000 EN Compression Machine

ADR-Auto 2000 and ADR-Auto 3000 are 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

EL36-4140/01 ADR-Auto 2000 EN Compression Machine for 220 – 240 V AC, 50 Hz, 1 ph.

EL36-4140/06 ADR-Auto 2000 EN Compression Machine for 220 – 240 V AC, 60 Hz, 1 ph.

EL36-4160/01 ADR-Auto 3000 EN Compression Machine for 220 – 240 V AC, 50 Hz, 1 ph.

Accessories for ADR-Auto Range

Distance Pieces see Section 37

Flexural Frames see Section 37

Printer see EL37-4859/01

Platen Handling Systems see EL37-4830 and EL37- 4832

Specifications of machines without Platen Handling Assemblies			
Machine	ADR-Auto 2000 Standard	ADR-Auto 2000 EN	ADR-Auto 3000 EN
Overall dimensions (l x w x h)	480 x 765 x 1050 mm	480 x 810 x 1125 mm	630 x 910 x 1255 mm
Max. vertical clearance	340 mm	340 mm	340 mm
Max. horizontal clearance	325 mm	355 mm	310 mm
Upper platen dimensions	222 mm diameter	300 mm diameter	300 mm diameter
Lower platen dimensions	222 mm diameter	220 mm square	220 mm square
Maximum ram travel	50 mm	50 mm	50 mm
Rated power	1600 W	1600 W	1600 W
Weight	860 kg	950 kg	1420 kg

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EN Standard Testing Machine

- *2000/250 kN capacity*
- *Meets requirements of EN 12390-3, -4, -12504-1, 1354, 1521, 13161, 1338 772-1, -6, 13286-41 196- 1 459-2. BS 3892-3, 187*
- *Concrete and cement specimens*
- *Tests 200, 150, 100, 70.7, 50 and 40 mm cubes and cylinders up to 320 x 160 mm diameter*
- *Calibration accuracy and repeatability conforms to BS EN ISO 7500-1; ASTM E4*
- *Supplied with Windows® download software as standard*

Designed to provide comprehensive test facilities, this twin-frame compression machine is controlled by the automatic console. The 2000 kN capacity frame meets the requirements of EN Standards and accepts the range of on-board accessories detailed in Section 37.

As the second outlet control port is connected to the 250 kN load frame, attachment of a flexural frame is not possible. The 250 kN frame is supplied complete with compression jig, 40 mm, 50 mm/2.0 inch square platens and meets the requirements of EN 196-1.

When selecting the frame to be used for testing the automatic changeover valve incorporated in the system delivers the hydraulic fluid to that frame.

EL36-4145/01 ADR-Auto 2000/250 kN EN Compression Machine

Ordering Information

EL36-4145/01 ADR-Auto 2000/250 kN EN Compression Machine. 2000 kN frame complete with digital control console and safety gates. 250 kN frame complete with compression jig assembly and 40 mm, 50mm/2.0 inch square platens.
For 220 – 240 V AC, 50 Hz, 1ph.

Accessories

Distance Pieces see Section 37

Printer see EL37-4859/01

EL37-4830 Platen Handling System complete with rectangular platens

Specification		
Load Frame	**250 kN**	**2000 kN**
Overall dimensions (l x w x h) Load frame Control console	 520 x 500 x 1215 mm -	 430 x 430 x 1050 mm 520 x 430 x 1255 mm
Max vertical clearance (platens removed)	230 mm	340 mm
Max horizontal clearance	225 mm	355 mm
Upper platen	150 mm dia	300 mm dia
Lower platen	150 mm dia	220 x 220 mm
Maximum ram travel	15 mm	50 mm
Rated power	-	1600 W
Weight (total)	-	1460 kg

1000 kN Compression/500 kN Tension Machine

- *Compression testing of concrete cubes and cylinders*
- *Calibration in compression is accurate to 1% of indicated load, satisfying BS EN ISO 7500-1; ASTM E4*
- *Self-aligning upper platen for compression tests*
- *Easily fitted grips for tension testing*

The load frame is of high quality steel construction with a fixed upper head carrying a ball-seated platen. The ram carrying the lower platen is contained in the base of the frame and is protected by a shroud. Sufficient clearance between the platens allows the compression testing of concrete cylinders up to 160 mm diameter by 320 mm long. To allow for the compression testing of concrete cubes, a range of distance pieces is available, see Section 37.

Tension tests on steel reinforcing bars are conducted by replacing the platens with special grips. As standard the machine is supplied with the following size grips for testing bars, 10 mm, 12 mm, 20 mm, and 25 mm diameter.

The machine is motorised, incorporating a change-over lever to select either compression or tension output from the pump.

Specification	
Dimensions (l x w x h)	440 x 600 x 1250 mm
Max. vertical clearance with compression platens	340 mm
Max. horizontal clearance	230 mm
Upper platen diameter	220 mm
Gauge diameter	250 mm
Maximum ram travel	100 mm
Rated power	1350 W
Weight	455 kg

Ordering Information

EL36-1410/01 1000/500 kN Motorised Compression/ Tension Machine supplied with grips as specified and pack of wax crayons to lubricate grips.
For 220 – 240 V AC, 50 - 60 Hz, 1 ph.

EL36-1410/01 1000/500 kN Motorised Compression/Tension Machine


Grips for EL36-1410/01

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Compression Machine Accessories

The selection and use of the correct accessories is essential if the range of machines described in Section 36 is to be utilised to its full advantage.

This section of the catalogue details a wide range of accessory items including distance pieces, specialist platens, flexural testing frames and other devices.

Load Calibration Devices

- *Calibrated to BS EN ISO376 Grade 1*
- *2000 kN capacity*
- *7½ digit high-resolution hand-held readout*
- *Designed for the calibration and verification of concrete compression machines*

The ELE electronic 2000 kN load cell and readout unit is an accurate and sensitive system for the calibration and verification of the load measuring systems of concrete compression machines.

The readout unit is supplied complete with rechargeable batteries and universal voltage charger unit for use on 115 – 240 V, 50 – 60 Hz, 1ph electrical supplies.

Each system is supplied complete with NPL (National Physical Laboratory UK) calibration certificate in compliance with BS EN ISO376 Grade 1.

Ordering Information

EL37-8315 2000 kN Capacity Calibration Load Cell with Hand-held Readout supplied with rechargeable batteries and universal charger for use on 110 – 240 V, AC 50 – 60 Hz, 1 ph.

ADR-Auto Console

- *Updates manual controlled machine to automatic loading*
- *Suitable for ELE machines manufactured after 1983*
- *Cost-effective*
- *On-board memory for 500 test results*

The ELE ADR-Auto console has been developed to satisfy the requirements for consistent high throughput testing of concrete samples.

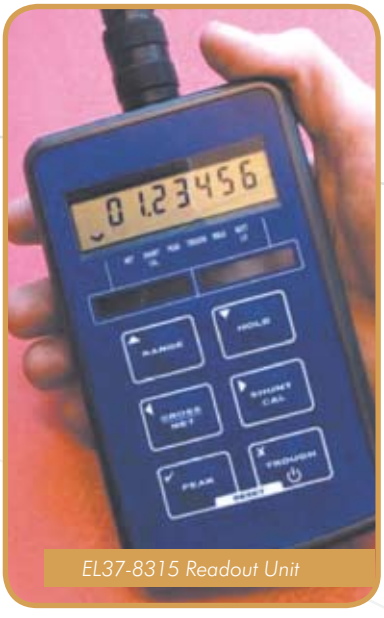
All control functions and display are built into the console. The microprocessor runs a series of self-test routines to check the operation of the system.

As standard, the unit is supplied with Windows® operating system download software and serial output port for connection to PC or suitable printer.

Ordering Information

EL37-4865/01 ADR-Auto Console for upgrading ELE concrete compression machines manufactured after 1983. For 220 – 240 V, 50 Hz, 1 ph.

EL37-8315 2000KN Calibration Load Cell



EL37-8315 Readout Unit

EL37-4865/01 ADR-Auto Console

ADR Advanced Digital Readout

- *Unrivalled accuracy*
- *Menu driven with simple data entry*
- *Dual input and operating modes*
- *Peak hold and auto stress calculation*
- *Full sample library with required pace rates*
- *RS 232C output*

The ADR Digital Readout is a technologically advanced microprocessor controlled instrument with facilities for data calculation and presentation.

The easy to read LCD display and touch-button data pad keys make the unit quick and straightforward to operate. All interaction with the measuring system is via the front control panel using simple menu-driven procedures.

Featuring diagnostic and test modes, security coded calibration routines and many other features including output to computer or printer, the ADR provides an effective upgrade option for existing compression and flexural testing machines fitted with analogue gauges.

Specification	
Dimensions (l x w x h)	360 x 320 x 130 mm
Inputs	2, via standard 5 pin DIN sockets
Input range Transducer excitation Measurement units	± 20 mV to ± 2 V FS 10 V @ 100 mA (total) kN, lbf or kgf (selectable)
Accuracy	Better than ±1% over the calibrated range
Display	4 rows x 20 characters LCD
Maximum load	Held until reset
Outputs	Serial RS 232C

Ordering Information

EL37-4855/09 ADR Digital Readout Unit supplied without transducer. For 110 – 240 V AC, 50 – 60 Hz, 1 ph.

ADR Accessories

EL37-4855/10 Pressure Transducer

EL37-4859/01 Impact Printer RS232 serial connection. Supplied complete with serial RS232 communications cable and one paper roll. For 220 – 240 V AC, 50 - 60 Hz, 1 ph.

Spares

EL37-4859/10 Ribbon Cartridge (black)

EL37-4859/12 Paper Roll. Pack of 10 rolls

EL37-4859/01 Impact Printer

EL37-4855/09 ADR Digital Readout Unit

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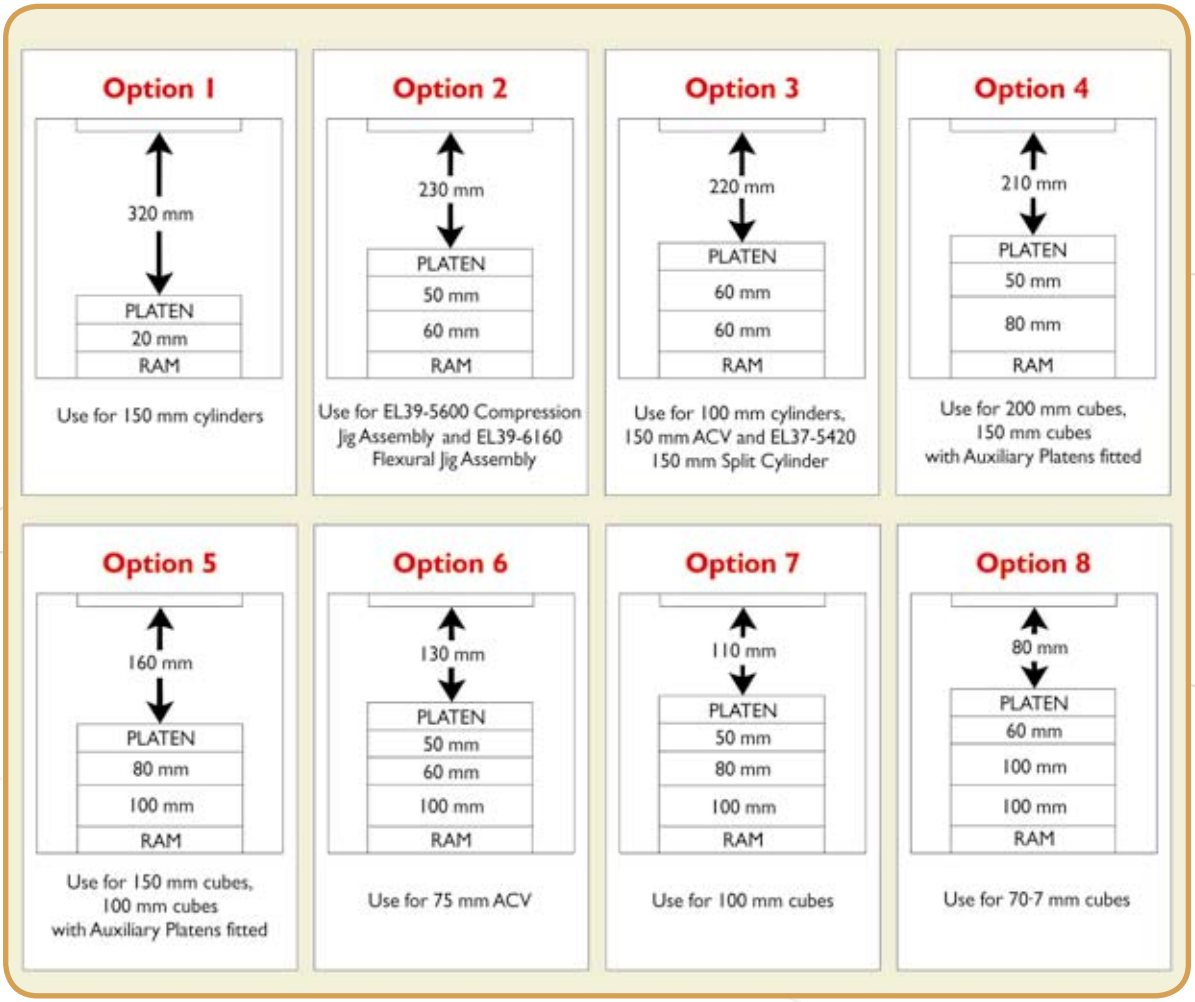
Distance Pieces

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 distance pieces	EN 12390-3, -4 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



Platen Assemblies

All ELE compression machines are supplied as standard with relevant platen assemblies. The versatility of the machines is such that other tests may be performed in addition to the main application. Often these tests will require different platens, e.g. for block testing. ELE offers a range of optional platen assemblies which are quickly fitted for use.

Rectangular Platens

EN772-1, BS 6073-1

These platens enable the testing of a wide variety of blocks and similar components. They are manufactured from high quality steel and hardened and finished where applicable to the requirements specified in the relevant Standards.

Ordering Information

EL37-4860 BS/EN Standard Rectangular Platens. Manufactured to the requirements of BS 6073-1 and EN 772-1 these platens, measuring 445 x 250 x 75 mm thick, are suitable for testing a wide range of samples. The upper platen is clipped to the machine's standard ball seating assembly. The platens are supplied complete with 2 bolt-on spacers for use when testing blocks of 140 mm or 190 mm height. Maximum vertical clearance is 245 mm. Weight 150 kg.

ELE 2000/3000 kN EN specification compression machines with serial numbers, prefix 1868 and 1881, have the load frame pre-drilled to accept Rectangular Platen Handling assembly on-site. 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 and roller assemblies for the platens.

Ordering Information

EL37-4830 Platen Handling System for 2000 kN EN compression machines, complete as specified.

EL37-4832 Platen Handling System for 3000 kN EN compression machines, complete as specified.

EL37-4835 Extended length safety gates for use with 2000 kN capacity machines fitted with rectangular platens.

EL37-4830 Platen Handling System

Split Cylinder Test Platens

EN 12390-5

This sub-platen assembly is designed to allow the tensile splitting strength of concrete cylinders to be determined in accordance with international standards. The assembly is supplied complete with a lower platen, integral locating device and load bar.

Ordering Information

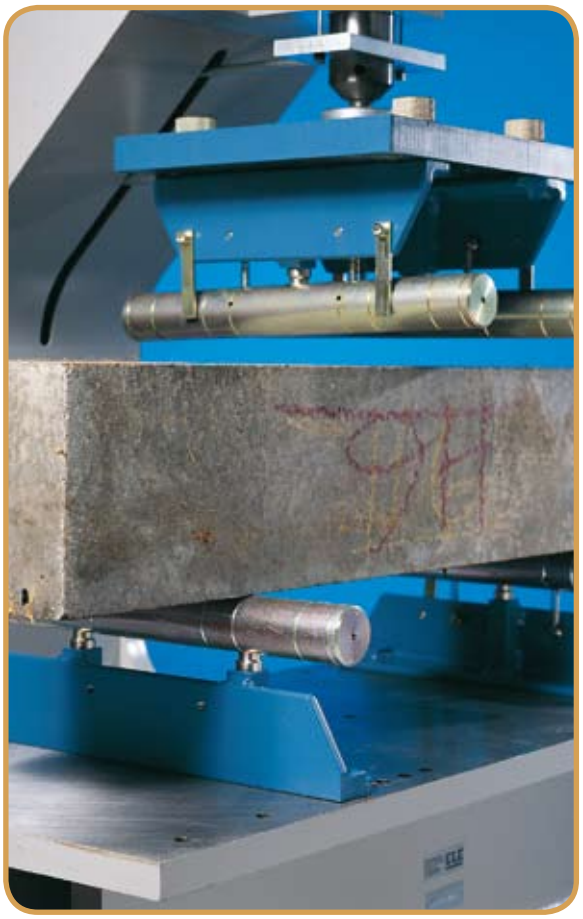
EL37-5420 Split Cylinder Platen Assembly for testing cylinders of 150 x 150 mm and 150 x 300 mm (diameter x length). Weight 10.5 kg.

Accessories

EL37-5450 Test Pieces. Hardboard strips for use with Split Cylinder Platen Assemblies. Pack of 100. Weight 0.1 kg.

EL37-5420 Split Cylinder Platen Assembly

Flexural and Transverse Testing Machines and Accessories



The flexural and transverse strength of concrete is of interest to engineers for many reasons. Movement of structures which may be induced by e.g. temperature changes, ground vibrations, cyclic loading of road pavements 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.

Modern concrete technology utilises a wide range of materials such as glass or steel fibres to improve the flexural strength of the concrete. These modified concretes often require the use of special tests and equipment.

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.

The range of flexural test equipment offered provides a wide variety of choice and test methods including low strength compression tests using optional ball seating assemblies.

50 kN Mini-flexural Machine

- *Hand operated*
- *Rugged, high strength frame*
- *Double-action hydraulic pump*
- *Dual calibrated (kN/lbf) gauge*

This compact flexural machine is designed for testing 100 mm and 150 mm square section beams. The base incorporates a series of bearer locating points, enabling a wide range of tests to be performed.

The unit is self contained with hydraulic pressure applied through a double-action hand pump to a ram fitted in the top of the frame making this an ideal portable on-site quality control machine. A 200 mm diameter load gauge, dual calibrated to 50 kN x 0.1 kN and 11000 lbf x 50 lbf graduations is fitted as standard.

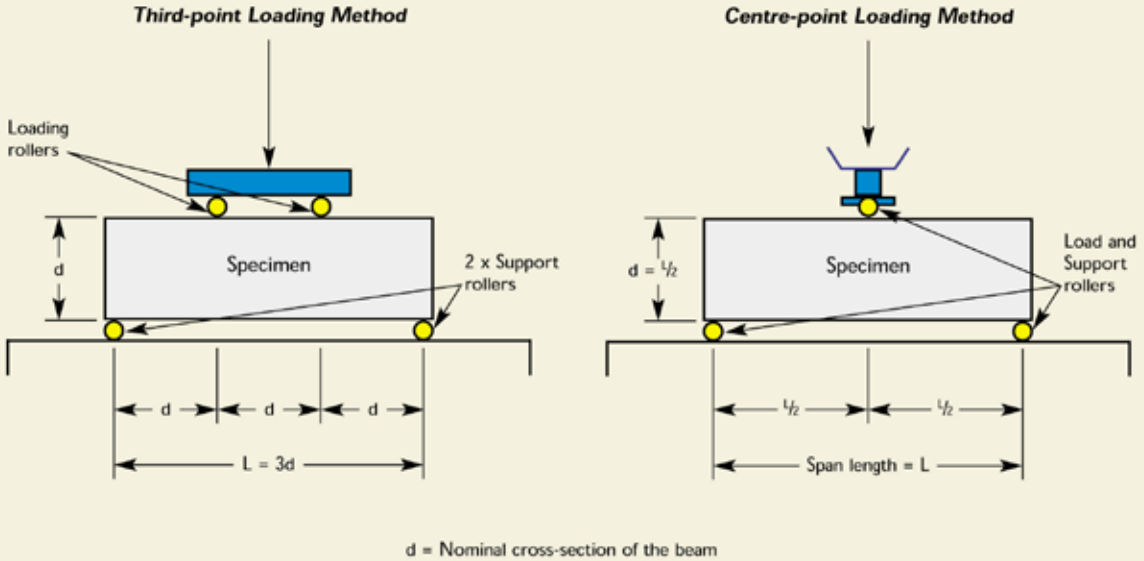
Specification	
Dimensions (l x w x h) Rollers	500 x 350 x 1090 mm 38 mm diameter x 160 mm long
Maximum vertical clearance	160 mm
Ram travel	15 mm
Accuracy and epeatability	±1% over upper 90% of working range
Weight	50 kg

EL37-6040 50 kN Mini-flexural Machine

Ordering Information

EL37-6040 50 kN Mini-flexural Machine
Hand-operated, supplied with upper and lower bearers.

Principles of Flexural Testing



d = Nominal cross-section of the beam

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100 kN Flexural (Beams) Frame

EN 12390-5, 1521, 13161, 772-6; ASTM C 78

- *Open sided for ease of specimen loading*
- *Meets EN 12390-5, 1521, 13161, 772-6 and ASTM C78 for standard section beams*
- *Optional ball seating assembly*

This rigidly constructed, open sided frame is suitable for testing 100 mm and 150 mm square-section beams. The frame supports a hydraulic ram and upper sub-platen assembly incorporating a spherical seating. The upper and lower sub-platens will accept various specimen loading bearers, which are supplied separately.

Compatability

These flexural frames can be used with a wide range of ELE compression machines. Simply select one of two fitting kits designed to link the flexural frame to either the ADR-Auto range of compression machines or any other ADR compression machine.

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

EL37-6130 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 and suitable for 3- or 4-point flexural testing of beams.

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.

Specimen size (effective height)	Distance pieces required		
40 mm	2 x 100 mm	1 x 80 mm	
50 mm	2 x 100 mm	1 x 50 mm	1 x 20 mm
70.7 mm	2 x 100 mm	1 x 50 mm	
100 mm	2 x100 mm	1 x 20 mm	

Special Note:

For details of suitable Standard Distance Pieces see EL37-4980 to EL37-5100.

100 kN Flexural and Transverse (Flags) Frame

EN 12390-5, 1339, 1340,1521,13161, 772-6

- *Open sided for ease of specimen loading*
- *Meets EN 1339, 1340 for kerbs and flagstones*
- *Optional ball seating assembly*

This rigidly constructed, open sided frame is suitable for testing kerbs and flagstones to EN 1339,1340. With optional accessories it can also be used to test 100 mm and 150 mm section beams for flexural strength to EN 12390-5.

The frame supports a hydraulic ram and upper sub-platen assembly incorporating spherical seating. The upper and lower sub-platens will accept specimen loading bearers, which are supplied separately.

Specification	
Dimensions (l x w x h) Rollers	840 x 845 x 1215 mm
Vertical clearance with bearers	170 mm
Throat clearance	330 mm
Ram travel	75 mm
Weight	460 kg

Ordering Information

EL37-6140 100 kN Flexural/Transverse (Flags) Frame for use with ELE compression machines. Supplied without specimen bearers.

Accessories

Flexural Fitting Kit for ADR Auto compression machines see EL37-6135 series

Flexural Fitting Kit for ADR compression machines see EL37-6138

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 and suitable for 3- or 4-point flexural testing of beams.

EL37-6362 Upper Bearer and Pair of Self-aligning Lower Steel Bearers for transverse testing of kerbs to EN 1340.

EL37-6364 Upper Bearer and Pair of Self-aligning Lower Steel Bearers for transverse testing of flags to EN 1339.

Ball Seating Assembly see EL37-6133

Specimen size Distance pieces required (effective height).

Specimen size (effective height)	Distance pieces required		
40 mm	3 x 100 mm	1 x 60 mm	
50 mm	3 x 100 mm	1 x 50 mm	
70.7 mm	2 x 100 mm	1 x 80 mm	1 x 50 mm
100 mm	3 x 100 mm		

Special Note:

For details of suitable Standard Distance Pieces see EL37-4980 to EL37-5100.

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