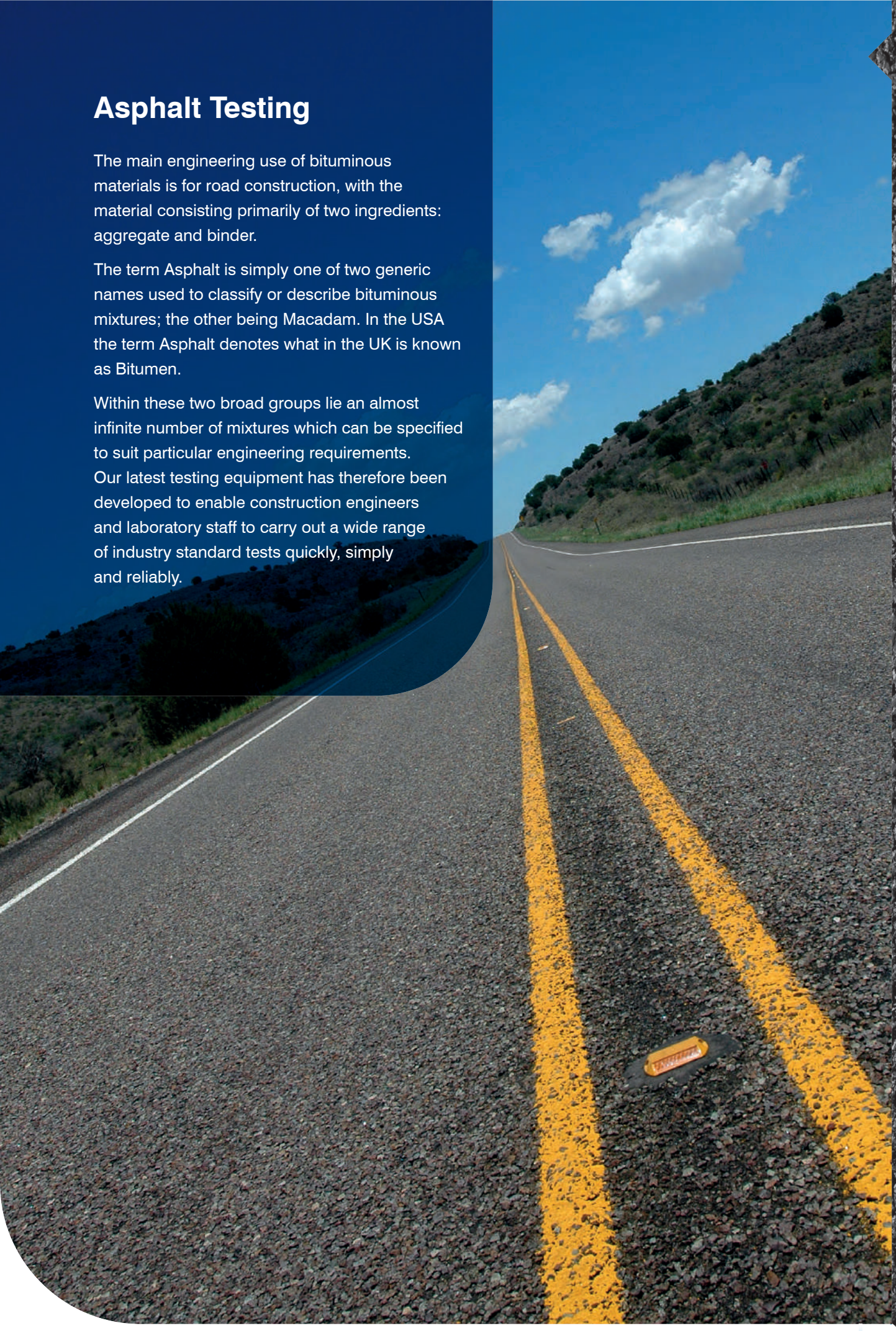
Asphalt Testing

The main engineering use of bituminous materials is for road construction, with the material consisting primarily of two ingredients: aggregate and binder.

The term Asphalt is simply one of two generic names used to classify or describe bituminous mixtures; the other being Macadam. In the USA the term Asphalt denotes what in the UK is known as Bitumen.

Within these two broad groups lie an almost infinite number of mixtures which can be specified to suit particular engineering requirements. Our latest testing equipment has therefore been developed to enable construction engineers and laboratory staff to carry out a wide range of industry standard tests quickly, simply and reliably.



Analysis & Binder Recovery

Ignition Method

Ever-increasing concern over the harmful, environmental effects of solvent-based asphalt extraction methods has led many countries to support the elimination of their use. The new Asphalt Binder Analyser from ELE International provides for an environmentally-friendly and cost-effective solution for determining asphalt content.

Asphalt Binder Analyser

Product Code: 46-6100/01

Product Standards:

EN 12697-39, ASTM D6307, AASHTO T308

Designed to measure the asphalt binder content of hot mix asphalt (HMA) using loss on ignition.

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.

Features:

- 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 (maximum sample is 4.5 kg).

Specifications	
Max Temp (°C)	750
Dimensions: Internal H x W x D (mm)	220 x 450 x 350
Dimensions: External H x W x D (mm)	980 x 600 x 775
Type	Bench-top
Thermocouple Type	K
Max Power (W)	8000
Power Supply	220-240 V AC, 50-60 Hz, 1 ph

Accessories:

Gloves (46-6100/10)

Face Shield (46-6100/11)

Asphalt Centrifuge Extractors

The Centrifuge Extractor is used to determine the quantitative amount of bitumen in bituminous paving mixtures whilst providing high safety to the operator.

- Continuously variable speed control from 0 to 3,600 rpm (1500 g capacity model).
- Brake control for rapid deceleration.
- Available in either 1500 g or 3000 g capacity models.

Rotatest 1500 & 3000

Product Codes: 45-3810/01, 45-3815/01

Product Standards:

EN 12697-1, ASTM D2172/D2172M, AASHTO T164

Centrifuge extractor used to determine the quantitative amount of bitumen in bituminous paving mixtures. Variable speed control from 0 to 3600 rpm through the front panel mounted control knob and brake control included for rapid deceleration.

Precision machined aluminium removable cover with integral cup for adding solvent, with sealed cast aluminium housing.

Further Information:

Supplied with 100 Filter Discs.
For 220 V AC, 50-60 Hz, 1 ph.

Specifications

Dimensions H x W x D (mm)	508 x 305 x 559	
Cover	Precision-machined aluminium; removable, with integral cup for adding solvent	
Housing	Cast aluminium, sealed	
Bowl	Precision-machined aluminium; removable	
Filter Discs	100 included	
Product Code	**45-3810/01**	**45-3815/01**
Control	1500 g: Variable speed, 0-3600 rpm	3000 g: Variable speed, 0-2600 rpm
Weight (kg)	35	41

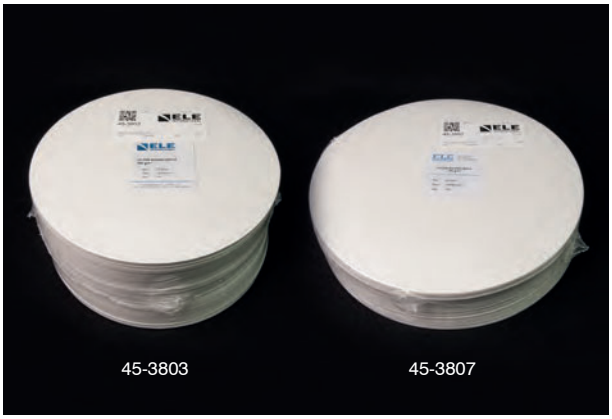
Accessories:

Desiccator - Non-vacuum (82-2100)
Evaporating Dish - 100 x 40 mm (82-1970)
Hotplate (78-2950/01)
Measuring Cylinder - Glass 100 ml (82-0380)
Measuring Cylinder - Glass 1000 ml (82-0500)
Sample Tray - 306 x 306 x 38 mm (81-4020)
Silica Gel (82-7091)
Volumetric Flask - 100 ml (82-1000)
Volumetric Flask - 1000 ml (82-1060)
Bowl 2.5 litre (81-5020)

Analysis & Binder Recovery

Rotatest Filter Disc Packs

Product Codes: 45-3803, 45-3807



Product Standards:

EN 12697-1, ASTM D2172/D2172M, AASHTO T164

Specifications

Product Code	45-3803	45-3807
Outer dia (mm)	248	295
Hole dia (mm)	44	44
Capacity (g)	1500	3000
Qty per Pack	100	100

Replacement Bowls for Rotatest 1500 & 3000 Centrifuge Extractors

Product Codes: 45-3810/10, 45-3815/10

Product Standards:

EN 12697-1, ASTM D2172, AASHTO T164

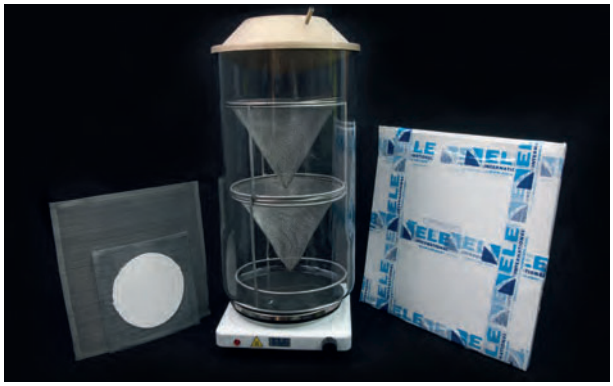
Specifications

Product Code	Capacity (g)
45-3810/10	1500
45-3815/10	3000

Reflux Extraction

Reflux Extractor

Product Code: 45-3855/01



Product Standards:

ASTM D2172/D2172M, AASHTO T164

- 4000 g capacity.
- Glass jar for visual observations.
- Thermostatically controlled hot plate.

The 4000 g capacity of the Reflux Extractor provides higher accuracy for acceptance testing procedures. This extractor has two cone type screens holding 2000 g each. The unit consists of two cone screens, water condenser, pyrex reflux jar, a thermostatically controlled hot plate and a supply of filter paper.

Specifications

Capacity (g)	4000
Baskets (2 included)	Stainless Steel wire, mounted; 2000 g capacity
Condenser	Copper
Jar - Pyrex Glass	280 mm dia x 510 mm height
Hot Plate	Thermostatically controlled
Hot Plate Power Supply	220-240 V AC, 50-60 Hz, 1 ph
Filter Paper	Coarse-textured (Grade 617); 40 mm dia

Spares/Consumables:

Borosilicate Glass Jar (45-3855/14)

Reflux Extractor Filter Paper Packs

Product Code: 45-3857

Product Standards:

ASTM D2172/D2172M, AASHTO T164

Filter papers for 4000 g capacity reflux extractor. Coarse-textured at grade 617 and 400 mm diameter.

Specifications

Pack Qty	50

Asphalt & Bitumen Ovens

The ovens listed here are specifically designed for the testing of bitumen.

Loss on Heat/Thin-Film Oven

Product Codes: 46-4100/01, 46-4100/06

Specifications	
Max Temp (°C)	163
Dimensions: Internal H x W x D (mm)	380 x 520 x 460
Dimensions: External H x W x D (mm)	570 x 870 x 630
Insulation	Double wall
Internal Material	304 Stainless Steel
Turntable Speed (rpm)	5.5
Max Power (W)	1500
Product Code	**Power Supply**
46-4100/01	220-240 V AC, 50 Hz, 1 ph
46-4100/06	220-240 V AC, 60 Hz, 1 ph

Product Standards:

EN 12607-2, BS 2000-460-2, EN 13303, ASTM D6/D6M, ASTM D1754/D1754M, AASHTO T47, AASHTO T179

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 (TFO) test method.

Features:

- 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. Side mounted controls comprise:
- Microprocessor digital control.
- Independent overheat thermostat.
- Mains switch.
- On/off switch for the turntable motor.
- Indicator lamps.

Spares/Consumables:

Spare Turntable for loss on heat test (46-4100/10)

Spare Turntable for thin film test (46-4100/11)

Bitumen & Tar

Rolling Thin-Film Oven

Product Codes: 46-4150/01, 46-4150/06

Product Standards:

EN 12607-1, BS 2000-460-1, ASTM D2872, AASHTO T240

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 ageing. The RTFO also provides a quantitative measure of the volatiles lost during the ageing process. The exterior is constructed from sheet steel finished in an easy clean powder coated paint and the interior chamber is made from Stainless Steel. The control system comprises a microprocessor digital controller and overheat thermostat with calibrated scale and tamper-proof lock.

Specifications	
Max Temp (°C)	163°C ± 1°C (preset)
Dimensions: Internal H x W x D (mm)	380 x 480 x 440
Dimensions: External H x W x D (mm)	800 x 710 x 660 (Add 40 mm for door handle)
Insulation	Double wall
Internal Material	Grade 304 Stainless Steel
Max Power (W)	1500
Product Code	**Power Supply**
46-4150/01	220-240 V AC, 50 Hz, 1 ph
46-4150/06	220-240 V AC, 60 Hz, 1 ph

Features:

- Double wall construction with high density thermal insulation.
- Non-rusting grade 304 Stainless Steel interior.
- Easy clean powder painted steel exterior in light grey (RAL 7035) textured finish.
- Top mounted fan constructed with an air plenum as described in ASTM D2872.
- 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.

Top mounted controls comprise:

- Dual display microprocessor digital control.
- Independent overheat thermostat.
- Mains switch.
- Flow meter to control air flow.
- Indicator lamps.
- 1500 watts.
- Supplied with built-in 305 mm diameter vertical circulator carriage for 8 sample containers.
- Glass samples rotate at 15 rpm ± 0.2 rpm (glass containers supplied separately).
- Temperature is controlled and pre-set at 163°C ± 1°C.

Required Accessory:

Glass Sample Container - Pack of 8 (46-4150/11)

Pressure Ageing Vessel

Pressure Ageing Vessel

Product Code: 46-5010/01

Product Standards:

EN 14769, ASTM 06521, AASHTO R28

The Pressure Ageing Vessel (PAV) is designed to simulate in-service oxidative ageing of asphalt binder by exposure to elevated temperatures in a pressurised environment.

- Includes a pressure relief valve and high-temperature thermal shut-down.
- Allows remote operation capabilities, and the user to completely control the PAV.
- Operating pressure range of 2.1± 0.1 mPa,

  and a temperature range of 80°C to 115°C, with resolution of 0.1°C.

Specifications

H x W x D (mm)	710 x 460 x 760
Weight (kg)	195
Power Supply	230 V AC, 50-60 Hz, 1 ph

Required Accessories:

Set of 10 Pans for Pressure Ageing Vessel (46-5010/10)

Pressure Ageing Vessel Calibration/Verification Kit (46-5010/11)

Sample Rack and Specimen Handling Tool for Pressure Ageing Vessel (46-5010/12)

Saybolt-Furol Viscosity

Saybolt Viscometer Two Place Unit with Furol & Universal Orifices

Product Code: 46-7003/01

Product Standards:

ASTM D88, ASSHTO T72

Used to determine the viscosity of petroleum products at specified temperatures between 70°F to 210°F. Stainless Steel made, the Saybolt Viscometer is supplied complete with two interchangeable orifices “Furol” and “Universal”, oil bath, electric heater with digital thermoregulator, stirrer, cooling coil, viscosity flask.

Thermometers, filter funnel and withdrawal tube are not included and must be ordered separately.

The Viscometer is equipped with a dual safety thermostat to prevent accidental over-heating.

Specifications

H x W x D (mm)	270 x 270 x 550
Weight (kg)	12
Power Supply	230 V AC, 50 Hz, 1 ph 500 W

Sampling & Preparation

Hubbard-Carmick Specific Gravity Bottles

Product Codes: 46-2190, 46-2191

Specifications

Product Code	Capacity (ml)
Conical Type (46-2190)	25
Cylindrical Type (46-2191)	24

Product Standards:

ISO 3838, ASTM D70, AASHTO T228

Design & Testing of Bituminous Mixtures

Mixing & Temperature

The density of Marshall specimens has a direct effect on stability and flow, therefore the correct moulding and compaction of laboratory specimens is essential if economical design mixes are to be produced.

Efficient mixing, temperature and compaction control are closely related. Poor coating of the aggregate due to low temperatures during the mixing process will have a major effect on subsequent test results.

Sample Mixers

A regular laboratory requirement is the mixing of samples with water and/or other constituents to provide a homogeneous mixture prior to subsequent testing. The following range of mixers provide an efficient means of mixing samples.

Bench-Mounting Mixer 4.7 Litre Capacity complete with Bowl, Beater & Whisk

Product Code: 23-6191/01, 23-6191/06

Mixer shown with Isomantle Electric Heater accessory.

Product Standards:

BS 598-107, BS 1377-1, BS 1924-1, EN 12697-35

The mixer has three electrically switched mixing speeds which obviates the need to switch off during speed selection. The mixing head comprises a beater which contra-rotates about a central shaft using planetary gearing. A lever-acting lifting device facilitates the insertion and removal of the bowl. This mixer is suitable for the mixing of soil samples, mortar, bituminous mixtures and associated materials where comparatively small samples are being prepared. Supplied with Stainless Steel bowl, beater and whisk.

Specifications	
Dimensions L x W x H (mm)	545 x 380 x 550
Beater Speeds (rpm)	Low 136, Med 281, High 580
Central Shaft Speeds (rpm)	Low 60, Med 124, High 255
Power Supply	220-240 V AC, 50 Hz, 1 ph
Rated Power	500 W
Weight (kg)	20.2
Product Code	**Power Supply**
23-6191/01	220-240 V AC, 50 Hz, 1ph
23-6191/06	220-240 V AC, 60 Hz, 1ph

Spares/Consumables:

Stainless Steel Bowl 4.7 litres (23-6191/10)

Accessories:

Isomantle Electric Heater (45-5580/01)

Specifications	
Power Supply	220-240 V AC, 50-60 Hz, 1 ph

Beater (23-6191/11)

Whisk (23-6191/12)

Compaction

The use of automatic compaction will result in consistent and repeatable laboratory specimens. Testing houses 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.

Automatic Compaction

AutoComp 100-A

Product Code: 45-6600/01, 45-6600/06

Product Standards:

EN 12697-10, EN 12697-30, 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 panel comprises 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.

Specifications	
Dimensions L x W x H (mm)	535 x 535 x 1880
Compaction Foot dia (mm)	98.52
Sliding Weight (g)	4535
Height of Drop (mm)	457
Weight (kg)	278
Product Code	**Power Supply**
45-6600/01	220-240 V AC, 50 Hz, 1 ph
45-6600/06	220-240 V AC, 60 Hz, 1 ph

Spares/Consumables:

Counter (8438X0017)
Tongue Spring (1108A0037)
Tongue (1108A0033)
Hammer Assembly (1108B0030)
Motor Gear Unit 50 Hz (6031A0092)
Motor Gear Unit 60 Hz (6031A0092-06)
Terminal Block for Power Pack (1312B300A)
Hammer Face (1108A0032)
Rear Cooling Fan 50 Hz (45-6600/10)

Accessories:

Digital Hotplate (78-3104/01)
Paper Discs (45-6462)
Sample Tray 306 x 306 x 38 mm (81-4020)
Marshall Compaction Mould 4 inch (45-6625)
Compaction Mould (45-6310)
Steel Block (45-6463)

AutoComp 100-A Spares Kit

Product Code: 45-6600/K1

Automatic Asphalt Compactor Spares Kit 220 V

Design & Testing of Bituminous Mixtures

Manual Compaction

Compaction Mould

Product Code: 45-6310

Product Standards:

EN 12697-30, BS598-107, ASTM D6926, AASHTO T245

Compaction Mould comprising of mould body, baseplate and combined filling/extraction collar.

Specifications	
Weight (kg)	3.5

Spares/Consumables:

Compaction Mould Body (45-6310/10)

Baseplate (45-6310/11)

Filling/Extraction Collar (45-6310/12)

Compaction Hammer

Product Code: 45-6460

Product Standards:

EN 12697-30, BS 598-107, ASTM D6926, AASHTO T245

Satisfies BS 598. The hammer has a 4535 g sliding weight with a free fall of 457 mm.

Specifications	
Drop	18 inches (457 mm)
Tamping Face	3-7/8 inches (98 mm) dia
Hammer	10 lb (4.54 kg)
Construction	Machined steel; cast aluminium handle
Weight (kg)	7.85

Compaction Pedestal

Product Code: 45-6410

Product Standards:

EN 12697-30, BS 598-107

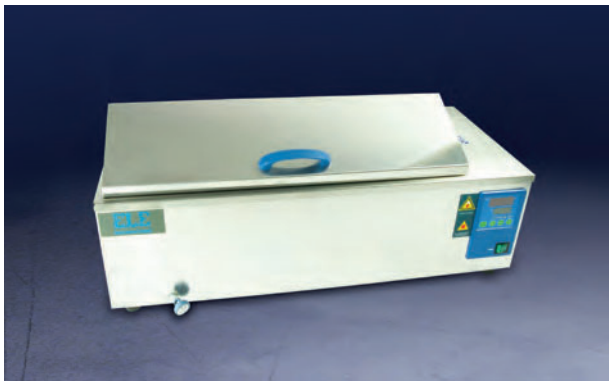
Comprising a 300 mm^2 x 25 mm thick steel plate complete with 4 tie rods and securing nuts. A mould clamp and hammer guide are fitted to the plate. The unit is supplied complete with a laminated hardwood block.

Specifications	
Weight (kg)	40

Manual & Automatic Compaction Accessories

Heating Bath 30 Litre

Product Code: 45-6550/01



Product Standards:

BS 598-107, EN 12697-30

Water Bath with LED display, cover and internal perforated shelf. Temperature range ambient to 60°C ± 5°C. For 220–240 V AC, 50-60 Hz, 1 ph.

Will hold up to 12 Marshall Samples.

Proctor/Core Cutter Extruder

Product Code: 23-4200

Product Standards:

BS 598-107, BS 1377-1, EN 12697-30

Paper Discs

Product Code: 45-6462

Product Standards:

BS 598-107, EN 12697-30

Non-absorbent, 99 mm diameter - Pack of 100.

Steel Block

Product Code: 45-6463

Product Standards:

BS 598-107, EN 12697-30

100 mm diameter x 50 mm height. For heating the compaction hammer foot. Weight 3 kg.

Design & Testing of Bituminous Mixtures

Marshall Stability & Flow

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 Load Frames

MultiPlex 50 Load Frame

Product Code: 25-3700/01

Compact bench mounting load frame designed for performing laboratory CBR, unconfined compression, consolidated drained, consolidated undrained and Marshall Stability tests. Has a variable speed of 0.5 to 50.8 mm per minute and features rapid approach of platen.

Specifications	
CBR Penetration	Yes
Unconfined Compression	Yes
Consolidated Undrained	Yes
Consolidated Drained	Yes
Marshall Stability and Flow	Yes
Power Supply	220-240 V AC, 50-60 Hz, 1 ph
Dimensions L x W x H (mm)	550 x 400 x 1470
Max Vertical Clearance (mm)	800
Horizontal Clearance (mm)	265
Platen dia (mm)	133
Platen Travel (mm)	100
Platen Speed Range	0.5 to 50.8 mm/min
Rapid Approach Speed	40 mm/min
Weight (kg)	100 (shipping 113 kg)

Product Standards:

Marshall

EN 12697-34, EN 12697-12, EN 12697-23, BS 598-107, ASTM D6927, ASTM D6931

CBR

EN 13286-47, BS 1377-4, ASTM D1883, AASHTO T193

Triaxial

BS 1377-7, BS 1377-8, ASTM D2166/D2166M, ASTM D2850, ASTM D4767, ASTM D7181, AASHTO T208, AASHTO T296, AASHTO T297

Spares Kit for MultiPlex 50 Load Frame

Product Code	Product
25-3700/K1	Spares kit for MultiPlex 50 Load Frame

Marshall Test 50

Product Codes: 45-6810/01, 45-6810/06

Product Standards:

EN 12697-34, EN 12697-12, EN 12697-23,
BS 598-107, ASTM D6927, ASTM D6931

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, is easy to clean and requires minimal maintenance.

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

Further Information:

Load frame, 50 kN capacity. Supplied without breaking head. For 220-240 V AC, 50 Hz, 1 ph.

Specifications	
Marshall Stability and Flow	Yes
Product Code	**Power Supply**
45-6810/01	220-240 V AC, 50 Hz, 1 ph
45-6810/06	220-240 V AC, 60 Hz, 1 ph

Spares/Consumables:

Jack Sleeve (1871B0045)
Jack Screw (1729B0032)
Nut (1274A0017)
Worm Gear (1274B0014)
Spares Kit (45-6810/K)

Marshall test Accessories

Product Code	Product
45-6850	Breaking Head Stability Mould
45-6880	Flow Meter BS/EN
45-6890	Flow Meter ASTM
78-0860	Clamped Boss Load Ring 50 kN
47-0202	Digital Thermometer -50 to +1000°C
47-0202/10	Asphalt Needle Probe
45-6550/01	30 ltrs Heating Bath
27-1559	S-Type Load Cell 50 kN
45-6860	Lottman Breaking Head

Breaking Head Stability Mould

Product Code: 45-6850

Product Standards:

BS 598

Electronic Instrumentation

Flow Transducer

Product Code: 45-6820/11

Product Standards:

EN 12697-34,
ASTM D6927-15

S-Type Load Cell 50 kN

Product Code: 27-1559

Product Standards: EN 12697-34

Maximum working capacity of 50 kN and excitation 10 V AC/DC with an output of 2.7 mV/V nominal. Aluminium alloy and Stainless Steel construction with IP65 environmental protection. Fitted with 5-pin DIN plug.

Specifications	
Value of CBR %	ALL
Environmental Protection	IP65
Force Capacity (kN)	50

Design & Testing of Bituminous Mixtures

DSU Electronic Readout & Control System

Product Codes: 27-1300/01, 27-1300/02

The Data System Unit (DSU) is a versatile instrument designed to accommodate the general logging requirements of geotechnical and materials testing engineers. Its intelligent interface allows the user to work with a range of different sensors.

- 4 channel automatic control and data-logging unit.
- Automatic, dual-frame control.
- Performs CBR, Marshall, unconfined compression, direct and residual shear, one-dimensional consolidation and unconsolidated undrained tests.
- LAN connection - software can be running anywhere on your server.
- Never lose data from power failures.
- 2 GB of non-volatile memory.
- Extended warranty.

Features:

The DSU has two distinct modes of operation; DS mode (Data System) and DU Mode, for operation with ELE International's established DS7 geotechnical testing software where the unit can be used as a stand-alone device without PC connection.

DS Mode:

- Up to four one dimensional consolidation tests.
- Up to two CBR tests.
- One direct/residual shear test.
- One triaxial quick un-drained test.

DU Mode:

- Up to two Marshall tests.
- Up to two CBR tests.
- Up to two unconfined compression tests.
- Automatic frame control.

Overview:

- Touch Screen data entry for stand-alone operation, Marshall/CBR/quick un-drained.
- Automatic single and dual frame control (with multiplex 50 frame).
- Log memory of 2 GB.
- Non-volatile memory.
- Ethernet TCPIP link and serial comms support.
- Market leading signal stability.
- Certificate and manual calibration features.
- Comes with 27-1510 RS232/USB cable.
- Comes with 27-1300/11 cable, safety/10.
- Comes with 27-1300/12 PC cable.

Specifications

Product Code	Power Supply
27-1300/01	220-240 V AC, 50-60 Hz, 1 ph
27-1300/02	100-120 V AC, 60 Hz, 1 ph

Accessories:

Dual Frame Comms Cable (27-1300/10)

Ductility Testing Machine

Product Code: 46-4120

Product Standards:

EN 13398, ASTM D113, ASTM D6084, AA SHTO T51, EN 13589, EN 13703, AASHTO T300.

The Ductility Testing Machine is used to determine the ductility of bituminous materials in a briquette mould by measuring the breaking elongation at a constant speed of 50 mm/min. It is designed for testing 3 specimens simultaneously. The internal tank is made of Stainless Steel. The bath is fitted with an immersion heater in order to obtain (in normal conditions) the 25°C test temperature.

Specifications	
Dimensions L x W x H (mm)	300 x 1850 x 550
Capacity	3 specimens
Weight (kg)	80
Watts (W)	1000
Power Supply	220 V AC, 50-60 Hz, 1 ph
Load	3 x max 300 N Load Cells
Accuracy	± 0.1 N

Features:

The Ductility Testing Machine comprises a speed control and water circulator to maintain the homogeneous water temperature.

- Elongation measurement through the motor encoder.
- 3 simultaneous load measurements with 18-bit resolution.
- Speed control with servo AC motor between 0.01 to 100 mm/min.
- Ethernet connection for computer interface.
- Has 3 load cells with an accuracy of ± 0.1 N, with a maximum capacity of 300 N.
- Failure conditions can be downloaded to the unit.
- Cooling unit.
- Automatic control and data acquisition.

Accessories:

Briquette Mould ASTM/AASHTO (46-4120/10)

Base Plate for Briquette Mould (46-4120/11)

Specific Gravity

Vacuum Pyknometer Apparatus

Product Code: 45-9305/01

Product Standards:

EN 12697-5, ASTM D2041/D2041M, AASHTO T209

The Vacuum Pyknometer is a large capacity unit used in the Rice Test for determining the maximum specific gravity of bituminous paving mixtures. The Pyknometer has a total volume of approximately 10 litres and will conveniently accept samples of 6000 g to minimise segregation effects. The unit is constructed of lightweight polycarbonate, with the upper half being transparent for visual observation of the effects of the vacuum. The Vacuum Pyknometer Apparatus consists of a 6000 g pyknometer, vacuum pump with control valves/gauges, 1000 ml filter flask, water trap and connection tubing.

- Large capacity design minimises segregation effects.
- Lightweight polycarbonate construction.
- Transparent top for visual observations.

Further Information:

For 220-240 V AC, 50 Hz, 1 ph.

Specifications	
Dimensions (mm) (Outside dia x height)	273 x 406 (outside dia x height)
Capacity	Approx. 10 ltrs, 6000 g sample weight
Connections	Water inlet valve; quick disconnect for vacuum gauge and hose
Weight (kg)	3.6
Power Supply	220-240 V AC, 50 Hz, 1 ph

Spares/Consumables:

Filter Flask 1000 ml (82-2350), 1 metre Red Rubber Tubing (81-3310/10), Vacuum Pump (5020 x 0076)

Vacuum Pyknometer 6000 g

Product Code: 45-9300

Product Standards:

EN 12697-5, ASTM D2041/ D2041M, AASHTO T209

Specifications	
Capacity	Approximately 10 ltrs, 6000 g (13.2 lbs) sample weight
Construction	Lightweight polycarbonate with transparent upper half
Gauge	2 inches (50.8 mm) dia
Aspirator	Plastic; 3/8 inch pipe thread (included)
Connections	Water inlet valve; quick disconnect for vacuum gauge and hose
Dimensions	10-3/4 inches (273 mm) outside dia x 16 inches (406 mm) height
Weight	Net 8 lbs (3.6 kg)

Accessories: 1/4 inch outside diameter Plastic Tubing (45-9301/14), Drierite Desiccant (45-9315/14), Filtering Kit (45-9301)

Rice Test Vibrator

Rice Test Vibrator

Product Code: 45-9415/01, 45-9415/06

Product Standards:

EN 12697-5, ASTM D2041/ D2041M, AASHTO T209

The Rice Test Vibrator is used with the 45-9300 6000 g Vacuum Pyknometer. Adjustable clamps hold the pyknometer securely to the base during vibration.

Further Information:

For 220-240 V AC, 50 Hz, 1 ph.

Specifications	
Dimensions W x H x D (m)	0.31 x 0.51 x 0.31
Weight (kg)	12

Accessories:

Attachment required for 6000 g Pyknometer (45-9315/10)

Timer Clock

Product Code: 81-0518

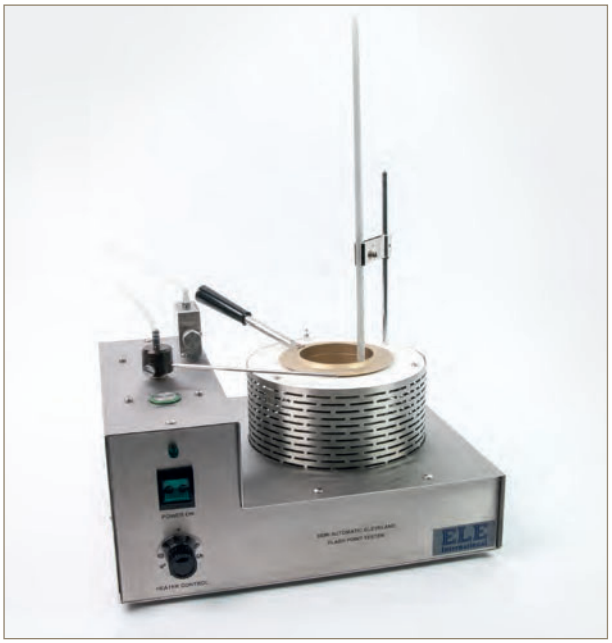
Specifications	
Main Body Length, Arm, Operating Length (mm)	13 x 64 x 58

Flash & Fire Point

There are a number of test methods using different equipment with closed or open cups. The Cleveland Flash Cup Apparatus is used to test cutback bitumen and may sometimes also be used to test penetration grade bitumen. The apparatus utilises the Open Cup test method. Note that results from different methods cannot be correlated.

Cleveland Flash Cup Apparatus

Product Code: 46-3310/01



Product Standards:

ISO 2592 (EN 22592), BS 2000-36, ASTM D92, AASHTO T48

The ELE Semi-Automatic Cleveland Open Cup Flashpoint Tester is equipped with an electrically heated cup (with a variable control to set temperature rise rate), a button operated and electrically driven sweep arm and a test flame for use on natural gas. Bench mounted, the unit is incorporated in an easy to clean Stainless Steel case.

Further Information:

For 220-240 V AC, 50-60 Hz, 1 ph.

Specifications	
Size H x W x dia (mm)	330 x 310 x 290
Temperature Range	Ambient to 400°C
Power (W)	500 max
Ramp Rate	Variable, manually controlled
Power Supply	220-240 V AC, 50-60 Hz, 1 ph
Weight (kg)	6.5

Spares/Consumables:

Test Cup (46-3310/10)

Cryostat (-20°C) (46-3310/11)

Bitumen & Tar

Softening Point

The test is performed in duplicate under closely controlled conditions. Water is used as the bath medium for binders with softening points below 80°C. Above this temperature glycerol is used in place of water. The softening point is a fundamental property of binders other than cutbacks and emulsions. The test is often referred to as the Ring and Ball test.

Ring & Ball Apparatus

Ring & Ball Apparatus BS/EN

Product Code: 46-4605

Product Standards:

EN 1427, BS 2000-58, ASTM D36/D36M, AASHTO T53

To measure softening point with 2 shouldered pattern rings, 2 ball-centring guides and 2 balls. The apparatus has a support frame and is retained in a heat resistant container.

Specifications	
Weight (kg)	0.6

Accessories:

Electric Hotplate (46-4825/01)

Laboratory Thermometer (mercury free) (82-5272)
Range -10°C to +101°C x 0.2°C divisions

Laboratory Thermometer (mercury free) (82-5274)
Range -10°C to +210°C x 1°C divisions

Electrical Hotplate with Integral Magnetic Stirrer

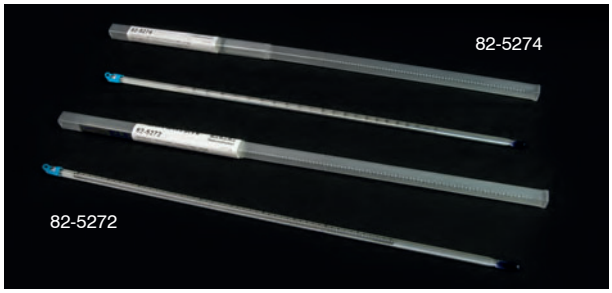
Product Code: 46-4825/01

Product Standards:

EN 1427, BS 2000-58

Utilises a rotating magnetic field to induce variable speed stirring action. A built-in regulating transformer provides fine temperature control of liquid up to a maximum temperature of +150°C. The unit is suitable for use with the Ring and Ball Apparatus.

Specifications	
Weight (kg)	2
Power Supply	220-240 V AC, 50-60 Hz, 1 ph



Thermometer

Product Code: 82-5272

Product Standards:

EN 1427, BS 2000-58

Mercury-free with a range of -10°C to +101°C and graduated every 0.2°C. Immersion up to 76 mm.

Specifications	
Temperature Range °C	-10 to +101

Thermometer

Product Code: 82-5274

Product Standards:

EN 1427, BS 2000-58

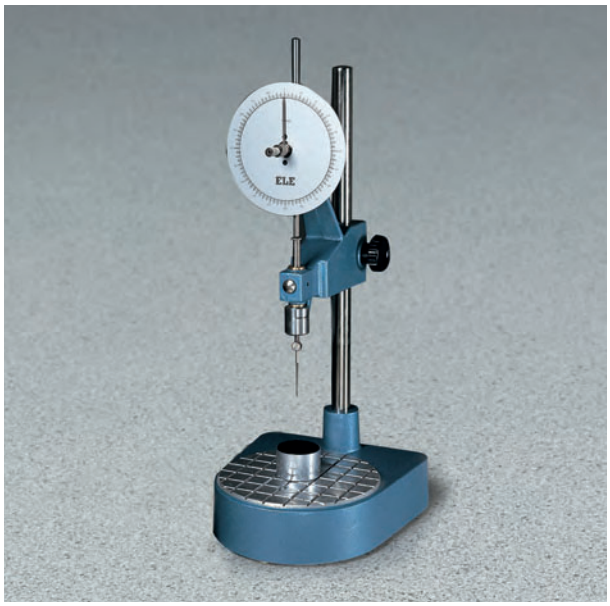
Mercury-free with a range of -10°C to +210°C and graduated every 1°C. Total immersion possible.

Specifications	
Temperature Range °C	-10 to +210

Penetration Test

Standard Penetrometer

Product Code: 46-5290



Product Standards:

EN 1426, BS 2000-49, EN 13179-2, ASTM D5/D5M, AASHTO T49

Penetration readings are quickly taken using this simple to operate apparatus. The 150 mm diameter dial is graduated in 400 divisions of 0.1 mm. Supplied without needles and penetration tins.

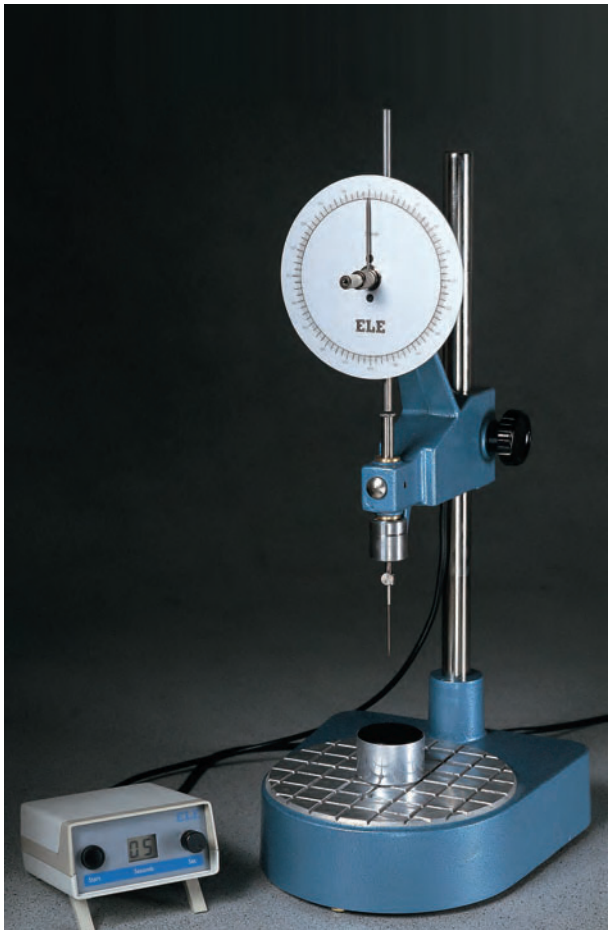
Further Information:

Model shown with sample container; not included, order separately.

Specifications	
Dial Indicator	6 inches (150 mm) dia
Plunger Weight (g)	47.5
Plunger Release	Manual mechanism
Weight	Net 18 lbs (8.2 kg)

Semi-Automatic Penetrometer

Product Code: 46-5295/01



Product Standards:

EN 1426, BS 2000-49, EN 13179-2, ASTM D5/D5M, AASHTO T49

As 46-5290 but incorporates Digital Automatic Controller which releases the needle assembly. The time set is displayed by a bright, easy to read display.

Specifications	
Power Supply	220-240 V AC, 50-60 Hz, 1 ph

Penetration Needle

Product Code: 46-5340/C

Product Standards:

EN 1426, BS 2000-49, EN 13179-2, ASTM D5/D5M, AASHTO T49

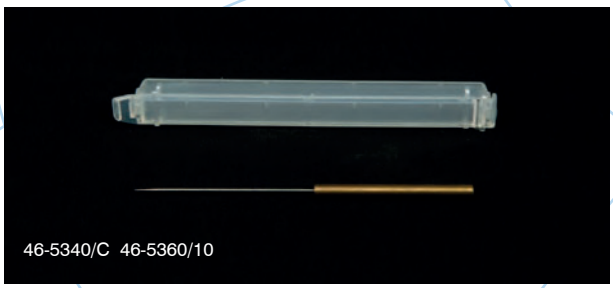
Hardened steel, supplied with a UKAS verification certificate. For testing to BS 2000-49 and ASTM D5. (Pack contains 1 needle only).

Specifications	
Weight (g)	2.5

Penetration Needle

Product Code: 46-5360/10

Unverified Hardened Steel



46-5340/C 46-5360/10

Bitumen & Tar

Constant Temperature Bath

Product Code: 46-5500/01

Accessories:

Separate Cooling Unit (46-5500/10).

Product Standards:

Conforms to Penetration Testing Standards.

A bench mounting bath specially designed for the conditioning of bitumen samples prior to penetration tests. Incorporating a highly accurate thermostat, the bath maintains a temperature between 21°C and 56°C ± 0.1°C (at ambient). An integral cover and deep tray for penetration testing are supplied as standard.

Specifications	
Weight (kg)	11
Power Supply	220-240 V AC, 50 Hz, 1 ph

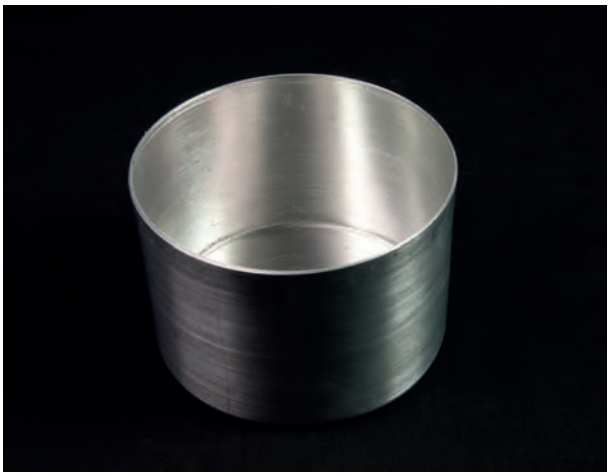
- Heater and circulation included.
- Cooling coil incorporated.
- Maximum temperature 100°C.
- Minimum temperature +2°C above water supply.
- Maximum fill volume 38 litres.
- External tank dimensions:

  490 x 335 x 255 mm (L x W x H).
- Internal tank dimensions:

  485 x 330 x 250 mm (L x W x H).

Transfer Dish

Product Code: 46-5800



Product Standards:

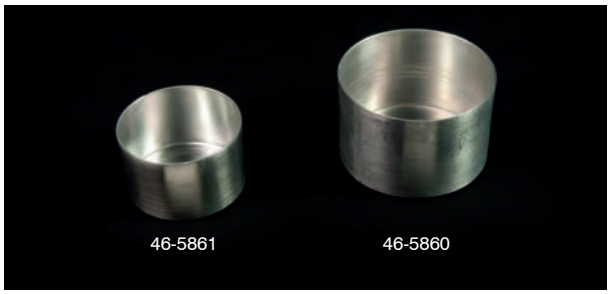
EN 1426, BS 2000-49, EN 13179-2, ASTM D5/D5M, AASHTO T49

For use with ELE Penetrometer 46-5295.

Specifications	
Weight (kg)	0.6

Penetration Tins (Two Sizes)

Product Codes: 46-5860/46-5861



Product Standards:

BS 2000-49, EN 1426, EN 13179-2, ASTM D5, AASHTO T49, IP 49

For penetrations up to 200, and between 200 and 350.

Specifications	
Product Code	**46-5860**
Dimensions (mm)	Approx 70 mm dia x 45 mm depth
Penetrations	Between 200 - 350
Weight (g)	30
Product Code	**46-5861**
Dimensions (mm)	Approx 55 mm dia x 35 mm depth
Penetrations	Below 200
Weight (g)	25

Gyratory Compaction

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™.

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.

Applications:

- Compaction of asphaltic paving material to a target mixture density or void content.
- Assessment of mixture compactibility.
- SHRP Superpave asphalt mixture design.
- Preparation of cylindrical test specimens.

Gyratory Compactor includes PC

Product Codes: 45-6750/01, 45-6750/02, 45-6750/06

Product Standards:

EN 12697-31
EN 12697-10
ASTM D6925
SHRP M-002
AASHTO T312

Features:

- 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™.
- UKAS traceable factory calibration.
- Can accept moulds up to 300 mm in height.

Product Speci ication:

- 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.

Software:

- User-friendly, intuitive and reliable Windows™ software.
- 2 methods of compaction - number 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 included for transducer check, diagnostic routines and calibration.

Specifications

Stress (kPa)	600 nominal, 1000 max
Mixture Types	Wet and Dry
Machine Speed	30 rpm
Angle of Gyration	0.2 to >2°
Electrical Supply	220-240 V AC, 50 Hz
Sample Sizes (mm)	100 and 150 dia
Compressed Air Supply	7-10 bar, 350 L p/m
Dimensions L x W x H (mm)	790 x 995 x 1920
Product Code	**Power Supply**
45-6750/01	220-240 V AC, 50 Hz, 1 ph
45-6750/02	110-120 V AC, 60 Hz, 1 ph
45-6750/06	220-240 V AC, 60 Hz, 1 ph

Gyratory Compaction

Gyratory Compactor Moulds

Used for preparation of compaction tests.

Product Code	Product	Sample dia
45-6750/10	Mould and Platens	100 mm
45-6750/12	Mould and Platens	150 mm
45-6750/15	Mould and Platens slotted for emulsion mix	150 mm
45-6750/20	Mould and Platens slotted for emulsion mix	100 mm
45-6750/21	Mould and Platens for specimen temperature measurement	150 mm
45-6750/22	Filter Papers (pack of 100)	150 mm
45-6750/23	Mould and Platens for specimen temperature measurement	100 mm
45-6750/24	Filter Papers (pack of 100)	100 mm
45-6750/25	Spacer to compact 63 mm height	100 mm
45-6750/26	Spacer to compact 63 mm height	150 mm
45-6750/27	Split Mould	100 mm

Gyratory Compactor Accessories

Product Code	Product
45-6710	Automatic Specimen Extruder
45-6715	Manual Specimen Extruder
45-6750/11	Calibration Kit for internal angle lead
45-6750/13	Internal angle measuring device
45-6750/14	Internal angle measuring device with hot mix simulator
45-6750/16	Option for 300 mm mould height (cannot be retro-fitted)
45-6750/17	2° angle plate
45-6750/18	Shear Force Display
45-6750/19	Specimen Temperature Measurement
45-6750/28	Air Compressor

Compact Core Drill Machine

This compact and portable core drilling machine is designed to cut cores up to 200 mm diameter from concrete, asphalt and similar hard construction material.

Compact Core Drill

Product Code: 47-6175

Product Standards:

EN 12697-27

This machine is designed to cut cores up to 150 mm diameter from concrete, asphalt and similar hard construction materials. It comprises a vertical support column which carries the drill head/motor assembly. The motor assembly comprises a 6.5 hp petrol engine, a ball screw mechanism enables close control of the drilling pressure and rapid return when drilling is completed. A water spraying assembly is mounted on the machine. The complete assembly is supplied on a rigid wheel mounted metal base frame with levelling and fixing facility during operation.

Core Barrels are available to order separately.

Further Information:

Special Note: Requires a continuous clean water supply via a 12 mm flexible hose (not supplied).

Core Barrels

Suitable for use with the Compact Core Drilling Machine, this range of core barrels comprise a thin-wall tube 450 mm long with a series of cutting segments formed from diamond abrasive set in a specially formulated hard matrix. The cutting face has been carefully designed to remove material rapidly and obtain the highest possible drilling rates. The solid back end includes a threaded fitting to connect to the water-swivel assembly of the core drill.

Core Barrel (Five Sizes)

Specifications

Product Code	Dia (mm)
47-5515	50
47-5525	75
47-5565	100
47-5605	150
47-5705	200

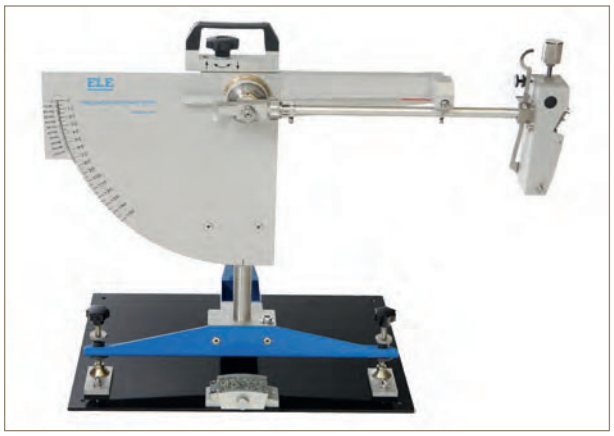
Pavement

Skid Resistance Testing

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 in-situ. 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.

Pendulum Skid Resistance Tester

Product Code: 42-6000



Product Standards:

EN 1097-8, EN 13036-4, EN 1436, BS 812-114, BS 7188, BS 7976-1, EN 14231, ASTM E303, EN 1341, EN 1342, EN 1338

Further Information:

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.
- Designed for laboratory and on site road surface testing.
- Factory calibrated to EN 1097-8.
- 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 and tool kit.

Specifications	
Dimensions W x D x H (mm)	695 x 295 x 695
Volume (m^3)	0.15
Weight (kg)	30

Spreader Feet for Skid Resistance Tester for In-Situ Testing Set of 3

Product Code: 42-6000/10

Skid Resistance Tester Base Plate for Laboratory Testing

Product Code: 42-6200

Rubber Mounted PSV Slider

Slider for polished stones for use with Pendulum Skid Resistance Tester (42-6000)

Product Code	Product
42-6000/11	1.25 inches Rubber Mounted PSV Slider
42-6000/12	3 inches Rubber Mounted TRL (55) Slider
42-6000/13	3 inches Rubber Mounted Four S (96) Slider
42-6000/14	3 inches Rubber Mounted CEN Slider
42-6000/15	First Traceable Calibration for Pendulum Skid Resistance Tester

Surface Regularity

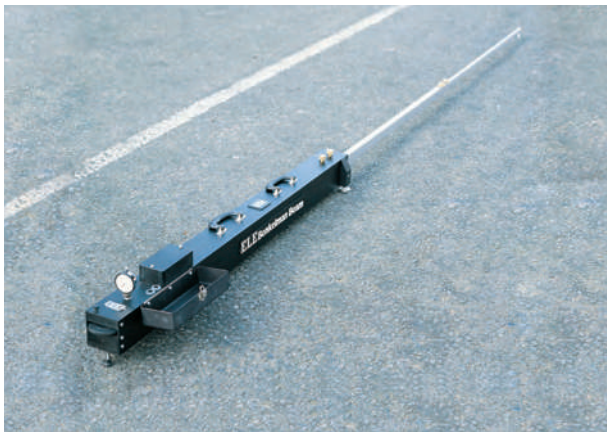
Benkelman Beam

- Lightweight construction.
- Compact, telescopic design.
- Direct reading of deflection.
- Anti-vibration system.
- Fully extended operating length 3.7 metres.

Designed for maximum operator efficiency, the Benkelman Beam is manufactured from a lightweight, durable material which telescopes into a small, compact unit for ease of storage and transport.

Benkelman Beam

Product Code: 47-1460



Product Standards:

AASHTO T256

Further Information:

Complete with Dial Gauge 25 mm travel x 0.01 mm divisions.

Specifications	
Open Length (ft)	12
Beam Fulcrum Ratio	2:1
Weight (kg)	15.9
Main Body	55 inches (1397 mm) long, black finish aluminium
Probe Beam	Aluminium, 8 ft (2.4 m) long, telescopes into case for storage
Probe Fulcrum	Ball pivot bearing, gives lever ratio of 2:1
Vibrator System	Operating switch mounted on top of instrument section (requires 4 “D” size batteries)
Levelling Wheel	Adjusts beams to proper elevation

Spares/Consumables:

Dial Gauge 25 mm Travel x 0.01 mm Divisions (83-5416)

Travelling Beam Device

Travelling Beam Device

Product Code: 47-3020

The 3 metre long Travelling Beam Device is used to check for any irregularities in both concrete and bituminous road surfaces. A sensing unit comprising a wheel connected to an indicator provides a magnification of 4:1. Deviation of the surface from a straight-line is shown on a scale calibrated in increments of 2 mm up to 10 mm and 5 mm up to 25 mm. A dye-marker is fitted which may be used to identify suspect areas. Outrigger wheels provide mobility on site. The device is supplied as three sub-assemblies which are quickly assembled on site. The Travelling Beam is supplied fitted with an autographic recorder providing a permanent record of the surface profile. Records of up to 1 kilometre can be recorded on the special chart paper rolls used.

Specifications	
Weight (kg)	66

Spares/Consumables:

Fibre-Tipped Pen (47-3131)

Autographic Recorder (35-3100)

Accessories:

Charts for Autographic Recorder - Pack of 10 (47-3130)

Pavement

Surface Dressing

The main purpose of a surface dressing is to prevent weathering, disintegration of the pavement and to increase the resistance to skidding in wet weather. The rate of spread and application of the chippings and binder is specified for most applications. Test methods have been developed to determine the actual rate of spread and are described in British Standards.

Rate of Spread of Coated Chippings

The equipment comprises a tray 300 mm square which, when used in conjunction with a specially graduated spring balance, will determine the rate of spread of coated chippings in terms of kg/m^2.

The spring loaded balance will accept rates of spread between 4 and 16 kg/m^2.

Between 5 and 10 trays are positioned in the path of the spreading machine and after the machine has passed over, each tray is lifted, together with the retained chippings, by means of four chains. The chains are hooked to the spring balance and the rate of spread is read directly from the balance scale.

Tray & Chains

Product Code: 47-0012

Product Standards:

EN 12272-1, BS 598-108

Comprising one 300 mm square tray and four chains.

Spring Balance

Product Code: 47-0011

Product Standards:

EN 12272-1, BS 598-108

Specifications	
Weight (kg)	0.8

Percentage Refusal Density (PRD)

Percentage Refusal Density (PRD) is defined as the ratio of the initial dried bulk density of the sample to the final density (refusal density) expressed as a percentage.

PRD Split Mould & Baseplate

Product Code: 47-0450

Product Standards:

EN 12697-32, BS 598-104

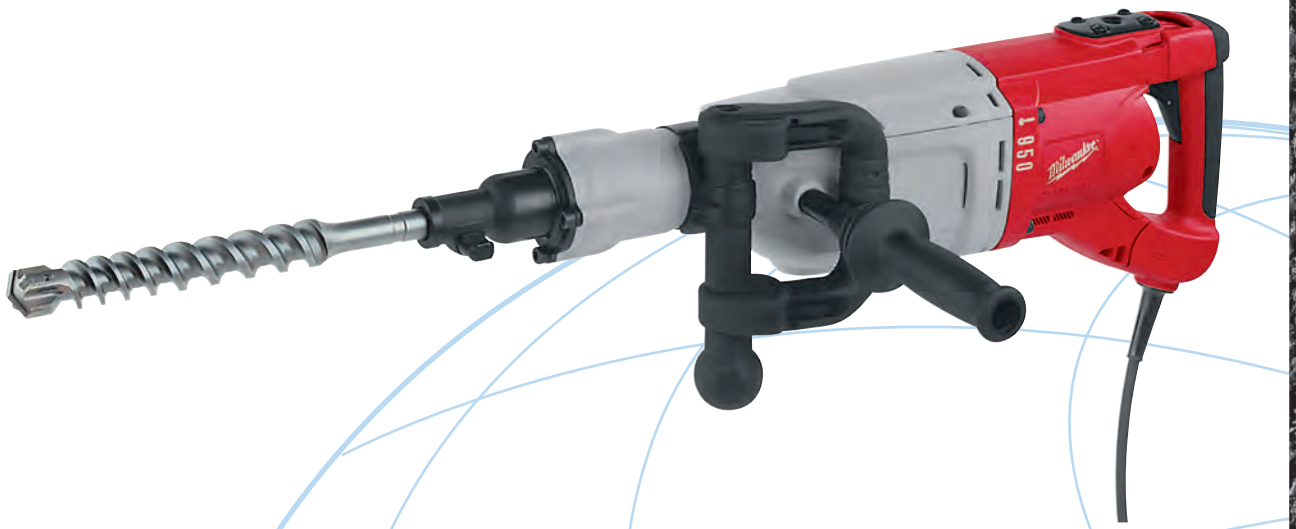
Specifications	
Weight (kg)	10.7

Spares/Consumables:

Base Plate (47-0450/10)

Vibrating Hammer

Product Code: 47-0455/01



Product Standards:

EN 12697-32, BS 598-104

Suitable for compacting asphalt samples.

Specifications	
Power Supply	220-240 V AC, 50-60 Hz, 1 ph

Accessories:

Small Tamping Foot 102 mm (47-0460)

Large Tamping Foot 146 mm (47-0470)

300 mm Shank only (47-0480/80)

300 mm Shank complete with Tamping Feet 102 mm and 146 mm diameter (47-0480)

Temperature & Density

Drying Ovens

Product Codes: 78-1215/01, 78-1225/01, 78-1235/01, 78-1250/01, 78-0135/01, 78-0140/03

225 litre two door and 100 litre single door shown in image.

Product Standards:

EN 12697-32, BS 598-104

This range of bench mounted ovens is designed to perform most materials testing requirements and is an ideal general purpose oven.

The ovens are constructed of mild steel with a powder coated exterior and an aluminium coated steel chamber which is both durable and corrosion resistant. The control system comprises a microprocessor digital controller with overheat safety system. They also include a main switch with indicator and heat and overheat indicators.

Specifications

Product Code	78-1215/01	78-1225/01	78-1235/01	78-1250/01	78-0135/01	78-0140/03
Capacity (ltrs)	50	100	150	225	425	750
Temp Fluctuation (°C)	+0.75°C	+0.75°C	+0.75°C	+/- 0.75°C	+0.75°C	+/- 0.75°C
No. of Doors	1	1	1	2	2	2
No. of Shelves Supplied	2	3	3	3	4	5
No. of Shelf Positions	3	4	5	4	5	8
Internal Dimensions L x W x H (mm)	330 x 490 x 330	450 x 490 x 450	550 x 490 x 530	540 x 920 x 440	760 x 920 x 640	1060 x 920 x 770
External Dimensions L x W x H (mm)	590 x 610 x 470	710 x 610 x 600	810 x 610 x 680	940 x 1090 x 570	970 x 1410 x 810	1420 x 1570 x 950
Temp Range (°C)	40-250°C	40-250°C	40-250°C	0-200°C	0-200°C	0-200°C
Rated Power Heater Elements (W)	750	1000	1500	2000	3000	6000
Weight (kg)	26	44	60	80	120	200
Power Supply	220-240 V AC, 1 ph	220-240 V AC, 1 ph	220-240 V AC, 1 ph	220-240 V AC, 1 ph	220-240 V AC, 1 ph	415 V 50-60 Hz 3 ph

Buoyancy Balance

Buoyancy Balance

Product Code: 34-8100/09

Product Standards:

EN 12390-7 (BS 1881-114), EN 12697-6, EN 1097-6, BS 812-2, ASTM C127, AASHTO T85

Buoyancy Balance 16 kg x 0.1 g auto density calculation. Supplied with frame, water tank and suspension hook. Cradle supplied separately.

Specifications	
Power Supply	110-240 V AC, 50-60 Hz, 1 ph

Spares/Consumables:

Tank 4 gallon capacity (9004X0058)

Buoyancy Balance Cradle

Product Code: 34-8105

Product Standards:

EN 12390-7 (BS 1881-114)

Specifications	
Weight (lbs)	1.5

Paraffin Wax

Product Code: 82-7031

5 kg Block, melting point 50°C-54°C

Temperature & Density

Temperature & Density

Delivery and compaction temperatures are probably the most common measurements taken during the placing of bituminous mixtures.

Digital Asphalt Thermometer

Supplied without probes the LCD display has large 12.5 mm characters and is powered by a standard PP3 battery or equivalent.

Asphalt Probe

Product Code: 47-0202/10

Product Standards:

BS 2000-49, EN 1426, EN 13179-2, ASTM D5, AASHTO T49, IP 49

A heavy-duty and reinforced needle probe, built with a t-shaped polyethylene handle.

Specifications

Product Code	47-0202/10	47-0202/11
Product	250 Probe	535 Probe
Max Temperature (°C)	250	250
Probe length (mm)	300	500
Tip dia (mm) Needle Point	6	6

Surface Probe

Product Code: 47-0202/14

130 mm long Ribbon-Type surface probe with a maximum tip temperature of 500°C.

Product Standards:

BS 2000-49, EN 1426, EN 13179-2, ASTM D5, AASHTO T49, IP 49

Specifications

Max Temperature (°C)	500
Probe length (mm)	100
Tip dia (mm) Needle Point	4

Digital Asphalt Thermometer

Product Code: 47-0202

Product Standards:

BS 2000-49, EN 1426, EN 13179-2, ASTM D5, AASHTO T49, IP 49

Comprises a hand-held digital thermometer with an operating range of -99°C to +1372°C with a switchable resolution between 0.1°C and 1.0°C. Operates on a 9 V battery and utilises K-type thermocouple sensors.

Further Information:

- Power Off: Auto Power off after 10 minutes.
- Battery Life: 5 year battery life with 3 x AAA batteries.
- Function: Hold function freezes current value.
- Calibration: Includes traceable calibration certi icate.
- Accuracy: ±0.4°C.

Specifications

Temperature Range (°C)	-99 to 1372
Resolution (°C)	Switchable between 0.1 and 1.0 (after 300°C)
Weight (g)	130

Quantitative Extraction of Bitumen. Centrifuge Extractor Method.

Standard(s)	EN 12697-1	
Product Code	**Product**	**Qty**
45-3800/01	Rotatest 1500 220-240 V AC, 50-60 Hz, 1 ph supplied with 100 Filter Discs	1
78-1300/01	Drying Oven 50 ltr capacity 1 Year Warranty 220-240 V AC, 50-60 Hz, 1 ph	1
78-6020/01	6 kg x 0.1 g Balance	1
81-4020	Sample Tray 306 x 306 x 38 mm	4
82-1000	Volumetric Flask 100 ml capacity with Stopper	1
82-1060	Volumetric Flask 1000 ml capacity with Stopper	1
82-2100	Non-Vacuum Desiccator 200 mm internal dia	1
82-7091	Silica Gel 2.5 - 6.0 mm Qty 500 g	1
Also required for determination of residual mineral matter by incineration		
78-2950/01	200 mm dia Hotplate 220-240 V AC, 50-60 Hz, 1 ph with Simerstat	1
78-6000/01	Electronic Top Loading 200 g at 0.001 g Balance	
81-5020	Bowl 2.5 ltr capacity Stainless Steel	1
82-0380	Measuring Cylinder 100 ml	
82-0500	Measuring Cylinder 1000 x 10 ml Soda Glass Spouted BS 604	2
82-1970	Evaporating Dish 100 mm dia x 40 mm depth	1
83-4140/01	Muffle (Ashing) Furnace with Digital Control PID 1100°C max temp	1

Determination of Particle Size Distribution

This test method determines the particle size distribution of aggregates of bituminous mixtures using test sieves. The test method is suitable for aggregates recovered after binder extraction in accordance with EN 12697-1.
Note: Fibres, solid additives and binder modifiers can influence test results.

Standard(s)	EN 12697-2	
Product Code	**Product**	**Qty**
78-1320/01	Drying Oven 220 ltr capacity. Fan circulated. Supplied with 4 Shelves. 1-Year Warranty	1
78-6000/01	Electronic Top Loading 200 g Balance Readability 0.001 g	1
78-6020/01	Electronic Top Loading 6 kg Balance Readability 0.1 g	1
78-6040/01	Electronic Top Loading 30 kg Balance Readability 1 g	1
79-0010	200 mm dia Lid	1
79-0020	200 mm dia Receiver	1
79-0070	200 mm dia BS Sieve 63 Mic Stainless Steel Mesh	1
79-0110	200 mm dia BS Sieve 125 Mic Stainless Steel Mesh	1
79-0150	200 mm dia BS Sieve 250 Mic Stainless Steel Mesh	1
79-0190	200 mm dia BS Sieve 500 Mic Stainless Steel Mesh	1
79-0230	200 mm dia BS Sieve 1 mm Stainless Steel Mesh	1
79-0270	200 mm dia BS Sieve 2 mm Stainless Steel Mesh	1
79-1500	200 mm dia BS Sieve 4 mm Perforated Plate	1
79-1540	200 mm dia BS Sieve 8 mm Perforated Plate	1
79-2010	300 mm dia Lid	1
79-2020	300 mm dia Receiver	1
79-2580	300 mm dia BS Sieve 16 mm Perforated Plate	1
79-2630	300 mm dia BS Sieve 31.5 mm Perforated Plate	1
79-2670	300 mm dia BS Sieve 63 mm Perforated Plate	1
79-2710	300 mm dia BS Sieve 125 mm Perforated Plate	1
79-7210	Sieve Brush double-ended, Nylon	3
80-0200/01	ELE Sieve Shaker complete with separate Control Panel 220-240 V AC, 50 Hz, 1 ph	1
81-4030	Sample Tray 406 x 406 x 50 mm	4

Determination of Bulk Density of Compacted Bituminous Specimen

The test methods are for use with laboratory compacted specimens or specimens from cores taken from pavement after laying and compacting.

Standard(s)	EN 12697-6	
Product Code	**Product**	**Qty**
34-6122/01	Melting Pot 4 ltr capacity. 50°C to 300°C temperature range. 220-240 V AC, 50-60 Hz, 1 ph	1
42-1000/01	Buoyancy Balance 6 kg x 0.1 g supplied with Support Frame Water Tank and Suspension Hook	1
42-1005	Wire Basket Brass with Handle nominal 6000 cm^3 capacity with 1.7 mm Wire Mesh	1
45-6550/01	30 ltr Heating Bath with LED Display Cover	1
81-0590	Vernier Caliper (LCD) range 0 to 200 mm x 0.01 mm	1
82-5420	Digital Pocket Thermometer -49.9°C to +199.9°C	1
82-7031	Paraffin Wax in 5 kg Block Melting Point 50°C to 54°C	5

Test Method for Moulding Specimens from Bituminous Mixtures by Impact Compaction

The test method is suitable for bituminous mixtures with a maximum aggregate size of 22.4 mm.

Standard(s)	EN 12697-30	
Product Code	**Product**	**Qty**
45-6310	Compaction Mould BS/EN/AASHTO including Filling/Extraction Collar Mould Body and Baseplate	6
45-6462	Paper Discs Pack of 100	3
45-6463	Steel Heating Block	1
45-6600/01	AutoComp 100A Automatic Marshall Compactor BS 598-107 for 220-240 V AC, 50 Hz, 1 ph	1
78-3104/01	Hotplate digital temperature indication 0-300°C 300 x 500 mm heating area. 220-240 V AC, 50 Hz, 1 ph	1
81-4020	Sample Tray 306 x 306 x 38 mm	3
Alternative hand compaction method.		
45-6310	Compaction Mould BS/EN/AASHTO including Filling/Extraction Collar Mould Body and Baseplate	6
45-6410	Compaction Pedestal to BS 598 fitted with Mould Clamp and Hammer Guide	1
45-6460	Compaction Hammer	1
45-6462	Paper Discs Pack of 100	3
45-6463	Steel Heating Block	1
78-3104/01	Hotplate digital temperature indication 0-300°C 300 x 500 mm heating area 220-240 V AC, 50 Hz, 1 ph	1
81-4020	Sample Tray 306 x 306 x 38 mm	3

Methods of Test for the Determination of Density & Compaction. The Percentage Refusal Density Test.

Standard(s)	EN 12697-32	
Product Code	**Product**	**Qty**
34-6122/01	Melting Pot 4 ltr capacity 50°C to 300°C temperature range 220-240 V AC, 50-60 Hz, 1 ph	1
34-8100/09	Buoyancy Balance 16 kg x 0.1 g auto density calculation 110-240 V AC, 50-60 Hz, 1 ph	1
34-8105	Cradle for Concrete Cubes to 150 mm and Cylinders	1
47-0202	Digital Thermometer -50°C to +1000°C supplied without Probes	1
47-0202/10	Asphalt Needle Probe 300 mm long 250°C max temperature	1
47-0450	Split Mould and Base Plate for PRD to BS 598	6
47-0455/01	Vibrating Hammer 220-240 V AC, 50-60 Hz, 1 ph	1
47-0460	Small Tamping Foot 102 mm dia for PRD to BS 598	1
47-0470	Large Tamping Foot 146 mm dia for PRD to BS 598	1
47-0480	300 mm Shank complete with Tamping Feet 102 mm and 146 mm dia	2
78-1250/01	Drying Oven 225 ltr capacity. Fan circulated. Supplied with 4 Shelves. 1-Year Warranty	1
81-0140	Spatula 200 mm	1
81-0518	Timer Clock	1
81-0590	Vernier Caliper (LCD) range 0 to 200 mm x 0.01 mm	1
81-0805	Engineers' Steel Rule 300 mm	1
82-7031	Paraffin Wax in 5 kg Block Melting Point 50°C to 54°C	4
82-7901	Filter Paper No 74 equivalent to Whatman No 40 150 mm dia Box of 100	1

Determination of Stability, Flow & Marshall Quotient Values of Specimens of Bituminous Mixtures

The test method is for specimens of bituminous mixtures mixed according to EN 12697-32 and is limited to dense graded asphalt concrete and hot rolled asphalt.

Automatic recording

Standard(s)	EN 12697-34	
Product Code	**Product**	**Qty**
23-4200	Proctor/Core Cutter Extruder Frame and Hydraulic Jack Extrudes 100 mm/4 inch dia Specimens	1
27-1300/01	DSU Electronic Data Acquisition and Control System	1
27-1559	S-Type Load Cell 50 kN for CBR or Marshall Tests fitted with 5-pin DIN plug	1
45-6550/01	30 ltr Heating Bath with LED Display Cover and internal Perforated Shelf	1
45-6810/01	Marshall Test 50 Machine 50 kN capacity 220-240 V AC, 50 Hz, 1 ph	1
45-6820/11	Flow Transducer 10 mm pre-calibrated	1
45-6850	Breaking Head Stability Mould	1
47-0202	Digital Thermometer 50 mm dia Dial 0°C to +1000°C	1
47-0202/10	Asphalt Needle Probe 300 mm long 250°C max temperature	1
78-1215/01	Drying Oven 50 ltr capacity 220-240 V AC, 50-60 Hz, 1 ph	1

Also required:

Determination of bulk density of compacted bituminous specimen EN 12697-6

Test method for moulding specimens from bituminous mixtures by impact compaction EN 12697-30

Determination of Stability, Flow & Marshall Quotient Values of Specimens of Bituminous Mixtures

Manual recording

Standard(s)	EN 12697-34	
Product Code	**Product**	**Qty**
23-4200	Proctor/Core Cutter Extruder Frame and Hydraulic Jack Extrudes 100 mm/4 inch dia specimens	1
45-6550/01	30 ltr Heating Bath with LED Display Cover and internal Perforated Shelf	1
45-6810/01	Marshall Test 50 Machine 50 kN capacity 220-240 V AC, 50 Hz, 1 ph	1
45-6850	Breaking Head Stability Mould	1
45-6880	Flow Meter (Dial Gauge) BS supplied complete with Flow Meter Pedestal	1
47-0202	Digital Thermometer -50°C to +1000°C supplied without Probes	1
47-0202/10	Asphalt Needle Probe 300 mm long 250°C max temperature	1
78-0860	50 kN Clamped Boss Load Ring complete with Dial Gauge and Calibration Certificate Height 248 mm	1
78-1215/01	Drying Oven 50 ltr capacity 1 Year Warranty 220-240 V AC, 50-60 Hz, 1 ph	1
Also required:		
Determination of bulk density of compacted bituminous specimen EN 12697-6		
Test method for moulding specimens from bituminous mixtures by impact compaction EN 12697-30		
Test method for laboratory mixing of bituminous mixtures for the manufacture of specimens EN 12697-35		

Test Method for Laboratory Mixing of Bituminous Mixtures for the Manufacture of Specimens

Standard(s)	EN 12697-35	
Product Code	**Product**	**Qty**
23-6191/01	Bench-Mounting Mixer 4.7 ltr capacity complete with Bowl Beater and Whisk 220-240 V AC, 50 Hz, 1 ph	1
45-5580/01	Isomantle Electric Heater for use with 5 ltr Bowl and 23-6191 series Bench Mounting Mixer	1
47-0202	Digital Thermometer -50°C to +1000°C supplied without Probes	1
47-0202/10	Asphalt Needle Probe 300 mm long 250°C max temperature	1
78-1300/01	Drying Oven 50 ltr capacity 1 Year Warranty 220-240 V AC, 50-60 Hz, 1 ph	1
78-3104/01	Hotplate Digital Temperature Indication 0-300°C 300 x 500 mm heating area 220-240 V AC, 50 Hz, 1 ph	1
78-6020/01	Electronic Top Loading 6 kg x 0.1 g Balance	1

Buyer's Guide

Determination of Ash Content of Bitumen

Standard(s)	BS 4450, ASTM D482	
Product Code	**Product**	**Qty**
81-0480	Crucible Tongs straight 200 mm	1
81-0508	Heat Resistant Gloves with Gauntlet	1
82-3320	Porcelain Crucible 30 ml supplied with Lid	1
82-3325	Porcelain Lid for 82-3320	1
83-4170/01	Muffle (Ashing) Furnace with Digital Control PID 1200°C max temperature	1
Also required:		
78-2950/01	200 mm dia Hotplate 220-240 V AC, 50-60 Hz, 1 ph with Simerstat	1
78-6010/01	Electronic Top Loading 1200 g x 0.01 g Balance	1

Determination of Flash Point by Cleveland Open Cup Method

Standard(s)	BS 4689, ASTM D92	
Product Code	**Product**	**Qty**
46-3310/01	Cleveland Flash Cup Apparatus; Open Cup, electrically operated with Gas Flame 220-240 V AC, 50 Hz, 1 ph	1

Determination of Softening Point Ring & Ball Method

Standard(s)	EN 1427, BS 2000-58	
Product Code	**Product**	**Qty**
46-4605	Ring and Ball Apparatus	1
46-4825/01	Electrical Hotplate with integral Magnetic Stirrer 220-240 V AC, 50-60 Hz, 1 ph	1
82-5261	Thermometer (IP60C) Total Immersion -2°C to 80°C	1
82-5263	Thermometer (IP61C) Total Immersion 30°C to 200°C	1
82-5265	Thermometer (IP89C) -1°C to +175°C to BS 5094 and ASTM D2398 total immersion	1

Determination of Penetration

Standard(s)	BS 2000-49, ASTM D5, AASHTOT49	
Product Code	**Product**	**Qty**
46-5290	Standard Penetrometer BS 2000 ASTM D5	1
46-5360/10	Penetration Needle unverified	1
46-5500/01	Constant Temperature Bath 21°C to 56°C +/- 0.1°C	1
46-5800	Transfer Dish	1
46-5860	Penetration Tin 70 mm dia x 45 mm deep	10
46-5861	Penetration Tin for penetrations below 200; Nominally 55 mm dia x 35 mm deep	10
81-0518	Timer Clock	1