



SECTION BA



BITUMEN-ASPHALTS

This section includes a wide range of test equipment for asphalt materials that are intended to be road pavement for long periods, therefore, it is necessary to analyze their resistance to bending and compression forces caused by the traffic that they must withstand in the future.

Among the products that Proeti develops in this section you will find equipment for the preparation, mixing and compaction of samples; asphalt mixture analysis equipment, cold and hot extraction and ignition and calcination systems; and machines for testing and analyzing the rheological properties of bitumen.



BA001 IGNITION OVEN NCAT

EN 12697-39 | ASTM 6307 | AASHTO TP53

This ignition oven is an analyzer that determines the asphalt content in a sample by igniting the sample. The asphalt sample is bathed in oxygenated air and weighed continuously during the ignition process. The software identifies the end point of the ignition and indicates the end of the test. A printer outputs the results.

The hot asphalt mix sample is weighed, divided into equal parts and placed in two reinforced baskets mounted on a tray assembly. The complete assembly is placed on the tray on the oven floor. The tray is mounted on four ceramic supporting tubes that, in turn, are placed on the platform of a digital scale.

A fan pushes ambient air through the holes in the four ceramic support tubes located at the base of the chamber. This oxygenated air saturates the asphalt sample laid out to facilitate its ignition and incineration.

The volatile elements that are released are later oxidised when they pass through a ceramic filter heated to 750°C in a chamber over the main chamber.



After between 20 and 40 minutes, depending on the weight of the sample, the oven detects the end of the test when all the bitumen has been incinerated and stops emitting a whistle. A report is printed showing the percentage of bitumen per aggregate and mixture.

It is supplied with two sample basket assemblies, printer, four rolls of printer paper, heat-resistant gloves, head gear with face shield, aluminium cool down plate, cool down safety cage and basket brush.

MG702 MUFFLE FURNACE 1200°C

EN 12697-1 Clause C | EN 13108

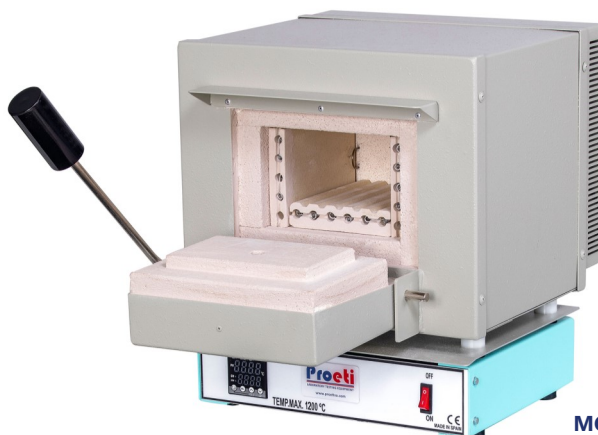
This furnace is used for the determination of residual mineral matter by incineration of the bituminous mixtures.

Power supply: 220 V
Volume: 7,6 litres
Internal dimensions: 200x240x160 mm
Overall dimensions: 540x520x490 mm
Weight: 45 Kg



BA001

Power supply: 240 V | 50-60 Hz | 8500 W
Máx weight of sample: 5000 g
Internal dimensions: 305 x457x305 mm
Overall dimensions: 610x810 x950 mm
Temperature range: 200° to 750 °C
Weight: 94 Kg



MG702

BA005 ASPHALT MIX ANALYZER

ASTM D2172 | EN 12697-1

The unit has been designed for the purpose of determining the bitumen content in asphalt mixture and it is the best solution to analyse and characterize the properties of the reclaimed asphalt pavement.

Through the use of solvent selectable from perchloroethylene, trichloroethylene or chloroethylene, the final result of the process is the separation of aggregates and filler from bitumen in order to verify the quality of the recovered granular materials and determine the mineral skeleton of the mixture.

The representative bitumen sample can be used to perform other test such as penetration, softening point, etc... Aggregates, including filler, are also separated and remain available for sample grading.

The asphalt sample (maximum 3,5 kg) is placed in a washing drum lined with woven mesh cloth with openings 0,063, 0,075 or 0,090 mm wide and it is fitted into the washing chamber. Bitumen and filler are separated from the sample by washing with solvent and ultrasonic motion.

The aggregates and filler are dried by forced air circulation and the residue of solvent recovered by condensation. The remaining bitumen/solvent solution is distilled and separated in two different tanks

Part of the bitumen/solvent solution can be drained off before distillation and connected to a flask for use with a rotary evaporator to recover a bitumen sample for other tests. The clean distilled solvent is recycled for other extractions.

The door is locked during all test phases to provide a safe environment. Furthermore, the test stops automatically in case of anomalies or malfunctions.

ACCESSORIES

OPERATION MODE

- BA005-01 Perchloroethylene operation mode
- BA005-02 Trichloroethylene operation mode
- BA005-03 Chloroethylene operation mode
- BA005-10 Centrifuge cup Ø120 mm
- BA005-11 Closing lid for washing drums



BA005-12

WASHING DRUMS

- BA005-12 Washing drum, mesh with opening 0,063 mm
- BA005-13 Washing drum, mesh with opening 0,075 mm
- BA005-14 Washing drum, mesh with opening 0,090 mm



BA005

The solvent mode extraction has to be selected before supplying the unit, and the machine will be calibrated accordingly.

The unit is supplied without the solvent that has to be purchased independently.

Power supply: 230 V | 50 Hz
Dimensions: 1400x750x1500 mm
Weight: 240 Kg

- BA005-20 Device for the extraction of the centrifuge cup
- BA005-21 Lining paper for centrifuge cup (Pack of 100)
- BA005-22 Solvent pumping device for safe solvent filling
- BA005-23 Water cooling system providing water 5° - 10°C
- BA005-24 Fast connection for rotary evaporator flask for bitumen solution sampling (to be ordered at time of order)
- BA005-25 Worktop balance for an easy and automatic determination of the bitumen content
- BA005-31 Testing device for the verification of the recycled perchloroethylene status
- BA005-32 Solvent stabilizer for recycled perchloroethylene

BA007

AUTOMATIC BINDER EXTRACTION UNIT

EN 12697-1 | ASTM D2172

Used to perform reliable analysis on bituminous mixtures utilizing the perchloroethylene (PCE) or tetrachloroethylene solvent which is classified: R40 (not cancer producing*), for quantitative determination of binder or bitumen contained in pavement samples and hot mixed mixtures.

The system performs in only one complete automatic cycle:

- The washing, disaggregation and separation of the bituminous mixture
- The separation of the filler from the solution formed by solvent, bitumen and filler
- The recovery and distillation of solvent material allowing a further utilization

The unit comprises:

- An electromagnetic sieving unit, insuring high quality double vibrating action (vertical/rotational), with solvent spraying cover for washing and disaggregation of the sample.
- A continuous flow filterless centrifuge having rotation speed of 11000 rpm equipped with a stainless steel beaker Ø120 mm, filler capacity approx. 400 g.
- A solvent recovery unit having reclaiming capacity of 50 l/h, equipped with cooling system switching ON and OFF the unit to automatically perform the test.
- A separate control panel allows to program all these functions in a fully automatic system. It is also possible to select the manual control.

This unit is supplied with:

- Two stainless steel beakers Ø120 mm
- Four stainless steel sieves Ø200 mm openings: 0,063 - 0,250 - 0,800 - 2 mm
- Sieve Frame only Ø200 mm to improve the capacity of the first sieve
- Set of O-ring gaskets for sieves



BA007

Power supply: 400 V | Three phase | 50 Hz | 5,5 kW

Overall dimensions: 1400x680x1820 mm

Weight: 185 Kg

ACCESSORIES

B007-01

Lining paper 370x200 mm for centrifuge cup (100 pieces)

B007-10

Cabinet with aspirator

It allows housing the automatic bitumen extraction unit, to minimize the diffusion of vapours and toxic solvents in the laboratory. The structure is anodized aluminium made and safety glass walls. The unit is supplied with 4 front doors, aspirator centrifugal electric vapour and appropriate filter group to activated charcoal.

A room with internal height at least 3 m is required.

Power supply: 380 V | 3 ph | 1100 W

Dimensions: 1950x980x2630 mm

Weight: 140 Kg



BA007-10

BA011 CENTRIFUGE EXTRACTOR 1500/3000 G

EN 12697-1, 13108 | ASTM D2172 | AASHTO T164A

Used for the determination of bitumen percentage in bituminous mixtures. It consists of a removable, precision machined aluminium rotor bowl, placed into a cylindrical aluminium box. The separate control panel incorporates an electronic card fitted with AC drive which automatically drives the bowl speed rotation ramp from 0 to 3600 rpm as requested by Standards, with fast stop bowl rotation at the end of the test.

Supplied with speed regulator and digital display monitoring the frequency. The centrifuge is supplied without aluminium bowl+cover and without filter discs to be ordered separately.

Power supply: 220-240 V | 50-60 Hz | 550 W

Dimensions: 550x380x500 mm

Weight: 50 Kg

BA013 CENTRIFUGE EXTRACTOR 1500/3000 G EXPLOSION-PROOF MODEL

EN 12697-1, 13108 | ASTM D2172 | AASHTO T164A

Same as model BA011, but equipped with a special explosion proof electric motor. The control panel has to be installed in a non explosive area.



BA011

ACCESSORIES

BA010-11

Bowl and cover 1500 g

BA010-12

Filter disc 1500 g (Pack of 100 pieces)

BA010-21

Bowl and cover 3000 g

BA010-22

Filter disc 3000 g (Pack of 100 pieces)



BA010-21

BA010-22

BA015 FILTERLESS CENTRIFUGE EXTRACTORS

EN 12697-1 | ASTM D1856

Designed for quick filterless separation of filler from binder solution or other mixtures containing sediments (cement, soil, clay), in suspension. The solution is poured into the top funnel and falls into the rotating test container with Ø70x200 mm. Because of the centrifugal effect, the liquid rises vertically leaving the filler and mineral particles inside the beaker. The centrifuge is supplied with aluminium beaker, two sieves 2 mm and 0,063 mm mesh respectively.

The rotation speed is 11500 r.p.m. with automatic ramp and preset speed control.

Extraction capacity is up to 100 g of filler per test.

Rotation speed:

11500 r.p.m.

Capacity:

To 100 g

Power supply:

230 V | 50 Hz | 600 W

Dimensions:

350x600x720 mm

Weight:

60 Kg



BA015

BA017 SOLVENT RECOVERY UNIT

This unit, is provided with two tanks: one for the clean solvent and one for the dirty solvent and of a water coolant system which only needs to be connected to a tap. A safety cut out is also supplied, being activated when the solvent level becomes too low or once the process is completed. Fully stainless steel very high quality made.

Supplied with funnel/tank with sieve insert and 10 m plastic tube.

Capacity:

10 L/h

Power supply:

230 V | 50-60 Hz | 1300 W

Dimensions:

320x400x650 mm

Weight:

17 Kg



BA017

BA021 VACUUM PYKNOMETER 10 LITRES (RICE TEST)

EN 12697-5 | ASTM D2041

This pyknometer is for determining the theoretical maximum specific gravity of uncompacted bituminous paving mixtures. They can also be used for the calculation of the percentage of air voids in compacted bituminous mixtures and the amount of bitumen absorbed by the aggregates.

To perform the test a minimum ultimate vacuum of 30mm/Hg is requested.

Dimensions: Ø300x450 mm
Weight: 8 Kg

ACCESORIES

- AR053
Electromagnetic shaker
- MG743
Vacuum pump 75 L/min
- MG740-01
Vacuum regulator
- MG740-02
Condensed water trap
- MG740-03
Tubing 3 m



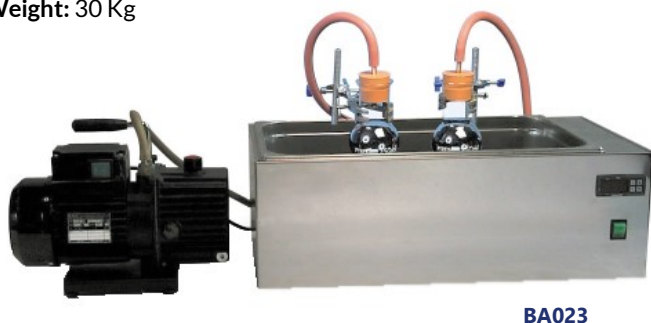
BA023 BINDER RECOVERY APPARATUS

EN 12697-1 CLAUSE B.3.1 | BS 598:102

This apparatus is used to remove the solvent from binder/solvent solutions in order to directly determine the total binder content of aggregate/binder mixtures.

The apparatus consists of a vacuum pump fitted with a regulator producing a vacuum down to 200 mbar, a thermostatically- controlled water bath, and two flat-bottomed 250 ml flasks with rubber bungs, plus all other necessary fittings and connections.

Power supply: 230 V | 50 Hz | 1000 W
Weight: 30 Kg



BA025 ROTARY EVAPORATOR

EN 12607 | ASTM D5404 | ASTM D7906

Rotary evaporation apparatus for determining the resistance to hardening under the influence of heat and air. 100 g of bituminous binder is introduced into the 1000 ml rotating flask of the rotary evaporator. When the test temperature reaches 165°C a flow of air at ambient temperature is introduced into the rotating flask. The air flow hardens the sample and the hardening effect is evaluated by measuring penetration, softening point and dynamic viscosity of the treated bituminous binder sample.

Temperature range: 20-210°C
Power supply: 230 V | 50-60 Hz | 14400 W
Dimensions: 845x477x740 mm
Weight (without glass): 16 Kg



BA027 BOTTLE ROLLING MACHINE

EN 12697-11

This machine is used for determining the affinity between aggregate and bitumen. The result is expressed by visual registration of the degree of coverage on uncompacted bitumen-coated mineral aggregate particles after the influence of mechanical stirring action in the presence of water.

The machine is designed to accommodate three test bottles. A glass rod is also required to complete the system. These items are not included and have to be ordered separately

Power supply: 230 V | 50-60 Hz
Dimensions: 385x295x160 mm
Weight: 10 Kg

ACCESORIES

- BA027-01
Test bottle 500 ml
- BA027-02
Glass rod Ø6x35 mm



BA031
HOT EXTRACTOR WIRE MESH FILTER METHOD
 EN 12697-1 CLAUSE B.1.2

This apparatus consists of a cylindrical glass jar containing a stainless steel wire basket cloth opening 0,063 mm. The asphalt sample (500 to 2000 g) is placed inside the wire basket, the solvent is poured inside the jar. Now the wire basket is inserted into the jar which is covered by a stainless steel condenser connected to a water supply. The apparatus is placed on a hot plate and the boiling solvent drips into the basket dissolving out the bitumen. The filler passing through the mesh basket must be separated using the centrifuge extractor.

Dimensions: Ø160x335 mm
Weight: 4 Kg



BA031

ACCESORIES

- BA031-01
Wire basket cloth 0,4 mm
- BA031-02
Wire basket double cloth 0,063 and 0,4 mm
- BA030-01
Wire mesh with ceramic centre 150x150 mm
- MG681-03
Hot plate Ø180 mm

MG275
DIGITAL THERMOMETER

This thermometer is particularly practical because it enables virtually any kind of temperature measurement. Whether for surface, air or immersion/penetration measurement. The thermometer requires to be connected with a probe.

Temperature measuring range: from -50 to +1000 °C
Dimensions: 182x65x40 mm
Weight: 171 g



MG275-01

ACCESORIES

- MG275-01
Waterproof immersion/penetration probe -60 a +400°C
- MG275-02
Waterproof surface probe -60 a +400°C for flat surfaces
- MG275-03
Service case for thermometer and probes
- MG275-04
Safe case to protect from impact and dirt

BA033
REFLUX EXTRACTOR 1000g
 ASTM D2172

Used for the quantitative determination of bitumen in hot-mix paving mixtures and pavement samples, these extractors consist of two wire mesh cones with interlocking frames, a cylindrical glass jar and a water condenser with inlet/outlet tubes. The bitumen content is calculated by difference from the weight of extracted aggregates, moisture content and ash from an aliquot part of the extract.

- It is composed by
- Cylindrical glass jar
- Metal frame supporting two metal cones
- Metal condenser on top of the jar
- 100 filter papers
- Wire gauze

Dimensions: Ø160x510 mm
Weight: 5 Kg



BA033

BA035
REFLUX EXTRACTOR 4000g

Similar to BA033 but having 4000 g capacity.

Dimensions: Ø280 x510 mm
Weight: 9 Kg

ACCESORIES

- BA030-01
Wire mesh with ceramic centre 150x150 mm
- BA030-02
Wire mesh with ceramic centre 200x200 mm
- BA030-03
Wire mesh with ceramic centre 300x300 mm
- MG681-03
Hot plate Ø180 mm
- MG681-04
Hot plate Ø220 mm

MG273
DIGITAL THERMOMETER FROM -50 TO 250°C
MG285
DIAL THERMOMETER FROM 0 TO 200°C

For temperature measurement of freshly mixed concrete, bituminous mixtures and general purpose use.



MG285

MG273

BA039 DRAINAGE BASKET

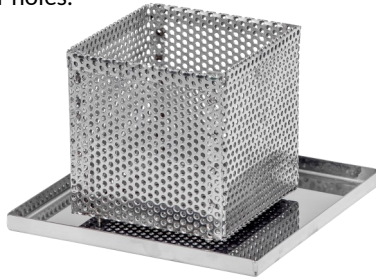
EN 12697-18

The drainage basket and metal tray are used for determining binder drainage of bituminous mixtures, estimating the binder drainage for different binder contents, and evaluating the effect of varying the fine aggregate quantity or anti-draining additive content. The basket is made of stainless steel perforated plate with 3,15 mm diameter holes.

Basket dimensions:
100x100x100 mm

Tray dimensions:
160x160x10 mm

Weight:
1000 g



BA039

BA041 HOT EXTRACTOR PAPER FILTER METHOD

EN 12697-1 CLAUSE B.1.1

This apparatus is used for the extraction of binder from hot-mix paving mixtures and can also be used for determining the moisture content.

Consisting of:

- A metallic pot with gauze basket and filter
- Dean Stark collector
- Liebig condenser
- 25 filter papers Ø 400 mm

Dimensions: 480x480x900 mm

Weight: 22 Kg

ACCESSORY

MG681-04
Hot plate Ø220 mm



MG681-04

BA043 SOXHELET METHOD

EN 12697-1 CLÁUSULA B.1.3

Consisting of:

- Flask 5000 ml
- Extractor 2000 ml
- Vapour tube
- Condenser
- 25 filtering cartridges of Ø80x240 mm
- Isomantle electric heater
- Stand and clamps

Power supply:
230 V | 50-60 Hz | 900 W

Dimensions:
400x400x1000 ml

Weight:
20 Kg



BA043

BA045 KUMAGAWA EXTRACTOR 1L

EN 12697-1 CLAUSE B.1.3 | LCPC

BA047 KUMAGAWA EXTRACTOR 2L

Used for the quantitative determination of bitumen in hot-mix paving mixtures and pavement samples.

This extractor consists of:

- Round glass flask
- Cooling unit
- Dean-Stark receiver
- Electric heating mantle with regulator
- Fittings

Two models are available: 1 or 2 litres.

Power supply:

230 V | 50-60 Hz | 750 W

Dimensions:
400x500x1000 mm

Weight:
20 Kg



BA045

BA049 ABSON METHOD

ASTM D1856 | CNR N°133

Used for recovering the asphalt (bitumen) from a solution generated by a previous extraction.

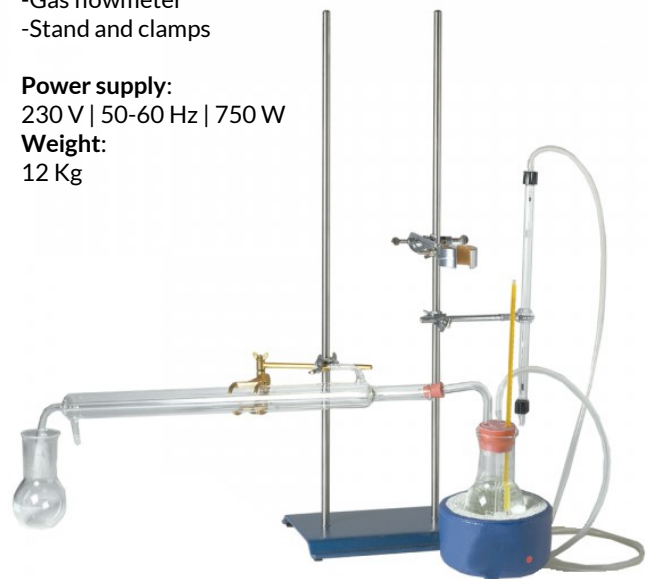
The apparatus is a distillation assembly that consists of:

- Extraction flasks
- Glass tubing
- Inlet aeration tube
- Electric heating mantle
- Water-jacketed condenser
- Thermometer
- Gas flowmeter
- Stand and clamps

Power supply:

230 V | 50-60 Hz | 750 W

Weight:
12 Kg



BA049

BA051

AUTOMATIC LABORATORY MIXER

EN 12697-35 | ASTM D6307 | AASHTO TP53

The design and testing of bituminous mixtures includes various laboratory tests such as:

- Marshall stability (EN 12697-34)
- Gyratory compaction (EN 12697-31)
- Slabs laboratory compaction (EN 12697-33)
- Prepare specimens for Wheel tracking (EN 12697-22)
- Determination of stiffness (EN 12697-26)
- Beam fatigue testing (EN 13108)

To produce samples for performing the above tests, it is essential that the preparation of a bituminous mixture is carried out at a reference temperature and within a limited time period in order to reduce mechanical degradation of the aggregates.

The mixer consists essentially of a horizontal stainless steel mixing container with a helical mixing shaft.

The container is thermally insulated and comes with a heating element and probe sensor which provide uniform temperature control. The container can be easily tilted by the electric motor for the unloading operation.

Automatic mixer consists of:

- Main frame holding a horizontal stainless steel bowl with a helical mixing shaft.
- The bowl, double wall insulation made of stainless steel contains an electric heater with probe sensor granting constant and uniform temperature control.
- An electromechanical motion allows to tilt the bowl facilitates the unloading operation, with total rotation up to 130°.



BA051

The control panel foresees:

- Digital thermo regulator to set temperature and to control the mixing temperature
- Mixing speed regulator
- Main and start/stop switches
- Command to tilt the bowl

Mixing capacity: 32 litres max.

Power supply: 230 V | 50-60 Hz | 4500 W

Mixing temperature: From ambient up to 260 °C

Mixing speed: adjustable from 4 to 40 rpm

Heating power: 3000 W

Dimensions: 1280x700x1210 mm

Weight: 350 Kg



Detail of the detachable mixing shaft with blades



Easy tilting with rotation angle up to 130°

BA055 PLANETARY MIXER 10 L

EN 12697-5 | ASTM D2041

This large capacity mixers have been designed to mix bituminous samples for compaction tests, Marshall and tensile splitting test and for other tests where uniformity is required.

A robust device for the efficient mixing of asphalt mixes, this model is a table mounted unit with planetary mixing action and a bowl and whisk that are easily fitted and removed.

The mixer is supplied with spiral, blade and whisk beaters and a stainless steel bowl.

Power supply: 750 W

Timer: 0-30 min

Dimensions: 410x523x688 mm

Weight: 44 Kg

ACCESORY

BA055-01

Isomantle heater for BA055

Used to heat the bituminous mixtures contained in the mixing bowl up to a maximum temperature of 180°C.



BA055

LABORATORY PLANETARY MIXERS

A robust device for the efficient mixing of asphalt mixes, these models are table mounted units with planetary mixing action and a bowl and whisk that are easily fitted and removed.

These machines operate with a dedicated and easy to use display and keyboard interface. Either Standard speeds or user defined speeds can be easily selected (also adjustable during mixing).

The front grill, when opened, automatically stops the machine for operator protection conforming to CE requirements. All machines are supplied with bowl and whisk.

Dimensions: 605x735x1180 mm



BA063

CODE	CAPACITY	POWER SUPPLY	WEIGHT
BA063	20 L	220 V 50 Hz 1 Ph 750 W	95 Kg
BA065	20 L	400 V 50 Hz 3 Ph 900 W	100 Kg
BA067	30 L	220 V 50 Hz 1 Ph 1100 W	100 Kg
BA069	30 L	400 V 50 Hz 3 Ph 1100 W	104 Kg

ACCESORY

BA060-01

Isomantle heater for 20 L bowls

Used to heat the bituminous mixtures contained in the mixing bowl up to a maximum temperature of 180°C.

BA060-02

Isomantle heater for 30 L bowls



BA060-01

BA071 ASPHALT ROLLER COMPACTOR

EN 12697-33 method 5.2 and annex A | ASTM D8079

This apparatus can compact asphalt slabs to a target density applying specific loads corresponding to those of pavements rollers used in the highway construction.

The machine works with an electromechanical system, and therefore it does not require any external air source or hydraulic pressure. It is used to simulate representative sample slabs of several dimensions of bituminous mixtures laid and compacted on site. The compaction is performed through a segmented roller with alternated operated rotation which simulates the on-site action of a street roller.

The slabs produced can be used for:

- Wheel tracker tests
- Perform specimens for indirect tensile
- Cut into beams for bending fatigue tests

Three transducers are installed to manage the roller and table displacements and vertical load pressure. The compaction cycle can be programmed up to a certain load or deformation value. When deformation value is programmed, the system automatically programs the suitable loads to obtain the selected final thickness.

The flexibility of the program grants the production of samples with uniform density and dimensions, fully meeting Standards specifications and Research requirements.

ACCESORIES

BA071-01

Rolling vibrating device
Reproducing street-roller vibrations during asphalt laying off.

BA071-11

Roller for 305x305 mm mould

BA071-21

Roller for 320x260 mm mould

BA071-31

Roller for 400x305 mm mould

BA071-41

Roller for 500x400 mm mould



BA071-21

BA070-13

Mould to prepare asphalt slabs 305x305x50 mm

BA070-14

Mould to prepare asphalt slabs 305x305x100 mm

BA070-23

Mould to prepare asphalt slabs 320x260x50 mm

BA070-24

Mould to prepare asphalt slabs 320x260x180 mm

BA070-33

Mould to prepare asphalt slabs 400x305x50 mm

BA070-34

Mould to prepare asphalt slabs 400x305x100 mm

BA070-35

Mould to prepare asphalt slabs 400x305x120 mm

BA070-43

Mould to prepare asphalt slabs 500x400x180 mm



BA070-24

BA070-10

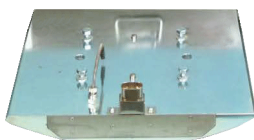
Centering plate for 305x305 mm mould

BA070-20

Centering plate for 320x260 mm mould

BA070-30

Centering plate for 400x305 mm mould



BA071-42



BA071

The Roller Compactor is supplied without roller segment, slab mould, centering plate, that must be ordered separately.

Power supply: 230 V | 50-60 Hz | 2100 W

Sliding carriage speed: adjustable 3 and 12 m/min

Vertical force selectable up to max: 40 kN

Dimensions: 2200x1030x2410 mm

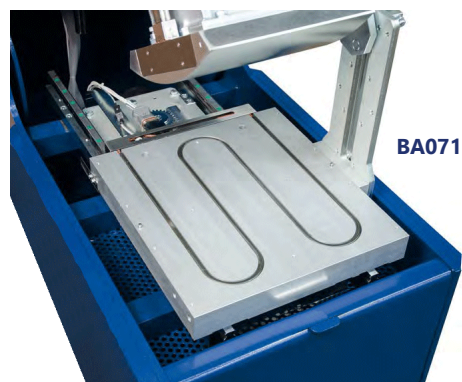
Weight: 1300 Kg

BA071-02

Heating of segment roller and sliding cart
Providing the possibility to heat and control temperature of the segment roller mounted on the compactor and sliding carriage to keep the mould warm and avoid thermal shocks the might affect specimen's workability.

The equipment is composed of:

- Control unit mounted in the roller compactor with probe to measure and to adjust the temperature from ambient up to 180 °C.
- Sliding cart heating system consisting of thermoregulated circuit with temperature probe to set and control cart temperature and keep mould hot. The temperature is adjustable from ambient up to 140 °C.



BA071-02

BA071-12

Heated segment roller for 305x305 mm mould

BA071-22

Heated segment roller for 320x260 mm mould

BA071-32

Heated segment roller for 400x305 mm mould

BA071-42

Heated segment roller for 500x400 mm mould

BA073 SINGLE WHEEL TRACKER

EN 12697-22 | BS 598: 110 | NF P98-251-1 | NF P98-251-4

This machine is used in laboratory, for evaluating the deformation (rut) depth of a bituminous mixture subjected to cycles of passes of a loaded rubber wheel under constant and controlled temperature conditions.

To perform the test, a loaded wheel, which bears on a sample held on a moving table is used to simulate the effect of traffic and to measure the deformation susceptibility of the bituminous sample. The table reciprocates with simple harmonic motion over a distance of 230 ± 5 mm.

The test frame is made of robust aluminium alloy and it is contained in a climatic cabinet with adjustable temperature from 30 to $65^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The cabinet is equipped with two doors with insulated glass for inspection.

The wheel tracker is equipped with 3 temperature probes:
-1 probe for the control of the cabinet temperature
-2 probes for temperature measurement inside the specimen

The sample table has 400×390 mm dimensions and can accept rectangular slabs of several sizes:

- Slabs of 305×305 mm, 50 mm height
- Slabs of 305×305 mm, 100 mm height
- Slabs of 400×305 mm, 50 mm height
- Slabs of 400×305 mm, 100 mm height
- Core samples $\varnothing 400 \times 305$ mm, 50 mm height
- Slabs of 500×400 mm, 180 mm height

Continuous real time rut depth measurement (penetration of the wheel into the sample) through a linear transducer 40 mm travel by 0,01 mm accuracy.



BA073

The machine is supplied complete with adaptors for a correct mould positioning and locking and hard rubber tyred wheel having outside diameter 200 mm. The confinement moulds are not included and have to be ordered separately.

Travel of the table: 230 ± 5 mm

Table cycle frequency: from 15 to 40 cycles per minute

Wheel load: $700\text{N} \pm 10\text{N}$ (EN) || 520N (BS)

Power supply: 230 V | 50-60 Hz | 2200 W

Dimensions: $1580 \times 650 \times 1790$ mm

Weight: 400 Kg

ACCESORIES

BA070-13

Mould to prepare asphalt slabs $305 \times 305 \times 50$ mm

BA070-14

Mould to prepare asphalt slabs $305 \times 305 \times 100$ mm

BA070-23

Mould to prepare asphalt slabs $320 \times 260 \times 50$ mm

BA070-24

Mould to prepare asphalt slabs $320 \times 260 \times 180$ mm

BA070-33

Mould to prepare asphalt slabs $400 \times 305 \times 50$ mm

BA070-34

Mould to prepare asphalt slabs $400 \times 305 \times 100$ mm

BA070-35

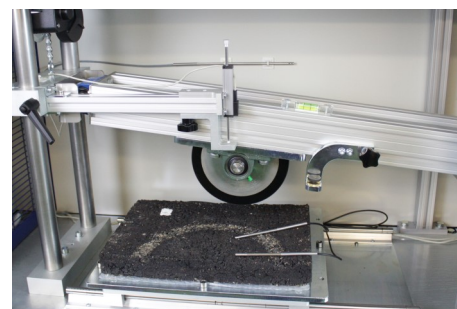
Mould to prepare asphalt slabs $400 \times 305 \times 120$ mm

BA070-43

Mould to prepare asphalt slabs $500 \times 400 \times 180$ mm

BA070-53

Mould to prepare asphalt slabs $\varnothing 200 \times 50$ mm



Test chamber inside: loading Wheel, slab, probes



BA070-34

BA070-43

BA070-13

BA075 MULTI WHEELS HAMBURG TRACKER

EN 12697-22 | AASHTO T-324

The Hamburg wheel tracking tester is used for determining the susceptibility of Hot Mix Asphalt to deformation under load by measuring the rut depth formed by repeated passes of a loaded wheel at a fixed temperature.

The AASHTO Hamburg type Standard states that the test must be performed in a water bath with a temperature range of 25 to 70° C±1°C, whilst the EN requires either an air or water environment. In both systems a water level of about 20 mm above the sample has to be maintained.

The machine has independent motors for each wheel which assure separate rutting analysis of each specimen. The user can perform wet or dry test with both wheels or run one wheel under dry and one wheel under wet condition simultaneously during a single test.

The wheel is moved 230 mm backwards and forwards on the top of the slab, which is fixed. The speed is adjustable via the PC from 20 to 30 cycles per minute (40 to 60 passes). The longest slab dimension is oriented to the wheel's direction of travel.

The user-friendly software is integrated into the on-board digital control unit based on Windows operating system. The software is fully customizable by the operator according to EN and AASHTO Standards, and the personal needs. Automatic calculation of stripping inflection point (AASHTO). Test execution and parameters such as water/air temperature, specimen temperature, rut depth can be monitored in real time.



BA075

Wheel load on the sample: 705 N
Temperature range: from ambient up to 75°C
Slab thickness: from 38 to 120 mm
Power supply: 220 V | 50-60 Hz
Dimensions: 1400x1300x1300 mm
Weight: 450 Kg

BA077 MULTI WHEELS HAMBURG TRACKER WATER TEST AASHTO T-324

Same as model BA075, but without cover. It allows water test only. The AASHTO standard for the Hamburg-type test establishes that the test must be carried out in water with a controlled temperature between 25 and 70 °C.

ACCESSORIES

EN 12697-22 AIR:

- BA075-11
- EN Rubber wheel 203x50 mm
- BA075-12
- EN mold 400x305x120 mm
- BA075-13
- Set of vertical adaptors for EN mold
- BA075-14
- Set of horizontal adaptors for EN mold
- BA075-15
- Air heating system EN



BA075-11



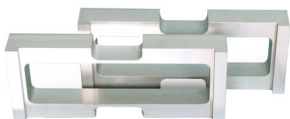
BA075-12

EN 12697-22 WATER:

- BA075-11
- EN Rubber wheel 203x50 mm
- BA075-12
- EN mold 400x305x120 mm
- BA075-13
- Set of vertical adaptors for EN mold
- BA075-14
- Set of horizontal adaptors for EN mold



BA075-13 + BA075-14



AASHTO T324 WATER:

- BA077-11
- AASHTO steel wheel 203x50 mm
- BA077-12
- AASHTO mold Ø150x60 mm
- BA077-13
- Adaptors for AASTHO mold
- BA077-14
- Stainless steel adaptors for AASHTO mold
- BA077-15
- Vertical adaptors for AASHTO mold



BA077-11



BA077-12

OPTIONAL ACCESORIES

- BA075-31
- Electrovalve group for hot water
- BA075-32
- Probe for specimens temperature determination
- BA075-33
- HPDE mould specimen holder
- BA075-34
- Kit for the calibration of the wheel load
- Composed of a support block with a calibrated 1000 N load cell with a digital readout.

BA081 GYRATORY COMPACTOR

EN 12697-10, EN 12697-31

This Gyratory Compactor is used to simulate and reproduce the real compaction conditions under actual road paving operations, hence determining the compaction properties of the asphalt. It is based on the motion of the bituminous sample which generates a conical surface of revolution, characterized by the gyratory angle. This motion produces shearing forces and, consequently, the sample compaction.

The Compactor comprises a highly rigid steel frame ensuring excellent angle control. Load is applied by a pneumatic cylinder, servo-controlled by a precision pressure regulator; the height is measured by a linear transducer. Gyratory motion is generated by an eccentric high precision system allowing an easy set up with precision and constant angle of gyration.

The machine is calibrated at factory with the internal angle set to 0,82° as requested by EN Specifications. The size of samples that the compactor accepts is a diameter of 100 or 150 mm and a height of up to 200 mm. Requires pressurized air of at least 7 bar.

The different operation modes that can be configured are:

- Compaction according to number of rotations;
- Compaction to selected sample height;
- Compaction to selected sample density;
- Final cycle of 0° angle to obtain a perpendicular face

Smart design for ease of use and operator safety with minimal manual exertion whilst handling hot and heavy asphalt-filled moulds. The touch-screen icon interface allows an easy set up of the parameters and an immediate automatic execution of the test, data acquisition and processing, graphics and file.

BA083 GYRATORY COMPACTOR

ASTM D6925 | AASHTO T312 | SHRP M-002

Factory calibrated gyratory compactor with the internal angle at 1,16° as established by ASTM and AASTHO



- Gyratory angle:** adjustable from 0 to 3°
- Number of cycles:** adjustable from 1 to 5000
- Gyration rate:** adjustable from 5 to 60 cycles/min
- Vertical load:**
 - Sample Ø150 mm:
 - from 10 to 1000 kPa (10 bar)
 - from 10 to 800 kPa (8 bar)
 - from 10 to 700 kPa (7 bar)
 - Sample Ø100 mm:
 - from 23 to 1500 kPa (7 bar)
- Power supply:** 230V 50-60Hz 1000W
- Dimensions:** 640x500x1050 mm
- Weight:** 240 Kg



BA080-11

ACCESSORIES	Ø100 mm	Ø150 mm
Hardened specimen cylinder with bottom plate	BA080-11	BA080-21
Hardened specimen cylinder with holes for cold mix compaction	BA080-12	BA080-22
Hollow mold to stabilize and to mature the simple	BA080-13	BA080-23
Top penetration piston	BA080-14	BA080-24
Discs to make easier the handling of specimens	BA080-15	BA080-25
Filter paper for moulds (Pack of 100 pieces)	BA080-16	BA080-26

ACCESORIES FOR GYRATORY COMPACTOR

BA080-01
Work top
Allows to attach the pneumatic sample extruder and a scale.

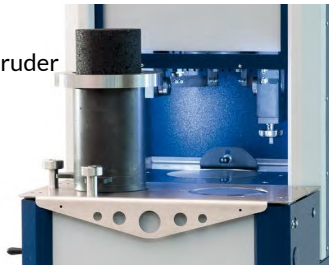
BA080-02
Pneumatic automatic specimen extruder

MG753
Air compressor, pressure 10 bar

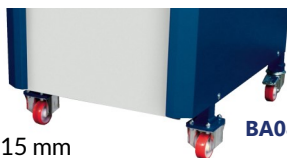
BA080-03
Filter group for condensed water removal from the compressed air (needed accessory)

BA080-04
Wheels (kit of 4) with brake for the compactor

BA080-05
Kit of 2 distance pieces of 105 and 115 mm high for the control of the height values measured by the linear transducer



BA080-01



BA080-04

BA080-06
Vertical force testing device with digital dynamometer

BA080-07
Vertical force testing device with load ring

BA080-08
Balance integrated 30 kg x 6 g to facilitate the sample and the mould weightings, by avoiding the stress of lifting them.

BA080-09
Bench for lateral bearing of a weighting balance.

BA080-10
Official vertical load calibration certificate

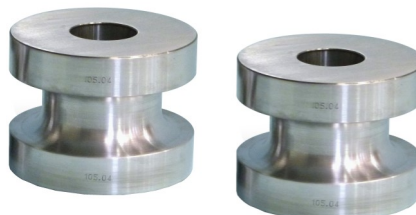
MG213-28
Electronic balance 30 Kg x 0,01 g as requires EN standard



BA080-06



BA080-07



BA080-05



BA080-03

BA089 INTERNAL ANGLE MEASUREMENT APPARATUS EN 12697-31 | ASTM D7115 | AASHTO T344

The device allows to perform top and bottom angle measurements as specified by the Standards; the average of the obtained values is then considered as the internal angle of the machine. In less than 30 minutes the operator may perform the calibration of the Gyratory Compactor.

Data are read by GAM and then downloaded (via RS232 cable) all together at the end of the measurements, with no need to connect the device to the PC after each measurement. Possibility to repeat even just one of the measurement, and lately include it in the calculation spreadsheet.

The device is supplied complete with:
-Ring to perform tests with M=240Nm
-Ring to perform tests with M=425Nm
-Upper and lower base plate
-RS232 cable
-Strong practical suitcase
-Calibration certificate

Dimensions: Ø150x115 mm
Accuracy: > 0,01°
Weight: 5,6 Kg



BA089



BA089-01



ACCESSORIES

BA089-01
Calibration squares according to EN angle of 0,82°
BA089-02
Calibration squares according to ASTM angle of 1,16°
BA089-03
Angle calibration certificate for both squares

BA091 AUTOMATED SAW

ASTM D7870

This apparatus is the next generation fully automated asphalt sawing system with integrated specimen clamping. The Automated Saw offers fast and accurate cutting of rectangular beams, trapezoidal prisms, overlay test specimens, semi-circular specimens, and trimming of cylindrical specimens.

It can be configured using one or two blades with a large range of jigs and fixtures. Capable of cutting prismatic specimens up to 240 mm high and a cutting length up to 700 mm and cylindrical specimens up to 200 mm diameter.

Various alignment blocks, guides and reference spacers allow operators to easily achieve the most commonly used dimensions specified in a range of international standards with little or no measurement. Any other dimensions can be accommodated with the aid of an integrated ruler.

The protective enclosure provides a high level of operator safety and protection from water spray. Safety interlocks prevent the operator from opening the enclosure and accessing hazardous areas while the blade is rotating. Once the cutting sequence has finished and the blade has stopped rotating, the enclosure is unlocked automatically.

Electronic control unit with touch screen colour display, that runs like a standard PC based on Windows operating system

ACCESSORIES

- BA091-01
Diamond blade Ø650 mm
- BA091-02
Diamond blade Ø700 mm
- BA091-05
Set of spacers for mounting diamond blade Ø650 mm
- BA091-06
Set of spacers for two blades configuration
- BA091-07
Spacer for one blades configuration
- BA091-09
Displacement transducer for the control of the blade position



BA091-01



BA091

The controller allows the operator to easily control the cutting speed and sequence and a series of adjustable limit switches minimizes the saw carriage travel during repetitive cutting.

It includes cooling water recirculation pump and tank.

- Power supply:** 400 V | 3 phase | 50-60 Hz
- Dimensions:** 2370x1340x1670 mm
- Blade Diameter:** 650 mm or 700 mm
- Max Cutting Depth:** 200 mm or 240 mm
- Weight:** 500 Kg

- BA091-10
Pneumatic circuit
If equipped with pneumatic cutting jigs, the unit requires compressed air, minimum 8 bar
- BA091-11
Manual jig for slabs and prims 40 - 240 depth x700 mm length
- BA091-12
Automatic jig for slabs and prims 40 - 240x700 mm
- BA091-13
Manual trapezoidal specimen jig for two point bend
It requires BA091-11 or BA091-12 jigs
- BA091-16
Manual core docking jig for Ø150-100-60-50-40-38 mm
- BA091-17
Automatic core docking jig for Ø150-100-60-50-40-38 mm
- BA091-20
Instrumentation for overlay test specimens
It requires BA091-11 or BA091-12 jigs

BA101 AUTOMATIC IMPACT MARSHALL COMPACTOR

ASTM D6926 | EN 12697-10 | EN 12697-30

This ruggedly constructed apparatus automatically compacts the sample and stops after a pre-set number of blows.

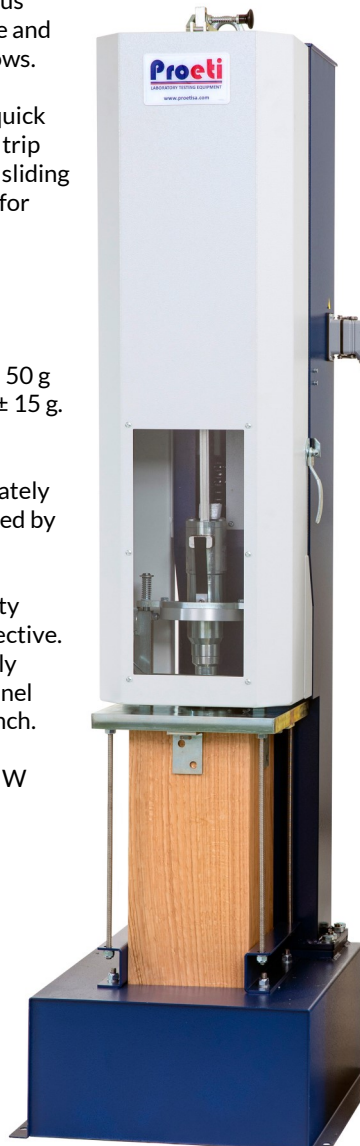
The mould is held in position by a quick and practical clamping device. The trip mechanism is arranged so that the sliding hammer falls at the same distance for every blow.

The compactor includes a vibrated concrete base where a laminate hardwood block is mounted, a the compaction hammer of 7850 ± 50 g and a sliding mass weight of 4535 ± 15 g.

The free fall height is 457 mm and the striking frequency is approximately 50 blows per 60 seconds, as required by international standards.

The machine is equipped with safety door, conforming to CE Safety Directive. When opened it stops automatically and cannot operate. The control panel can be wall fixed or placed on a bench.

Power supply: 230 V | 50 Hz | 300 W
Dimensions: 500x500x1890 mm
Weight: 220 Kg



BA101

ACCESSORY

BA101-01
Cabinet lined with sound-proofing
It is covered with a soundproof material for maximum noise reduction.

Dimensions: 800x800x2000 mm
Weight: 100 Kg



BA101-01

BA103 MANUAL MARSHALL COMPACTOR

ASTM D6926

This version of Marshall compactor is for compacting specimens by hand and consists of a wooden compaction pedestal, a support rod to hold the hammer in a perpendicular position, a compaction hammer and mould holder.

Dimensions:
1580x300x300 mm
Weight:
45 Kg



BA103

BA105 MARSHALL MOULD Ø4"

EN 12697-10 | EN 12697-30 | NF P98-251-2

Steel manufactured, plated against corrosion.

Consisting of:
-Mould Ø4" 1300 g
-Collar Ø4" 850 g
-Base Ø4" 1000 g

BA105



BA107 MARSHALL MOULD Ø6"

ASTM D5581-96

Consisting of:
-Mould Ø6"
-Collar Ø6"
-Base Ø6"



BA105

ACCESSORIES

BA105-01
Marshall filter paper (100 pieces)
BA105-02
Sample extractor piston

SU085 UNIVERSAL EXTRUDER

Hand operated, actuated by a hydraulic jack, it is designed to extrude samples having Ø4" and 6". It can therefore extrude Marshall, CBR, Standard and Modified Proctor specimens.

Dimensions: Ø300x500 mm
Weight: 32 Kg



SU085

SU255 VIBRATING HAMMER

EN 12697-9 | EN 12697-10 | EN 12697- 32 | EN 13266-4
BS 1377:4 | BS 1924:2

The hammer is used for compacting asphalt in the percentage refusal density test and for the compaction of Proctor and CBR soil specimens.

Power supply: 230 V | 50-60 Hz | 720 W
Dimensions: 105x430x270 mm
Weight: 6 Kg

ACCESSORIES

SU255-01
Supporting frame for vibrating hammer

Dimensions: 500x320x1100 mm
Weight: 75 Kg

SU255-02
Small head tamping foot Ø102 mm
SU255-03
Large head tamping foot Ø146 mm



BA109 PRD MOULD

EN 12697-9 | EN 12697-10 | EN 12697- 32 | EN 13266-4
BS 1377:4 | BS 1924:2

Used to determine the degree of compaction of asphalt for road pavement quality control testing, this device consists of a mould, split vertically on one side, together with a clamp-attached baseplate.

Both parts are plated for protection against corrosion.

Weight:
12 Kg



BA111 ASPHALT CORE DRILLING MACHINE

EN 12697-20, EN 13108-6

Designed for fast, accurate cutting of cores from cylinders, prisms and slabs prepared using asphalt compaction machines.

The machine includes:

- Three selectable drill speeds
- Clear protective/splash screen conforming to CE standards
- Adjustable specimen clamp eliminates specimen movement
- Water container

Drill Bit Diamond/tungsten alloy, laser welded.
Core diameter 100 mm or 150 mm.
Core height up to 40 cm.
Specimen sizes:
-Cylindrical: Ø160 x 70...400 mm
-Prismatic: 200...450 x 150...185 x 120...420 mm
-Prismatic: 315...340 x 220...260 x 120...420 mm

Power supply: 230 V | 50-60 Hz
Dimensions: 600x800x1400 mm
Weight: 85 Kg



ACCESSORIES	Ø25 mm	Ø38 mm	Ø42 mm	Ø50 mm	Ø55 mm	Ø75 mm	Ø100 mm	Ø150 mm
Core Drilling	BA111-01	BA111-02	BA111-03	BA111-04	BA111-05	BA111-06	BA111-07	BA111-08
Core extractor	-	-	-	BA111-14	-	BA111-16	BA111-17	BA111-18
Clamping for cylindrical	BA111-21							
DCT jig	BA111-23							
Transversal jig	BA111-25							

BA115 INDENTATION PENETROMETER

EN 12697-20 | EN 13108-6

The Asphalt indentation penetrometer is one of the most important machines for testing mastic and rolled asphalt and is included in the test methods described by EN 13108-6 for CE marking of mastic asphalt. The test is used for determining the depth of indentation of mastic and rolled asphalt and can be performed both on 70 mm cubes and Marshall samples.

Comprising:

- Rugged frame where a screw penetration load device is fixed
- Two interchangeable pistons having 1 and 5 cm² surface
- Two metallic discs 5.1 kg on the load device
- Stainless steel water bath with water discharge cock.

Dimensions: 530x600x820 mm

Weight: 160 Kg

ACCESSORIES

BA115-01

Cube mould 70,7 mm

BA115-02

Penetration test mould 69 mm

BA115-03

Base to fix the Marshall specimen into the Penetrometer

BA115-04

Calibration device for the Indentation Penetrometer

BA115-05

Digital heating thermostat

To heat water to 22° or 40° as required by standards

Power supply: 230V | 50Hz | 1500W

Weight: 3 Kg

MG041

Separate control panel in according to CE safety directive



BA115

BA115-03

BA115-01



BA115-02



BA115-04



BA117

DIGITAL MARSHALL WATER BATH

EN 12697-34 | ASTM D6927 | AASHTO T245

Used to maintain in water Marshall specimens at constant temperature of 60°C ± 1°C and asphalt specimens at 37,8 °C ± 1°C. The internal tank and cover are stainless steel made, outside box is of painted steel sheet with wool insulation. The bath can hold up to 20 Marshall specimens. It is supplied with digital heating thermostat.

Capacity: 46 litres

Temperature range: from ambient to 95°C

Inside dimensions: 615x505x150 mm

Dimensions: 660x540x230 mm

Weight: 18 Kg



BA117

BA119

ANALOGIC MARSHALL WATER BATH

EN 12697-34 | ASTM D6927 | AASHTO T245

Same as the Marshall BA117 but supplied with analogic heating thermostat

ACCESSORY

MG041

Separate control panel in according to CE safety directive



MG041

BA121 DIGITAL MARSHALL LOAD FRAME

EN 12697-34, 12697-23, 12697-12 | BS 598:107 |
ASTM D6927, D5581, D1559 | AASHTO T245 | NF P98-251-2

The Marshall frame are bench-mounted, with a motor and worm gear housed within the base unit. Easy to use, it is designed to operate with the minimum of maintenance.

Platen rate is 50,8 mm/min also maintained under load through to an overpowered electric motor.

The load is measured by an 50 kN cell with high precision strain transducers; the flow is measured by an electronic displacement transducer 50 mm stroke $\pm 0,1\%$ linearity.

A digital display unit with microprocessor measures and displays at the same time the stability in kN and the flow in mm with peak hold features, with the possibility to transfer them to a PC and a printer through a RS232 port.

Supplied with a stability mould.

Power supply: 230 V | 50 Hz | 900 W
Dimensions: 650x400x1100 mm
Weight: 120 Kg



BA121

BA123 ANALOGIC MARSHALL LOAD FRAME

ASTM D6927 | ASTM D5581 | ASTM D1559
AASHTO T245 | BS 598:107 | NF P98-251-2

The testing frame is the same as for model BA121, but the load is measured by a 30 kN proving ring incorporating a stem brake holding the maximum reading and it is supplied with relevant calibration certificate.

The machine includes an electric device for automatic stop when reaching the max capacity load of the proving ring, in order to prevent any overload damage, limit switches stop the platen at max and min excursions.

The unit is supplied with a 30 kN load ring, stability mould, flow meter with dial gauge.

Power supply: 230 V | 50 Hz | 900 W
Dimensions: 650x400x1100 mm
Weight: 120 Kg



BA123

ACCESSORIES

MARSHALL TEST

BA120-02
Marshall mould Ø 4" steel made ASTM D6927

BA120-03
Marshall mould Ø 6" steel made ASTM D5581

MG030-31
Software for Marshall tests
EN 12697-34 | BS 598:107 | NF P98-251-2
ASTM D6927, D5581, D1559

INDIRECT TENSILE TEST

BA120-11
Splitting tensile device
EN 12697-23 | ASTM D6931 | AASHTO T283
Steel manufactured and plated against corrosion.
Dimensions: Ø248x270 mm
Weight: 14 Kg

For digital frame BA121:
BA120-12
Two 10 mm transducers
Complete with supports and accessories for strain measurements
CNR N.134

BA120-13
Additional 50 mm transducer for a double measurement of the vertical displacement of the specimen during the tensile splitting test.
MG030-33
Software for indirect tensile strength

For analogic frame BA123:
BA120-14
Set of two dial gauges 10x0,01 mm with adjustable supports for strain measurements
CNR N.134

BA120-15
Lottman Tensile Splitting device
AASHTO T283
For Ø4" y 6".
Alternative to BA120-11.

LEUTNER TEST

BA120-21
Leutner direct shear head
ALP A StB T.80
Direct shear test Leutner on the connection between bituminous strata in Ø150 mm samples
BA120-22
Spacers for Ø100 mm specimens with Leutner head
MG030-36
Software for Leutner tests



BA120-02



BA120-11



BA120-11



BA120-15



BA120-21+BA120-22

SU325

DIGITAL CBR-MARSHALL FRAME

The frame is provided of three fixed speed ranges, easily selectable with a frequency changer (inverter) activated by an electric switch:

- CBR 1,00 mm/min
- CBR 1,27 mm/min
- Marshall 50,8 mm/min

The load is measured by an electric load cell 50 kN with high precision strain Transducers, holder for transducer; the flow is measured by an electronic displacement transducer 50 mm stroke and $\pm 0,1\%$ linearity.

Supplied with a digital display unit with microprocessor, load cell and displacement transducer, but without accessories to be ordered separately.

Power supply:

230 V | 50-60 Hz | 750 W

Dimensions:

450x400x1200 mm

Weight:

130 Kg



BA120-01

SU325

SU327

ANALOGIC CBR-MARSHALL FRAME

The testing frame is the same as for mod SU325, but the load is measured by a precision proving ring.

Supplied without load ring and accessories which have to be ordered separately.

Power supply:

230 V | 50-60 Hz | 750 W

Dimensions:

450x400x1200 mm

Weight:

130 Kg



MG061-10S

SU350-01

BA120-04

SU327

ACCESSORIES

MARSHALL TEST

SU350-01

Load piston

BA120-01

Marshall mould \varnothing 4", aluminium made

BA120-02

Marshall mould \varnothing 4", steel made

BA120-03

Marshall mould \varnothing 6", steel made



BA120-01

For digital frame SU325:

MG030-31

Software for Marshall tests

For analogic frame SU327:

MG061-10S

30 kN Load ring

BA120-04

Flowmeter

BA120-05

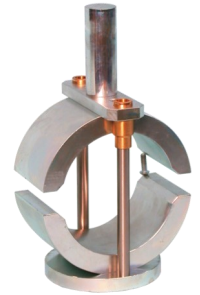
Dila gauge for Flowmeter

MG060-10

Brake device to hold max. load

MG010-82

Device to fix the displacement dial



BA120-03

INDIRECT TENSILE TEST

BA120-13

SU350-01

Load piston

BA120-11

Splitting tensile device

BA120-12

For digital frame SU325:

BA120-12

Two 10 mm transducers

BA120-13

Additional 50 mm transducer

MG030-33

Software for indirect tensile strength



BA120-11

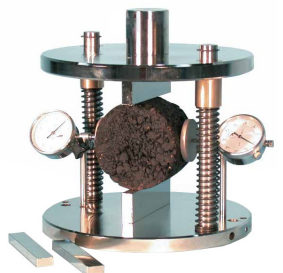
For analogic frame SU327:

MG061-10S

30 kN Load ring

BA120-14

Set of two dial gauges 10x0,01 mm



BA120-11 + BA120-14

LEUTNER TEST

SU350-01

Load piston

BA120-21

Leutner direct shear head

BA120-22

Spacers for \varnothing 100 mm specimens

MG030-36

Software for Leutner test



SU350-01

BA120-21 + BA120-22

SU351 DIGITAL MULTIPURPOSE TESTER 50 KN

This frame represents the ideal solution for major laboratories performing tests requiring displacement control. The multipurpose tester features a rigid two-column structure with an upper cross beam which can be set at various heights and an automatic load or displacement/deformation control, for testing:

The versatility of the machine allows to carry out the tests:

ASPHALT:

Marshall
Splitting tensile
Direct shear Leutner

SOIL:

CBR (California Bearing Ratio)
Unconfined compression

Quick triaxial

CONCRETE:

Flexural on beams and tiles

CEMENT:

Flexural test on mortar prisms 40x40x160 mm
Compression test on mortar prisms 40x40x160 mm

CLAY BLOCKS:

Punching

ROCKS AND STONES:

Uniaxial splitting tensile

The load is applied by a mechanical jack that is driven by a motor brushless with closed loop through optic encoder and controlled by a microprocessor. Limit switches are installed at the end of the stroke to prevent accidental damage.

The electronic control unit with touch-screen colour display, runs like a standard PC based on Windows. The machine has unlimited memory storage with: 2 USB ports, 1 SD card slot.

Supplied without accessories and software to perform the specific tests which must be ordered separately.

ACCESSORIES MULTIPURPOSE 50 KN FOR ASPHALTS:

MARSHALL TEST

EN 12697-34 | ASTM D1559, D5581, D6927
AASHTO T245 | BS 598 :107 | NF P98-251-2

MG020-06
Load cell 50 kN
SU350-01
Loading piston
BA120-01
Marshall mould Ø 4" aluminium made
MG030-31
Software for Marshall test

LEUTNER TEST

ALP A StB T4

MG020-06
Load cell 50 kN
SU350-01
Loading piston
BA120-21
Leutner direct shear head
BA120-22
Spacers for Ø100 mm specimens
MG030-36
Software for Leutner test



Power supply: 230 V | 50-60 Hz | 150 W
Adjustable testing speed: from 0,01 to 51 mm/min
Load gradient: from 1 to 15000 N/seg
Max. ram travel: 100 mm
Daylight between columns: 380 mm
Max. vertical daylight: 850 mm
Dimensions: 500x450x1450 mm
Weight: 130 Kg

INDIRECT TENSILE TEST

EN 12697-12 | EN 12697-23 | ASTM D6931
AASHTO T283 | CNR 134

MG020-06
Load cell 50 kN
SU350-01
Loading piston
BA120-11
Splitting tensile device
BA120-12
Two 10mm transducers
BA120-13
Additional transducer 50 mm
MG030-33
Software for indirect tensile strength



BA120-01



BA120-21 + BA120-22



BA120-11

BA120-13

BA120-12

SU355 DIGITAL MULTIPURPOSE TESTER 200 KN

By using suitable devices, our multipurpose tester performs compression, flexural, splitting tensile and direct tensile tests with automatic load or displacement/deformation control, up to 200 kN for compression/flexural and 50 kN for tensile tests.

The versatility of the machine allows to carry out the tests:

ASPHALT:

Marshall
Splitting tensile
Direct shear Leutner
Duriez

CEMENT:

Flexural test on mortar prisms 40x40x160 mm
Compression test on mortar prisms 40x40x160 mm
Tensile on mortar briquettes

CONCRETE:

Flexural on beams and tiles

CLAY BLOCKS:

Punching

SOIL:

CBR (California Bearing Ratio)
Unconfined compression
Quick triaxial

ROCKS AND STONES:

Uniaxial splitting tensile

METAL, PLASTIC, WIRES, ROPES, TEXTILES, PAPERS,...

Tensile test 50 kN max capacity load

The machine consists essentially of a robust two-column frame with an upper crosshead which can be adjusted in height and a lower mobile crosshead moved by an electromechanical system with a single recirculating ball screw powered by a brushless servomotor which assures smooth application of load at constant speed.

The load is applied by a mechanical jack that is driven by a brushless motor with closed loop through optic encoder and controlled by a microprocessor. Limit switches are installed at the end of the stroke to prevent accidental damage.

The electronic control unit with touch-screen colour display, runs like a standard PC based on Windows. The machine has unlimited memory storage with: 2 USB ports, 1 SD card slot.



SU355

Supplied with an electric load cell 200 kN and lower compression platens. Accessories and software for specific tests are not included which must be ordered separately.

Power supply: 230 V | 50-60 Hz | 850 W
Maximum vertical distance: 900 mm
Daylight between columns: 650 mm
Adjustable testing speed: from 0,01 to 100 mm/min
Load gradient: from 1 N/s to 5 kN/s
Dimensions: 950x560x2400 mm
Weight: 820 Kg

ACCESORIES MULTIPURPOSE 200 KN FOR ASPHALTS:

DURIEZ TEST

NF P98 - 251-1 | NF P98 - 251-4

ACCESORIES	Ø80 mm	Ø120 mm
Duriez testing mould	BA120-41	BA120-51
Penetration piston	BA120-42	BA120-52
Upper/Lower piston	BA120-43	BA120-53
Two temporary supports	BA120-44	BA120-54
Demoulding cylindrical container	BA120-45	BA120-55
For cold mixtures with bituminous emulsions:		
Penetration piston grooved	BA120-46	BA120-56
Upper/Lower piston grooved	BA120-47	BA120-57
Software for Duriez test	MG030-37	

MARSHALL TEST

EN 12697-34 | ASTM D1559, D5581, D6927
AASHTO T245 | BS 598 :107 | NF P98-251-2

MG020-06
Load cell 50 kN
MG020-16
Connector for 50 kN load cell
SU350-01
Loading piston
BA120-01
Marshall mould Ø 4"
MG030-31
Software for Marshall test



BA120-01



BA120-41...BA120-44

AR169

ACCELERATED POLISHING MACHINE

EN 1097-8, 1341, 1342, 1343 | BS 812:114
NF P18-575 | CNR N.105

This machine is used to measure the resistance of road stone to the polishing action of vehicle tyres on a road surface, simulating actual road conditions.

The specimens are manufactured with suitable moulds and located on the Road Wheel. The wheel is now rotated and enters in contact with solid rubber tyre, spring loaded.

Abrasive charges are continuously introduced by two automatic mechanical feeders (hoppers). The feeders are held by a suitable support disjoined from the machine body; this solution safeguards feeding calibration and reliability/life of the hoppers from the influence of test execution vibrations. The water is supplied at a controlled rate through a water container equipped with flow regulator.

During the test execution the display shows the remaining time and the speed rotation of the wheel holding the specimens.

Supplied with 2 rubber wheels (one for corn and one for flour emery), set of 4 specimen moulds and 2 mould covers, while control stone, corn and flour emery have to be ordered separately.

Power supply: 230 V | 50 Hz | 750 W
Samples: 14
Wheel speed rotation: 310-330 r.p.m.
Dimensions: 1800x820x600 mm
Weight: 175 Kg



ACCESSORIES

- AR169-01 Corn Emery (25 Kg pack)
- AR169-02 Flour Emery (5 Kg pack)
- AR169-03 Flour Emery "Original" (5 Kg pack)
- AR169-04 Friction Criggon Stone ungraded (25 Kg bag)
- AR169-05 Control stones ungraded (20 Kg bag)

AR171

SKID RESISTANCE TESTER

EN 1097-8, 1338, 1341, 1342, 13036-4, 1436 | BS 7976

Used for the measurement of surface friction properties, this apparatus is suitable for both site and laboratory applications. It can be used for determining the Polished Stone Value (PSV) using curved specimens obtained from accelerated polishing tests performed by the Accelerated polishing machine (conforming to EN 1097-8), and also for testing Paving Stones (EN 1341, EN 1342) and Paving Blocks (EN 1338).

During operation the pendulum is raised and then released to swing freely, allowing the edge of the rubber slider to skid across the surface of the road or sample.

The skid tester is supplied with:

- Additional incorporated scale for tests on PSV specimens
- Rule made of plexiglass, for sliding length verification
- Thermometer -10 to +110°C for surface temperature
- Stool wash bottle, bristle and tool set for machine use
- Carrying case

The tester is supplied without rubber sliders that have to be ordered separately.

Case dimensions: 730x730x330 mm

Weight: 32 Kg



AR171

ACCESSORIES

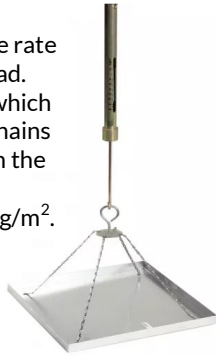
- AR170-01 Mounted rubber slider 32 mm width
- AR170-02 Mounted rubber slider 76 mm width
- AR170-03 Mounted rubber slider, 4S rubber, 76 mm width
- EN 13036-4 | BS 7976 Recommended for ceramics, marbles, paving tiles,...
- AR170-04 Metal base plate for PSV tests in laboratory
- AR170-05 Clamping device for Polished Stone Value tests in laboratory
- AR170-06 Clamping device for tests on natural stones (EN 1341, 1342); for concrete block pavers (EN 1338) and skidding tests on wooden floor (EN 1339)
- AR170-07 Pink lapping film (10 sheets) for Skid Calibration

BA151 RATE OF SPREAD APPARATUS

EN 12272-1 | BS 598:108

This simple apparatus is for determining the rate of spread of binder on the surface of the road. It consists of a 300 mm square metal tray, which can be lifted by means of four chains. The chains are attached to a digital balance from which the rate of spread can be assessed. The rate of spread is directly measured in kg/m².

Weight: 1500 g



BA151

BA153 RADIAL FLOW FALLING HEAD PERMEAMETER

EN 12697-40

Used to determine the time taken for 4 liters of water to dissipate through an annular area of the surfacing of a pavement under known conditions.

Consisting of an acrylic tube Ø125x560 mm marked at 1 liter and at 5 liters, an internal rod with rubber ball valve mounted on a wooden base with sealing gasket.

Dimensions:
800x450x680 mm
Weight:
8 Kg



BA153

BA161 TRAVELLING BEAM WITH RECORDING UNIT

EN 12846 | EN 13357 | NF T66-005 | IP 484

This apparatus is used for detecting road surface irregularities. It can be used for either concrete or asphalt pavements. The apparatus consists essentially of a beam with rigid wheels at the extremities, with a wheel in the middle that can detect any vertical deviation of the surface from the straight-line between the two wheels at the ends of the apparatus. It is supplied with a recording unit to obtain a graph of vertical deviations.

Dimensions: 790x3200x1080 mm
Weight: 55 Kg



BA161

BA155 PERMEAMETER LCS

NLT 327

This apparatus is for measuring the time water takes to percolate through draining pavements and comprises a graduated transparent cylinder, a metal support, a rubber gasket and a 20 kg counterweight with handles.

Dimensions: 200x200x700 mm
Weight: 25 Kg



BA155

BA159 VIALIT PLATE

EN 12272-3

Used to assess the adhesion property of aggregates to bitumen. The test is performed to check how well aggregates applied to the surface of wearing course rolled asphalt will adhere.

The apparatus consists of a metal base with three vertical pointed rods to hold the test plate, a 50 cm high vertical rod with a chute at the upper end for the steel ball to drop from, a 512 g steel ball, a supply of 6 metal test plates, and a hand-operated rubber-lined roller with lead shot ballast.

Weight: 40 Kg



BA159

BA163 MOT STRAIGHTEGE

EN 13036-7

Manufactured from anodized aluminium alloy, it is utilized to measure irregularities of road pavement, floors, concrete pavement.

Supplied with two graduated wedges.

Length: 3000 mm
Width: 26 mm
Height: adjustable from 0 to 30 mm
Dimensions: 150x3050x130 mm
Weight: 9 Kg



BA163

BA165 BENKELMAN BEAM APPARATUS

ASTM D4965-03 | CNR N° 141

This apparatus is used to measure the deflection of flexible pavements under the action of moving wheel loads. Alluminium alloy made, complete with dial indicator and accessories.

During operation the beam is placed between the tyres of the test vehicle and in contact with the pavement. The deflection is measured as the vehicle passes over the test area.

Beam fulcrum ratio 4:1
Supplied with wooden carrying case.

Length of the beam: 2500 mm
Dimensions: 430x1800x350 mm
Weight: 16 Kg

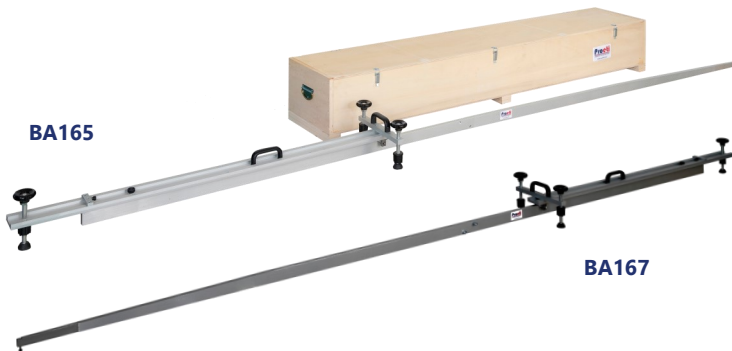
BA167 BENKELMAN BEAM APPARATUS

NF P98-200-2

Same as the BA165 beam but the measurement ratio is 2:1, according to the NF standard.

ACCESSORY

BA165-01
Calibration device for Benkelman beam

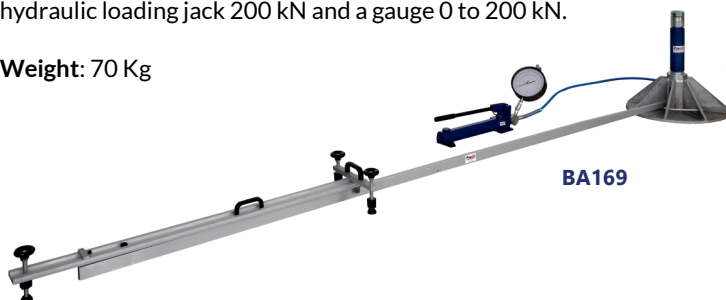


BA169 PLATE BEARING TEST 200 KN

NF P94-117-1

To determine the static deformation of flexible road pavement in the centre of the loading plate. It consists of a Benkelman NF beam, a Ø600 mm bearing plate cast aluminium with reinforcing ribs, upper spherical seat, hydraulic loading jack 200 kN and a gauge 0 to 200 kN.

Weight: 70 Kg



BA157 SAND PATCH

EN 13036-1 | ASTM E965 | NFP98 216-1

The sand patch test is performed by spreading a measured volume of fine sand (ASTM) or glass spheres (EN) into a circular patch on the road surface and filling the surface depressions to the level of the peaks.

The equipment comprises:

- Spreader disc with handle and rubber coated surface
- Wind shield
- Screw-adjusted compass 500 mm graduated rule.
- Three graduated cylinders 10, 25 and 50 ml cap
- Soft brush
- Two glass pyknometers with metallic screw top and hole
- Metallic cylinder for spheres volumen measurement
- Knee-guard
- Carrying case

Weight: 4 Kg



BA157

ACCESSORIES

- BA157-01
Glass spheres, size 180/212 microns EN (5 Kg)
- BA157-02
Natural sand 300/150 microns ASTM (25 Kg)
- BA157-03
Natural sand 150/75 microns ASTM (25 Kg)

BA171 WET TRACK ABRASION TESTER

ISSA TB 100 | ASTM D3910

Designed to determine the abrasion resistance of bituminous slurries, simulating abrasion conditions on wet pavements.

It consists of a 4,7 L mixing bucket, mixing paddle, anchoring devices, quick-change abrasion head, mold (1/4"), asphalt cloth, accessories and connections.

Power supply: 230 V | 50 Hz
Dimensions: 600x600x600 mm
Weight: 65 Kg



BA171

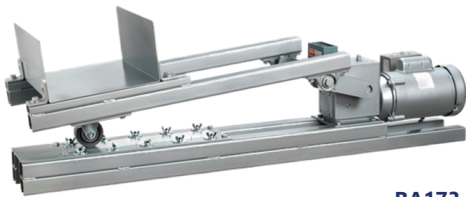
BA173 LOADED WHEEL TESTER

ISSA TB 109 y 147

It is used for the establishment of upper limits of asphalt content and multilayer rutting potential in muds and microsurfaces. Rutting is a permanent deformation of the asphalt mixture in the traffic footprint of vehicles. The accumulation of deformations causes a lack of safety and comfort for users who travel on the pavement and is one of the types of failure that occur in asphalt pavements when they are exposed to high temperatures, heavy traffic and low load speeds.

The equipment consists of a simple reciprocating wheel designed for traffic counting, excess bitumen measurement and groove power, sand holder, 20 mounting plates, lid, 24 gauge and 3,2-4,8-6,4-8,0-9,5-12,7 mm moulds

Dimensions:
406x432x1423 mm
Weight:
110 Kg



BA173

BA181 GRIPTESTER

The GripTester is highly reliable instrument for investigating accident sites, problem areas, and for predicting the safety of pavement surfaces.

Measurement of surface friction and contaminated runways is at the forefront of airport safety. The flexible, accurate and economical way to measure your whole road network for skid resistance.

Its light weight, robust construction and reliable performance make it the most deployable runway friction tester in the world. It is designed to be used in all seasons and has the ability to function in extreme weather conditions. The GripTester's light tow bar pull and low center of gravity ensure safe, stable operation on winter and summer surfaces.

The GripTester is easy to use. An onboard computer handles daily calibrations internally and the unit can be towed by almost any vehicle and can use almost any laptop as a data collection computer. These features allow one person to quickly and comfortably prepare the GripTester, carry out a survey and create a runway/pavement friction report.

Dimensions: 1010x1090x510 mm
Weight: 85 Kg



BA181

BA175 COHESION TESTER

EN 12274-4 | ASTM D3910

This pneumatically operated tester is for determining the proper consistency (mix design) for a slurry seal mixture. It consists of a double-acting, double-ended pneumatic cylinder fitted in a frame which houses a pressure gauge and valves. A hand torque wrench is also supplied.

Dimensions:
400x250x300 mm
Weight:
20 Kg



BA175

ACCESSORIES

- BA175-01
Mould with 4 truncated conical holes 140x140x6,3 mm
- BA175-02
Mould with 4 truncated conical holes 140x140x10 mm
- BA175-03
Mould with 4 truncated conical holes 140x140x13 mm
- BA175-04
Mould with 4 truncated conical holes 140x140x19 mm

BA185 GRIPTESTER MICRO

The Micro GripTester's compact, lightweight design allows it to be used as a one man operation. It can measure the skid resistance of any paved area or paint markings at a walking pace. No user calibration is required and it is not affected by bends, cambers or inclines and any horizontal slope is measured and reported so as not to skew the results. These features allow for ease of use and ensure accurate and consistent measurements regardless of user or condition.

The Micro GripTester's touch screen display guides the user through the friction test procedures and allows operators to save their results directly onto the inbuilt hard drive or onto a removable hard drive. The Micro GripTester utilizes integrated GPS to allow all surveys to be overlaid on a map providing a graphical Grip Number display.

Dimensions:
510x960x1020 mm
Weight:
23 Kg



BA185

BA201 BACON SAMPLER

EN 58 | ASTM D140 | AASHTO T40 | CRR 81 | CNR 98

Used to obtain bitumen or oil samples from various depths within storage containers.
Made from brass.

Dimensions:
Ø80x250 mm
Weight:
2 Kg



BA201

BA205 BREAKING POINT-FRAAS

EN 12593

The apparatus is for determining the Fraas breaking point of solid and semi-solid bitumen.

Including:
-Flexure device
-Two concentric sliding resin tubes
-Jaws for the test specimen
-Flexure system with handle
-Cooling device with three containers
-Plate in special harmonic steel
-Thermometer IP 42C

Weight: 4 Kg



BA205

BA209 AIR BATH

Used for softening bitumen before performing a range of tests including ductility, flash point, penetration, loss on heating.
Inner vessel, stainless steel made.
Supplied with thermoregulator and pilot lamp.

Capacity: 600 g
Power supply: 230 V | 50-60 Hz | 500 W
Dimensions: 140x140x350 mm
Weight: 5 Kg



BA209

BA211 STANDARD DIAL PENETROMETER

EN 1426 | ASTM D5 | BS 1377-2 | NF T66-004 | AASHTO T49

Used to determine the consistency of a bituminous sample under fixed conditions of load, time and temperature.
The penetration is expressed in distance of tenths of millimeters vertically penetrated by a standard needle.

Consisting of:
-Aluminium base with levelling screws and spirit level
-Chromed vertical rod with micrometric displacement device
-Dial gauge Ø150 mm, graduated in 360°, division 0,1 mm
-Slider, brass made, with free fall
-Stop and release push button
-Automatic zero set
-Penetration needle
-Set of weights 50 and 100 g
-Brass cup Ø55x35 mm
-Brass cup Ø70x45 mm

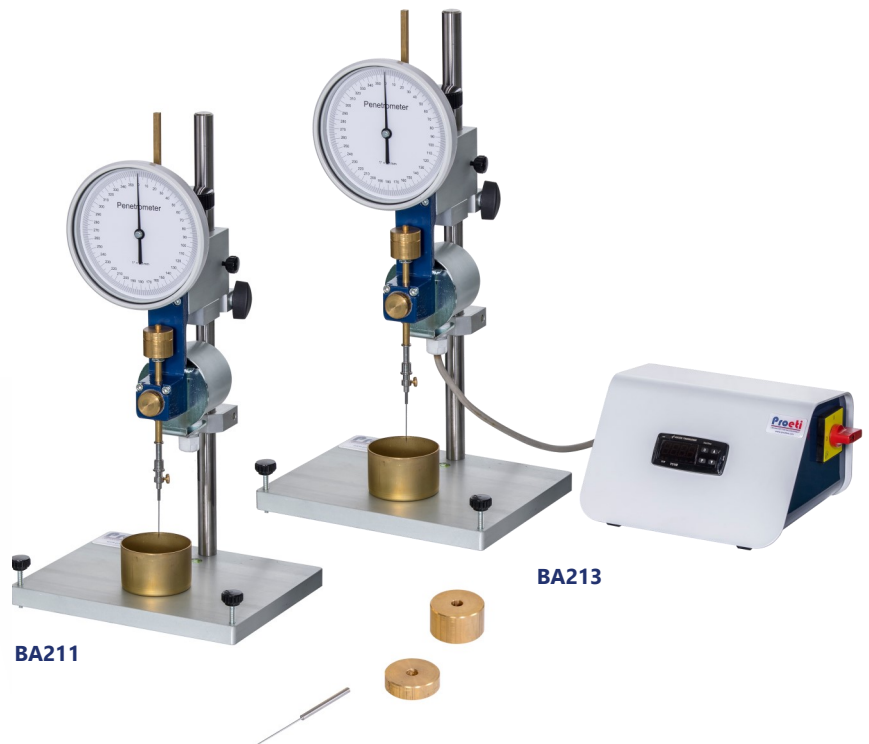
Dimensions: 220x170x410 mm
Weight: 11 Kg

BA213 SEMI-AUTOMATIC DIAL PENETROMETER

EN 1426 | ASTM D5 | BS 1377-2 | NF T66-004 | AASHTO T49

Same as BA211 but equipped with a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensures free falling of the needle during the 5-seconds test.

Power supply: 230 V | 50-60 Hz | 200 W
Dimensions: 220x280x410 mm
Weight: 15 Kg



BA211

BA213

BA215

STANDARD DIGITAL PENETROMETER

EN 1426 | ASTM D5 | BS 1377-2 | NF T66-004 | AASHTO T49

Same as BA211 but with digital readout of the penetration values which has readings in mm and inch, with 0,01 mm resolution, LCD 5 digits display, with zero set in any position.

BA217

SEMI-AUTOMATIC DIGITAL PENETROMETER

EN 1426 | ASTM D5 | BS 1377-2 | NF T66-004 | AASHTO T49

Same as BA215 but equipped with a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensures free falling of the needle during the 5-seconds test.



ACCESORIES FOR PENETROMETERS BA211...BA217:

BA210-02

Hardened steel needle 42,5 mm with UKAS verification

BA210-03

Hardened steel needle 42,5 mm with EN1426 verification

BA210-04

Long penetration needle not hardened 52,5 mm
For penetrations to exceed 35 mm

BA210-05

Long penetration needle hardened 52,5 mm EN1426
For penetrations to exceed 35 mm

BA210-06

Standard penetration cone Ø65 mm
EN 13880-2 | ASTM D217 | IP 179 | ISO 2137 | DIN 51804
Brass body and steel point made for measuring the consistency of lubricating grease
Weight: 102,5 g

BA210-06



BA210-07

Penetration ball
EN13880-3
Test method for the determination of penetration and recovery (resilience).



BA210-07

BA210-10

Mirror for an easier setting of the needle.

BA210-11

Transfer dish, made of glass with support

BA210-08

Sample cup aluminium made Ø55x40 mm
BS 1377-2



BA210-08

MG260-09

Termometer ASTM 17C Range: 19° a + 27°C

MG260-27

Termometer IP 38C, Range: 23°C to +26°C

BA210-20

Thermostatically water bath for penetrometer
It is used to maintain water at the required temperature of 25 ± 0,1°C. The bituminous sample is immersed in the water bath and placed on the penetrometer only at the time of testing, by eventually using the transfer dish.

Capacity: 10 L

Power supply: 230 V | 50-60 Hz | 350 W

Dimensions: 375x335x420 mm

Weight: 12 Kg

BA210-21

Water bath dish with thermostatic coil
It is connected to the BA210-21 bath to maintain the temperature of the sample in the penetrometer.

Dimensions: Ø151x90 mm



BA210-20

BA210-21

BA213

BA221 AUTOMATIC SOFTENING POINT APPARATUS

EN 1427 | ASTM D36 | AASHTO T53 | NF T66-008
BS 2000 | DIN 52011 | UNE 7111 | CNR N.35

This microprocessor controlled automatic tester is used to determine the softening point of bitumen using water or glycerol as heating fluid.

The softening point is taken by two suitably positioned light barriers and the temperature is measured by a probe sensor placed in a central position.

The temperature gradient is strictly maintained throughout the test by the electronic system which conforms with the Standards.

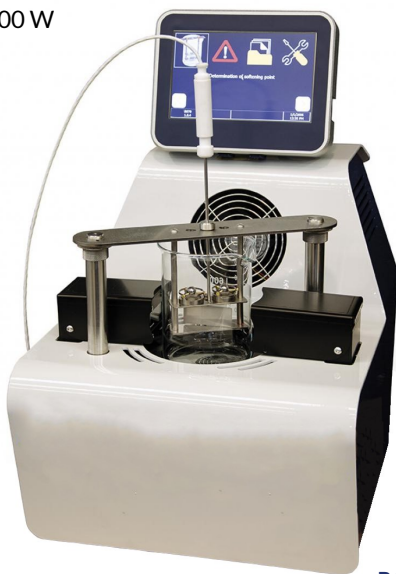
Two operation modes can be selected:

- On boiled distilled water for softening point from 30 to 80°C
- On glycerol for softening point from 80 up to 150°C

Real time display of the Temperature (°C)-Time(sec) graph along the entire test.

Top quality components: laser sensors, electronic magnetic stirrer, ceramic-glass heating plate.

Power supply:
230 V | 50-60 Hz | 700 W
Weight:
20 Kg



BA221

ACCESSORY

BA221-01
Spherical rods for calibration (two pieces)

BA225 CLEVELAND FLASH TESTER

EN 2592 | ISO 2592 | ASTM D92 | AASHTO T48 | IP36

Used to measure the flash and fire points of lubricated oils and petroleum products. Supplied with brass cup, electric heater with thermoregulator, flame gas device, double line fuse and IP 28C thermometer -6 +400°C (ASTM 11C).

Power supply: 230 V | 50-60 Hz | 600 W
Dimensions: 220x285x265 mm
Weight: 10 Kg



BA225

BA223 RING AND BALL APPARATUS

EN 1427 | ASTM D36 | AASHTO T53 | NF T66-008
BS 2000 | DIN 52011 | UNE 7111

This set of equipment is used for determining the softening point of bituminous materials.

The unit consists of:

- Pyrex beaker
- Brass frame
- Two balls
- Two tapered rings
- Two ball centering guides

Weight: 1000 g



BA223-01



BA223

ACCESSORIES

MG260-07
Thermometer ASTM 15 C -2 a +80°C, div 0,2°C
MG260-08
Thermometer ASTM 16 C +30 a +200°C, div 0,5°C

BA223-01
Pouring plate 50x75 mm
Used to pour the bituminous mixture into the brass tapered ring, as required by EN 1427
Dimensions: 75x50x10 mm

BA223-05
Hot plate with magnetic stirrer

Power supply: 220 V | 50-60 Hz | 500 W
Dimensions: 180x220x125 mm
Weight: 3 Kg



BA223

BA227 TAG OPEN CUP FLASH

ASTM D1310 | ASTM D3143

For the determination of open cup flash points of volatile flammable materials having flash points between 0 and 175°F

Supplied with cup, water bath, thermoregulated electronic heating device, thermometers ASTM 9C -5 to +110°C and ASTM 57C -20 to +50°C.

The tester is equipped of a gas flame feeder.

Power supply:

230 V | 50-60 Hz | 700 W

Dimensions:

200x300x400 mm

Weight:

10 Kg



BA227

BA229 TAG CLOSED CUP FLASH

ASTM D56 | API 509

Used for testing volatile flammable flashing between 0 and 175°F (except fuel oils).

Supplied with cup, water bath, lid, slide, thermometer ASTM 9C range -5 to +110°C, thermometer ASTM 57 C range -20 to +50°C and thermoregulated electronic heating device. The tester is equipped of a gas flame feeder

Power supply:

230 V | 50 Hz | 700 W

Dimensions:

200x300x400 mm

Weight:

10 Kg



BA229

BA241 DEGREE OF SOLUBILITY OF BITUMINOUS BINDERS

EN 12592 | ASTM D2042

The set comprises :

- Gooch crucible with funnel and rubber ring
- Filter flask 500 ml with rubber stopper
- Whatman filter discs, Ø25 mm (pack of 100)

Weight: 1000 g



BA241

BA243 SETTLING TENDENCY OF BITUMEN EMULSIONS STOPPERED GLASS GRADUATED CYLINDER

EN 12847 | IP 485

The cylinder has 600 ml, it is marked at 500 ml and two side tubes are foreseen.

Weight: 800 g

BA245 PENETRATION POWER OF BITUMEN EMULSIONS GLASS TUBE WITH FUSED-ON GLASS FILTER

EN 12849 | IP 487

The glass tube has Ø41.5 mm by 115 mm height, a fused-on glass filter with holes size between 0,160 and 0,250 mm is fitted.

Weight: 300 g



BA245

BA243

BA251 WATER IN BITUMINOUS MATERIALS TEST SET 10 ML

ASTM D95, D244 | AASHTO T55 | NLT 123 | CNR 101

Used for determining the water content of bituminous and petroleum materials by distillation with a water immiscible, volatile solvent.

The equipment comprises:

- Glass balloon 500 ml
- Glass receiver 10 ml with 0,1 ml grad
- Glass reflux condenser
- Electric heater with thermoregulator
- Clamps

Power supply:

230 V | 50 Hz | 500 W

Weight:

8 Kg



BA251

BA253 WATER IN BITUMINOUS MATERIALS TEST SET 25 ML

EN 1428, 12847 | ASTM D244 | NF T66-023

Identical to BA251 except for the receiver having 25 ml capacity.

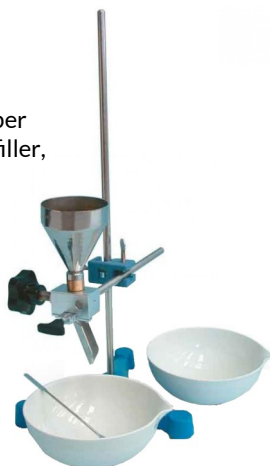
BA255 BREAKING VALUE OF CATIONIC BITUMEN EMULSIONS

EN 13075-1 | IP 494

The breaking value is a dimensionless number corresponding to the amount of reference filler, in grams, needed to coagulate 100 g of bitumen emulsions.

The equipment comprises a filler feeding pan with support base and clamp, nickel spatula, two round porcelain dishes.

Weight: 2 Kg



BA255

BA257 AUTOMATIC BREAKING VALUE OF CATIONIC BITUMEN EMULSIONS

EN 1430 | ASTM D244 | CNR 99

Basically similar to mod BA255 but equipment is composed by an electric stirrer with a base and a propellant and a 500 ml container.



BA257

ACCESORIES BA255 AND BA257

BA255-01
Forshammar Reference Filler
Bag 10 Kg

BA255-02
Forshammar Reference Filler
Bag 25 Kg

BA259 EMULSIFIED ASPHALT DISTILLATION

EN 1431 | ASTM D 244 | AASHTO T 59 | CNR N° 100

This apparatus is used to examine asphalt emulsions composed principally of a semi-solid or liquid asphaltic base, water and an emulsified agent.

The set is formed by:

- Aluminium still container
- Glass connectors including condenser
- Stands
- Graduated cylinder
- Two thermometers ASTM 7C range -2 to +300°C
- Gas ring burner with gas stop valve controlled by a sensor

It can be sold on CE markets, but not usable in closed spaces.

Weight:
12 Kg



BA259

BA261 PARTICLE CHARGE OF EMULSIFIED ASPHALT

EN 13075-1 | IP 494

It is used to identify the particle charge of bitumen emulsions.

The equipment include a milliammeter scale up to 10 mA on support base, a variable resistor, two stainless steel electrodes, a insulating device, a beaker 250 ml capacity to EN spec and a glass rod.

Power supply: 250 V | 50-60 Hz

Dimensions: 200x200x600 mm

Weight: 3 Kg



BA261

ACCESSORY

BA261-01
Beaker ASTM 500 ml

BA263 WILHELMI SOFTENING POINT

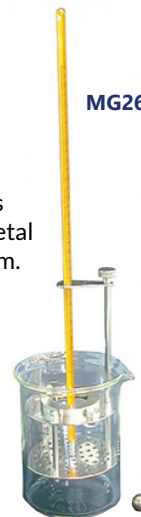
EN 1871 | DIN 1996-15

Used for determining the softening point of bituminous materials for road construction, according to Wilhelmi method. The apparatus comprises a ring divided in two halves on a metal support frame, glass beaker, steel ball Ø15 mm.

Weight: 2 Kg

ACCESSORIES

MG260-08
Thermometer +30 a +200°C (ASTM 16C)
BA223-05
Hot plate with magnetic stirrer



MG260-08

BA263

BA265 DISTILLATION OF CUT-BACK ASPHALTS

ASTM D402 | AASHTO T78 | NF T66-003 | UNE 7072, 7112

This apparatus is used for the examination of cut-back asphaltic materials by the distillation test.

The apparatus consists of:

- Electric heater with thermoregulator
- Distillation flask
- Condenser tuve
- Adapter
- Shield
- Receiver
- Supports
- Graduated cylinder
- Thermometer ASTM 8C

Power supply:
230 V | 50-60 Hz | 750 W

Weight:

12 Kg



BA265

BA267 STORAGE STABILITY OF ASPHALT EMULSIONS

NF T66-022

This apparatus is used for the determination of the storage stability of emulsions by decantation. It consists of a 12 V current stabilized source, cylindrical electrode, base with holder, stainless steel vessel 500 ml capacity and watch glass.

Power supply:

230 V | 50-60 Hz

Dimensions:

200x200x500mm

Weight:

5 Kg



BA267

BA271 PLANETARY ABRASION TESTER

EN 12274-5 | ASTM D3910 | NLT 320

This machine is used for determining the resistance of slurry mixtures to abrasion. It consists of a mechanical planetary stirrer equipped with a rubber hose abrasion head.

Dimensions: 530x550x800 mm

Weight: 70 Kg



BA271

BA271-01

ACCESSORIES

BA271-01

Metallic molds (4) EN

Diameter: 279 - 295 mm

Heights: 6,3 - 10 - 13 - 19 mm

BA271-02

Metallic molds (3) ASTM

Diameter: 279 - 295 mm

Heights: 6,3 - 8,2 - 10,5 mm

BA281 SAYBOLT DIGITAL VISCOMETER

ASTM D88 | AASHTO T72

This test is for taking an empirical measurement of the Saybolt viscosity of petroleum products at specified temperatures between 21,1 to 98,9°C (70 to 210°F).

Stainless steel made is equipped of a dual safety thermostat to prevent accidental over-heatings.

Supplied with two interchangeable orifices Furol and Universal, oil bath, electric heater with digital thermoregulator, stirrer, cooling coil, viscosity flask. Thermometers, filter funnel, withdrawal tube are not included and must be ordered separately.

Power supply: 230 V | 50-60 Hz | 500 W

Dimensions: 280x260x510 mm

Weight: 12 Kg

BA283 SAYBOLT DIGITAL VISCOMETER TWO PLACES

ASTM D88 | AASHTO T72

Similar to the BA281 model but with two elements.

Dimensions: 270x270x550 mm

Weight: 14 Kg



BA283

BA281-01



BA281-02

ACCESSORIES

BA281-01

Filter funnel with filter ring mesh

BA281-02

Withdrawal tube

MG260-09

Thermometer +19 to +27°C (ASTM 17C)

MG260-10

Thermometer +34 to +42°C (ASTM 18C)

MG260-11

Thermometer +49 to +57°C (ASTM 19C)

MG260-12

Thermometer +57 to +65°C (ASTM 20C)

MG260-13

Thermometer +79 to +87°C (ASTM 21C)

MG260-14

Thermometer +93 to +103°C (ASTM 22C)

BA285

ENGLER DIGITAL VISCOMETER

ASTM D940, D1665 | AASHTO T54
BS 2000 | NF T66-020 | CNR 102

Used to determine the specific viscosity of tars and their products. The viscometer is equipped of a dual safety thermostat to prevent accidental over-temperatures.

It consists of a water bath with digital precision thermoregulator, electric stirrer, cooling device and Engler flask.

Power supply:
230 V | 50 Hz | 300 W
Dimensions:
265x270x550 mm
Weight:
12 Kg



BA285

BA287

ENGLER DIGITAL VISCOMETER TWO PLACES

ASTM D940, ASTM D1665 | AASHTO T54
BS 2000 | NF T66-020 | CNR 102

Similar to the BA285 model but with two elements.

Weight: 20 Kg

ACCESSORIES

BA285-01
Kohraush calibration flask 200 ml
BA285-02
Filter screen ASTM N°50
MG260-15
Thermometer +18 to +28°C (ASTM 23 C)
MG260-16
Thermometer +39 to +54°C (ASTM 24 C)
MG260-17
Thermometer +95 to +105°C (ASTM 25 C)
BA285-03
Thermometer +0 to +55°C (NF T66-020)

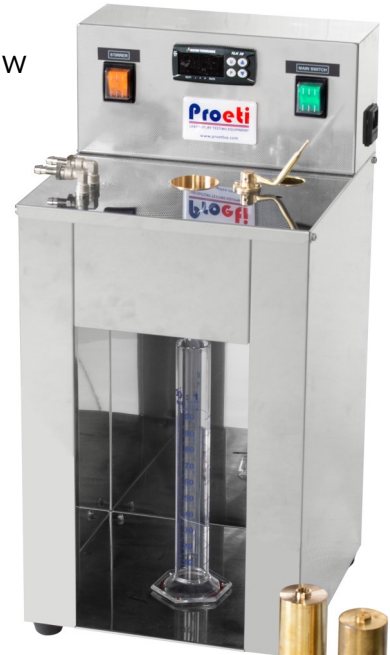
BA291

TAR-ESTÁNDAR DIGITAL VISCOMETER

EN 12846 | EN 13357 | NF T66-005 | IP 484

Used for determining the viscosity of cut-back bitumen and road oil. The instrument consists of a stainless steel bath (tank), agitator, rheostat, immersion electric heater with digital thermostat to take the water to the desired temperature, cooling coil for water supply connection and control glass thermometer IP 8C, range 0 - 45°C. The viscometer is equipped of a dual safety thermostat to prevent accidental over-temperatures.

Power supply:
230 V | 50-60 Hz | 300 W
Dimensions:
265x270x550 mm
Weight:
12 Kg



BA291

ACCESSORIES

EN 12846-02
BA291-01
Go/not go gauge for Ø2 mm orifice
BA291-02
Cup with orifice Ø2 mm
BA291-03
Ball valve Ø2 mm

EN, NF, IP
BA291-11
Go/not go gauge for Ø4 mm orifice
BA291-12
Cup with orifice Ø4 mm
BA291-13
Ball valve Ø4 mm

EN, NF, IP
BA291-21
Go/not go gauge for Ø10 mm orifice
BA291-22
Cup with orifice Ø10 mm
BA291-23
Ball valve Ø10 mm

BA293

TAR-STANDARD DIGITAL VISCOMETER TWO PLACES

EN 12846 | EN 13357 | NF T66-005 | IP 484

Similar to the BA291 model but with two elements.

Weight: 20 Kg

ROTATIONAL VISCOMETERS HIGH RANGE

ASTM D2196, D4402 | AASHTO T316 | EN 13302

The apparent viscosity of unfilled asphalt is evaluated with a rotational viscometer that measures the torque generated by a needle rotating at a selected speed on an asphalt sample at specified temperatures on a scale from room temperature to 260°C. The measured relative resistance to rotation is converted, with a factor, into viscosity units, cP or mPA-s.

The equipment consists of a control unit mounted on a foot-know stand, a spindle protector, the spindle support, the spindle set and a carrying case.

The unit emits an audible and visual alarm in case of malfunction, the reading of the parameters can be observed in real time and when the test is stopped, the system causes a progressive decrease in speed to avoid vibrations in the spindle.

Power supply: 240 V | 50-60 Hz | 25 W
Temperature range: from -40°C to +300°C
Weight: 5 Kg



MODELS

- BA301
Rotational viscosimeter range 20 to 2.000.000 cP
- BA303
Rotational viscosimeter range 100 to 13.000.000 cP
- BA305
Rotational viscosimeter range 200 to 106.000.000 cP

ROTATIONAL VISCOMETERS HIGH PERFORMANCE

ASTM D2196, D4402 | AASHTO T316 | EN 13302

Determines the dynamic viscosity of a substance by the rotation of a specified spindle within the sample at the speed giving the maximum torque reading on the viscometer. The resulting torque reading is used to calculate the viscosity of the substance.

The exclusive software allows you to create repeatable custom tests on your PC. Once the program (up to 25 steps) is created, it can be downloaded to a supplied USB.

Includes 6 spindles (RV/HA/HB) or 4 spindles (LV), Temperature Probe, Lab Stand and carrying case.



MODELS

- BA311
Rotational viscosimeter range 1 to 6.000.000 cP
- BA313
Rotational viscosimeter range 100 to 40.000.000 cP
- BA315
Rotational viscosimeter range 200 to 80.000.000 cP
- BA317
Rotational viscosimeter range 800 to 320.000.000 cP

ACCESSORIES

BA310-01
Software RheocalcT
Automatically control the instrument and collect data with RheocalcT running on a dedicated PC with USB interface. RheocalcT can analyze data, generate multiple plot overlays, print tabular data, run math models and perform other time-saving routines.

BA310-05
Temperature control unit
Consists of a heating chamber that works in conjunction with rotational viscometers at high temperatures. A digital microprocessor control unit assures that the required test temperature is maintained



BA321 DUCTILOMETER

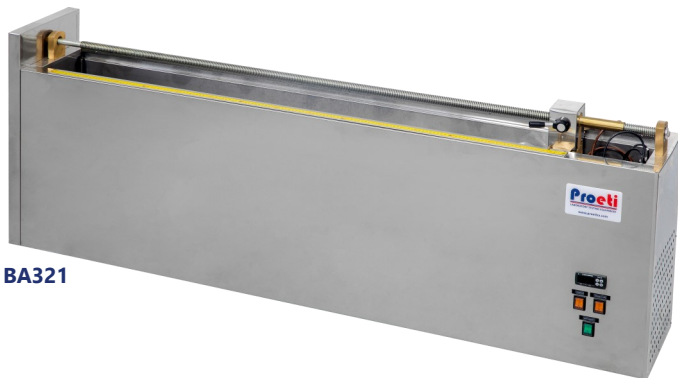
EN 13589,13398 | ASTM D113 | AASHTO T51
NF T66-006 | UNE 7093 | CNR N° 44

Made in stainless Steel with glass fiber insulation, it is used to determine the ductility of bituminous materials by measuring the elongation of a briquette before breaking when it is stretched at a set velocity and temperature.

It consists of a moving carriage moving along a set of guide rails. The carriage moves powered by an electric motor inside a large tank equipped with an immersion heater, digital thermostat, cooling coil for cold water circulation and pump.

It has enough capacity to test up to three briquettes simultaneously, and a double safety thermostat to avoid accidental overheating.

Maximum traction force: 300 N
Maximum travel: 1500 mm
Velocity: 50 mm/min
Power supply: 220 V | 50 Hz | 1000 W
Dimensions: 1880x360x680 mm
Weight: 95 Kg



BA321

BA323 DUCTILOMETER WITH COOLING SYSTEM

EN 13589,13398 | ASTM D113 | AASHTO T51
NF T66-006 | UNE 7093 | CNR N° 44

Same as the BA321 ductilometer, but equipped with a cooling unit for performing tests with a water temperature between +5° and +25°C.

Weight: 130 Kg



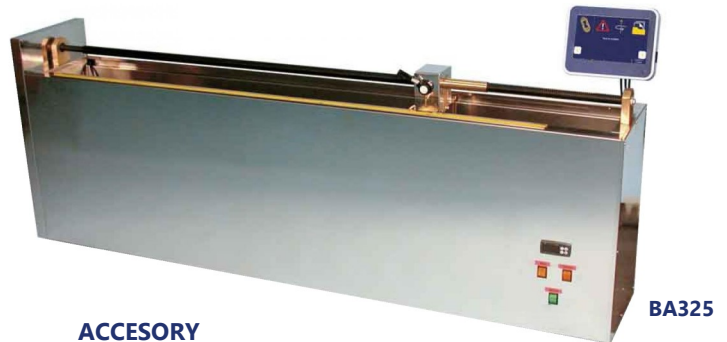
ACCESORIES

BA320-01
Briquette mould EN 13398, brass
BA320-02
Briquette mould EN 13589, brass
BA320-03
Briquette mould ASTM, AASHTO, brass
BA320-04
Base plate for ductility briquette moulds
BA320-05
Load cell 50 N
A ductilometer can be fitted with up to three cells

BA325 DUCTILOMETER WITH DATA ACQUISITION

EN 13589, 13398, 13703 | ASTM D113, D6804 |
AASHTO T51 | GOST 11505-75, 33138-2014

Same as the BA321 ductilometer, but fitted with a digital control unit for data acquisition and test control. The control module is equipped with USB ports and SD card slot to transfer data to a PC.



BA325

ACCESORY

BA320-10
Cooling unit to maintain the water between +5° and +25°C
It cannot be fitted to an existing machine. It must be specifically requested when the ductilometer is ordered.

BA327 DUCTILOMETER FOR RESEARCH

EN 13589, 13398, 13703 | ASTM D113, D6804 |
AASHTO T51 | GOST 11505-75, 33138-2014

Developed to perform ductility tests for research purposes. It is equipped with a stepper motor with a variable velocity from 1 to 400 mm/min and a digital displacement measurement system.

It has a 500 N load cell, and it can be fitted with up to 3 cells to test three specimens simultaneously.

The digital control unit allows:

- Visualization of the elongation in mm during the test
- Plotting load vs elongation
- Constant temperature adjustment
- Continuous data acquisition during the test
- Printing or exporting (USB) tests

Power supply: 230 V | 50-60 Hz | 1000 W
Dimensions: 2140x400x450 mm
Weight: 110 Kg



BA327

ACCESORIES

BA327-01
Load cell 500 N
A ductilometer can be fitted with up to three cells
BA327-02
Cooling unit to maintain the water between +5° and +25°C
It cannot be fitted to an existing machine. It must be specifically requested when the ductilometer is ordered.

BA351 PAV4

AASHTO R28 | ASTM D6521 | EN 14769

This apparatus is designed to simulate in service oxidative aging of asphalt binder by exposure to elevated temperatures in a pressurized environment. This improved PAV model simplifies the running and documenting of asphalt binder aging operations.

The apparatus includes a touch screen controller with front panel user interface with easy to use step-thru operation. Bench top unit with integral vessel/oven design with top opening door. Network ready with remote capabilities: view and control the PAV with an APP designed for smart phones, tablets, iPads, iPhones, or other PCs.

Temperature is 80 to 115°C (176 to 239°F) and programmable from 50 to 150°C (122 to 302°F). Pressurization is programmable from 1 hour to 99 h. This enables AASHTO R28, ASTM D5621 and EN 14769 specifications to be met without any special programming and also enables greater freedom for research and development projects.

Data acquisition of temperature, pressure, and time is collected throughout the aging process. Once the aging process is complete, a .csv file can be created and saved via the USB port on the front of the PAV4.

The apparatus includes a precision anodized aluminium sample rack, a specimen loading/ unloading tool, a hex socket wrench and 10 AASHTO T179 specimen pans. Compressed air requirement: 2,24 MPa.

Power supply:
230 V | 50-60 Hz
Dimensions:
700x460x760 mm
Weight:
130 Kg



BA351

BA353 VACUUM DEGASSING OVEN (VDO)

AASHTO R28 | ASTM D6521

The ASTM D6521 and AASHTO R28 make degassing of the PAV-aged asphalt samples mandatory. This vacuum degassing oven conforms fully with these Standards.

Stainless steel construction, holds up to 4 specimen containers, self contained automatic vacuum system, high precision controller featuring a digital display indicating time, temperature and the current stage of each process, maintains temperature up to 170°C with an accuracy of ±5°C.

Power supply: 230 V | 50-60 Hz
Temperature range: ambient to 210°C
Dimensions: 610 x304x406 mm
Weight: 35 Kg



BA353

BA361 BENDING BEAM RHEOMETER (BBR)

ASTM D6648 | AASHTO T313 | EN14771

The BBR System consists of a fluid bath base unit, a three-point bending test apparatus which is easily removed from the base unit for specimen loading and unloading, an external cooling unit with temperature controller and a calibration hardware kit with carrying case.

Integral stainless steel frictionless construction, two independent platinum RTDs for precise temperature control, 500 g load cell, PID temperature controller with digital display, and ASTM/AASHTO compliant specimen moulds.

Its software provides ease of setup and operation. Real-time displacement, loading, and temperature graphs are displayed during the test cycle and can be rescaled as needed for easy viewing.

Temperature range:
ambient to -40 °C
Test load range:
from 0 to 200 g
Weight:
100 Kg



BA361

BA371 ROLLING THIN-FILM OVEN HIGH PERFORMANCE

EN 12607-1 | ASTM D2872 | AASHTO T240

Designed to study the aging phenomena in bituminous binders. Made of stainless steel with a large door to detect the test room.

Test parameters are controlled from a touch screen and when the test begins, temperature, airflow and platen speed are displayed in real time. It has a double safety thermostat to prevent overheating.

The oven must be connected to an air compressor 2 bar max. pressure, or to a diaphragm pump.

Supplied with digital flow meter, precision digital thermostat to maintain a temperature of 163 °C, ventilation device, control thermometer ASTM 13C and 8 glasses Ø64x140.

Power supply:
230 V | 50 Hz | 1700 W
Dimensions:
620x620x910 mm
Weight:
55 Kg



BA371

BA373 ROLLING THIN-FILM OVEN RTFO

EN 12607-1 | ASTM D2872 | AASHTO T240

Same as the BA371 but it is the most basic model since it does not include a touch screen

ACCESSORY

BA373-01
Diaphragm pump 2,4 bar



BA373

BA381 CORELOK

ASTM D6752-02, D6857-03 | AASHTO T-331

The Corelok is a system for sealing asphalt samples so that the sample densities may be measured by water displacement methods. Samples are automatically sealed in specially designed puncture-resistant polymer bags. Densities measured with the Coreloke system are highly reproducible and accurate.

The equipment performs 5 standard tests:

- Bulk Specific Gravity
- Maximum Specific Gravity
- Bulk Specific Gravity of Aggregates
- The porosity of Compacted Asphalt
- Percent Asphalt Calculation

Power supply: 220 V | 50 Hz | 1430 W
Dimensions: 490x640x500 mm
Weight: 55 Kg



BA381

BA375 ROTATING SHELF THIN FILM OVEN TFO

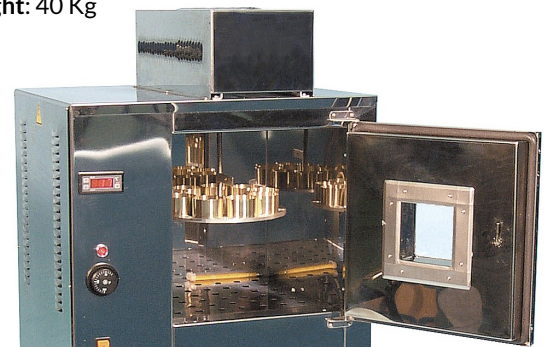
EN 12607-2, 13303 | ASTM D6, D1754 | AASHTO T47, T179
BS 2000 | NF T66-011 | UNE 7110 | CNR 50

This oven is used to determine the mass loss (excluding water) of oil and asphalt compounds and the effect of heat and air on sheets of semi-solid bituminous material.

Internal chamber and external frame all made of stainless steel, double wall insulation with fiberglass, double door. Temperature control by digital thermoregulator. The oven is equipped of a dual safety thermostat to prevent accidental over-heatings. The plate rotates at 5-6 r.p.m.

Supplied with thermometer ASTM 13C, +155 to +170°C. but without rotating shelf and accessories, that must be ordered separately.

Power supply: 230 V | 50 Hz | 1500 W
Internal dimensions: 330x330x330 mm
Overall dimensions: 460x450x700 mm
Weight: 40 Kg



BA375

ACCESSORIES

BA375-01
Rotating shelf for the determination of loss on heating
EN 13303 | ASTM D 6 | BS 2000 | NF T066-011
AASHTO T47 | CNR N° 50
Includes 9 containers Ø55x35 mm.

BA375-02
Rotating shelf for the determination of thin film
EN 12607-2 | ASTM D1754 | AASHTO T149 | UNE 7110
Includes 2 containers Ø140x9,5 mm.

BA375-03
Rotating shelf for the determination of thin film
Same as BA375-02 but including 4 containers Ø140x9,5 mm.

BA375-02

BA375-01

BA383 COREDRY

ASTM D7227 | AASHTO R79

CoreDry is an automatic system for rapid drying of material samples and objects. Use this device to remove moisture from your sample in minutes. It includes a high-performance vacuum pump and an extremely efficient moisture trap that ensures long-term pump performance and maintenance-free operations. It allows to take a core sample from the field and measure its density in less than 20 minutes, saving you time and providing the confidence you need to continue producing quality pavements. Enables crews to construct quality pavements. Quick determination of density results allows the paving crews to make adjustments during paving, not after the job is complete. Allows offset adjustments for your nuclear and non-nuclear gauges. Unlike using ovens, there is no loss of volatiles or damage to the sample integrity. Samples stay close to room temperature through the drying process.

Power supply:
220 V | 50 Hz | 1650 W
Dimensions:
480x660x430 mm
Weight:
43 Kg



BA383

BA385 MIST

ASTM D7870

Mist is designed as a quick method for testing moisture damage susceptibility of asphalt mixtures. It is a stand-alone unit that consists of a pressurized chamber that pushes and pulls water through a compacted asphalt sample, simulating the action of an automobile tire on the road.

The tests can be performed at different pressures and temperatures to replicate different traffic and environmental conditions.

The unit is completely automatic and results are ready in as little as 24 hours. Simply place your asphalt core sample in the Mist testing chamber, select your test parameters, press start and the unit does the rest. Data can be stored and transferred to a PC for evaluation and archiving.

Power supply: 230 V | 50 Hz | 1650 W
Dimensions: 530x530x1350 mm
Weight: 159 Kg



BA385

BA391 NON NUCLEAR DENSITY GAUGE PQ1380

It is used to take quick and accurate readings of the asphalt during the compaction process. Fast, reliable, accurate and repeatable readings in real time, user friendly, in-process, cost effective tool for any crew member.

Full color graphics driven user interface with led backlight for easy visibility in daylight or dark situations. When activated GPS will display latitude and longitude positions, number of satellites the gauge is connected to as well as the UTC date and time.

Sensing area (Ø279 mm) allows optimum measurement on fine and coarse material types. Measurement depth can be selected by the user from 25 mm to 100 mm.

Most important, non-nuclear means no badges, licenses or storage and transport concerns. The equipment is supplied with interchangeable batteries easily to change in field, a battery charger and carrying case.

Dimensions: 279x279x304 mm
Handle length: 736 mm
Recharge time: 4 h
Weight: 6 Kg



BA391

SU211 NUCLEAR DENSITY-MOISTURE GAUGE

ASTM D6938, D2950, D7013, D7759, C1040 | AASHTO T310

This device is an advanced, yet easy to operate moisture density gauge. A Cesium 137 source measures density while an Americium 241:Beryllium source measures humidity.

Density, moisture and other required field parameters are automatically calculated and displayed and can be stored under specific userdesigned projects.

The battery pack is designed to provide weeks of operation and is integrated with a 9V battery for backup. The data can be easily downloaded to a computer, printer or written to a USB flash drive.

Density range:
70 to 170 pcf (1,120 to 2,73 gcc)
Moisture range:
0 to 40 pcf (0 to 0,64 gcc)
Memory Storage:
10 Projects with 40 readings each
Dimensions:
678x358x248 mm
Weight:
13 Kg



SU211

ACCESSORIES

- SU210-01 Drill pin
- SU210-02 Rod guide - Scraper plate