Bitumens

GROUP I&S

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CONTINUOUS FLOW CENTRIFUGAL EXTRACTOR
UNE EN 12697-1 / 12697-14 / EN 13108 / ASTM D1856 / BS 598

B001 Centrifugal extractor 5000 gr continuous flow capacity without filter to determine the content of filler in bituminous binders. Manufactured steel outer body casting. It has four strong legs for settlement on soil and absorb vibrations caused by the load. The control panel has the on-off switch, emergency brake and zeta.
The machine is supplied complete with lockable metering hopper, two stainless steel conical sieve UNE 0.100 and 0.063 mm. and bucket 5 l. capacity.
Rotational Speed: 3500 rpm
Container capacity: 500 g. retention.
Power: 380 V. 50 Hz

Accessories:
B001.01 Sieve tapered stainless steel UNE 1.00 mm.
B001.02 Sieve tapered stainless steel UNE 0,063 mm.
B001.03 Bucket 5 l. capacity stainless steel.

HOT REFLUX EXTRACTORS
UNE EN 12697-1 / EN 13108 / DIN 1996

B002 Extractor heated to reflux in 5000 g capacity to determine the content of bitumen in asphalt mixtures for calculating the weight difference of aggregates.
The team consists of a cylindrical stainless steel basket stainless steel mesh of 3 mm. and a cover with water condenser inlet and outlet water.
Dimensions Ø 180 x 380 mm.
Weight: 6 kg approx.

Accessories:
B002.01 Basket with stainless steel mesh
B002.02 Hotplate Ø 150 mm. and 1000 W. power.

CONTINUOUS FLOW FILTERLESS CENTRIFUGE
EN 12697-1 all. B.2.1, EN 13108 / DIN 1996 CNR N° 38 / ASTM D1856

B003 Designed for quick filterless separation of filler from binder solution or other mixtures containing sediments (cement, soil, clay), in suspension. As no filter is required, there is no dispersion of material so that the highest accuracy is assured. The solution is poured into the top funnel and falls into the rotating test container dia. 70x200 mm. Because of the centrifugal effect, the liquid rises vertically leaving the filler and mineral particles inside the beaker.
The centrifuge is supplied complete with aluminium beaker, two sieves 2 mm and 0,063 mm mesh respectively. The rotation speed is 11500 rpm, with automatic ramp and preset speed control.
Extraction capacity is up to 100 g. of filler per test.
Power supply: 230 V 1ph 50 Hz 600 W
Dimensions: 350x600x720 mm.

SPARE:
B003-01 Aluminium beaker Ø70 x 200 mm high

SOLVENT RECOVERY STILL 10 L/HOUR

B004 This efficient and compact unit, easy to install, is totally self contained.
It is provided of 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 (AISI 316) made.
Supplied complete of funnel/tank with sieve insert, 10 m plastic tube.
Power supply: 230 V 1 ph 50-60 Hz 1300 W
Dimensions: 320x400x650 mm
Weight: 17 kg

BITUMINOUS BINDERS. DETERMINATION OF THE RESISTANCE OF HARDENING. ROTATING FLASK TEST: RFT METHOD. UNE EN 12697-3 / 12697-1

B005 This unit is used to evaluate the hardening effect of a treated bituminous binder sample. The test is performed by introducing 100 g of bituminous binder into the rotating flask. The sample is heated at 165°C and ambient temperature air is blowed into the flask containing the binder hardening the same. The hardening effect is evaluated by penetration, viscosity and softening point tests.
The Rotary Evaporation Apparatus is essentially composed by:
- Distillation flask 1000 ml capacity.
- Motor of variable speed, suitable to rotate the flask at an adjustable rate of 20 to 270 rpm.
- Condenser.
- Solvent recovery flask, 1000 ml capacity.
- Heated oil bath.

The angle of the rotary/distillation flask is 15° approx.
The instrument is supplied complete with glass tubing with three way valve and transparent flexible hose for solution intake.
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The Rotatory Apparatus requires a vacuum pump and a vacuum regulating system (see accessories).
Power supply: 230V 1ph 50Hz
Weight: 27 kg approx

DETERMINATION OF THE AFFINITY BETWEEN AGGREGATES AND BITUMEN UNE EN 12697-11 / EN 13108

B007 Bottle rolling machine with rotation speed adjustable from 0 up to 85 rpm, used for the determination of the affinity between aggregate and bitumen, expressed by visual registration of the degree of bitumen coverage on uncompacted bitumen-coated mineral aggregate particles afther influence of mechanical stirring action in the presence of water. The machine can roll up to 3 bottles at the same time. Supplied complete with timer range 0 – 6 hours.
Power Supply: 230V, 50 Hz
Dimensions: 385x294x162 mm
Weight: 11 kg approx.

B007.01 Test bottle, made of borosilicate glass, 500 ml capacity, diameter 86 mm, height 176 mm, neck with diameter opening 34 mm, as expressly requested by EN Specification.
B007.02 Glass rod with a diameter of 6 mm equipped with 35 mm long fitting rubber tube.


B011/B009


B009/B009.01 B009.02/B009.03 B010


B010

VACUUM PYKNOMETER 10 LITROS CAPACITY THEORETICAL MAXIMUM SPECIFIC GRAVITY OF UNCOMPACTED BITUMINOUS PAVING MIXTURES (RICE-TEST)

UNE EN 12697-5, 12697-12 / EN 13108 /ASTM D2041

B009 Transparent plexiglass made, it is utilized for a rapid determination of asphalt content, bulk specific gravity of aggregates, the max. theoretic specific gravity of bituminous uncompacted road mixtures and the percent air voids in compacted mixtures.
To perform the test a minimum ultimate vacuum of 30 mm/Hg is requested.
Dimensions: 300 mm dia. x 450 mm high Weight : 8 kg approx.

Accessories:

B011 Vibro-Deaerator electromagnetic, with adjustable vibrating intensity. To vibrate the pycnometer for the evacuation of the air this unit can be used also as a Sieve Shaker.
Technical details: see section Aggregates, pag. 14
B009.01 Analogue pressure gauge
B009.02 Dewar vessel plate 1500 ml capacity, flat base
B009.03 Condensation trap 175 mm length
B009.04 Special pycnometer (Flask) 1000 ml capacity of 135 mm. cap and hook height according standard EN 12697-5
B009.05 Special pycnometer (Flask) 500 ml capacity of 130 mm. cap and hook height according standard EN 12697-5
V6204 Disk Ø290 mm porcelain with holes placed in the bottom of container 10 l.

B010 Portable vacuum pump with vacumetro and digital timer and magnetic induction ventilated motor, silent, vibration or oil contamination when working in dry membrane. Vacumetro controller and digital timer to preset test time.
Vacuum: 750 mm Hg
Pressure: 13 mbar
Flow: 12 l / min.
Dimensions: 260x310x130 mm
Power supply: 230 V, 50 Hz
Weight: 6,100 g.

Accessories:

B010.02 Connecting pipe to bind the vacuum pump pycnometer


B009.04/05 B009.02 B009.03

NON NUCLEAR ELECTROMAGNETIC DENSITY GAUGE, INFRARED TEMPERATURE SENSOR

B012 The Electromagnetic Density Gauge is a non nuclear sensing device that allows field density real time measurement of asphalt.
This technically advanced instrument for quality control allow operators to immediately identify spots with low pavement density and trigger corrective actions leading to more uniform pavements.
The Electromagnetic densimeter allows:
- Pavement tests.
- Real time measurements, in a continous mode.
- LCD visualization of:
• Average density.
• % Maximum density.
• % Air voids.
- Non Nuclear device, so maximum safety for operator
- Storing up to 999 measurement data records and RS-232 computer interface.
- Infrared sensor for an accurate measurement of the road surface (optional).
- Rechargeable batteries for 32h continous usage.
- Charging supply for standard 230V/50Hz or 12Vcc.

Dimensions: 229x406x152 mm.
Weight: 5 kg

BITUMEN CONTENT FURNACE BY IGNITION METHOD

UNE EN 12697-39 / ASTM 308-99 / AASHTO T 164

B014 The unit provides asphalt content of bituminous paving mixtures accurate to 0.11%, with a fast, accurate, environmentally friendly, and cost effective method of determining asphalt content.

Ignition method reduces testing time when compared to solvent extraction. A 1200-1800 gram sample of asphalt can be tested in 30-45 minutes using this Content Furnace.

Unit can accommodate samples up to 5000 grams!

Furnace has an internal scale, that automatically monitors the sample weight throughout the ignition process, saving valuable technician time and increasing productivity in the lab.

The ignition method replaces the costly and time consuming sol-vent extraction method by eliminating the primary cost of solvent purchase and the secondary cost of solvent disposal.

Content Furnace eliminates the exposure of the asphalt technician to harmuful solvents. The automatic door-lock feature prevents opening the chamber door during the critical test time.

This feature provides operator safety and helps ensure testing integrity.

This Content Furnace is the only system on the market containing a high temperature afterburner used in conjunction with a patented ceramic filter to reduce the emissions of the ignition process by up to 95%.

Our System has the capability to accept positive or negative correction factors for use with mixes containing hydrated lime.

This unique furnace automatically detects endpoint within .01% of the sample weight.

Furnace software allows you to choose between automatic and manual test mode.

In the automatic mode, the endpoint is detected; the software ends the test, prints out the results and beeps.

In the manual mode, the endpoint is detected; the unit begins to beep but will continue to test until the user presses “stop” to end it.

Once the “stop” button has been pressed, the door will unlock and the results will be printed.

Furnace software automatically compen-sates for weight change due to sample and basket assembly temperature change.

This compensation is computed for each sample load tested, unlike competitive models that assign a fixed number to a given range of load sizes.

An RS232 port provides data interface with personal computer for graphical data analysis.

The Furnace is supplied complete with 4 basktes, 2 trays, 2 covers, handle, cooling cage, insulated plate, gloves, face shield, 4 rolls of printer tape.

Overall dimensions: 552x654x933 mm

Chamber Dimensions: 355x355x355 mm

Power supply: 230 V 1 F 50 Hz 4800 W 20 A

Temperature range: 200-650°C Weight: 120 Kg

Accessories:

B014.01 Cage for incinerating the simple

B014.02 Heat resistant gloves

B014.03 Thermal printing paper

B014.04 Flexible aluminium tube, 100 x 1.5 m

AUTOMATIC EXTRACTION OF BITUMEN
UNE EN 12697-1 / ASTM D2172 / DIN 1996 / CNR A VII Nº 38

B015 Used to perform reliable analysis on bituminous mixtures utilizing the perchloroethylene (PCE) or tetra-chloroethylene solvent which is classified: R40 not cancer producing (see note*), 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 bitumi-nous mixture;
- the separation of the filler from the solution formed by solvent, bitumen and filler;
- the recovery and distillation of solvent material allow-ing a further utilization.

The unit comprises:
- An electromagnetic sieving unit, insuring high quality double vibrating action (vertical/rota-tional), 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 dia. 120 mm., filler capacity approx. 400 g.
- A solvent recovery unit having reclaiming capacity of approx. 50 l/h, equipped with cooling system foreseen of devices switching.
- A separate control panel allows to program all these functions in a fully automatic system. It is also possible to select the manual functi.

This unit is supplied complete with:
- Two stainless steel beakers dia. 120 mm
- Four stainless steel sieves dia. 200 mm openings: 0,075 - 0,250 - 0,800 - 1,6 mm
- One Sieve Frame only dia. 200 mm. to improve the capacity of the first sieve.
- Set of O ring gaskets for sieves.

Sieves with different openings are available on request. A complete extraction cycle is performed ot in approx. 25 minutes and the max. quantity of mixture per extraction is 3500 g
Power supply: 400 V 3 ph 50 Hz 5,5 kW
Overall dimensions: 1400x680x1820 mm. Total weight: 185 Kg

Accessories:
B015.01 Stainless stell Beaker dia. 120 mm.
B015.02 Sieve Ø200 mm fully stainless steel. ASTM 200
B015.03 Sieve Ø200 mm fully stainless steel. ASTM 170
B015.04 Sieve Ø200 mm fully stainless steel. ASTM 100
B015.05 Sieve Ø200 mm fully stainless steel. ASTM 50
B015.06 Sieve Ø200 mm fully stainless steel. ASTM 30
B015.07 Sieve Ø200 mm fully stainless steel. ASTM 10

MIXER 20 AND 30 LITRES CAPACITY
EN 12697-35

B016 This large capacity mixer has been designed to mix bituminous samples for compaction tests, Marshall and tensile splitting test and for other tests where uniformity is required. Thanks to the planetary action this mixer ensures a complete and uniform mixing. The machine is provided with a variable speed drive allowing to set a wide range of speeds. The stainless steel cover can be lifted to inspect the boxl, and in this case the motor automatically turns off to prevent accidents to CE safety Directive.
A timer allows to select the mixing time or the continuous mixing.
The mixer is supplied complete with stainless steel bowl 20 litres capacity, but "without" whisk beater, "without" coupling and "without"electric heater that must be ordered separately (see accessories).
Power supply: 400V 3ph 50Hz 1,1kW (230V 1ph on request)
Dimensions: 489x693xh 944 mm
Weight: 110 kg approx.
B016.10 Mixer 20 litres capacity identical to mod. B016 but with power supply 230V I ph 50 Hz 1,1 KW
B016.11 Mixer 30 litres capacity identical to mod. B016, but with bowl capcity 30 litres. Power supply: 400V 3 ph 50 Hz 1,1 KW
B016.12 Mixer 30 litres capacity identical to mod. B016.11 but with power supply: 230V Iph 1,1 KW

Accessories:
B016.01 Isomantle heater, electric, complete with thermoregulator.
B016.02 Spiral beater
B016.03 Whisk thick wire beater, conforming to EN Specifications.

Supplied complete with bag retainer ring and 10 spare bags

B017.01 Residue Bag

Regenerator (recuperator) solvent capacity of 25 l. with digital indicator

TECHNICAL CHARACTERISTICS:

Regenerators solvents:

Modelos	B018
Tank capacity	25 lts
Power supply	220-240v/1/50-60 hz
Operating voltage	2570 w
Temperature	50-190 ºC
Heating	Indirecto aceite diatérmico
Total Oil	14 lts.
Refrigeration	Ventilación forzada por aire
Normative electrical part	EN-60204-1
Dimensions	600 x 850 x 1100 mm
weight	75 kg

B018.01 Bolsa de residuo

Regenerator (recuperator) solvent of 15 l. capacity with digital indicator

TECHNICAL CHARACTERISTICS:

Regenerators solvents:

Modelos	B017
Capacty	15 lts.
Power supply	230/1/50-60 hz.
Operating voltage	low Voltage 24 v.
Installed power	1600 w.
Temperature	50-190ºC.
Heating	Indirect thermal oil
Total Oil	7.5 lts.
Refrigeration	Forced air ventilation
Normative electrical part	EN-/50014/ EN-50015/EN-50018 / 60204-1
Dmensions	500 x 720 x 1050 (h) mm
Weight	60 kg.

Supplied complete with bag retainer ring and 10 pare bags

B019 Kerosene centrifuge suited for research centers. LCD panel with microprocessor control Digital control with speed selector, maximum 4,200 rpm and 2,603 x g. 100 rpm, timer of 0-99 minutes and hold position, push open lid, rotor-lights tour, open top light or not properly closed. Metal housing with air circulation to avoid excessive temperatures in the chamber. Camera centrifugation quality stainless steel AISI 304. Manufactured according to EC guidelines. Supplied complete with two cups swivel open metal ends of Ø52, 39x71, 4 mm high, fitted with a perforated brass plate. Power: 220 V, 50 Hz

B019.01 Rotor for Kerosene test.

AUTOMATIC ASPHALT LARGE LABORATORY MIXER, 32 LITRES CAPACITY
EN 12697-35/ ASTM D6307/ AASHTO TP53

B020 The PaveMix has been expressly designed to prepare homogeneous bituminous mixtures at a strictly controlled temperature.
The preparation of the bituminous sample is obtained in a short time period (a few minutes) to avoid any mechanical aggregate degradation and to fully coat all mineral components, as requested by EN 12697-35.

The mixer produces representative samples to perform:
- Gyratory compaction tests (EN 12697-10, EN 12697-31)
- Marshall stability tests (EN 12697-34, EN 13108)
- Wheel tracking wet and dry tests (EN 12697-22)
- Slabs compaction laboratory tests (EN 12697-33)
- Beam fatigue and Stiffness tests (EN 12697-26, EN 13108)
- Asphalt general purpose tests.

PaveMix consist of:
- Main frame holding a horizontal stainless steel bowl with a helical mixing shaft.
- The bowl, double wall insulation made of stainless steel AISI 316, contains an electric heater with probe sensor granting constant and uniform temperature control.
- An electromechanical motion allows to tilt the bowl to get easy the unloading operation.

The control panel foresees:
- Digital thermo-regulator to set temperature andto control the mixing temperature.
- Mixing speed regulator.
- Main and start/stop switches.
- Command to tilt the bowl.

Technical Specifications and features:
- Mixing capacity: 32 litres max.
- Mixing bowl: stainless steel AISI 316
- Mixing temperature: selectable from ambient up to 260°C through sensitive probe and digital display control.
- Mixing speed: adjustable from 4 to 40 rpm.
- Easy tilting unloading operation by electromechanical motion.

Heating power: 3000 W
Power supply: 230V 1ph 50/60Hz 4500 W
Dimensions: 1280 x 700 x h1210 mm
Weight: 350 kg

MARSHALL AUTOMATIC COMPACTOR
UNE EN 12697-30, 12697-10 / BS 598:107

B022 This ruggedly constructed apparatus automatically compacts the bituminous sample and stops off the motor after the preset number of blows has been completed on the automatic digital display counter.
The trip mechanism is structured so that the sliding hammer falls at the same height at every blow.
The mould is held in position by a fast clamping device.
The compactor includes a vibrated concrete base where a laminate hardwood block is mounted.
Total weight of the compaction hammer (Rod + Foot + Sliding mass): 7850 ± 50 g
Sliding mass weight: 4535 ± 15 g
Free fall height: 457 ± 5 mm
Blow frequency: 50 blows in 55/60 seconds.
The machine is equipped with safety door, conforming to CE Safety Directive.
When opened it stops automatically and cannot operate.
All moving parts are quickly/easily accessible for maintenance.
The compactor is supplied complete, **"except for the mould"** that must be ordered separately.
Power supply: 230 V 1 ph 50 Hz 300 W
Dimensions: 500 x 500 x 1890 mm
Weight: 220 kg

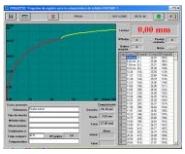
.Accessories:

B022.01 Vibrated concrete Base 450x450x200 mm.
B022.02 Compaction hammer for the machine
B022.03 Cabinet, for noise reduction within CE limits
B022.04 Marshall compaction test software
B022.05 Potentiometric sensors 50 mm. linear IP63
B022.06 Control module for measuring deformation
B022

B022

B022.05

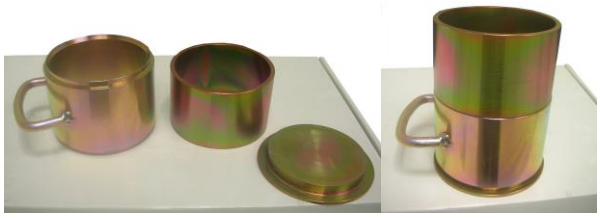
B022.06



MARSHALL COMPACTOR, HAND OPERATED, FOR MOULDS DIA. 4''
ASTM D6926, D5581, D1559 / AASHTO T245

B023 Supplied complete with compaction hammer 4" diameter, wooden pedestal capped with
steel plate and mould clamp device, support/ hammer guide.
Dimensions: 320x320x1700mm
Weight: 45 kg approx.

B023.01 Marshall compaction hammer manual weighs 4.53 kg type "Army". Height 457 mm.
B024 Marshall mould solderless steel, treated against corrosion.
B025 Filling collar to adapt to the mould Marshall
B026 Baseplate for Marshall Mould
B027 Filter paper Marshall box of 100



UNIVERSAL EXTRUDER
UNE 103.400 / ASTM D698 / BS 598, 1377
S123 Hand operated actuated by a 5 tons hydraulic jack. Used to extrude samples having dia. 4", 6", 100 mm, 150 mm. It can therefore extrude CBR, Marshall and Proctor specimens.
The extruder is actuated by a 50 kN hydraulic jack, having ram travel of 190 mm + 170 mm screw.
Supplied complete with adaptors.
Dimensions: dia. 300x500 mm
Weight: 30 Kg

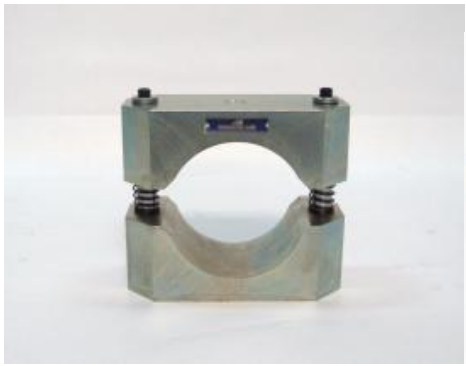
MARSHALL TEST MACHINE
UNE EN 12697-34 / UNE 103.502 / EN 13108 / ASTM D1559 / BS 598:107
B029 Machine capacity 50 KN for testing MARSHALL Manufactory by a sturdy frame with two columns chrome. The upper deck where it engages the load cell and the swivel plate serves as closure of the test frame. This can be positioned at will with locking system. Operation via the gear motor to the load applied by a spindle at constant speed. It has dual limit. Control module available with digital display with two display to measure the force, deformation or penetration and potentiometric sensor for measuring strain or specimen thickness. Supplied complete with protective screen test area.
Capacity: 50 KN.
Dimensions: 1550 x 500 x 450 mm.
Distance between tie bars: 300 mm.
Power supply: 220 V, 50 Hz.

Accessories:
B029.03 Metal structure for the placement of the machine

B032 Marshall rectangular thermostatic bath for 15 specimens cured. Interior made of stainless steel. Bridge adaptable thermostat with digital display on the edge of the bath; provided agitation system, heating and thermometer-thermostat that can regulate its temperature between ambient ± 5 ° C and 99.9 ° C. Supplied complete with digital electronic thermostat bath.
Useful dimension of the basin: 600 x 200 x 480 mm.
Power supply: Single phase 220 V.

B033 Marshall thermostatic bath similar to above, but with the following
Dimensions: 480 x 200 x 290 mm.

Accessories:
V043 Tray covers-bath resistances of 20 l.




B035 Marshall jaw (stability mould) 4"Ø(101,6 mm) manufactory in steel machining and treated against corrosion. Supplied complete with support bracket to comparison. Weihgt 6 Kg

Accesorios:
V364 Dial gauge stroke 10 mm, div. 0,01 mm
V360 Dial gauge stroke 12,5 mm, div. 0,01 mm
B036 Marshall load piston, manufactory of machined steel and treated against corrosion.
B037 Disco extractor with plunger
V370 Magnetic base with articulated arm


VIBRATING HAMMER COMPACTION
UNE EN 12697-32 / BS 1377/4; BS 1924/2
S147 Kango hammer, alternative method for soil compaction and density determine the relationship between dry and the moisture content.
Supplied in a carrying case.

Accessories:
S147.01 Tool carrier
S147.02 Tamper, Ø 146 mm, used for CBR, gravel-cement tests, etc.
S148 Kango hammer support to achieve uniform compaction. Manufactured in a steel structure with anti corrosion treatment, where it engages the hammer and the mold.

EN 12697-9, 12697-10, 12697-32 / BS 598:104
B040 P.D.R. moulde (Porcentaje Refusal Density)
Mould for determining the degree of compaction of the bituminous pavements.
Manufactured cylindrical steel tube corrosion treatment, generating open and close with screws and two hooks crabbing allowing perfect anchor to the base of the mold.
Dimensions: 152 x 170 mm
Weight: 12,100 g

ROLLER COMPACTOR
EN 12697-33

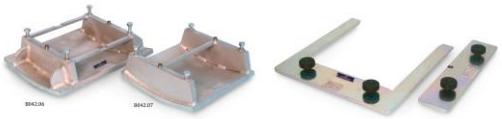
B042 This Roller Compactor entirely developed and manufactured by Group I&S, fully operates with the electro-mechanical system, and therefore it does not require any air source (compressor) or hydraulic pressure.
It is used to produce representative sample slabs of several dimensions of bituminous mixtures 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 compaction cycle can be programmed in accordance to a certain load or deformation value.
The flexibility of the program grants the production of samples with uniform density and dimensions, fully meeting Standards specifications and research requirements; these samples are compatible for rut test with Group I&S Wheel Tracking apparatus B043.
The sample slabs can be also cored or cut off to obtain cylinders and beams for bending fatigue, indirect tensile, static and dynamic creep, stiffness, and 4-point tests.

MAIN FEATURES:

- Sturdy frame made of steel
- Mould supporting table with alternating displacement system, for table displacement and vertical load pressure
- Integrated touch screen control unit based on Windows operating system**.** The control unit runs like a standard PC for the management and analysis of data, test results, graphs.
  The **touch-screen icon interface** allows an easy set up of the parameters and an immediate execution of the test.
- Direct Internet and Intranet (LAN) connection for remote technical assistance. This features allows operators to establish a remote communication and receive software updates or an immediate diagnostic analysis of the potential problem from Matest technicians.
- Unlimited memory storage with: 2 USB ports,1 SD card slot.
- Heating of the segment roller (optional)
- Simple and quick roller and mould positioning
- Perfect horizontal flatness of the slab surface
- Uniform density and dimensions of the slabs
- Easy to maintain

TECHNICAL SPECIFICATIONS:

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 Spec. and Research requirements.. A friendly and easy to use interface allows an immediate and fully automatic test execution, data acquisition and processing, test report and file.
The Roller Compactor is supplied **"without"** roller segment, slab mould, centering plate that must be ordered separately (see accessories).
Power supply: 230V 50/60Hz 1ph 2100W (3100W with the heated segment roller)↗



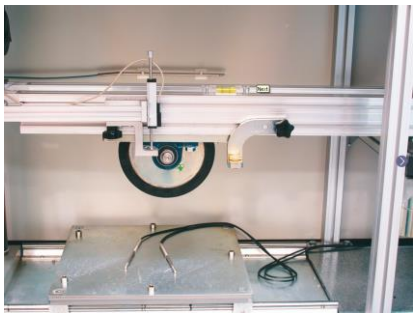
Dimensions: 2200x1030 xh 1880 mm (2410mm with opened guard)
Weight: 1300 kg

Heating of the Segment Roller

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 by:

ACCESORIOS:

Segmento de rodillo, dimensiones disponibles:
B044-04 Roller for 320x260mm mould
B044-05 Roller for 500x400mm mould
B044-06 Roller for 400x305mm mould
B044-07 Roller for 305x305mm mould
MOLDES para preparar placas de aglomerados:
B043-09 Mould for slabs 320x260x180mm
B043-10 Mould for slabs 305x305x50mm
B043-11 Mould for slabs 305x305x100mm
B043-12 Mould for slabs 400x305x50mm
B043-13 Mould for slabs 400x305x100mm
B043-18 Mould for slabs 500x400x180mm
B043.19 Mould for slabs 400x305x120 mm
B043.20 Mould for slabs 320x260x50 mm
B044.21 Centering plate for 400x305 mm mould
B044.22 Centering plate for 305x305 mm mould
B044.23 Centering plate for 320x260 mm mould
B044.15 Rolling vibrating device
B044.02 Control unit mounted in the Roller Compsctor, it foresees a thermoregulatory circuit, complete with probe to measure and to adjust the temperature from room up to 180ºC.
B044.03 Sliding cart heating option.
Thermoregulated circuit with temperature probe to set and control cart temperature and keep mould hot



Firmware

The multilingual testing firmware allows:
- Management and automatic control of machine and test.
- Setup of all test parameters.
- Test data acquisition and processing.
- Real time display of: number of cycles, rut depth, temperatures. Real time cycle rate will also be displayed when using a serial connection to PC
- Calibration menu for setting and checking all test data.
- From the control board, it is possible to select parameters, set data acquisition and processing according to EN and BS test procedures, with:
Identification data of the sample (slab) under test.
Cycle frequency.
Number of passes to end the test.
Max rut depth to end the test.
Sampling frequency of the rut depth.
Testing temperature.
Sample (slab) thickness.
The use of the B043 Wheel Tracker requires connection to a PC with Windows 98, 2000, XP minim

PLASTIC DEFORMATION RESISTANCE WHEEL TRACKING EN 12697-22/ BS 598:110

B043 This test, developed in laboratory, consists in 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 wheel tracking apparatus is used to simulate the effect of traffic and to measure the deformation susceptibility of the bituminous sample.
Wheel tracker performs the test as per procedures A and B (6 or 2 tests), clearly specified by the EN Standard.

Technical specifications

- The machine fully satisfies both EN 12697-22 and BS 598:110 Specifications.
- Travel of the table: 230 +/- 5 mm
- Table cycle frequency: adjustable 15 to 40 cycles per minute.
- Hard rubber tyred wheel having outside diameter 200 mm
- Wheel load on the sample: 700N +/-10N (EN 12697-22) or 520N (BS 598:110). The load is applied on the sample through a lever.
The effective load applied on the sample can be adjusted by micrometrical weights positioning.
- 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.
- The test frame is made of robust aluminium alloy and it is contained in a climatic cabinet with adjustable temperature from 30 to 65°C. +/- 1.0°C.
The cabinet is equipped with two doors with insulated glass for inspection
- The sample table has dimensions: 400 x 390 mm and can accept rectangular slabs of several sizes:
305 x 305 mm, 50 or 100 mm high
305 x 400 mm, 50 or 100 mm high
200 mm dia. core samples, 50 mm high
The sample confinement frames are not included and have to be ordered separately (see accessories)
- Wheel tracker accepts also samples with dimensions up to 400 x 500 mm, 180 mm high (this mould can be compacted with Group I&S Roller Compactor)
- The machine is supplied complete with adaptors for a correct mould positioning and locking
- The wheel tracker is equipped with 3 temperature probes:
1 probe, connected to the thermoregulator, for the control andadjustment of the cabinet temperature.
2 probes for temperature measurement inside the specimen.

Hardware

- Data acquisition and processing system fully managed by microprocessor.
- Multifunctions keyboard with encoder for easy and rapid setup.
- Large graphic display 320x240 pixel.
- RS 232 port for connection to PC.

Power supply: 230V 50/60Hz 1ph 2200W
Power rating of the table: 500 W
Dimensions: 1580 x 650 xh 1790 mm
Weight: 400 kg approx.

Accessories:
B045.01 Hardened specimen cylinder Ø100 mm complete with bottom plate
B045.02 Hardened specimen cylinder Ø150 mm complete with bottom plate.
B045.03 Hardened specimen cylinder Ø100 mm with holes for cold mix compaction, compete with bottom plate
B045.04 Hardened specimen cylinder Ø150 mm with holes for cold mix compaction, compete with bottom plate
B045.05 Top penetration piston Ø100 mm
B045.06 Top penetration piston Ø150 mm
B045.07 Filter Paper Ø100 mm (pack 100 units)
B045.08 Filter Paper Ø150 mm (pack 100 units)
B045.09 Pneumatic automatic specimen extruder
B045.11 Air compressor, low noise, 220v, 50 Hz.
B045.12 Vertical forcé testing device qith load ring
B045.14 Kit of 2 distance pieces of 105 and 115 mm high for the control of the height values measured by the linear transducer

GYRATORY COMPACTOR
EN 12697-10 / 126931 / ASTM D6925 / AASHTO T312 / SHRP M-002

B045 Gyratory compactor is used to simulate and reproduce actual conditions compaction operations in actual road pavement, thus determining the asphalt compaction properties.
Such compaction is achieved by the combination of rotary action and the resulting vertical force applied by mechanical force.
The compactor has a steel frame which ensures high rigidity excellent control angle.
The load is applied by an electro-pneumatic cylinder, controlled by a servo pressure regulator, the height is measured by a linear transducer.
Rotational movement is generated by a system which allows high precision eccentric easy to set accurately and steering angle.
The rotation speed is controlled by the control software via microprocessor.
The results obtained are also used in the investigation of the volumetric and mechanical characteristics of asphalt mixtures.

FEATURES

- Manufactured steel frame ensures rigidity adequate control angle.
- Electro-pneumatic servo-regulated by controlled
- Electronic control unit with touch screen, which works like a standard PC operating system based on Windows, allows easy parameter settings for immediate execution and automatic test, data acquisition, processing, and graphics files.

Unlimited memory storage

TECHNICAL SPECIFICATIONS:

- Mould Dimensions: diameter 100 and 150 mm, height of 0-200 mm for both molds.
- Swivel angle: adjustable from 0 to 2.4 °
- Number of cycles (rotary): Adjustable from 1-5000
- Rotation angle: adjustable from 5 to 60 working cycles / min (30 cycles per minute required by the Rules)
- The vertical load of 150 mm diameter at the sample: adjustable from 10 to 900 kPa (with a compressor 8 bar)
- The vertical load in samples 100 mm in diameter: Adjustable from 23 to 1500 kPa (7 bar compressor)
- The vertical load on the sample is automatically controlled and adjusted by the electronics.

Power supply: 220V, 50Hz., 1000W
Dimensions: 650x500xh1000mm
Weight: 235 kg approx.
Compressed air required, a minimum of 8 bar (must be ordered separately).
The gyratory compactor is supplied complete with standard height block, lubricants, power cord. (See accessories).

KUMAGAWA (SOXHELET) EXTRACTOR
EN 12697-1 / EN 13108 / LCPC CNR N. 38

B047 Designed to extract the bitumen emulsions. Assembly consists of a heating mantle, flask of 1000 ml capacity refrigerant balls, glass plug 25 and filter cartridge.
Power supply: 220V, 50 Hz

B048 Kumagawa extractor (Soxhelet) similar to mod. B047, but of 2 l. capacity.

Accessories:
B047.01 Filters cartridge Ø58x170 mm (25 pieces)
B048.01 Filters cartridge Ø80x200 mm (25 pieces)

DETERMINATION OF THE WATER SENSITIVITY OF BITUMINOUS MIXTURES UNE EN 12697-12

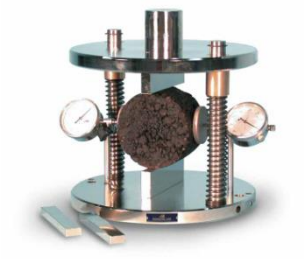
B032 Marshall Water bath rectangular thermostatic for crued 15 specimens. Interior made of stainless steel. Bridge adaptable thermostat with digital display on the edge of the bath; provided agitation system, heating and thermometer-thermostat that can regulate its temperature between ambient ± 5 ° C and 99.9 ° C. All elements are immersed stainless steel and has an adjustable flow lift pump 5 liters / min for circulation and agitation.
Supplied complete with digital electronic thermostat bath.
Useful dimension of the basin: 600 x 200 x 480 mm.
Single phase 220 V.

B033 Marshall thermostatic bath similar to above, but with the following dimensions:
480 x 200 x 290 mm.

Accessories:
V043 Cover slip resistance.

B050 Desktop team cooling, all stainless steel. Cooling constant without temperature control.
Hermetically sealed compressor with anti-vibration condenser and evaporator immersion in stainless steel AISI-316.
Immersion evaporator measures 32 mm x 160 mm long.
Hose 900 mm. long.
Equipment designed for cooling liquid in thermostatic baths which require a temperature below ambient.
For temperature control must be used in conjunction with an immersion thermostat.
Temperature range: Ambient to -10 ° C
Dimensions: 330x275x350 mm
Power supply: 220V, 50 Hz, 166 W
Weight: 14 Kg

NOTE: To perform this test need a press Marshall B029 or B030 and B031 indirect traction device.



B050 **B031**

B031 Used to measure the splitting tensile strength and the radial strain of a Marshall specimen dia 4" and 6", where a vertical load is applied. Supplied complete with knives to test specimens having dia. 4" and 6". Steel manufactured, plated against corrosion. As analog or digital gauges (not included)
Dimensions: dia. 248x270 mm
Weight: 14 kg

CONSISTENCY DETERMINATION, PENETRATION BITUMEN UNE EN 1426 / UNE 104281-1,4 / BS 2000 / ASTM D5, D217 / AASHTO T49 / NF T66-004

B052 Standard penetrometer 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. The standard penetrometer is ruggedly constructed, with an aluminium base table with levelling screws, plated vertical rod, "**micrometric vertical adjustment device**". The dial, graduated in 360° (division 0,1 mm.), has diameter of 150 mm. The penetrometer is supplied with stop and release push button, automatic zero set, micrometer adjustment, set of weights 50 and 100 g. penetration needle, brass sample cups dia. 55x35 mm and 70x45 mm.
Dimensions: 220x170x410 mm.
Weight: 11 kg

B052.10 Basically structured as mod. B052 but having a magnetic controller device with electronic digital programmable timer that automatically releases the plunger head and ensure free falling of the needle during the 5-seconds test.
Power supply: 230 V 1 ph 50/60 Hz 200 W
Dimensions: 220x280x410 mm.
Weight: 15 kg.

B053 B053.10

Accessories:
B052.01 Sample cup, brass made, dia 55x35 mmh.
B052.02 Sample cup, brass made, dia 70x45 mmh.
B052.03 Mirror for easy adjustment of the needle
B052.04 Ø1 Penetration needle, Ø1.00 mm
V9117 Termometer ASTM 17C (+19 ° C to 27 ° C).
B052.07 Termometer IP 38C (+23ºC to +26ºC) rad 0,1ºC
B052.05 Transfer dish, made from glass, with support

B053 Standard digital penetrometer 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. The standard penetrometer is ruggedly constructed, with an aluminium base table with levelling screws, plated vertical rod, "**micrometric vertical adjustment device**".
The slider is brass made with free fall. The digital readout of the penetration values has readings in mm and inch, with 0,01 mm resolution, LCD 5 digits display, with zero set in any position.
Power: 1,5V battery.
The penetrometer is supplied with stop and release push button, automatic zero set, micrometer adjustment, set of weights 50 and 100 g penetration needle, brass sample cups dia. 55x35 mm and 70x45 mm.
Dimensions: 220x170x410 mm Weight: 11 kg

B053 Semi-automatic digital penetrometer Basically structured as mod. B053 but having 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 1 ph 50/60 Hz 200 W
Dimensions: 220x280x410 mm
Weight: 15 kg

B055 Thermostatically controlled water bath for penetrometer
Provides water at the required temperature of 25 ±0,1°C.
The unit consists of a stainless steel water bath 10 litres capacity with wool insulation, immersion heater with digital thermostat, motor pump with connections, cooling coil device, current water operated, to maintain a constant temperature of the bath when room temperature is slightly higher. The bituminous sample is immersed into the water bath, and placed on the penetrometer only at the time of the test, by eventually using the transfer dish (accessory mod. B052-05).
Power supply: 230 V 1 ph 50/60 Hz 350 W
Dimensons: 375x335x420 mm
Weight: 12 kg

UNE EN 12697-18 / EN 13108
B058 Metal mesh basket 100 x 100 x 100 mm to determine the drainage of samples obtained at different bituminous mixtures with mineral aggregates or fine additive.
The basket is manufactured of stainless steel mesh Ø3 mm.
B058.01 Ray 160x160x10 mm made of galvanized steel

Breaking value of cationic bitumen emulsions. Mineral
EN 13075-1
B059 Breaking value of cationic bitumen emulsions. Mineral filler method.
Equipment for the determination of the breaking value of cationic emulsions, (manual version) comprising: Filler feeding pan, complete with support base and clamp, nickel
spatula, two round porcelain dishes.
Weight: 2 kg approx.
B059.05 Reference Filler container 25 kg
B059.06 Support base for stirrer
B059.10 Electric stirrer having 260 rpm., 230V 50 Hz I ph.
B059.11 Propeller for electric stirrer

IMMERSION COMPRESSION / SIMPLE COMPRESSION BITUMINOUS MIXTURES
ASTM D1047 / AASHTO T167
B060 Cylindrical steel mould with internal diameter of 101.6 x 177.8 mm high..
B061 Bottom piston, Ø 101.5 x 50.8 mm high.
B062 Top piston, Ø 101.5 x 201.6 mm high.
B063 Support with square section measuring 25 x 75 mm long.

DURIEZ TEST
ASTM D1047 / NF P98-251-1,4 / AASHTO T167
TEST FOR ASSESSING THE CHARACTERISTICS OF BITUMINOUS MIXTURE COMPONENTS
Two types of specimens Ø80 or 120 mm.
B065 Duriez Ø 80 mm mould
B066 Mould Base
B067 Piston
B068 Demoulding Cylinder

Complete Duriez test set for Ø 120 mm, including:
B069 Duriez Ø 120 mm mould
B070 Mould Base
B071 Piston
B072 Demoulding cylinder

THIN FILM AND LOSS ON HEATING DETERMINATION. TFOT METHOD
UNE EN 12607-2, 13303 / UNE 104.281 / ASTM D6, D1754 / BS 2000 / AASHTO T47, T179

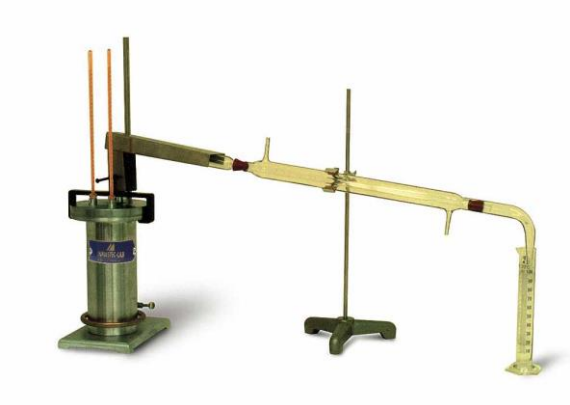
B075 Internal chamber and external frame all made from stainless steel, double wall insulation with fiberglass, double door. Temperature control by digital thermoregulator. The oven is equipped of a dual safety thermostat to prevent accidental over-heatings. The plate rotates at 5-6 rpm. Supplied complete with glass control thermometer ASTM 13C, +155 to +170°C subd 0.5°C.
The oven is supplied "without rotating shelf and accessories", that must be ordered separately.
Power supply: 230 V 1 ph 50 Hz 1500 W
Internal dimensions: 330x330x330 mm
Outside dimensions: 460x450x700 mm
Weight: 40 kg

THE OVEN MOD. B064 CAN BE EQUIPPED IN TWO VERSIONS, WITH THE FOLLOWING ACCESSORIES:

B075.01 Rotating shelf complete with 9 containers dia. 55x35 mm for the "Determination of Loss on Heating" to: EN 13303 / ASTM D 6 / BS 2000 / NF T066-011 / AASHTO T47 / CNR N° 50 / NF T066-011 - AASHTO T47 Standards.
B075-03 Rotating shelf, complete with 2 containers dia. 140x9,5 mm for the "Determination of Thin Film" to Standards: EN 12607-2 / ASTM D1754 / AASHTO T149 / UNE 7110.
Accessories:
B075.02 Brass container Ø 55 x 35 mm
B075.04 Aluminium rotating plate with two Ø 140 x 9.5 mm

ROLLING THIN-FILM OVEN ASTM / EN
EN 12607-1 / ASTM D2872 / AASHTO T240
B076 EFFECT OF HEAT AND AIR ON A MOVING FILM OF ASPHALT. RTFOT METHOD
Utilized to measure the air and heat effect on a moving film of asphaltic semisolid materials. External frame and internal chamber are stainless steel made with insulated fiberglass intermediate chamber.
Provided of large glass door for inspections. The oven must be connected to a suitable air pressure supply.
Supplied complete with precision digital thermostat to maintain 163°C temperature, control thermometer ASTM 13C, ventilation device, set of eight glass containers dia. 64x140 mm.
The oven is equipped of a dual safety thermostat to prevent accidental over-heatings.
Power supply: 230 V 1 ph 50 Hz 1700 W
Dimensions: 620x620x910 mm
Weight: 56 kg

Accessories:
B076.01 Capsules Ø64x140 mm glass
V9113 Thermometer ASTM 13C, range 155 ° to 170 ° C



DISTILLATION FLUIDIFIED BITUMEN
UNE EN 1431 / ASTM D402 / AASHTO T59
B092 Complete equipment for fluidified bitumen distillation consists of the following components:
B092.01 Distillation flask, capacity 500 mL
B092.02 Flask protection device
B092.03 Glass Liebig West condenser.
B092.04 Extension with 105° angle
V9118 Thermometer ASTM 8C (- 2 + 400 °C)
B092.05 100 ml specimen
B092.06 Container for residue 75 x 55 mm
V243 Bunsen gas burner
V284 Ring with bosshead to hold the flask
V255 Plate base support (2)

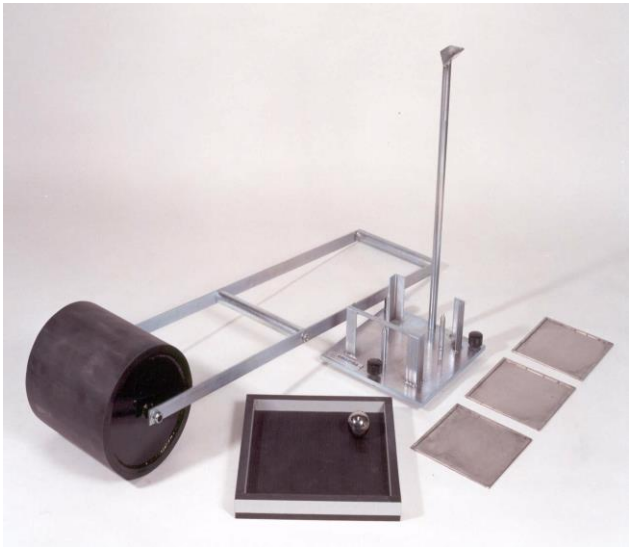
Bituminous emulsios:
Residue on sieving
EN 1429
B094 Sieve staninless steel, 75 mm dia, 0,5 mm opening
B095 Sieve staninless steel, 75 mm dia, 0,16 mm opening
B095.01 Cover stainless steel, 75 mm dia
B095.02 Pan stainless steel

COLLECT SAMPLES
ASTM D140 / AASHTO T40
B096 Bacon sampler for sampling within one asphalt tanker at different depths. The equipment consists of a cylindrical body with a lid at the top and one at the bottom and a tapered piston that acts as shut off valve. It has both at the top and at the bottom with holes for attaching a rope (not included) for introducing into the reservoir.
Capacity: 237 ml
Dimensions: Ø50x250 mm
Weight: 2 kg approx.

ASTM C188, C189/ BS 812
RELATIVE DENSITY FILLER
B097 Pycnometer manufactured in glass 250 ml capacity. It has deep concavities facilitate stirring of the sample.
Length: 250 mm approx.
V6225 Funnel German form of short branch Ø100 mm

VIALIT BINDER ADHESION TEST
UNE EN 12272-3 / NF P98-274-1

B099 Equipment Vialit board to evaluate the adhesion property of aggregates of bitumen on the rolling surface of rolled asphalt.
A metallic base formed by three rods with sharp vertical supports on which the test plate, a vertical metal bar 500 mm. high with a superior device to the ball drop, ball 500 gr. steel test three steel plates and a rubber covered roller compaction drag manual.



Accessories:
B099.01 500 g steel ball
B099.02 Metal plate test
B099.03 Stainless steel basket 3 mm mesh and 500 g of capacity.

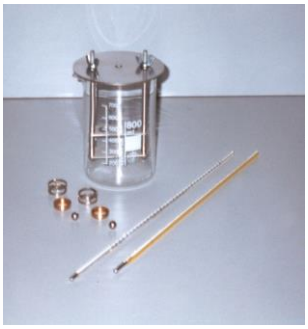
AUTOMATIC DIGITAL PENETROMETER
EN 1426 / ASTM D5 / BS 2000 / NF T66-004 / NLT 124 / AASHTO T49 / UNI 4162 / UNE 7013 / CNR N° 24

B100 Digital measure of the penetration values.
Measuring range: 50 mm, sens. 0,01 mm
Motorized approach of the needle, driven by camera (needle diameter = 5 mm on the monitor).
Electric control of the approach.
Electromechanical release and locking device of the needle.
Motorized return of the needle.
USB port for printer or PC connection (with the accessory B100.01)
Supplied complete with **automatic plunger with conductivity detection kit,** needle, weights, sample cups.
Power supply: 230V 1 ph 50 Hz
Dimensions: 260 x 320 x 540 mm. Weight : 23 kg

BITUMINOUS SLURRIES ABRASION MACHINE
UNE EN 12274-5 / NLT 320/87 / ASTM D 3910

B102 Apparatus wet abrasion bituminous slurries. Is designed to determine the wear resistance of bituminous slurries used in road construction. The equipment consists of a thermostatic bath to immerse the specimen and the abrasion head planetary rotation. The thermostatic bath (optional) is controlled by a thermostat type out - overboard. Temperature control is programmable via the digital microprocessor. The abrasion mechanism, a planetary motion to print head abrasion. Abrasion time is programmed and operated by the user.
The unit is supplied with three annular test molds of different sizes.
External dimensions: 500 x 700 x 440 mm
Power supply: 220 V 50 Hz
B102.01 NLT 320 Set de moldes 6,3 a 8,2 de 10,5 mm altura.
B102.02 Set molds 6,3 - 10 - 13 19 mm height EN 12274-5

B102.06 Tthermostatic stirrer with temperature control



RING AND BALL SOFTENING POINT APPARATUS EN-1427 / ASTM D36 / AASHTO T53 / DIN 52011 / BS 2000

B105 Equipment for determining ring and ball softening point of the bitumen. Formed by a stainless steel bracket height adjustable, two rings, two centering guides, steel balls and two 800 ml beaker. Capacity is low.

Accessories:
V9115 ASTM 15C thermometer
V9116 ASTM 16C thermometer
B105.01 Centring guides
B105.02 Tapered rings
B105.03 Stell ball
V243 Bunsen burner
V265 Metal fabric with ceramic fibres, 120 x 120 mm
V281 Tripod round ring Ø 100 mm.
V111 Magnetic stirrer with heating

Automatic Digital Ring ball apparatus EN 1427 / ASTM D36, E28 / IP58 / DIN 52011 / ISO 4625 / NFT 66008

B106 This "high tecnology" digital microprocessor tester, automatically determines the softening point of asphalts and pitches.
Two laser sensors detect the balls fall determining the softening point.
The bath temperature is measured by an electronic system maintaining the gradient (5°C./min) as specified by the Standards.
Real time visualization of the Temperature (°C)-Time (sec) graph along the entire test.
A magnetic stirrer with electronic speed adjustment from 0 to 160 rpm also ensures an uniform temperature in the vessel during the test execution.
The touch-screen graphical interface allows an easy set up of the parameters and the immediate execution of the test.
High resolution color display, 1/4 VGA, offers all the functions of a PC for the management and analysis of data, test results, and graphs.

Main Functions:
Touch-Screen display like a normal PC
Unlimited memory
Multilanguage selection
Microprocessor friendly-driven menu to control all the test phases
Top quality components: laser sensors, electronic magnetic stirrer, ceramic-glass heating plate
Fully automatic
Two test parameters can be selected by the microprocessor menu:
- test on boiled distilled water for softening point from 30 to 80°C.
- Test on glycerol for softening point from 80 up to 150°C.
Language selection: English, French, Spanish, German, Italian, Polish, Russian, Greek, Portuguese, Dutch.
Functions of: clock calendar, test number, user/customer name, general notes, start/end of the test.
Real time visualisation of the bath temperature, test progress, rpm of the stirrer. **Unlimited memory, with possibility to save data onto an external memory (USB pendrive, SD card) and then edit them through an Excel spreadsheet.** ↗

The tester is basically composed by:
- Ceramic-glass heating plate with automatic cut off at the end of the test cycle.
- Motherboard with microprocessor, which controls: heater/stirrer, temperature probe, laser sensors, pre-heating phase of the plate, and memorizes all the test parameters.
- Steel balls centering device.
Power supply: 230V 1ph 50/60Hz 700W
Dimensions: 500x350xh550 mm
Weight: 20 kg approx.

ACCESSORY:
B106.11 Rods with spherical ends (set of 2 pieces). For checking and calibration **of the instrument.**

SPARE PARTS for B106:
B105.01 Brass centring guide, chromed
B105.02 Brass tapered ring, chromed
B105.03 Steel ball 9,5 mmm dia.
V6807 Glass beaker 800 ml.

CLEVELAND OPEN CAP FLASH AND FIRE POINT TESTER
UNE 51023 / EN 22592 / ASTM D92 / BS 4689 / AASHTO 48

B109 Cleveland electrically heated apparatus for determining the flash and fire points of lubrificated oils and petroleum products.
Complete with brass cup, thermometer IP 28C (ASTM 11C) range -6 +400°C., electric heater with thermoregulator, double line fuse.
Supplied "without" flame gas device to be ordered separately.
Power supply: 230V 1ph 50/60Hz 600W
Weight: 10 kg

B110 Flame gas device, complete with gas-stop valve controlled by a flame sensor and maximum thermostat with reset button.
It can be sold in CE markets, but not usable in closed spaces.

B110 **B111**

ASTM D1310, D3143

B110 Tag open-cup viscometer for determining of open cup flash points of volatile flammable materials having flash points between 0 and 175 °F.
Supplied complete with cup, water bath, thermoregulated heating device, thermometers ASTM 9C -5 to +110°C and ASTM 57C -20 to +50°C.
Power supply: 230 V 1 ph 50 Hz 600 W.
Dimensions: 200x300x400 mm approx.
Weight: 6 kg.

B111 Tag clossed-cup viscometer, Flash Point ASTM D56 / API 509

PRESSURE AGEING VESSEL (PAV3)
EN 14769 / AASHTO R28 / ASTM D652

B112 The unit has been developed to simulate the accelerated ageing of bitumen and bituminous binders after 5 to 10 years. The sample is exposed to high pressure and temperature for 20 hours, to simulate the effect of a long time oxidative ageing by verifying the penetration and softening point characteristics.

PAV3 features include:
- Touch screen controller with front panel user interface with easy to use step-thru operation.
- Bench top unit with integral vessel/oven design.
- USB port on front unit with software upgrades and data storage.
- Remote capabilities: with APP control PAV with smart phone, tablet or IPad.
- Timer to set time and date for automatic preheat.

Construction: CE certified vertical stainless steel pressure vessel with encased band heaters and integral pressure measurement control.
Temperature is measured by Platinum RTD.

Specifications:
- Operating pressure: 2.1 +/- 0.1 Mpa
- Temperature range: 80°C to 115°C, res: 0.1°C
- Test temperature uniformity: +/- 0.5°C
- Time to return to set point temperature: less than 60 min.

The unit is supplied complete with:
10 specimen pans AASHTO T179; O-Ring; precision anodized aluminum sample rack; Hex socket wrench; specimen loading/unloading tool; single stage regulator; high pressure hose assembly; instruction manual. Power supply: 230V 1Ph 50/60Hz 10A
Dimensions: 760x460x700 mm.
Weight: 130 kg
NOTE: a source of compressed air with a pressure of at least 325 psi and a pressure regulator is required to operate the PAV3

Vacuum Degassing Oven for PAV

B112.01 For degassing pressure aged binder samples to precisely and accurately meet ASTM D6521 and AASHTO R28 Standards.
Stainless steel construction, hinged lid to conserve space and access the vacuum chamber, holds up to 4 specimen containers.
Self-contained automatic vacuum system, high precision digital display controller indicating: time, temperature, current stage of each process.
It maintains temperature up to 170°C with accuracy +/- 5°C
Power supply: 230V 1ph 50Hz.
Dimensions: 610x400x305 mm
Weight: 60 kg approx.

SAYBOLT DIGITAL VISCOMETER
ASTM D88 / UNE 7066, 51021 / AASHTO T72

B118 Saybolt viscometer used to determine the viscosity of petroleum products at specified temperatures between 70 to 210 °F. Stainless steel made, the Saybolt viscometer is supplied complete with two interchangeable orifices “Furol” and “Universal”, oil bath, electric heater with digital thermoregulator, stirrer, cooling coil, viscosity flask.
Thermometers, filter funnel, withdrawal tube **“are not included”** and must be ordered separately.
The viscometer is equipped of a dual safety thermostat to prevent accidental over-heatings.
Power supply: 230 V 1 ph 50 Hz 500 W
Dimensions: 270x270x550 mm.
Weight: 12 Kg
B118.01 Furol orifice
B118.02 Universal orifice
B118.03 Saybolt flask 60 ml capacity
V9117 Thermometer ASTM 17C (+19 º to +27 º C) x 0.1 ° C
V9118 Thermometer ASTM 17C (+34 º to +42 º C) x 0.1 ° C
V9119 Thermometer ASTM 17C (+49 º to +57 º C) x 0.1 ° C
V9120 Thermometer ASTM 17C (+57 º to +65 º C) x 0.1 ° C
V9121 Thermometer ASTM 17C (+79 º to +87 º C) x 0.1 ° C
V9122 Thermometer ASTM 17C (+95 º to +103 º C) x 0.1 ° C

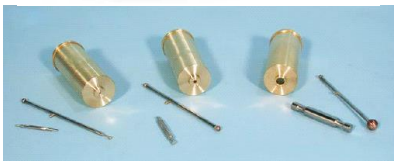
TWO TUBE SAYBOLT VISCOMETER

B119 Saybolt viscometer with digital Basically structured as mod. B087 but with two tubes.
Supplied complete except thermometers, filter funnel and withdrawal tube.
Power supply: 220 - 240V 50 Hz, 500 W.
Dimensions: 270 x 270 x 550 mm.
Weight: 16 kg

PENSKY-MARTENS DIGITAL FLASH POINT TESTER
EN 22719 / ASTM D93 / AASHTO T73 / IP 34, 35 / ISO 2719

B120 Used for the determination of the flash point of petroleum products by the Closed Cup Test, with a Flash Point between 40°C to 360°C.
Supplied complete with stirrer, shield for radiations, cast iron bath, electric heater with digital thermoregulator two thermometers ASTM 9C -5 + 110°C div. 0,5 C, and ASTM 10C +90 +370°C div. 2°C.
The stirrer allows to perform both "A" and "B" methods.
The tester is equipped of a gas flame feeder.
Power supply: 230 V 1 ph 50 Hz 600 W.
Weight: 10 kg

EFFLUX VISCOMETER STANDARD TAR (BRTA, REDWOOD)
EN 12846 / EN 12846-02 / En 13357 / IP 184 / NF T66-005 / BS 2000
B125 Used to determine 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.
The viscometer is equipped of a dual safety thermostat to prevent accidental over-temperatures.
Supplied with control glass thermometer IP 8C, range 0 - 45°C., subd. 0,2°C., graduated glass cylinder 100ml capacity.
Supplied **"without"** Cup, Go/not go gauge, ball valve to be ordered separately (see accessories).
Power supply: 230V 50/60Hz 1ph 300W
Dimensions: 265 x 270 x 550 mm.
Weight: 12 kg



B126 TWO PLACES STANDARD TAR (BRTA, REDWOOD) DIGITAL VISCOMETER

Accessories:
Standard: EN, NF, IP
B126.01 Go/not go gauge for dia. 4 mm orifice
B126.02 Cup with orifice dia. 4 mm.
B126.03 Ball valve dia. 4 mm.

Standard: EN, NF, IP, BS
B126.04 Go/not go gauge for dia. 10 mm orifice
B126.05 Cup with orifice dia. 10 mm
B126.06 Ball valve dia. 10 mm.

Standard: EN 12846
B126.07 Go/not go gauge for dia. 2 mm orifice
B126.08 Cup with orifice dia. 2 mm..
B126.09 Ball valve dia. 2 mm.

EN 12847/ NLT 140/ IP 485
SEDIMENTATION OF BITUMINOUS EMULSIONS
B127 The glass tube has 41,5 mm inside dia. by 115 mm height, and a fused-on glass filter with holes size between 0,160 and 0,250 mm is fitted.
Weight: 300 g approx.

ENGLER DIGITAL VISCOMETER
ASTM D940, D1665 / AASHTO T54 / BS 2000 / NF T66-020 / CNR Nº102

B128 Engler viscometer to use to compare the specific viscosity of road-oils and tars to the viscosity of water. It consists of a water bath complete with digital precision thermoregulator, electric stirrer, cooling device, Engler flask. The viscometer is equipped of a dual safety thermostat to
prevent accidental over-temperatures.
Power supply: 230 V 1 ph 50 Hz 300 W
Dimensions: 265x270x550 mm.
Weight: 12 kg

B129 Engler digital viscometer Two elements
Basically structured as mod B128 but having “Two elements”, electrically operated, supplied complete. Weight: 20 Kg.

Common accessories:
V9123 Thermometer ASTM 23C rang +18 +28ºC.
V9124 Thermometer ASTM 24C rang +39 +59ºC.
V9125 Thermometer ASTM 25C rang +95 + 105ºC.
B326.01 Kohlraush calibration flask 200 ml capacity
B129.01 Engler testing flask
B129.02 Graduated cylinder, glass with spout, cap. 25 ml. Hexagonal base.
B129.03 Graduated cylinder, glass with spout, cap. 100 ml. Hexagonal base.

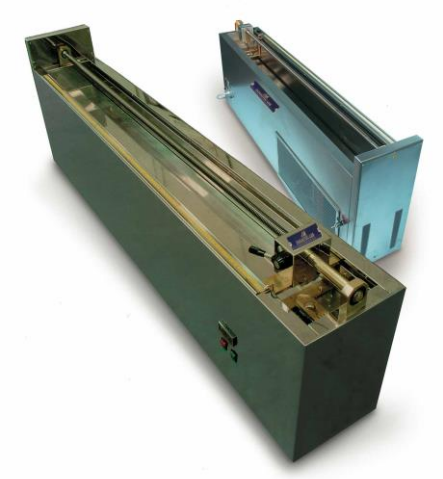
BROOKFIELD VISCOMETER
UNE EN 13302 / ASTM D3205, 4402 / CENTC 19

B130 Programmable digital rotational viscometer to determine the viscosity of bitumen. The machine operates by rotating a cylinder or spindle which is immersed in the material analyzed by measuring the resistance of this substance at a selected speed. The resulting resistance or torque flow is a measure of viscosity, depending on the velocity and characteristics of the spindle according to rule. The team has a record of research and development PC. Assays easily automated with Rheocalc software Wingather or for subsequent analysis. Sensor and display on screen in continuous time function controlled trials countdown clock. The display shows the torque calculation of viscosity (cPs or mPas), temperature% torque (Torque or scale Brookfield), and spindle speed in use. Choose from 54 different speeds. Displaying the maximum measurable viscosity for each spindle-speed combination.
Resolution:
Measuring range: 100-40.000.000 cP or mPa
Repeatability: 0.2%
Accuracy: ± 1% of range
Power supply: 220 V, 50 Hz

DUCTILITY AND BREAKPOINT
UNE EN 13589, 13398 / AASHTO T51 / ASTM D113 / NFT66-006 / CNR Nº 44
B122 Ductilómetro to determine the elongation of a bituminous specimen, that is to say, the distance to which a briquette of molten bitumen can be extended under controlled conditions, before its breaking. The Ductilometer basically consists of a moving carriage travelling along
guide ways. The carriage is driven by an electrical motor, inside a large tank which is fitted with digital thermostat, immersion electric heater, cooling coil for cold water circulation and pump unit. This model works in an automatic way at a speed of 50 mm/min. and its max. stroke is 1500 mm. The tank and the external frame are all made from stainless steel with fibreglass insulation. Water bath temperature is maintaned constant at 25°C ± 0,5°C. by a digital thermoregulator. The unit is equipped of a dual safety thermostat to prevent accidental over-temperatures.
Max. traction force: 300 N, accuracy: ± 0,1 N
The ductilometer can accept up to 3 specimens simultaneously.
Supplied complete "**except**" for the briquette mould and base plate that must be ordered separately (see accessories).
Power supply: 230V 1 ph 50 Hz 1000 W
Dimensions: 2140x350x400 mm Weight: 95 kg

Accessories:
B122.01 Used to prepare the specimen, it is brass made, accurately machined. StandardS ASTM and AASHTO Supplied without base plate. Weight: 300 g.
B122.02 Base plate for ductility mould
B122.04 Ductility briquete mould standard EN 13398. Used to prepare the specimen, it is brass made, accurately machined. Supplied without base plate. Weight: 300 g
B122.05 Ductility briquete mould Standard EN 13589. Used to prepare the specimen, it is brass made, accurately machined. Supplied without base plate. Weight: 300 g

B123 Ductilometer with cooling system. Same as for mod. B122 but equipped with incorporated refrigerating unit for tests with water temperature from + 5° to + 25°C.
Dimensions: 2140x350x750 mm. Weight: 130 kg
B122.10 Ductilometer with data acquisition system Technical and mechanical specifications: same to mod. B122, but upgraded with:
- Evolution data acquisition and processing system, "colour touch screen display" 1/4 VGA, 24 bit resolution. It automatically performs data acquisition and processing. Directly connected to printer (accessory) via USB it prints the test certificate. Equipped with slots for external pendrive or SD card infinite memory support with direct connection to PC.
- One electric load cell 50 N capacity complete with installation and calibration. (Possibility to install up to 3 cells). Supplied "**without**" briquette mould and base (see accessories).
B122.15 Load cell electric, 50 N capacity, complete with installation and calibration (possibility to install up to 3 cells).
B122.16 Refrigerating unit, incorporated into the machine, for tests with water temperature from +5°C to +25°C.



B122/B123

B122.10

ASPHALT SAMPLES VACUUM DRYING DEVICE
ASTM D7227 / AASHTO PP75

The device is a vacuum drying device specifically designed for rapid drying of compacted asphalt cores and samples. The quick and accurate dry weight, helps contractors determine pavement density close to real time and make adjustments to rolling pattern and material if necessary.
It can also provide a matching baseline for density comparison between contractors and agencies.
The device dries specimens near room temperature, ensuring sample integrity and the most accurate & repeatable dry weight. Rapid moisture loss is attributed to electronic desiccation and high vacuum technologies.
The system cycles a flow of ambient air and vacuum, ensuring a highly efficient moisture removal process.
The state-of-the-art and patented thermoelectric cold trap is specifically designed to protect the vacuum pump from damage by capturing moisture extracted from the sample.
Vacuum Pump: 1 HP
Power supply: 230V 1ph 50Hz 1650W
Dimensions: 810x600x880 mm
Weight: 77 kg

BBR – BENDING BEAM RHEOMETER
AASHTO T313 / ASTM D6648

B130 Bending Beam Rheometer is engineered to perform flexural tests on asphalt binder and similar specimens. These tests consist of a constant force being applied to a specimen in a chilled bath in order to derive specific rates of deformation at various temperatures.
TEST FRAME:
- Three-point bend test apparatus
- Integral stainless steel frictionless construction
- Load cell 500 g with mechanical overload protection
- Linear Variable Displacement Transducer (LVDT) 0.25 in (6,35 mm)
- Two independent platinum RTD for precise temperature control
- Liquid bath:
stainless steel construction
temperature range: -40 to 25°C
mechanical refrigeration system
cooling coil located within the test bath
no pumping required. Cools Ethylene Glycol - water - methanol mix (recommended for safety) to -40°C.
- Compressed air: 0.34 MPa clean, dry air supply required
- CE certified model
SOFTWARE:
- Control, acquisition and analysis software
- BBR Software version 4.16W
- Computer interface card
- Menu driven program, mouse compatible
- Daily calibration routines
- Displays and graphs real time load, displacement and bath temperature
The BBR System includes: complete calibration kit with carrying case, 5 specimen molds with accessories, PC, accessories.
Power supply: 230V 1ph 50/60Hz
Weight: 110 kg approx.

PARTICLE CHARGE TESTER
B134 Apparatus for determining the particle charge in bitumen emulsions.
The equipment comprises:
Miliammeter scale up to 12V DC. On support base
Variable-resistance
Two stainless steel electrodes
Insulating device
Dimensions: 140x200x270 mm.
Power supply: 230V, 50 Hz.
Weight: 2,200 kg

COHESION TESTER
UNE EN 12274-4 / ASTM D3910
B135 This instrument is used for cohesion tests on the mix, and to determine the proper consistency or mix design for a slurry seal mixture.
The pneumatic cylinder incorporated into the unit applies a pressure to the sample. A hand torque tester supplied with the cohesion tunit, measures the torquing strength by determining the complete solidification of the mix.
Supplied complete with 5 moulds dia. 60 x h 6 mm, 5 moulds dia. 60 x h 10 mm, accessories, spare parts.
To perform the test an air pressure source is needed.
Dimensions: 400x250x300 mm approx.
Weight: 20 kg approx

ACCESSORIES:
B045.11 Air Compressor. 230V, 50Hz 1 ph.
Square mould with 4 holes to prepare the sample:
B135.12 Mould 140x140x6,3 mm
B135.13 Mould 140x140x10 mm
B135.14 Mould 200x200x13 mm
B135.15 Mould 200x200x19 mm

SPARE PARTS:
B135.16 Mould dia 60xh6 mm (5 pieces)
B135.17 Mould dia 60xh10 mm (5 pieces)

SAND PATCH EQUIPMENT
EN 13036-1 / ASTM E965 / CNR N. 94 / NF P98 216-1
B136 Road and airfield surface characteristics.
Measurement of pavement surface to determine the average macrotexture depth using a volumetric patch technique.
The equipment comprises:
- Spreader disc with handle and rubber coated surface.
- Wind shield
- Soft and wire brushes.
- Screw-adjusted compass 300 mm graduated rule.
- Metallic cylinder for spheres volume measurement.
- Two glass pyknometers with metallic screw top and pouring hole
- Three graduated cylinders 10, 25 and 50 ml cap.
- Knee-guard
- Carrying case

Weight. 4 kg approx.

V215

V218

V217

V215 Thermometer with digital display, ranges -50 º to 250 º C. With 200 mm rod to puncture. Resolution 0.1 º C to -19.9 º C to 150 º C., rest 1 º C.
V216 Thermometer with digital display, ranges -40 to 200 ° C. With 180 mm rod to puncture. Movable head. Resolution 0.1 º C to -19.9 º C to 150 º C., rest 1 º C.
V217 Thermometer with digital display, ranges -50 º to 150 º C. With 110 mm probe to puncture.

V218 Thermometer with digital display, for temperatures from -50 ° to +1000 ° C. Possibility of connecting 2 sensors, resolution 0.1 ° C. up 199.9 ° C, remaining 1 º C.
Accessories:
V219 Probe immersion / penetratio
V220 Surface Probe
V218.01 Protective cover

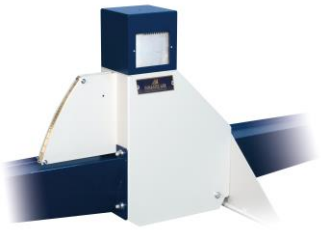
C078 Corer probe electric aluminum double column of 580 mm. of stroke, feed per worm gear, with foot balance column and bolts and bearings for drilling at angles. Equipped with electric geared motor three speeds, drill from 50-205 mm diameter.
Power supply: 220-240V, 50 Hz
Weight: 100 kg approx.

Accessories:
C078.01 Diamond Crown Ø 50 mm.
C078.02 Diamond Crown Ø 75 mm.
C078.03 Diamond Crown Ø 100 mm.
C078.04 Diamond Crown Ø 150 mm.

C079 Core drilling machines “high performance”
This rugged, compact and por table machine with vertical screw feed, is used for pavement core sampling where it is not easy to get electrical power.
Petrol engine 5 HP power, 4-cycle Briggs & Stratton model.
Dimensions: 850x580x1230 mm
Weight: 135 Kg.
C079.02 Pavement core drilling machine 12,5HP 4-stroke petrol engine, Same to mod. C319, but activated by a petrol engine 12,5 HP power 4-stroke Briggs & Stratton model.
Weight: 150 Kg

TEST PAVEMENT
UNE EN 13036-7
B137 Mobile ruler approximately 3 m long to measure road irregularities. Manufactured from aluminium alloy. Two graduated wedges are used together.

Accessories:
B137.01 Graduated wedge



TRAVELLING BEAM DEVICE
B138 Used to detect and check any irregularity in both bituminous and concrete road surfaces. The unit consists essentially of a 3 metre long beam fixed on two rigid wheels at the extremities. In the middle of the beam a sensing unit comprising a wheel connected to an indicator provides a magnification of 4:1 and measures deviations of the surface. The deviations are shown on a scale calibrated in increments of 2 mm up to 10 mm and 5 mm up to 25 mm. The beam is supplied as three sub-assemblies which are quickly assembled on site.
Weight: 55 kg approx.

B138.02 Pack of 10 chart rolls for approx. 1000 metre run
B138.03 Pen nibs (10 units).
Accessories:
B138.01 When connected to the Travelling Beam Device mod. B138, it provides a permanent record of the surface profile. It records up to 1000 metre surface on the special chart paper rolls.Supplied complete with 10 chart rolls and 2 fibre-tipped pens.

AASHOT T256-77
B139 Benkelman beam to measure elastic flexible surface under the action of the load. The beam is positioned between the wheels of the vehicle and in contact with the pavement. Flexibility is measured when the vehicle passes over the test area. Made of lightweight aluminum. Beam length 2440 mm. and extension of 1220 mm.
Weight: 15 kg

B140

B140 Calibration device with analog gauge to Benkelman beam

B139

LOAD BEARING PLATE
UNE 103.308 / NLT-357/98 / UNE 7391 / ASTM D1194, D1195, D1196 / BS 1377-9
S170 Assay plate 200 KN load capacity, to determine the load capacity of a soil in static load conditions and for use together with the Benkelman beam. The team consists of the following elements:
• 1 300 mm plate. Ø, surface plate 700 mm2.
• 1 plate Ø 600 mm.
• 1 Piston 20 Tm. and 100 mm. route.
• 1 manual piston pump.
• 1 pressure hose 3 m. Quick plug
• 3 Magnetic media for holding the comparator
• comparators 3 30 x 0.01 mm.
• 1 swivel coupling
• Reference 1 Bridge. (tripod)
• Cases
S171 Load cell capacity of 200 KN and engageable in the module plate with display and buttons of force membrane (TM or KN) pressure (Kg / cm ² or mPa) and button size of the plates 300, 600 and 762 mm. has reset button. Direct reading and rechargeable
S172 Module 4 channel control with display and membrane buttons for strength (TM or KN), pressure (Kg / cm ² or MPa) and deformation to the plates 300, 600 and 762 mm. has reset button, memory, rechargeable battery and direct reading
S173 plate Ø 762 mm. for load plate with handles
S174 Square plate300 mm. load plate according to UNE 7391
V361 Digital Comparator 0-30 mm capacity and resolution 0.01 mm.
V360 Digital Comparator 0 to 12.5 mm capacity and resolution 0.01 mm. with data output
S175 Potentiometric sensor tip 25 mm and spring
S170.05 ENAC officially certified calibration for the load cell load plate.

MUFFLE FURNACE HIGH TEMPERATURE

Muffle furnace up to 1800 ° C. PAD execution allows for the control and automatic regulation of the temperature by means of a pyrometer connected to the digital-type automatic regulator.
This model is designed with the most advanced technical fiber types and elements calorification insulating current market, allowing you to get a very high temperature scale in remarkably short time. Fiber plates which form the sides and roof of the chamber are supported and are anchored on dual chamber ceramic refractory plates of the same type as the sill plate.
Uniformity ± 5%. Stability ± 2 º C.
External insulation for double chamber with forced air circulation.
Scheduler ramps 4 programs 15 segments.
Automatic digital pyrometer. microprocessor, ↗

Alarm, PID parameters. Nonvolatile memory.
Manufactured under EEC standards.
Security alarm on temperature.

CODE	Interior Dimensions mm H x W x D	External dimensions mm H x W x D	Maximum temperature º C	Power Kw	Power supply
V340	100 x 140 x 154	600 x 550 x 600	1350	4	220
V341	140 x 170 x 300	700 x 700 x 800	1375	6	220
V342	140 x 170 x 300	700 x 700 x 800	1450	7	220
V343	120 x 175 x 250	650 x 950 x 700	1450	6	220
V344	100 x 130 x 250	650 x 950 x 700	1525	7	220
V345	100 x 130 x 250	650 x 950 x 700	1650	6	220
V346	250 x 250 x 260	650 x 1000 x 800	1650	10	220
V347	150 x 150 x 150	800 x 550 x 600	1650	5	220
V348	150 x 150 x 150	800 x 550 x 600	1700	6	220
V349	250 x 250 x 260	1000 x 600 x 700	1700	10	220
V350	150 x 150 x 150	800 x 550 x 600	1800	6	220
V351	250 x 250 x 260	1000 x 600 x 700	1800	10	220
V352	400 x 400 x 400	2100 x 850 x 1000	1600-1700-1800	30	380III
V353	450 x 450 x 450	2150 x 1000 x 1200	1600-1700-1800	40	380III
V354	600 x 600 x 600	2100 x 900 x 1400	1600-1700-1800	50	380 III

MUFFLE FURNACE AT 1200 ° C.

Muffle furnace up to 1200 ° C. allows for the control and automatic regulation of the temperature by a pyrometer connected to the digital-type automatic regulator.
Microprocessor control system for programming functions and temperature ramps at different times,
Manufactured under CE standards.
Safety switch
Security alarm.
Type K Thermocouple

1200ºC

Referencia	V355	V356	V357
Chamber Interior: H x W x D	100 mm 150 mm 200 mm.	150 mm 200 mm 300 mm	200 mm 280 mm 400 mm
External Dimensions: H x W x D	505 mm 460 mm 560 mm	700 mm 550 mm 800 mm	750 mm 600 mm 900 mm
Power supply	220 V	220 V	220 V

GROUP I&S