ASFALTI TEST

With a combined 80 years' experience, the Asphalt division of CONTROLS and IPC Global are pioneers and global leaders in construction material testing and dynamic asphalt test equipment. This know-how and experience has been accumulated in collaboration with the academic world and major international laboratories, as well as an active participation in trade associations and reference Standard organizations from around the world.

Superpave™ methods are directing the market of asphalt pavement testing towards more advanced systems and the new division is aligned with these requirements.

Contents

ASPHALT TESTING

ADVANCED SERIES

Automatic Closed-System Asphalt Analyzer

75-PV50A15

For the quantitative determinations of bitumen in hot-mixed paving mixtures for specification acceptance, service evaluation, control and research.

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

PAVELAB50

STANDARD

ASTM D8179 ▸ EN 12697-1

Operating principle

The asphalt sample (maximum 3.5 kg) is placed in a washing drum lined with a sinthered multilayer mesh and it is fitted into the washing chamber. Bitumen and filler are separated from the sample by washing with solvent and ultrasonic motion. The mixture of filler/bitumen/solvent is then centrifuged and the filler is separated. 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 Pave Analyzer shall be connected to a suitable water cooling unit to feed the three different cooling coils of the apparatus.

MAIN FEATURES

» Fully automatic test cycle:
- Washing of the asphalt sample (up to 3.5 kg) with solvent and ultrasonic motion, with simultaneous heating and rotation of the drum lined with screening mesh
- High speed extraction centrifuge for separation of filler from binder solution
- Condensation of solvent vapour in a stainless steel tank including cooling coil
- Automatic recovery of solvent by a continuous distillation process
- Easy binder recovery for further tests such as penetration, softening point, etc.
- Fast connection for rotary evaporator flask available an option
- Extraction time reduced to approx. 55 minutes (including drying)

» No toxic fumes in the laboratory, conforming to latest anti-pollution requirements

» 7" touchscreen swinging panel

» Version incorporating a balance for an accurate measurement of asphalt sample (10 Kg ± 0.1 g) also available

» High extraction capacity: up to 300 g of filler for each extraction

» Automatic sample drying after extraction

» Silent operation

Automatic closed-system asphalt analyzer with open chambers

Water cooling system. (Accessory)

7" touchscreen swinging panel displays the operating stage and recorded data.

Placing the centrifuge cup into the centrifuge unit

Introduction of the washing drum

Detail of fast connection for Rotary evaporation flask, for bitumen solution sampling. (Accessory)

BITUMAX
Asphalt binder analyzer by ignition method

STANDARD

▸ EN 12697-39 ▸ ASTM D6307 ▸ AASHTO T308/TP53

The Asphalt binder analyzer essentially consists of a high precision apparatus combining an ignition oven to a continuous weighing system to monitor the loss of weight of the asphalt sample and to automatically determine, at the end of the test, the binder content and percentage. An independently controlled auxiliary afterburner chamber significantly reduces the furnace emissions.

The Analyzer is supplied complete with double sample basket/safety cover, extraction fork and 3 meters of metal exhaust pipe.

Specifications

- 240 x 128 pixel large graphic display
- Weighing system 10000 g capacity, 0.1 g resolution
- High quality stainless steel internal chamber
- Sample size up to 4500 g for a more representative test result
- Maximum power rating: 10 kW
- Holding power during the test: 3.5 kW
- Safety features: automatic door lock during the test even if the power is interrupted; Door closure is automatically monitored before the test starts

Overall dimensions:
- width: 640 mm
- depth: 900 mm
- height (without external pipe): 960 mm
- height (with external pipe): 1060 mm
- Weight (without accessories): 155 Kg approx

MAIN FEATURES

» Full automatic test cycle with simultaneous display of all test parameters, including weight loss and %

» High efficiency heating system with additional afterburner for complete combustion of exhaust fumes, conforming to CE prescriptions

» PID closed loop temperature control

» Built in weighing system

» Test time reduced to 30-40 minutes

» Test performance menu comprising the simultaneous display of all test data

» Internal database, up to 100 tests. Each test can be displayed and printed or sent to PC by the RS 232 port

75-PV0008
Asphalt binder analyzer by the ignition method. Complete with double sample basket/safety cover, extraction fork and 3 meters of metal exhaust pipe. 380 V, 50 Hz, 3 ph

75-PV0008/Z
As above but 220 V, 60 Hz, 3 ph

Accessories

75-PV0008/5
Metal stand

75-PV0008/10
Face shield

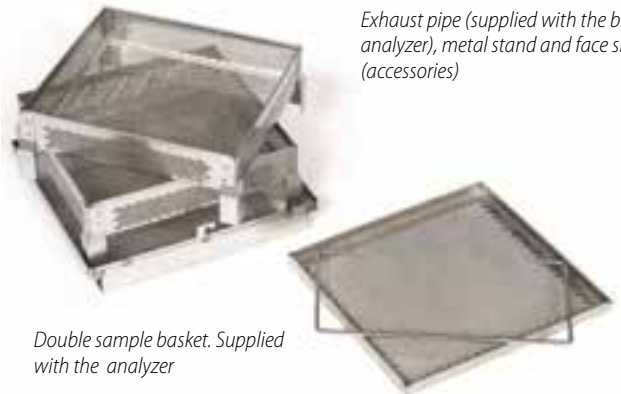
75-PV0008/12
Safety cover for sample basket. Bench mounting

75-PV0008/14
Additional double sample basket

75-PV0008/2
Auxiliary top pan digital balance, 10.000 g capacity, 0.1 g sensitivity, for connection to Asphalt binder analyzer via the RS 232. 230 V, 50-60 Hz, 1 ph

Example of printed report

Exhaust pipe (supplied with the binder analyzer), metal stand and face shield (accessories)



Double sample basket. Supplied with the analyzer

Automatic bitumen extractor

STANDARD

▸ ASTM D2172 ▸ EN 12697-1

Used for separation and extraction of bitumen by use of perchloroethylene or trichloroethylene solvents and sieving, for the separation of filler by centrifuge action and for the recovery of solvent material. The complete cycle is carried out automatically.

The basic machine comprises:

- A sieving unit with solvent spraying nozzle to separate and wash out the asphalt sample capacity 7 sieves 200 mm diameter.
- A filterless centrifuge to separate the filler from the solvent and bitumen solution.
- A solvent recovery unit to recover the solvent.

75-B0005 model includes the following parts:

- 200 mm diameter stainless sieve 75 µm op., 250 µm op., 710 µm op., 2 mm op.
- 200 mm diameter sieve frame only
- 200 mm diameter sieve pan
- O-ring gaskets for above

-Overall dimensions of the testing unit: 1200x650x1200 mm approx.

-Weight approx.: 170 kg

MAIN FEATURES

» Fully automatic testing cycle:
  - Sieving
  - Centrifuge extraction
  - Solvent recovery

» Conforms to latest anti-pollution requirements

» Ideal for mastic asphalt

» Big reduction of toxic fumes in the laboratory

» Maximum quantity of asphalt per extraction: 3.5 kg

» High extraction capacity: up to 400 g of filler per test

» Sensible reduction of extraction time

» Avoids solvent handling by the operator

» Low quantity of solvent material used and sensible reduction of extraction cost

» Use of perchloroethylene as solvent

» Maximum solvent recovery capacity: 40 to 50 l/h

75-B0005/A
Automatic binder extraction unit, supplied without sieves. 380 V, 50 Hz, 3 ph

75-B0005/AZ
As above but 220 V, 60 Hz, 3 ph

75-B0005
Automatic binder extraction unit complete with four 200 mm diameter test sieves: 0.075, 0.250, 0.710 and 2 mm openings. Conforming to EN 12697-1 and ASTM D2172. 380 V, 50 Hz, 3 ph

Accessories and spares

75-B0005/1
Spare stainless cup for centrifuge

15-D2330/J
200 mm diameter stainless sieve 75 µm op.

15-D2275/J
200 mm diameter stainless sieve 250 µm op.

15-D2230/J
200 mm diameter stainless sieve 710 µm op.

15-D2185/J
200 mm diameter stainless sieve 2 mm op.

5-B0005/2
Spare lining paper for centrifuge cup. Pack of 100

75-B0005/8
O-ring gasket. Pack of 10

15-D2001/J
200 mm diameter sieve frame only

Cabinet with aspirator

75-B0005/50
Cabinet with aspirator for Automatic extraction unit. 230 V, 50 Hz, 1 ph.

Designed to house the extraction unit. Including wheel mounted carriage for easy removal of the extraction unit, fit with electric aspirator and roof opening with basket for activated charcoal. The use of this cabinet is recommended to minimize the diffusion of toxic solvents in the laboratory.
>Overall dimensions (wxdxh): 1635x920x2300 mm
>Weight approx.: 200 kg

Filterless centrifuge binder extractors

STANDARD

▸ ASTM D1856 ▸ EN 12697-1 ▸ AASHTO T170 ▸ AASHTO R59

75-B0024/N with sieves

MAIN FEATURES

» 11000 rpm maximum speed with continuous flow

» Filterless method assures complete filler recovery

» Automatic ramp and pre-set speed control

» Two models available: 75-B0024/N for filler extraction up to 100 g per test and 75-B0024/B for filler extraction up to 400 g per test

» Up to 100 g or 400 g can be extracted per test

Specifications

Models 75-	B0024/N	B0024/B
Max. quantity of filler, g	50-100	400
Cup dim. Mm	Dia. 70x190	Dia. 122x211
Max. speed rpm	11000	11000
Power, W	550	1000
Sieves included	See accessories	0.075, 0.25, 0.71, 2 mm
Overall dim. mm (lxwxh)	500 x 370 x 850	560 x 640 x 1200
Weight approx., kg	55	100

Used for rapid filterless separation of filler (ash) from binder solution coming, for instance, from Wire mesh extractor model 75-B0015. The centrifuge can also be used for binder recovery from an asphalt sample previously disgregated in solvent and poured into the funnel fit with 200 mm diameter test sieves to gradually separate the aggregates.

The test is carried out by pouring the solvent from the top funnel into the rotating aluminum cup. Due to the centrifugal effect, the liquid spreads on the wall and moves upwards, leaving mineral particles in the cup whilst the liquid is discharged outside through the outlet tubing. The cup should be internally lined with paper for a better and complete removal of filler. See accessories: 75-B0005/2.

75-B0024/B

75-B0024/N
Continuous flow filterless centrifuge, 70 mm **diameter** cup. 230 V, 50 Hz, 1 ph.

75-B0024/NY
As above but 220 V, 60 Hz, 1 ph.

75-B0024/NZ
As above but 110 V, 60 Hz, 1 ph.

75-B0024/B
Continuous flow filterless centrifuge, 122 mm diameter cup, complete with four 200 diameter sieves, openings 0.075, 0.250, 0.710, 2.00 mm. 380 V, 50 Hz, 3 ph.

75-B0024/BZ
As above but 220 V, 60 Hz, 3 ph

ACCESSORIES AND SPARES

Accessories

Test sieves

15-D2335/J
200 mm diameter ISO test sieve, 63 µm opening

15-D2330/J
200 mm diameter ISO test sieve, 75 µm opening

15-D2300/J
200 mm diameter ISO test sieve, 150 µm opening

15-D2275/J
200 mm diameter ISO test sieve, 250 µm opening

15-D2230/J
200 mm diameter ISO test sieve, 710 µm opening

15-D2185/J
200 mm diameter ISO test sieve, 2 mm opening

Note: *the EN standard require 63 µm and 2 mm opening sieves.*
The ASTM standards require 75 µm and 150 µm opening

Lining paper

75-B0005/2
Lining paper for 75-B0024/N and 75-B0024/B series centrifuges. Pack of 100

Spares

75-B0024/1
Spare aluminum cup diameter 70x190 mm for 75-B0024/BN series centrifuges.

75-B0005/1
Spare stainless steel cup diameter 122x211 mm for 75-B0024/B centrifuge.

Centrifuge binder extractors

STANDARD

▸ ASTM D2172 ▸ AASHTO T164-A ▸ EN 12697-1

75-B2212 to 75-B2314

75-B2222, 75-B2322 Explosion proof models

The centrifuges are used for the determination of bitumen percentage in bituminous mixtures. All models comprise a removable precision-machined rotor bowl housed in a cylindrical aluminum box. The rotating unit is suspended on the base by four calibrated springs, which assure a perfect stability all over the test.

All models are fit, for emergency use, by a hand brake system. The control panel includes: Start/Stop button, speed control knob, and digital display.

Two capacities and two versions available:

- Standard 1500 and 3000 g capacity (75-B2212,75-B2214; 75-B2312,75-B2314)
- Explosion proof 1500 and 3000 g capacity (75-B2222; 75-B2322)

The standard models can be upgraded with an electromagnetic system to prevent the opening of the cover during rotation. This option (see code 75-B2210/UP1) is applicable on standard models only and has to be factory installed.

- AC drive motor (inverter), 550 W
- Overall dimensions (lxdxh): 539x406x509 mm
- Weight approx.: 54 kg

MAIN FEATURES

» Speed control up to 3600 rpm at 50 or 60 Hz by AC drive (inverter)

» Can be set for the automatic speed ramp up to 3600 rpm or to any intermediate speed

» Electric brake

» Stable and silent throughout the test

» Electronic control and digital display monitoring the frequency (proportional to the speed)

» CE version available with electromagnetic arrangement to prevent the opening of cover during rotation

» Explosion proof option

» Supplied complete with 100 filter discs

» Interchangeable rotating bowl (1500 or 3000 g capacity)

Standard versions

75-B2212
1500 g capacity digital centrifuge extractor. Speed control up to 3600 rpm. Complete with 100 filter discs. 230 V, 50-60 Hz, 1 ph

75-B2214
As above but 110 V, 60 Hz, 1 ph

75-B2312
3000 g capacity digital centrifuge extractor. Speed control up to 3600 rpm. Complete with 100 filter discs. 230 V, 50-60 Hz, 1 ph

75-B2314
As above but 110 V, 60 Hz, 1 ph

Explosion proof versions

75-B2222
1500 g capacity digital centrifuge extractor, explosion proof version. Speed control up to 3600 rpm. Complete with 100 filter discs. 230 V, 50-60 Hz, 1 ph

75-B2322
As above but 3000 g capacity 230 V, 50-60 Hz, 1 ph

ACCESSORIES, SPARES AND UPGRADING

75-B0022/1
Filter discs for 1500 g capacity centrifuges. Pack of 100

75-B0023/1
Filter discs for 3000 g capacity centrifuges. Pack of 100

75-B0022/2
Spare bowl and cover for 1500 g capacity centrifuges

75-B0023/2
Spare bowl and cover for 3000 g capacity centrifuges

75-B2210/UP1
Electromagnetic system to prevent the opening of the cover during rotation conforming to CE directive.
Suitable for 75-B2212 and 75-B2312 standard models only.
To be factory installed and specified at time of order.

75-B2210/UP1

75-B0022/2, 75-B0022/1

Hot methods binder extractors for the quantitative determination of bitumen in hot-mix mixtures and pavement samples

STANDARD

▸ EN 12697-1 ▸ Clause B.1.2

75-B0015
HOT EXTRACTION APPARATUS: WIRE MESH FILTER METHOD

75-B0015 with 10-D1402/D and 75-B0015/6

The apparatus consists of a glass jar with a wire basket suspended in it by a supporting ring, and a metal condenser. The filler, or ash, passing through the 75 µm wire basket has to be separated from the bitumen/solvent solution using an appropriate centrifuge extractor (see model 75-B0024/N page 330). The solvent used can then be recovered using the solvent recovery unit (see page 337). The apparatus has to be used with a hot plate, such as our model 10-D1402/D, and an aluminum disk 75-B0015/6 for better heat distribution.

- Maximum basket capacity: 3 kg
- Overall dimensions: 165 mm diameter x 335 mm height
- Weight: 2.8 kg (approx.)

Accessories

10-D1402/D
Hot plate, 185 mm diameter 230 V, 50-60 Hz, 1 ph.

10-D1402/DZ
Same as above but 110 V, 60 Hz, 1 ph.

75-B0015/6
Aluminum disk, 160 mm diameter.

STANDARD

▸ ASTM D2172

REFLUX EXTRACTORS

75-B0013/A with 10-D1402 and 75-B0015/6, 75-B0014/A

These extractors consist of two wire mesh cones with interlocking frames, a cylindrical glass jar and a water condenser with inlet/outlet tubes. Two models are available with 1 or 4 kg capacities (75-B0013/A and 75-B0014/A).

They have to be used with a hot plate and an aluminum disk. Filter paper is not included and has to be ordered separately (see Accessories).

The solvent used can be recovered using the solvent recovery unit (see page 337).

Overall dimensions (h x diameter):

- 75-B0013/A, 465 x 150 mm
- 75-B0014/A, 510 x 265 mm
- Weight (approx.): 3/9 kg

75-B0013/A
Reflux bitumen extractor, 1000 g capacity

75-B0014/A
Reflux bitumen extractor, 4000 g capacity

Accessories

10-D1402/D
Hot plate, 185 mm diameter 230 V, 50-60 Hz, 1 ph.

10-D1402/DZ
Same as above but 110 V, 60 Hz, 1 ph.

75-B0015/6
Aluminum disk, 160 mm diameter.

75-B0013/4
Filter paper, 300 mm diameter, for 75-B0013/A. Pack of 50.

75-B0014/4
Filter paper, 400 mm diameter, for 75-B0014/A. Pack of 50.

STANDARD

▸ EN 12697-1 Clause B.1.1
▸ EN 12697-14

75-B0016
HOT EXTRACTOR APPARATUS: PAPER FILTER METHOD

It is supplied complete with a pack of 100 filter papers (Grade No.5, 400 mm diameter) and has to be used with a suitable hot plate (eg. 10-D1402/D), which is not included.

- Overall dimensions (assembled): 1000 x 500 x 500 mm
- Weight: 25 kg (approx.)

75-B0016

75-B0018

STANDARD

▸ EN 12697-1

KUMAGAWA EXTRACTORS

It consists of a round glass flask, a cooling unit, a Dean-Stark receiver, and an electric heating mantle with regulator and fittings. Two models are available with 1 or 2 liter capacities. The filtering cartridges have to be ordered separately - see Accessories.

- Weight: 15 kg (approx.)

75-B0018
Kumagawa extraction apparatus, 1 liter capacity. 230 V, 50-60 Hz, 1 ph.

75-B0018/A
Kumagawa extraction apparatus, 2 liter capacity. 230 V, 50-60 Hz, 1 ph.

Accessories

75-B0018/1
Filtering cartridges, 58 mm diameter x 170 mm, for 75-B0018 extractor. Pack of 25.

75-B0018/A1
Filtering cartridges 80 mm diameter x 200 mm, for 75-B0018/A extractor. Pack of 25.

Binder recovery apparatus

STANDARD

- EN 12697-3
- ASTM D5404
- AASHTO TP2
- EN 12607-3

ROTARY EVAPORATOR

The apparatus is used for the recovery of soluble bitumen from bituminous pavement materials in a form suitable for further testing.

For the test sets conforming to EN and ASTM versions, see accessories.

- Complete with 1000 ml capacity glass flat evaporating balloon
- Rotation speed: adjustable from 20 to 270 rpm
- Temperature range: from + 20 to + 210°C
- Power: 1300 W
- Weight approx.: 27 kg

The Rotary evaporator can accept evaporating balloons up to 5000 m capacity

75-PV1650
Rotary evaporation apparatus. 230 V, 50-60 Hz, 1 ph

75-PV1650/Z
As above but 110 V, 60 Hz, 1 ph

86-D2004/1D

75-B0165/6

Accessories

EN 12697-3 and EN 12603 accessories

75-B0165/5
Diathermic oil. 18 kg can

75-B0165/4
Glass flask 1 liter capacity with rubber stopper

75-B0165/3
Glass tubing with three way valve and transparent flexible hose for solution intake

86-D2003
Dual stage high vacuum pump. 230 V, 50 Hz, 1 pf. (For 110 V, 60 Hz ask model 86-D2003/Z)

86-D2004/1D
Vacuum regulator with digital gauge, 0.001 bar resolution. 230 V, 50-60 Hz, 1 ph. (For 110 V, 60 Hz ask model 86-D2004/1DZ)

86-D2064
Rubber tube for vacuum, 6.5/16.5 int./ext. mm diameter, 2 m

ASTM D5404, AASHTO TP2 accessories

75-B0165/5
Diathermic oil. 18 kg can

75-B0165/2
Glass flat evaporation balloon 2000 ml capacity

75-B0165/3
Glass tubing with three way valve and transparent flexible hose for solution intake

86-D2003
Dual stage high vacuum pump. 230 V, 50 Hz, 1 pf. (For 110 V, 60 Hz ask model 86-D2003/Z)

86-D2004/1D
Vacuum regulator with digital gauge, 0.001 bar resolution. 230 V, 50-60 Hz, 1 ph. (For 110 V, 60 Hz ask model 86-D2004/1DZ)

86-D2064
Rubber tube for vacuum, 6.5/16.5 int./ext. mm diameter, 2 m

75-B0165/6
Flow control device and flowmeter to monitor the CO_2 flow rate up to 1000 ml/min

Note: *for more information on vacuum pumps and vacuum regulator see page 431*

STANDARD

- ASTM D1856
- CNR 133
- AASHTO T170
- AASHTO R59

BINDER RECOVERY APPARATUS BY ABSON METHOD

Used for recovering the asphalt (bitumen) from a solution of a previous extraction. The apparatus consists of a distillation assembly including: Extraction flasks, Glass tubing, Inlet aeration tube, Electric heating mantle, Water-Jaketed condenser,Thermometer, Gas flowmeter, Stands and clamps

75-B0026
Distillation assembly for recovery of binder from solution by Abson method. 230 V, 50-60 Hz, 1 ph

75-B0026/Z
As above but 110 v, 60 Hz, 1

STANDARD

- EN 12697-1

BINDER RECOVERY APPARATUS BY VACUUM

Used to remove the solvent from the binder/solvent solution in order to determine directly the total content binder in the aggregate/binder mixtures.

The apparatus includes a vacuum pump with vacuum regulator, thermostatically controlled water bath, and two flat-bottomed flasks 250 ml capacity, fittings and connections.

- Power rating: 1380 W (1200 water bath, 180 vacuum pump)
- Weight approx.: 23 kg

75-B0025/B
Binder recovery apparatus, vacuum pump method. 230 V, 50-60 Hz, 1 ph

75-B0025/BZ
As above but 110 V, 60 Hz, 1 ph

Determination of maximum density

STANDARD

▸ EN 12697-5 ▸ ASTM D2041
▸ AASHTO T209

LARGE VACUUM PYKNOMETERS

These pyknometers are 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.

We offer three models, all of which are fitted with a vacuum gauge, a coupling for vacuum application and a vent valve:

- 75-D1122, heavy duty version, 10 liter capacity, specially designed for this application, made from robust transparent plastic. Suitable for paving mixture samples up to 6 kg, with a maximum aggregate size of 50 mm (2").
- 75-D1123/C, 4.5 liter capacity, made from aluminum with a transparent lid. Suitable for paving mixture samples up to 2 kg, with a maximum aggregate size of 19.1 mm (¾").
- 75-D1123/D, 10 liter capacity, made from plastic with a transparent lid. Suitable for paving mixture samples up to 6 kg, with a maximum aggregate size of 50 mm (2").

The 10 liter models (75-D1122 and 75-D1123/D) can also be used as vacuum bells for small glass pyknometers with capacities up to 2000 ml.

All the above models have to be used with the 15-D0407/C vibro-deaerator which gently shakes the pyknometer to evacuate the air. A vacuum pump with de-airing system is also required to complete the apparatus. For more information see page 431 and 432 . These are not included and have to be ordered separately - see Accessories.

75-D1123/D

Product code	75-D1122	75-D1123/C	75-D1123/D
Capacity, L	10	4.5	10
Maximum sample weight, kg	6	2	6
Maximum aggregate size, mm	50 (2")	19.1 (¾")	50 (2")
Internal dimensions, mm (diameter x height, approx.)	280 x 186	191 x 152	273 x 337
Overall dimensions, mm (diameter x height, approx.)	300 x 450	200 x 160	300 x 360
Weight, kg (approx.)	6.7	3	5

75-D1122
Large, heavy duty vacuum pyknometer, 10 liter capacity.

75-D1123/C
Vacuum pyknometer, 4.5 liter capacity.

75-D1123/D
Vacuum pyknometer, 10 liter capacity.

75-D1123/C

75-D1122 with de-airing vacuum system, including Vacuum pump 86-D2003, Air drying unit 86-D2005 filled with 86-D0819 Silica gel desiccant, and two rubber tubes 86-D2064.

Accessories

Electromagnetic vibro-deaerators

15-D0407/C
Electromagnetic vibro-deaerator, complete with timer. 230 V, 50-60 Hz, 1 ph.
Power: 400 W
Overall dimensions: 496 x 406 x 600 mm (w x d x h) approx.
Weight: 30 kg (approx.)

15-D0407/CZ
As above but 110 V, 60 Hz, 1 ph.

15-D0407/B1
Device for clamping pyknometers to the electromagnetic vibro-deaerator.

Vacuum pump and de-airing system

86-D2003
Vacuum pump, double stage. 230 V, 50-60 Hz, 1 ph.
(For 110 V / 60 Hz, ask for model 86-D2003/Z.)

86-D2005
Air drying unit.

86-D0819
Silica gel desiccant with indicator, 1 kg.

86-D2064
Rubber vacuum hose (two pieces required).

For more information on the vacuum pump and de-airing system see Vacuum pumps, page 431 and 432.

15-D0407/B1

75-D1122 fitted to the 15-D0407/C with the device 15-D0407/B1

75-D1123/D fitted to the 15-D0407/C with the device 15-D0407/B1

STANDARD

▸ EN 12697-11

BOTTLE ROLLING MACHINE

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 (model 75-B0011/A1). A glass rod, 75-B0011/A2 is also required to complete the system. These items are not included and have to be ordered separately - see Accessories.

Rotating speed: adjustable up to 80 rpm

Dimensions: 380x300x160 mm (wxdxh)

Weight: 10 kg (approx.)

75-B0011/A
Bottle rolling machine. 230 V, 50 Hz, 1 ph.

Accessories

75-B0011/A1
Test bottle, Pyrex glass, 86 mm diameter x 176 mm high, 34 mm neck diameter.

75-B0011/A2
Glass rod, 6 mm diameter, one end fitted with a 30 mm long rubber tube.

75-B0011/A with 3 test bottles 75-B0011/A1

Test bottles 75-B0011/A with 75-B0011/A2 glass rod

STANDARD

▸ EN 12697-18

DRAINAGE BASKET

75-B0019/A and 75-B0019/B

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 and has four feet.

Weights (approx.):

75-B0019/A Drainage basket 360 g;

75-B0019/B Metal tray 210 g.

75-B0019/A
Drainage basket, 100 x 100 x 100 mm.

75-B0019/B
Metal tray, 160 mm sq., 10 mm deep.

STANDARD

▸ EN 12697-13

DIGITAL ASPHALT THERMOMETER

This microprocessor-controlled digital thermometer can be used for various field and laboratory applications in road and concrete testing. It is dual range (reading in both °C and °F), high resolution and is housed in a rugged ABS case. The highest and lowest temperatures measured in a test cycle can be recalled by simply pressing a button.
It is supplied without probes, which have to be ordered separately according to the requirements of the application. For asphalt temperature measurements, we recommend the following probes:

- 82-D1229/1 Penetration probe, 120 mm long, 3 mm diameter
- 82-D1229/2 Surface probe
- 82-D1229/5 Penetration probe, 220 mm long, 5 mm diameter
- 82-D1229/5S Penetration probe 300 mm long, 5 mm diameter conforming to NF
- 82-D1229/6 T bar probe, 650 mm long, conforming to BS 594

82-D1229
Digital thermometer, measuring ranges -50 to +199 °C and +200 to +1350 °C resolution: 0.1 °C up to 199.9 °C and 1 °C over.

82-D1229 with probes

Solvent recovery apparatus

SOLVENT RECOVERY UNIT

Used to recover the solvent liquid after its use for the extraction tests. This unit has been designed to recover non-flammable solvents and consists of two stainless steel chambers, one for dirty solvent and the other for the cleaned solvent. An electric heater in the left-hand chamber distils the solvent, which then passes through a water cooling system and drops into the second chamber ready for re-use in a new test. Once the process is completed, a temperature switch automatically stops the heating elements. Supplied complete with 10 m plastic tube, tube clamps, sieve insert 0.6 mm opening and one lid. Particularly useful to recover solvent used with the Paper filter extractor, Wire mesh extractor, Kumagawa extractor, Reflux extractors, Filterless centrifuge binder extractors.

- Maximum temperature: 150°C
- Power: 1200 W
- Overall dimensions: 400x320x650 mm
- Weight approx.: 17 kg

75-B0027/A
Solvent recovery unit, 10 l/h. 230 V, 50-60 Hz, 1 ph

FUME EXHAUST CUPBOARD WITH ASPIRATOR

The extraction method of the EN 12697-1 and corresponding ASTM standards, often require toxic solvent (e.g. methylene chloride). This solvent is hazardous to health and is subject to occupational exposure limits as described in relevant legislation and regulations. This unit fully satisfies the EN requirements.

MAIN FEATURES

- Double aspiration system, Class 1, certified conforming to EN 14175-2-3, Bureau Veritas
- Activated charcoal filter for solvents
- Electrical aspirator delivering up to 1350 m^3/h
- Waterproof illumination system
- Stainless steel worktop 1200x750 mm, incorporating sink and bibcock
- Front sash opening with counterweight
- Electric control panel
- Double current outlet
- Base cabinet with two doors and two shelves
- Overall dimensions (wxdxh): 1200x830x900+1600 mm
- Weight approx.: 185 kg

75-D3521
Fume exhaust cupboard with aspirator and activated charcoal filter for solvents. Stainless steel worktop incorporating sink and bibcock. Base cabinet with two doors and two shelves. Certified to EN 14175-2-3 Bureau Veritas. 220/400 V, 50-60 Hz, 3 ph.

Marshall compaction

STANDARD

▸ ASTM D6926 ▸ EN 12697-10
▸ EN 12697-30

ASTM AND EN MARSHALL AUTOMATIC IMPACT COMPACTORS

The apparatus automatically compacts the sample and stops after the 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 the laminate hardwood block and the EN version also includes a vibrated concrete base 450x450x200 mm.

All moving parts are protected with safety guard, which automatically stops the compactor when opened, and the control panel is fitted with an emergency stop button, all conforming to CE prescriptions.

The compactor can be factory installed inside the 76-B4000/CB Noise reduction and CE security cabinet. See accessories.

Common FEATURES

» Automatic control
» Complete protection for operator safety to CE prescriptions
» High resolution graphical display 128x80 pixel and 6 key membrane keyboard
» Improved rammer lifting device, constant height fall, modern and reliable design
» User friendly rammer replacement system
» Noise reduction and security cabinet available on request
» Power rating: 800 W
» Blows frequency: 50 blows in 55/60 s
» Sliding mass weight: 4535 ± 9 g
» Total hammer weight: 7850 ± 50 g
» Free fall height: 457± 3 mm
» Laminated hardwood block: 200x200x450 mm, density 670 to 780 kg/m3
» Concrete base (EN version only,included): 450x450x200 mm
» Overall dimensions: EN version 540x556x2066 mm, ASTM version 385x470x1867mm
» Weight approx.: EN version 270 kg, ASTM version 150 kg

STANDARD

▸ EN 12697-10 ▸ EN 12697-30

76-B4432
Marshall impact automatic compactor for 101.6 mm diameter specimens. Conforming to EN Standard 230 V, 50 Hz, 1 ph

76-B4433
Same as above but 220 V, 60 Hz, 1 ph

76-B4434
Same as above but 110 V, 60 Hz, 1 ph

STANDARD

▸ ASTM D6926

76-B4442
Marshall impact automatic compactor for 101.6 mm diameter (4") specimens conforming to ASTM D6926. 230 V, 50 Hz, 1 ph

76-B4443
Same as above but 220 V, 60 Hz, 1 ph

76-B4444
Same as above but 110 V, 60 Hz, 1 ph

Accessories

76-B4000/CB
Noise reduction cabinet for automatic Marshall ASTM and EN compactors

The Marshall automatic compactors can be factory installed inside the cabinet which provides either the sound isolation (less than 78 dB) or operator safety conforming to CE prescriptions, as the machine automatically stops opening the door. The cabinet is delivered disassembled with instructions for the easy laboratory assembly.
-Dimensions: 850x670x2200 mm approx
-Weight approx.: 130 kg

EN and ASTM compactors. Detail of lifting mechanism.

EN and ASTM compactors. Detail of clamping mechanism

Noise reduction and security cabinet for automatic Marshall ASTM and EN compactors model 76-B4000/CB

STANDARD

- ASTM D6926
- AASHTO T245
- ASTM D1559

MARSHALL HAND COMPACTION ASSEMBLY

The assembly consists of a wooden compaction pedestal, support rod to hold the hammer in a perpendicular position, compaction hammer and mould holder. All parts can be ordered individually.

76-B0058/AC
Manual Marshall compactor.

Spare parts

76-B0058/A
Compaction hammer for 4" samples.

76-B0059
Compaction pedestal.

76-B0058/B
BS compaction pedestal

76-B0059/1
Hammer guide.

76-B0056/A
Compaction mould holder.

76-B0057, 76-B0057/B5, 76-B0059 with 76-B0056/A, 76-B0059

STANDARD

- ASTM D1559
- AASHTO T245
- EN 12697-10
- EN 12697-30
- ASTM D6926

MARSHALL COMPACTION MOULDS AND OTHER ACCESSORIES

All moulds are made from steel, protected against corrosion. They are specially made for use with the automatic compactors.
The three parts of the compaction moulds can be purchased individually. See spare parts.
Conforming to ASTM D6926 (ex D1559), the compaction can also be performed manually.

76-B0057
Standard compaction mould, 101.6 mm diameter (4"), including base plate, mould body and filling collar, conforming to ASTM and EN standards

Mould parts

76-B0057/1
Base plate

76-B0057/A2
Mould body

76-B0057/A3
Filling collar

Other accessories

76-B0060
Paper discs, 101 mm diameter (4"). Fit the mould base before introducing the mixture. Pack of 1000.

76-B0057/B5
Extraction plate. For removing 101.6 mm (4") specimens

76-B0060, 76-B0057/B5

Accessories EN 12697-30

76-B0042/1
Steel block 100 mm diameter 50 mm high. For the initial heating of the compaction hammer.

76-B0043/4
Storage plate with six 100 mm diameter discs. To cool the specimens in air.

Marshall stability, Water sensitivity, Indirect tensile strength

THE MARSHALL TESTERS

Under this denomination we offer various testers which satisfy one or more Standards as follows:

Standard	Title	Tester*	
ASTM D1559	Resistance of plastic flow of bituminous mixtures (1981)	76-B0030 76-B0030/A 76-B3802	34-V1072 34-V1172 70-T1082 70-T1192
ASTM D5581 ASTM D6927 ASTM D6931 ASTM D8225	Resistance of plastic flow of bituminous mixtures on 6" diameter specimens Standard test method for Marshall stability and flow Standard test method for Indirect Tensile (IDT) strength Cracking tolerance index by indirect tensile	76-B3802 34-V1072 34-V1172	70-T1082 70-T1192
EN 12697-12 EN 12697-23 EN 12697-34	Determination of the water sensitivity Determination of the indirect tensile strength Marshall test	76-B3802 34-V1072 34-V1172	70-T1082 70-T1192

*With the suitable accessories

STANDARD

▸ ASTM D1559 ▸ ASTM D5581 ▸ AASHTO T245 ▸ ASTM D6927

MARSHALL COMPRESSION TESTER ANALOG VERSION

MAIN FEATURES

» 50 kN maximum capacity, suitable for testing 4" and 6" diameter specimens

» All the load rings are provided with 0.001mm high resolution dial gauge, assuring a strict conformity to the standards.

» Platen speed 50.8 mm/min

76-B0030/A with 76-B0033 and 76-B0034

A bench mounted compression frame with motor and worm gear housed within the base unit. The machine is supplied complete with load ring, 30 kN capacity, incorporating stem brake feature to hold the maximum reading. For testing 6" diameter (152.4 mm) specimens, the 82-T1009/F load ring should be used instead of the 30 kN fit on the machine. See accessories.

The stability mould and flow meter have to be ordered separately. See accessories.

The machine is also available in the frame-only version (76-B0030), for alternative configuration.

- Power rating: 736 W
- Overall dimensions (hxlxd): 1028x392x560 mm
- Weight approx.: 85 kg

76-B0030/A
Marshall compression testing machine. Complete with load ring 30 kN capacity with peak hold function, fitted with 0.001 mm resolution dial gauge (fully conforming to the standards) and compression device.
230 V, 50 Hz, 1 Ph

76-B0030/AY
Same as above but 220 V, 60 Hz, 1 ph

76-B0030/AZ
Same as above but 110 V, 60 Hz, 1 ph

Load frame only:

76-B0030
Marshall compression tester, 50 kN capacity 230 V, 50 Hz, 1 ph

76-B0030/Y
Marshall compression tester, 50 kN capacity 220 V, 60 Hz, 1 ph

76-B0030/Z
Marshall compression tester, 50 kN capacity110 V, 60 Hz, 1 ph

Accessories to complete the 76-B0030 frames only

34-T0104/10
Compression device. To fit the load ring to press the stability mould

82-T1007/F
Load ring, 30 kN capacity, fitted with gauge 0.001 mm resolution, complete with stem brake feature to hold the maximum reading.

82-T1009/F
Load ring, 50 kN capacity, fitted with gauge 0.001 mm resolution, complete with stem brake feature to hold the maximum reading. (As alternative to 30 kN model)

Alternative configuration

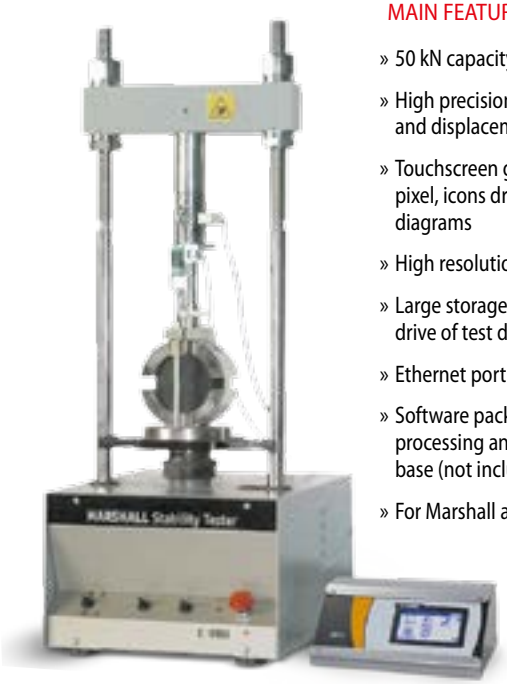
82-T1007/FC
Load ring, 30 kN capacity, fitted with gauge 0.01 mm resolution, complete with stem brake feature to hold the maximum reading.

82-T1009/FC
Load ring, 50 kN capacity, fitted with gauge 0.01 mm resolution, complete with stem brake feature to hold the maximum reading. (as alternative to 30 kN model

STANDARD

ASTM D1559 ASTM D5581 ASTM D6927 ASTM D6931
AASHTO T245 EN 12697-12 EN 12697-23 EN 12697-34
AASHTO T283

MARSHALL COMPRESSION TESTER DIGITAL VERSION



MAIN FEATURES

- 50 kN capacity
- High precision strain gauge load cell and displacement transducer included
- Touchscreen graphic diplay 240x128 pixel, icons driven showing figures and diagrams
- High resolution: 132000 points
- Large storage capacity on USB pen drive of test data downloadable to PC
- Ethernet port for connection to PC
- Software package available for data processing and print including database (not included)
- For Marshall and Indirect tensile tests

The frame is identical to the 76-B0030/A version. The machine is fit with a precision strain gauge load cell and displacement transducer, both connected to the Digimax Touch data acquisition and processing system (which is part of the system) featuring a large display and standard software covering either the Marshall or the Indirect tensile test. For more details see PC software.

The machine can be completed with a PC software (see accessories) suitable for running CBR, Marshall, Indirect Tensile and universal load/displacement tests. Data is presented numerically and graphically in real time.

Note: *For detailed and complete information concerning the Digimax TS Data acquisition and processing system, and 82-SW/CMU software see page 129*

76-B3802
Marshall compression testing machine with digital control panel and readout unit, motorized ram, two-column structure and adjustable crossbeam, load cell 50 kN capacity, external displacement transducer 25 mm travel, compression device and connector between load cell and crossbeam. 230 V, 50 Hz, 1 ph

76-B3803
As above but 220 V / 60 Hz / 1Ph

76-B3804
As above but 110 V / 60 Hz / 1 Ph

Accessories (for all testers)

For Marshall test, ASTM/AASHTO and EN 12697-34

76-B0033/4
Stability mould for 4" diameter (101.6 mm) specimens

76-B0033/6
Stability mould for 6" diameter (152.4 mm) specimens to ASTM D5581

76-B0034
Flow meter (for use with the 76-B0030 and 76-B0030/A only)

76-B033/C, 76-B0033 *76-B0034*

For indirect tensile test, EN 12697-12, EN 12697-23, ASTM 6931, ASTM D8225. AASHTO T283

76-B0078/F
Frame for tensile splitting device. Tensile splitting device for compacted bituminous samples up to 160 mm (6") diameter complete with loading strips for 150 mm diameter samples

76-B0078/F1
Pair of loading strips for 100 mm diameter samples

76-B0078/F2
Pair of loading strips for 150 mm diameter samples

76-B0078/F3
Pair of loading strips for 160 mm diameter samples

76-B0078/F with 76-B0078/F1 and 76-B0078/F2

Interlayer bonding. Shear bond test (Leutner Test).
EN 12697-48

76-B0033/E
Shear bond test apparatus, for subjecting 150 mm diameter samples to direct shear loading.

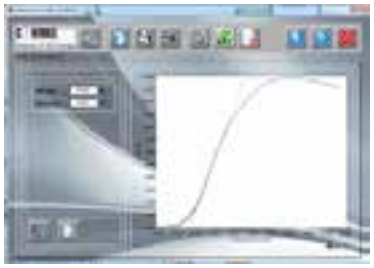
76-B0033/E1
Adaptor to test 100 mm diameter samples with shear bond test apparatus

Material on the basis of organic binders for road and airfield construction. (Russian Standard).
GOST 12801

76-B0033/D
Stability head for 71.4 mm diameter specimens

PC software

82-SW/CMU
PC software for CBR, Marshall, Indirect tensile and universal tests. See page 125



Example of 82-SW/CMU software. Marshall test in progress

Marshall stability
Other testers to perform Marshall and Indirect tensile tests

MULTISPEED

COMPRESSION TESTERS

The ideal solution for Road testing laboratory. The 50 or 100 kN capacity and the fully variable test speed of 0.2 to 51 mm/min make it possible to perform not only the CBR and Marshall tests, but many other applications as for instance Indirect Tensile test, Quick Triaxial tests, Unconfined and Uniaxial soil testing and, in general, all tests to be performed under displacement control. Two versions available:

For complete and detailed information see page 126 or visit our website

MULTISPEED DIGITAL COMPRESSION TESTER

34-V1072

The machine can be equipped with analog or digital load/displacement measurement systems as well as with the specific accessories, to suit either the field or central laboratory requirement. The various test accessories and relevant Standards, are shown and listed on page 340, 341.

34-V1072 With Marshall test accessories (Analog mode)

34-V1072 With Marshall test accessories (Digital mode)

MULTISPEED AUTOMATIC UNIVERSAL TESTER WITH TOUCHSCREEN DIGITAL SPEED CONTROL AND DATA ACQUISITION

34-V1172

No external transducer is required for displacement measurement. The firmware allows performance of transducer calibrations and setting of up to 10 test profiles, saving data onboard. A real time test graph and transducer data are displayed on the touchscreen. The machine has built-in data acquisition with four channels dedicated to two strain gauge load cells and two potentiometric linear transducers; one of each can be used during the test.

MULTISPEED 34-V1172 equipped with Marshall digital testing accessories

UNIFRAME

70-T1182 and 70-T1192

Electromechanical Universal Testers, 50, and 100 kN capacity suitable for any kind of test that requires load and/or displacement control.

For complete and detailed information see page 318 and 320 or visit our website

UNIFRAME 70-T1192, 100 kN cap. equipped with Marshall digital testing accessories

Water baths

STANDARD

▸ EN 12697-34 ▸ ASTM D5581 ▸ ASTM D6927 ▸ AASHTO T245

Used to condition Marshall (60±1°C) and other asphalt specimens (e.g. tar specimens at 37.8±1°C) in water. The water baths are available in four different dimensions: 30, 40 (with cooler unit), 56 and 110 liters capacity. Digital thermo-regulator and temperature display, internal and external outer case in stainless steel. Complete with perforated base shelf and cover. The water baths are available with or without continuous recirculating system (see technical specifications). The continuous recirculating water system ensures temperature uniformity. The larger model with recirculating system also responds to ASTM D5581 requirement to have a deeper bath for 6" samples.

Our product range also includes the model 65-D1409/A fitted with cooling unit with temperature range starting from 5°C, to satisfy EN 12697-23. This model is fully described on page 292

76-B0067/A 76-B0067/B

Code	76-B0066/A 76-B0066/B	76-B0067/A 76-B0067/B	76-B0067/C	65-D1409/A
Capacity	30 l	56 l	110 l	40 l
Marshall spec. capacity, appr.	12	20	30	15
Temp. Range, °C	Ambient to 60	Ambient to 60	Ambient to 95	+5 to + 60
Accuracy, °C	±1	±1	±1	±1
Power, W	1200	1200	2500	2000
Recirculating pump	76-B0066/B only	76-0067/B only	yes	yes
Inside dim. Mm (w x d x h)	500 x 300 x 185	610 x 500 x 185	600 x 500 x 280	550 x 360 x 200
Outside dim.	640 x 340 x 240	650 x 540 x 240	816 x 547 x 600	830 x 480 x 950
Weight approx. kg	9.5	20	30	62

76-B0067/C, Circulating water bath, also suitable for Marshall specimens according to ASTM D5881 which need a deeper bath.

76-B0066/A
Digital water bath, 30 liters capacity 230 V, 50-60 Hz, 1 ph

76-B0066/AZ
As above but 110 V, 60 Hz, 1 ph

76-B0067/A
Digital water bath, 56 liters capacity 230 V, 50-60 Hz, 1 ph

76-B0067/AZ
As above but 110 V, 60 Hz, 1 ph

76-B0066/B
Digital recirculating water bath, 30 liters capacity 230 V, 50-60 Hz, 1 ph

76-B0066/BZ
As above but 110 V, 60 Hz, 1 ph

76-B0067/B
Digital recirculating water bath, 56 liters capacity 230 V, 50-60 Hz, 1 ph

76-B0067/BZ
As above but 110 V, 60 Hz, 1 ph

76-B0067/C
Digital recirculating water bath 110 liters capacity with PID thermoregulation, maximum temperature 95°C. 230V/50-60Hz/1Ph

76-B0067/CZ
As above but 110 V, 60 Hz, 1 ph

65-D1409/A
Circulating water bath with cooler unit, temperature range +5 to + 60°C conforming to EN 12697-23. 230 V, 50-60 Hz, 1 ph

65-D1409/AZ
Same as above but 110 V, 60 Hz, 1 ph

65-D1409/A

76-B0066/A, 76-B0066/B

Vibration compaction hammer

STANDARD

▸ EN12697-9 ▸ EN 12697-10
▸ EN12697-32 ▸ EN 13286-4
▸ BS 1377:4 ▸ BS 1924:2

Used for the compaction of Proctor and CBR soil specimens. using the appropriate tamping foot it can also be used for compacting asphalt in the "Percentage refusal density test". See Vibrating hammer for PRD specimens.
The hammer is supplied without support frame and tampers which have to be ordered separately. See accessories.

- Overall dimensions (wxdxh): 130x530x380 mm
- Weight approx.: 6.8 kg

Ordering information

33-T8702/A
Vibrating hammer. 220-240 V, 50-60 Hz, 1 ph

33-T8702/AZ
Same as above but 110 V, 60 Hz, 1 ph

Accessories

33-T8702/FR
Supporting frame for vibrating hammer.
- Weight: 26 kg approx.

33-T8702/W
Extra weight, 20 kg total, for steel frame model 33-T8702/FR

33-T0087/6
Small tamping foot, 102 mm dia., head only

33-T0087/7
Large tamping foot, 146 mm dia., head only

33-T0087/8A
Shank, 300 mm long

33-T8702/A with 33-T8702/FR, 33-T0087/6, 33-T0087/7 and mould

PRD Split mould and baseplate

76-B0088
PRD (Percentage Refusal Density) mould.

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: 20 kg(approx.)

76-B0088

Static tests on bituminous mixtures

STANDARD

▸ NF P98-251-1 ▸ NF P98-251-4

DURIEZ COMPRESSION TEST SETS

The Duriez test is performed to determine and study the physical and mechanical properties of bituminous mixtures. We produce two sets for performing the test: one for 80 mm diameter specimens and one for 120 mm. All parts are made from steel protected against corrosion. 80 and 120mm diameter specimens can be compressed with our UNIFRAME 250 model 70-T2502, 250 kN capacity. For more information see page 322, 323.

Ordering information

77-B0090
Test set for 80 mm diameter specimens, consisting of:

77-B0090/A1
80 mm diameter mould
77-B0090/A2
80 mm diameter cylindrical container
77-B0090/A3
80 mm diameter extraction piston
77-B0090/A4
80 mm diameter upper and lower pistons
77-B0090/A6
80 mm diameter upper and lower engraved pistons
77-B0090/A5
80 mm diameter set of two half spacers

77-B0091
Test set for 120 mm diameter specimens, consisting of:

77-B0091/A1
120 mm diameter mould
77-B0091/A2
120 mm diameter cylindrical container
77-B0091/A3
120 mm diameter extraction piston
77-B0091/A4
120 mm diameter upper and lower pistons
77-B0091/A6
120 mm diameter upper and lower engraved pistons
77-B0091/A5
120 mm diameter set of two half spacers

All the above parts can also be ordered separately

BITUMIX

Automatic laboratory mixer

STANDARD

▸ EN 12697-35

AUTOMATIC LABORATORY MIXER

MAIN FEATURES

- » Ideal to prepare laboratory samples for mix design
- » New improved mixing drum and heating system quickly adjustable up to 250° C
- » Mixing capacity up 30 liters
- » Mixing speed adjustable from 5 to 35 rpm
- » Mixing temperature adjustable up to 250°C
- » Stainless steel (AISI 304) mixing container
- » Temperature control by PT 100 probe
- » Control panel including Digital mixing temperature display, thermo-regulator, mixing speed controller and commands
- » Easy unloading by motorized tilting system of the container
- » Tilting angle adjustable up to 130° for easy downloading

Detail of drum with helical mixing shaft

The design and testing of bituminous mixtures includes various laboratory tests such as the Marshall stability (EN 12697-34), Gyratory compaction (EN 12697-31), Slabs laboratory compaction (EN 12697-33) to prepare specimens for Wheel tracking (EN 12697-22) and Determination of stiffness including Beam fatigue testing (EN 12697-24, 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 a limited time period in order to reduce mechanical degradation of the aggregates. The mixer shall also be capable of entirely coating all mineral substances in not more than 5 minutes as stated by EN 12697-35.

- Power: 7000 W (total)
- Overall dimensions: 1350 x 650 x 1205 (w x d x h)
- Weight: approx. 320 kg

Aggregate loading

77-PV0077/C
BITUMIX automatic laboratory mixer, 30 liters capacity.
380-400 V, 50 Hz, 3 ph

77-PV0077/CZ
Same as above but 220 V, 60 Hz, 3 ph

Detail of the control panel

Detail of unloading: the mixing cylinder is rotated by a motorized tilting system for easy unloading. The tilting angle is adjustable to 130° to speed up the unloading operation.

LABORATORY DIGITAL PLANETARY MIXER

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 front grill, when opened, automatically stops the machine for operator protection conforming to CE requirements. Mixing speed can be easily selected (also adjustable during mixing).

-Power: 370 W

-Overall dimensions: 465 x 540 x 620 mm (l x d x h)

-Weight:35 kg (approx.)

76-B0702
Laboratory planetary mixer, 5 l capacity, complete with bowl and whisk. 230 V, 50-60 Hz, 1 ph

76-B0704
As above but 110 V, 60 Hz, 1 ph

MAIN FEATURES

- 5 l Bowl capacity
- Whisk/Planetary speeds adjustable from 12/5 to 149/65 rpm, depending on the mix consistency.
- Continuously variable speed (VFD technology).
- Digital alphanumeric display 2x16 characters with keyboard control.
- Safety features including emergency stop, steel safety grid and micro-switch preventing the machine from being started without bowl in position.
- Machine operated by a dedicated and easy to use inbuilt software.
- Can be fitted with isomantle heater to heat the bituminous mixture up to 180°C. See accessories

Accessories

Isomantle heaters

Used to heat the bituminous mixtures contained in the mixing bowl of the asphalt mixers up to a maximum of 180°C. Complete with electronic temperature regulator. They can be easily fit to the machine bowls by spring arrangement.

76-B0702/H
Isomantle heater for 76-B0702 mixer. 700W, 230 V, 50-60 Hz, 1 ph.

76-B0702/HZ
Isomantle heater for 76-B0704 mixer. 700W, 110 V, 60 Hz, 1 ph.

Stainless steel mixing hook

LABORATORY PLANETARY MIXERS 10 AND 20 L CAPACITY

These mechanically operated mixers are similar in operating principle to the 5l digital version, and can also be used for other applications as, for instance, for mixing subbase soil samples. Supplied complete with bowl and whisk.

Models 76-	B0072	B0075/B
Capacity l	10	20
Planetary speeds	8 pos. 50 to 150	8 pos. 50 to 150
Spindle speeds	10 pos. 115 to 400	10 pos. 180 to 540
Power	370 W	736 W
Overall dim. mm	570 x 340 x 585	730 x 610 x 1180 mm
Weight approx..	42 kg	128 kg

76-B0072
Laboratory planetary mixer, 10 l capacity, complete with whisk. 230 V, 50 Hz, 1 ph

76-B0072/Y
As above but 220 V, 60 Hz, 1 ph

76-B0072/Z
As above but 110 V, 60 Hz, 1 ph

76-B0075/B
Laboratory planetary mixer, 20 l capacity, complete with whisk. 380 V, 50 Hz, 3 ph

76-B0075/BZ
As above but 220V, 60Hz, 3 ph

76-B0072 with 76-B0072/HM

Accessories

Isomantle heaters

76-B0072/HM
Isomantle heater for 76-B0072 mixer. 1000W, 230 V, 50-60 Hz, 1 ph.

76-B0072/HMZ
As above but 110 V, 60 Hz, 1 ph.

76-B0075/HM
Isomantle heater for 76-B0075/B mixer. 1000 W, 230 V, 50-60 Hz, 1 ph.

76-B0075/HMZ
As above but 110 V, 60 Hz, 1 ph.

Mixing hooks

76-B0072/9
Mixing hook for 76-B0072 mixers

76-B0075/9
Mixing hook for 76-B0075 mixers

76-B0075/B fitted with Isomantle heater 76-B0075/HM

ADVANCED SERIES

Electromechanical multisize slab compactors

EMS TECH

77-PV41A02 series

Standard 8" touchscreen control version

77-PV41C05 series

Advanced PC control version

SERIES **ROLLERCOMP**

STANDARD

- ASTM D8079
- EN 12697-33
- TP Asphalt-StB part 33

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

COMMON FEATURES

- Completely electromechanically operated
- Base and foot adjustable heating system and vibrating roller available as an option
- Mould dimensions: 500 x 400, 500 x 300, 400 x 300, 300 x 300 and 320 x 260 mm, 195 mm height
- Compaction direction in the longest (major) mould dimension to obtain specimens of the proper length conforming to Standard
- Vertical sliding cover for easy access and complete three side view
- Maximum compaction load 30 kN
- User defined controlled linear speed up to 300 mm/sec and adjustable pause at the mould inversion point
- Ideal for producing test beams for 4-Point bending (EN 12697-24, EN 12697-26, AASHTO T321) and slabs down to 38 mm
- PRO-COMPACT* closed loop control slabs
- Customization of compacting cycle which can be saved and recalled from the database

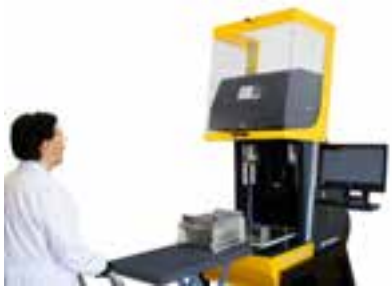
PRO-COMPACT Unique features

The combined load/displacement compaction procedure provides a controlled displacement compaction, which can grant a flat surface of the compacted slab, followed by a load compaction phase, which can replicate the real compaction on the road surface.

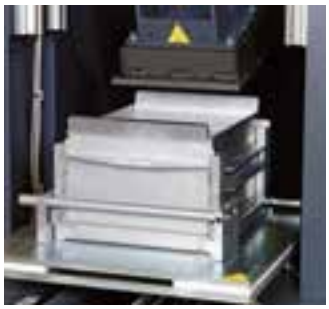
77-PV41A02 series

77-PV41C05 series

Detail of segment head incorporating vibration unit



Detail of the vertical sliding cover for easy access and three side view

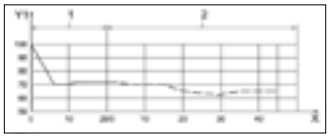


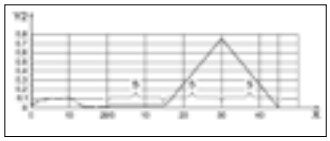
Detail of segment head and mould

500 x 400 mm slab and lead rolled ball screw system

Additional features of the PC control version

- Possibility to program user defined procedures as free combination of load and displacement (or combined) controlled cycles
- 21" all-in-one touchscreen PC controlled , PC and software included
- Load measurement by two precision load cells
- Includes the compaction procedure defined in new EN 12697-33 method 7.3 and TP Asphalt-StB part 33, providing a controlled displacement compaction which can grant a flat surface followed by a load compaction phase , which can replicate the real compaction on the road surface
- Customization of compacting cycle which can be saved and recalled from the database





Advanced versions allow the performance of the energy-controlled compaction procedure required by the new EN 12697-33 Clause 7.3 and TP Asphalt-StB part 33, composed by a fixed combination of displacement controlled and load controlled cycles.

PReSBOX ® Asphalt Prism Shearbox Compactor
Unique solution for specimen preparation

STANDARD
- ASTM D7981

MAIN FEATURES

» The PReSBOX produces a prismatic specimen with nominal dimensions of 450 mm (length) x 150 mm (width) x 120 to 185 mm (height)

» Asphalt prisms prepared in the PReSBOX compactor can be sawn or cored to produce 4-6 prismatic beams or 1-4 cylindrical specimens

» The PReSBOX can be operated by a single person

» Produces specimens with excellent air void distribution and particle orientation

» Designed for an easy unlocking of the compaction mould, facilitating an effortless specimen extraction at safe height, handling and user safety

The PReSBOX provides the latest in asphalt specimen preparation and mix evaluation technology. PReSBOX produces high quality asphalt prisms from which beams and cylinders with excellent air void distribution, homogeneity and particle orientation can be cut.

The unique shearing action of the PReSBOX closely replicates the conditions under which asphalt is placed in the field and produces specimens with excellent homogeneity and volumetric properties, giving an exceptional measure of workability.

The PReSBOX also provides an accurate measure of the workability (relative effort required for compaction) of Hot Mix Asphalt (HMA) needed in the field to achieve a target void content.

The PReSBOX Shearbox Compactor features a PC interface for user entry of compaction parameters, and provides a real time graphic display of data, e.g. specimen height, vertical stress, shear stress and air voids per cycle.

Controlling PReSBOX is a dedicated high performance controller, delivering leading edge performance, unparalleled control and the ultimate in flexible data acquisition.

The PReSBOX features an ergonomic interaction of users with the testing machine

Three simple steps

PReSBOX has been designed to replicate the field properties of asphalt, in a simple and efficient manner.

Charging the compaction mould with loose asphalt

Using the distribution chute provided, pour HMA into the compaction mould. Slots in the distribution chute ensure the material is tipped uniformly into the PReSBOX. Discharge gates at the bottom allow the material to fall freely into the mould avoiding segregation.

Commencing the test

The mould is then pushed into the PReSBOX and automatically locked into place. Using IPC Global's world renowned UTS Software the user can set the required compaction parameters. The PC controlled compaction process can then be commenced.

Removing the Sample

The compaction mould is then unlocked, pulled into the ejection position and the sample is elevated to a safe height to allow for removal and cooling.

Specifications

- Shearing motion: Electromechanically driven at 4°
- Vertical stress: Pneumatic user defined up to 2 MPa
- Specimen size: 450 mm x 150 mm x 120 - 185 mm (l x w x h)
- Integrated specimen extruder
- Specimen Loading: Easy loading with included accessory kit (includes: distribution chute, levelling tool & comb)
- Compaction Frequency: 3.7 cycle/min +/- 16 s/cycle
- Mould hardness: 50 Rockwell C (minimum)
- Platen Hardness: 50 Rockwell C (minimum)
- Mould Surface: finish smoother than 1.6 µm
- Loading Platen Size: 448 mm x 149 mm (l x w)
- Loading Platen Finish: smoother than 1.6 µm
- Number of cycles: user definable (unlimited)
- Air Supply: clean dry air supply at minimum 600 kPa
- Size (h x w x d): 1540 mm x 1765 mm x 1050 mm
- Weight: 1100 kg

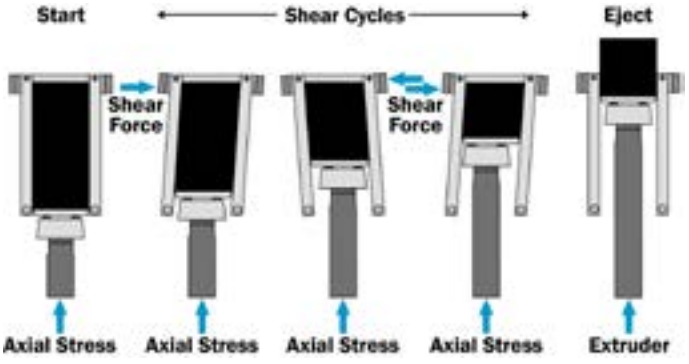
77-PV46A02
PReSBOX, Asphalt Prism Shearbox Compactor.
220 - 240 V, 50 - 60 Hz, 1 ph.

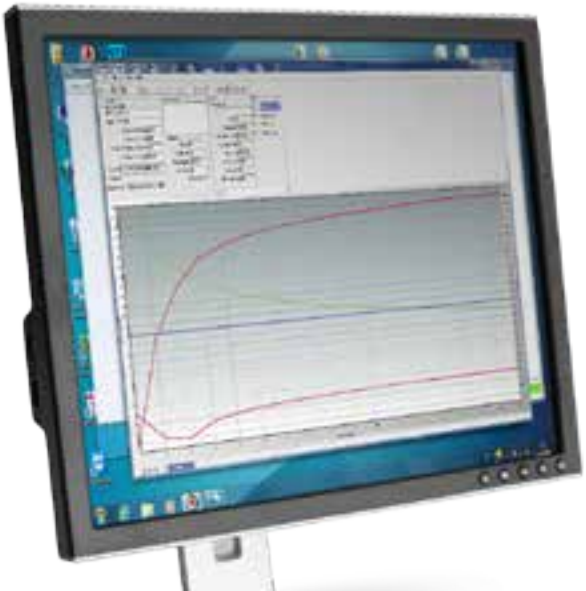
Accessories

79-PV71102
Pneumatic filtration kit - wall mount, 12 bar.

77-PV46202
Heater to pre-heat the box walls.
220 V, 50 - 60 Hz, 1 ph

77-PV46204
Heater to pre-heat the box walls.
110 V, 60 Hz, 1 ph





Perfectly Uniform Specimens

Asphalt prisms prepared in the PReSBOX compactor can be sawn using Universal Automated Asphalt Saw (Autosaw, see page 353) or cored using the Multi Core Drill (see page 354) to produce prismatic beams or cylindrical specimens suitable for testing in the Asphalt Mixture Performance Tester (AMPT), Four Point Bend Apparatus, Asphalt Standards Tester, TSRSTplus or UTM Systems.

Specimens cut from PReSBOX prisms have identical properties with uniform air voids distribution and particle orientation ensuring consistent and repeatable test results.

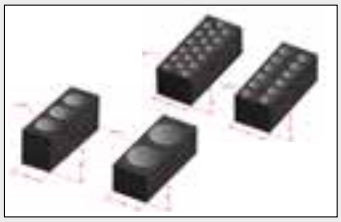
Specimens cut from the PReSBOX

- Prismatic specimen produced by the PReSBOX

- Up to four 70mm wide prismatic specimens

- Up to six 50mm wide prismatic specimens

- Up to four 100mm diameter cylindrical specimens



- Many cylinder samples can be cored from the prismatic specimen using the Multi Core-Drill

- Many cylinder samples can be cored from the cylindrical specimen using the Multi Core-Drill

PReSBOX mould heater

ADVANCED SERIES

Advanced Automated Asphalt Saw

77-PV47105

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

AUTOSAW II

Application

- Cutting of prisms and slabs to be used in Four Point Beam Bending tests according to EN 12697-24D and 26B and AASHTO T321
- Cutting of trapezoidal specimens to be used in Two Point Beam Bending tests according to EN 12697-24A and 26A
- Cutting AMPT cylindrical specimens round cores according to AASHTO R83
- Cutting TSRST specimens according to EN 12697-46 and AASHTO TP10
- Cutting and dressing of Wheel Tracking slabs or cores according to EN 12697-22 and AASHTO T324
- Cutting Prall test specimens according to EN 12697-16
- Cutting Overlay test specimens according to TX-248-F and ASTM WK26816
- Cutting Semi-Circular Bend test specimens according to EN 12697-44, AASHTO TP105, TP124, ASTM D8044 (except for the notch)
- Cutting accurately 100, 150 and 200mm diameter cylindrical cores to different lengths.

MAIN FEATURES

» Touchscreen CPU control allows for easy set-up including carriage speed and retraction sequence

» Intelligent system with adjustable limit switches allow for repetitive cuts with minimal carriage overtravel saving time

» Protection cabinet with several automatic locking access doors to ensure unparalleled safety and clean operation in laboratory environments.

» Slab and prism of any shape and dimensions can be sawn without additional accessories

» Pneumatic clamping of prisms and cores

» Compressed air gun for cleaning specimens and sawing system

» Easy spacer system allows precise preparation of beams or cores

» Automatic advance and retraction of saw blade to home position

» Adjustable cutting speed for optimum specimen finish and throughput

» Motor features dynamic braking to immediately stop while switched off

» Unique clamping mechanism for cylindrical specimens minimizes specimen damage. Use of a sacrificial PVC tube produces a superior finish and minimizes edge chipping

» Jig for round cores, 100 or 150 mm diameter, with automatic feeding of the sample, length up to 200 mm, and jig for up to 200 mm diameter cores with manual feeding

» Quick and easy specimen set-up

» Blade diameter: 650 mm

» Maximum cutting depth: 200 mm

» Accuracy: ±1% max. according to Standards

Trapezoidal specimen jig for two point bend

Clamping device for slabs included in Autosaw II and Multisaw

Jig for prisms and slabs

Automatic core docking jig for 100/150 mm diameter cores. For use with Autosaw II only

Wheel tracking core, Semi circle and Disk shaped compact tension specimen jig

The protection cabinet ensures easy access for sample set-up, safe operation and protection from spray during cuts. Several automatic locking doors on the front, back and top prevent the operator from accessing the dangerous areas while the blade is running

MULTISAW

Universal multipurpose saw to cut Asphalt, Concrete and Rock samples

77-PV47005

The MULTISAW is mechanically identical to the AUTOSAW II model and has the same applications. It can also receive the same accessories except the Automatic core docking Jig.

It can also be conveniently used for cutting concrete and rock samples.

To get more information visit
www.controls-group.com
or link directly to the QRCode

Multi core-drill, Advanced Asphalt core drill

MAIN FEATURES

» For coring samples 100 mm diameter, 150 mm high for Dynamic modulus (AMPT, AASHTO T378/ TP79, AASHTO R83) and 30 to 75 mm high for Indirect tensile tests (EN 12697-24 and 26)

» Complete with support and clamping device ensuring asphalt samples coming from PReSBOX to be held firm and in the correct position for drilling

» Sliding base table and translational movement (Bidirectional) permitting to obtain the largest number of cores from the same sample. See upgrading options.

» Guided rail provides a smooth and precise track for the drill to travel while cutting samples

» Transparent protection/splash covers conform to CE requirements

A superior laboratory core drill providing a precise coring of asphalt prisms, cylindrical and slab samples to the highest quality

77-PV75202
Multi Core-Drill, laboratory asphalt core drilling machine with clamps for prisms up to 450 x 180 mm. Three speeds: 540, 1300, 1800 rpm. 2200 W, 10 A. 230 V, 50-60 Hz, 1 ph

77-PV75204
As above but three speeds: 560, 1300, 1850 rpm. 2050 W, 16 A. 110 V, 60 Hz, 1 ph

Upgrading options. To be specified at time of order.

77-PV75200/UP
Upgrade with translation device for transversal movement of the drill (up to 80 mm translation) for parallel coring. Suitable for 38, 50 and 75 mm diameter cores.

Technical specifications

- Motor speeds: 540, 1300, 1800 rpm (for 50 Hz use) and 560, 1300, 1850 rpm (for 60 Hz use)
- Cylindrical sample size: up to 160 mm diameter, max 400 mm high
- Prismatic samples size: up to 450 x 180 x 150 mm
- Coring diameter: from 38 to 150 mm (see accessories)
- Dimensions (h x w x d): 1400 x 600 x 800 mm
- Weight: 85 kg

Included support and clamping device

The Multi core drill Includes, as standard, the support and clamping device that sits inside the stainless steel tray and ensures asphalt samples produced by the PREsBOX are held firm and in the correct position for drilling. The same samples can also be placed horizontally in the stainless steel sample tray for coring 150 mm diameter specimens.

Accessories

Core bits

Thin wall diamond type, fixed standard coupling 1 1/4"W, 400 mm total length.

83-C0323
Diamond core bit to take 150 mm diameter sample.

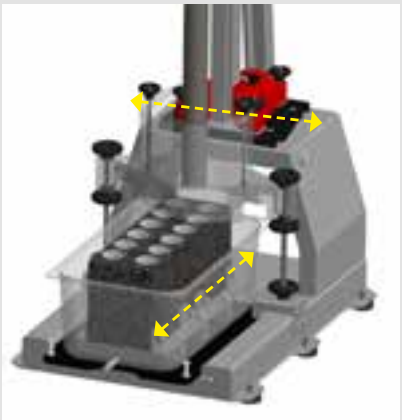
83-C0322
As above to take 100 mm diameter sample.

83-C0321
As above to take 75 mm diameter sample.

83-C0320
As above to take 50 mm diameter sample.

83-C0319
As above to take 38 mm diameter sample

Transversal bidirectional displacement for parallel coring option



The Multi core drill can be provided with an optional device (see 77-PV75200/UP) which allows up to 80 mm transversal displacement of the drill for parallel coring assuring high cutting alignment and increasing the number of cores obtainable from the same prismatic sample. Suitable for 38, 50 and 75 mm diameter cores.

Accessories (continued)

Coring cylindrical asphalt samples

77-PV75210
Clamps system for overcoring on cylindrical specimens from 50 mm to 150 mm diameter

A unique, easy and intuitive cylindrical clamp accessory for quickly coring specimens from cylindrical samples up to 150 mm diameter produced with Gyratory compactors. The same operation can be performed with the Kor-Bit machine 77-PV75302 which is supplied as standard with suitable clamp.

Transversal coring

77-PV75220
Accessory for transversal coring on 100 or 150 mm diameter cylindrical samples, length up to 300 mm

The innovative transversal coring clamp system allows users to obtain cylindrical specimens in 38, 50 and 75 mm diameter This unique feature ensures that 100 and 150 mm diameter samples are securely clamped whilst drilling is commenced to provide perfect specimens.

77-PV75230
Spacer for vertical coring on samples thinner than 120 mm

KorBit, Core drilling machine

MAIN FEATURES

- To take samples from cores up to 150 mm diameter
- Particularly suitable for coring samples 100 mm diameter 150 mm high for Dynamic modulus (AMPT-AASHTO T378/TP79, AASHTO R83) and 38 to 75 mm high for indirect tensile tests (EN 12697-24 and 26)
- Complete with protection device conforming to CE prescriptions
- Mechanically identical to model Multi core-drill (speeds, dimension and weight.)

77-PV75302
KorBit, laboratory asphalt core drilling machine with clamps for samples up to 150 mm diameter Three speeds: 540, 1300, 1800 rpm. 2200 W, 10 A. 230 V, 50 Hz, 1 ph*

77-PV75304
Same as above but speeds: 560, 1300, 1850 rpm. 2050 W, 16 A. 110 V, 60 Hz, 1 ph

*The 77-PV75302 model can also operate at 220V, 60 Hz. in this case the speeds are 560, 1330 and 1850 rpm

Core bits

Same as listed for the Multi core-drill

Pavement core drilling machine

MAIN FEATURES

- 6 HP, 4-stroke high quality petrol engine
- Coring range up to 200 mm diameter
- Robust, compact and portable
- Vertical screw feet
- Complete with strap wrench and spanner

This simple but rugged machine is a portable unit, which can be easily carried in a pick-up truck. The powerful 6 HP engine is more than adequate for all types of work and materials. The relatively heavy weight (106 kg) contributes to the machine's stability during coring.

- Overall dimensions (wxdxh): 520 x 1140 x 1100 mm
- Weight: 106 kg approx..

77-B0202/B
Pavement core drilling machine, 6 HP, 4-stroke petrol engine

Accessories

Core bits

In addition to those listed for the Multi core-drill:

83-C0324
Diamond core bit to take 200 mm diameter

Core extractors

See page 243

ADVANCED
SERIES

Fully electro-mechanical gyratory compactors

78-PV20G02

Available in two versions:
GALILEO and
GALILEO Research

The completely new Galileo range represents a true Copernican Revolution of gyratory compaction and are, probably, the most evolved models currently available on the market

Galileo is the natural evolution of world-wide renowned IPC Global's Servopac , for more than 25 years the most popular research grade gyratory compactor. Highly regarded for its robust design and reliability, the Servopac granted excellent performances now possible on Galileo gyratory compactor, based on new EmS technology.

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

SERIES **GALILEO**

STANDARD

EN 12697-10 ▸ EN 12697-31 ▸ ASTM D6925 ▸ AASHTO T312/TP4 ▸ SHRP M002 ▸ AS 2891.2.2

MAIN FEATURES

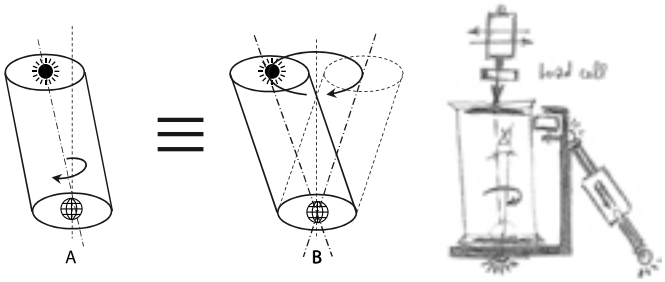
- High precision, robust load mechanism combined with an extremely rigid frame assures high accuracy and repeatability
- Load cell fitted directly on the vertical actuator for accurate load measurement and feedback control
- User defined axial stress and speed of rotation
- Fresh concrete testing configuration available
- Easy control using the integrated 7" color touchscreen panel or connected PC
- User friendly PC software for data analysis and test set-up. Remote communication is available to receive immediate diagnostics
- Automatic data saving on USB or directly on Windows PC
- Safe and easy mould insertion and extraction with automatic lifting ensures low effort for the operator and higher productivity
- Easy specimen extraction with the integrated extruder
- Optional real-time direct shear and torque resistance measurement. Automatic calculation of the compaction energy, an important parameter for Research
- Gyratory angle range 0-3° ± 0.01

Safe and easy mould insertion and extraction with automatic lifting ensures low effort for the operator and higher productivity.

The "ORBITAL" patent-pending, smart intelligent-easy mechanism is the heart of the gyratory compactors and we modestly believe it is worthy of the name of the famous scientist Galileo

Additional features of the GALILEO Research version

- Perfect gyratory angle with real time closed loop automatic angle adjustment recovering compliance and minor strains independently from the vertical loads
- Easy and accurate motorised regulation of the gyratory angle set and displayed from the control panels
- Possibility to automatically set the zero angle at the end of the test
- Included real time direct shear and torque resistance measurement and automatic calculation of the compaction energy, an important parameter for Research
- Automatic weight acquisition and density calculation with the integrated balance (optional)
- Gyratory angle range 0-3° ± 0.005



The "ORBITAL" patent pending, smart intelligent mechanism is characterized by the simple rotation of the mould around its own inclined axes resulting in a precise and regular motion maintaining the gyratory angle constant at all stages of rotation. The micrometrical adjustment of the gyratory angle is actuated by a mechanical device (Galileo version) or by the EmS electromechanical servo-actuation system (Galileo Research version)

Detail of the integrated balance (optional for both models) for the automatic weight acquisition and density calculation.

GYROCOMP
Gyratory compactors

The ideal solution for on-site laboratories for production control. Light and portable, can be easily installed in mobile laboratories.

Very attractive price/quality ratio. Thousands of units operating successfully all over the world.

MAIN FEATURES

» High productivity, designed for continuous and heavy use
» High rigidity thus light weight due to the proprietary Orbital system
» Also ideal for mobile laboratories
» Very reliable and accurate
» Certified to EN and AASHTO
» Approved as Superpave™ Gyratory Compactor in U.S.A.
» Integrated touchscreen control panel with large display
» Sliding transparent door
» Safe, and ergonomic design
» Integrated electromechanical extruder option
» 2 years full warranty

STANDARD

▸ EN 12697-10 ▸ EN 12697-31 ▸ ASTM D6925 ▸ AASHTO T312/TP4 ▸ SHRP* M002

** Strategic Highway Research Program*

Robust yet lightweight, and with high stiffness, steel monocoque structure, incorporating a pneumatic cylinder for vertical load application and propriety electromechanical gyration and mould rotation system. This design delivers highly accurate and repeatable test results, together with stiffness and angle stability that fall comfortably within the limits defined in EN 12697-31. The large user-friendly integrated touchscreen control panel, shows the test graph in real time. The on-board firmware includes twelve languages making the interface suitable for local user needs and also offers the option to control the tests from a PC.

The machine can be fitted with the electromechanical extruder. See accessories.

The machine is supplied complete with height calibration tool, PC software, air hose, operating instructions and calibration certificate. Available in two versions:

78-PV2522
conforming to AASHTO/ASTM Standards and

78-PV2522/E
conforming to EN standards

Models preset to ASTM/AASHTO are supplied complete with Accredia traceable certificate of load, displacement and internal angle. Models preset to EN are supplied complete with Accredia traceable certificate of load, displacement and internal angle, including all the parameters required in EN 12697-31 Annex C ("stability factor", "parallelism factor", "full rotation factor").

Cylinder moulds, distance plates and air compressor not included. See accessories.

Operating principle

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, sample compaction.

High stiffness frame

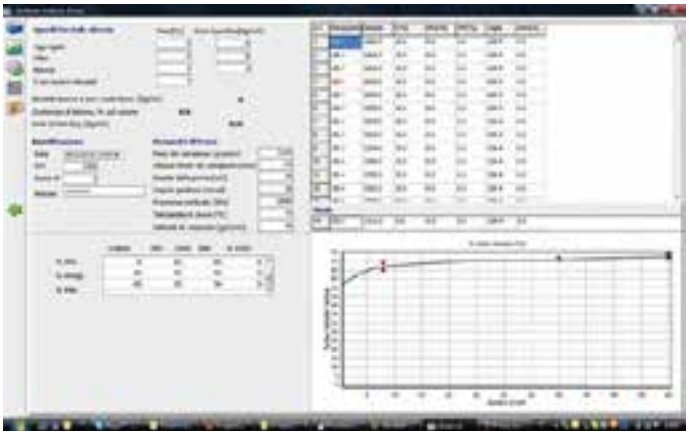
The very rigid but lightweight frame is due to the unique body design, resulting in high rigidity values exceeding the EN 12697-31 Standards

Change of internal gyratory angle

The internal gyratory angle can be easily and quickly changed to any value, between 0.7 and 1.4°, following a factory calibrated conversion scale.

Periodical verification and re-calibration

The Gyrocomp compactors can be easily verified and re-calibrated by the operator, using the ILS Internal angle measurement apparatus model 78-PV0255 (see page 361). This apparatus is verified with traceable calibration instruments.



Example of single test processing with PC software

Technical specifications

- Compacted specimen size: 150 and 100 mm diameter
- Sample height: 80 to 200 mm (150 mm)-50 to 125 mm (100 mm)
- Consolidation pressure: 80 to 800 kPa (150 mm) -160 to 1400 kPa (100 mm)
- Internal angle of gyration: Adjustable from 0.70 to 1.40 °.
- Preset to 1.16° internal angle (78-PV2522, ASTM/AASHTO models)
- Preset to 0.82° internal angle (78-PV2522/E, EN models)
- Speed of gyration: adjustable from 20 to 60 rpm
- Number of gyrations: adjustable up to 999
- Test programmable either by number of gyrations or specimen height
- Communication with PC: RS 232 connections
- Internal memory: thousands of tests
- Power rating: 1000 W
- Dimensions (including extruder bench, wxdxh): 502x753x1940 mm
- Dimensions (wxdxh): 469x615x1130 mm
- Weight approx.: 100 kg

78-PV2522
GYROCOMP gyratory compactor, internal angle of gyration preset to 1.16° to AASHTO T312/ASTM D6925. 230-110 V, 50-60 Hz, 1 ph

78-PV2522/E
GYROCOMP gyratory compactor, internal angle of gyration preset to 0.82° to EN 12697-31 Annex C. 230-110 V, 50-60 Hz, 1 ph

Note *All models nominally comply to EN 12697-10, EN 12697-31, ASTM D6925, AASHTO T312 and SHRP M-002. The only difference between the 78-PV2522 and the 78-PV2522/E versions, is the angle of gyration, factory set to ASTM/AASHTO or to EN standards. This means that it is possible, with our intervention, to upgrade from one version to the other the angle of gyration.*

Accessories

Cylinder moulds and distance plates

Suitable for all our Gyratory compactors. For detailed information see page 360

Integrated worktop with extruder

The bench top with extruder fits the GYROCOMP perfectly resulting in an ergonomic solution that aids the operator. The Electromechanical 550 W motor with speed reducer produces a maximum load that is also suitable for cold mix specimens.
Dimensions: 502x753x808(h) mm
Weight approx.: 45 kg

78-PV2520/15
Integrated work top with electromechanical specimen extruder. 230 V, 50-60 Hz, 1 ph

78-PV2520/15Z
Integrated bench top with electromechanical specimen extruder. 110 V, 60 Hz, 1 ph

Air compressor

78-PV0250/7
Low noise air compressor. 230 V, 50 Hz

Internal angle measurement apparatus

78-PV0255
ILS Internal angle measurement apparatus (For detailed information see page 361)

Integrated worktop with electromechanical extruder 78-PV2520/15

Gyrocomp installed inside a van as a road mobile laboratory

GALILEO | GYROCOMP
Accessories

Cylinder moulds and distance plates

Suitable for all our gyratory compactors: GALILEO, GALILEO Research and GYROCOMP

All made from special alloy steel, hardened to 53-55 HRC, internally grinded, internal roughness, Ra less than 1µm, fully conforming to EN 12697-31 and exceeding AASHTO T312

78-PV0250/2
Cylinder mould, 150 mm diameter. Complete with top and bottom plates.

78-PV0250/5
Cylinder mould, 100 mm diameter. Complete with top and bottom plates.

78-PV0250/8
Cylinder mould, 100 mm diameter, with holes for cold mix compaction. Complete with top and bottom plates.

78-PV0250/10
Cylinder mould, 150 mm diameter, with holes for cold mix compaction. Complete with top and bottom plates.

78-PV0250/3
Distance plate, 150 mm diameter, 50 mm high, for preparing short samples.

78-PV0250/6
Distance plate, 100 mm diameter, 38 mm high, for preparing short samples.

78-PV0250/4
Accessories for compacting 100 mm diameter specimens, including 100 mm height calibration device.

78-PV0250/11
Vertical force indicator complete with 25 kN load cell, baser, spherical seat, load readout unit and calibration certificate.

78-PV0250/10, 150 mm diameter mould with holes for cold mix compaction and accessories

ils

ILS, Internal angle measurement apparatus

MAIN FEATURES

» Accurate calibration of internal angle of Gyratory compactors and verification of frame stability, to International Standards

» Quick and accurate measurement of the internal gyratory angle: less than 30 minutes

» No hot mix required: when placed into the mould, the device reproduces the internal shearing forces generated by the hot mix during compaction

» Ideal for periodic verification of the internal gyratory angle

» Compatible with any make of Gyratory compactors

» Reproducibility: 0.01° Class, fitting to all Standards

» Battery operated

STANDARD

EN 12697-31 Annex B ▸ ASTM D7115

The importance of a precise gyratory angle has been widely noted. The measurement of the internal angle represents, in practice, the most accurate method of calibration. This method comprises two individual values: angle between cylinder and top plate and angle between cylinder and bottom plate.

The average of these two values is taken as the "internal angle". To date the internal angle calibration of gyratory compactors has been considered a difficult task leading to wide variations in results even between machines of the same brand.

The ILS device fully satisfies the verifications requirements to measure the internal angle conforming to EN 12697-31 Annex B. It can also be used on any other makes of gyratory compactors.

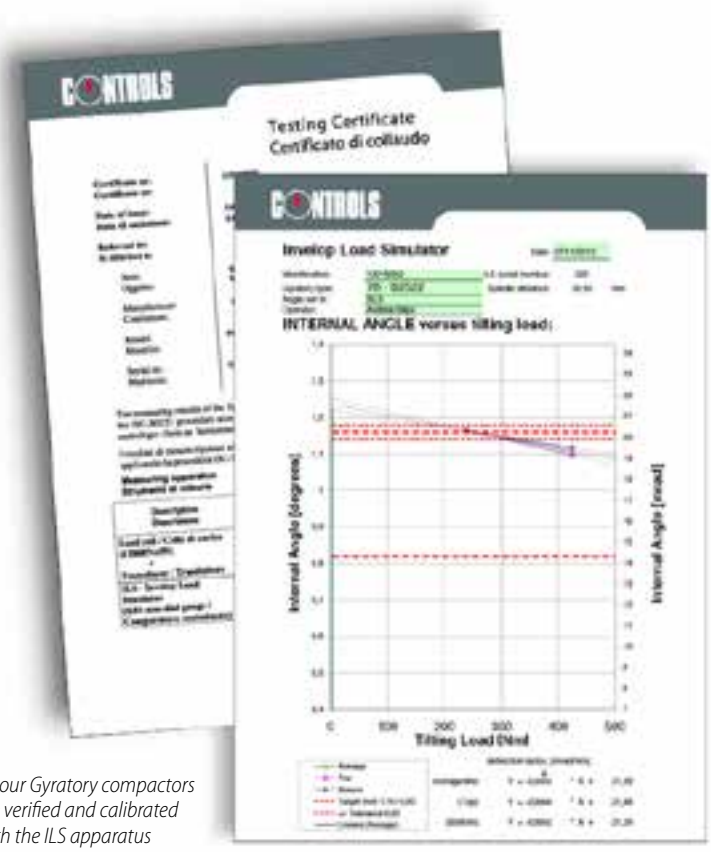
- Dimensions: 150 mm diameter 115 mm high
- Weight approx.: 5.6 kg

78-PV0255
ILS device for internal angle measurement for Gyratory compactors. Complete with Excel Macro and PC connection cable

78-PV0255 complete set

Accessories

78-PV0255/1
Calibrator blocks for ILS, set of two different angles, supplied with factory certificate



All our Gyratory compactors are verified and calibrated with the ILS apparatus

ADVANCED SERIES

Double Wheel Trackers

We offer the EN version, the AASHTO version (Hamburg type) and the Universal version which satisfies both EN and AASHTO requirements

EMS TECH

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

SERIES DWT

STANDARD

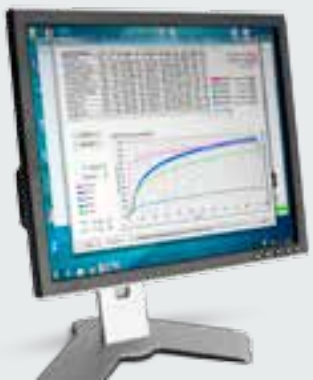
AASHTO T324 · EN 12697-22 (small size device)

WET AND/OR DRY VERSIONS

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

The two methods according AASHTO T324 and EN 12697-22 "small size device" are practically identical except for:

- Test environment: Dry and wet for EN; wet for AASHTO
- Wheel material and size: rubber wheel, 203 x 50 mm (diameter x width) for EN; steel wheel, 203 x 47 mm (diameter x width) for AASHTO



MAIN FEATURES

- Fully automatic test performance on two specimens or one specimen
- Variable wheel speed from 20 to 30 cycles/min
- Fixed table, mobile wheel 230 mm travel
- Wheel load of 700/705 N or adjustable from 700 to 1500 N (Universal model only)
- Temperature range from ambient to 80°C (±0.5°C)
- Accurate temperature control (±0.5°C) for both in water and air test
- Rut depth transducers feature 50 mm travel, 0.01 mm accuracy
- Direct rut depth measurement system, with transducers axially mounted in alignment with the wheel's centre
- Motorized wheel-assembly lifting system for easy removal of slabs
- Free access to the wide testing area
- Optional independent lifting system for double or single wheel testing
- Slab mould size of 400x300 mm (EN) or 360 x 300 mm (for 320 x 260 mm slabs), double 150 mm gyratory compactors cylinders, 200 mm/8"/10" cores
- Slab thickness adjustable from 40 to 100 mm (in 10 mm steps)
- Extensive use of stainless steel in the machine's construction; not limited to the parts in contact with water
- PC and software included
- Automatic water filling and levelling system, no need to adjust or control the water level above the specimen during test
- Possibility to add two optional temperature probes to monitor the two sample's temperature
- Laptop PC control with dedicated software including results performance, test database management and multiple test elaboration

Standards	AASHTO T324	EN 12697-22		AASHTO T324 / EN 12697-22
Testing mode	in water	in air	in air and water	in air and water
Models 78	PV31A16* * PV31A26 PV31A15* * PV31A25	PV32E05	PV33E05	PV33B05 PV33B06 PV33D05 (1500 N) PV33D06 (1500 N)
Descriptions	 DWT Hamburg type double wheel tracker, wet conditioning version	 DWT double wheel tracker, dry conditioning version	DWT double wheel tracker, wet and dry conditioning version	 DWT, Hamburg and EN type, double wheel tracker, inter-changeable wheels (steel for AASHTO and rubber for EN), wet and dry conditioning
Material and dimensions (diameter x width) of the two loaded wheels	Stainless steel 203 x 47 mm	Rubber tyre 203 x 50 mm	Rubber tyre 203 x 50 mm	Stainless steel 203 x 47 mm and Rubber tyre 203 x 50 mm
Temperature control method (accuracy ±0.5°C for both water and air)	Three 1500 W heaters, re-circulating pump, automatic filling and control level*	Three 1200 W electronically controlled air blowers	Air: Three 1200 W electronically controlled air blowers Water: Three 1500 W heaters, re-circulating pump, automatic feed and control level	Air: Three 1200 W electronically controlled air blowers Water: Three 1500 W heaters, re-circulating pump, automatic feed and control level
Power rating	5500 W	4600 W	5500 W	5500 W

**Model 78-PV31A26 and 78-PV31A25 only* ***Protection sliding cover not included*

Detail of the sliding cover and motorized lifting system that rises the wheel assembly at the end of the test, making the use of the hoists obsolete

Detail of the testing wheels with rut depth measurement transducers axially mounted in alignment with the wheel's centre

IPC Global's

Superior Universal and Modular Testing Machines

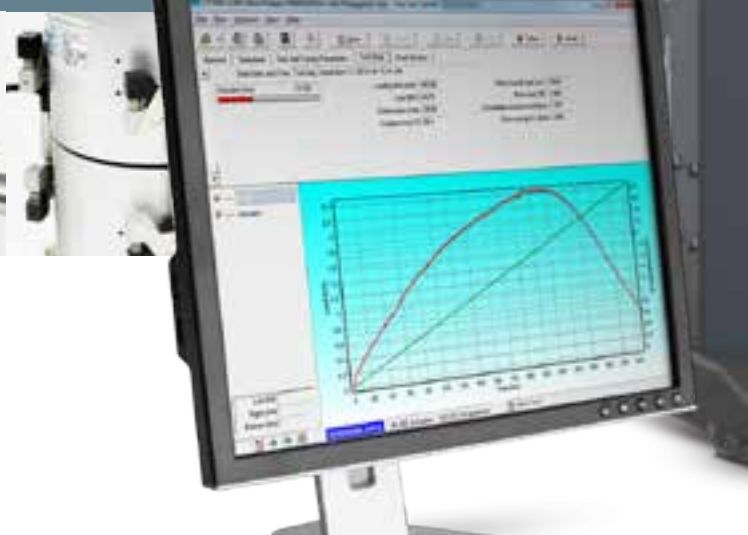
IPC Global's range of Servo-Hydraulic and Servo-Pneumatic Universal Testing Machines (UTM) and modular testers are flexible, accurate, reliable and affordable. IPC Global has the largest customer user-base of servo-controlled systems in the asphalt and pavement materials testing industry.

- **New and Improved Technology**
  IPC Global's range of new and improved systems are significant advancement on our previous UTM systems
- **World Leading Control**
  Paired with IPC Global's world leading IMACS2 Digital Controllers you are guaranteed unparalleled real time control and data acquisition
- **Tried and Tested**
  IPC Global's technology has been tried and tested by leading research institutes and government organizations around the world for over 30 years
- **Precision Engineered**
  IPC Global is renowned for its easy to use, reliable and high quality materials testing technology
- **Clarity of results and analytical power**
  IPC Global's test and control software is appreciated and trusted by leading research organizations worldwide
- **Complete Turnkey Solution**
  IPC Global offers a wide range of high quality test fixtures, transducers and environmental chambers to complement its range of UTM systems and extend their capabilities
- **Full conformity**
  to AASHTO, ASTM, EN, BS, AS, NCHRP etc.

UTM ASPHALTQUBE AMPTQUBE® AMPT PRO

The complexity and scope of this subject makes it difficult to quickly identify and configure the most appropriate equipment for your needs without the inclusion of significant detail and technical information.

We are therefore only providing a brief introduction to these products here as a Guide and invite you to visit our website where all products are fully illustrated, described and specified based on the knowledge and experience accumulated, over almost 30 years, by IPC Global.



IPC global® | CONTROLS GROUP

Over the last 30 years we have been working closely with Government Highway Authorities, Universities, Asphalt Producers, Road Construction Industry and Research Organisations to pioneer the world's best and most innovative range of advanced asphalt testing systems.

In addition, our worldwide network our Branch officers and Distributors are available to assist you with the correct product selection and configuration.

4P3 IMACS2 UTS NEUTRON

UTM 16P

Servo-pneumatic Universal Testing Machine, 16 kN capacity

ADVANCED SERIES

Advanced UTM Universal Testing Machines with Dynamic Controller and Data Acquisition

We've listened to feedback about your needs and requirements and have adopted the most advanced electronic technologies to develop a superior controller and testing software that provides the ultimate in testing machine control and powerful data-acquisition and flexible yet easy-to-use materials testing software for all types of users.

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

79-PV70A02/I2

MAIN FEATURES

- » Robust, high-strength and compact two column load frame
- » Digital servo-pneumatic control
- » Optional motorized crosshead available: controlled via PC, it ensures the crosshead is locked safely without backlashes for waveshape fidelity and high accuracy in tension-compression tests
- » Fully customisable to suit a large range of testing applications
- » 2 axis control and 8 channel data acquisition as standard
- » Environmental chamber for temperature range from -25 to +60°C

IMACS2

Introducing IMACS2, the 3rd generation Integrated Multi-Axis Control & Data Acquisition System, ideal for laboratories who want the best and with no compromise. You can be assured that your tests will be performed with minimum variability, precisely to specification and results are totally accurate with no peak, trough or failure point being missed.
See page 374

UTS NEUTRON

New UTS Neutron dynamic materials testing and analysis software, available in three licence levels and with configurable user access-rights, provides the ultimate man-machine-interface whether you are a leading researcher wanting to develop your own tests or a laboratory manager who wants an easy step-by-step process for your QC operators.
See page 375

UTM 30

Servo-Hydraulic Universal Testing Machine, 30 kN capacity

UTM 130 UTM 130 XL

Servo-Hydraulic Universal Testing Machines, 130 kN capacity

79-PV70B12/I2

79-PV70C05/I2

79-PV70C15/I2

MAIN FEATURES

- Rigid two column load frame
- Standard tie-rod sealed actuator
- Available with double acting, through-rod high precision labyrinth bearing actuator providing superior performance
- High performance servo valve allows sinusoidal loading frequencies up to 70 Hz
- Motorized crosshead positioning
- Hydraulic crosshead clamping
- Fully customizable to suit a large range of testing applications
- Environmental chambers for temperature ranges from -25 to + 70°C or from -50 to + 80°C

MAIN FEATURES

- Rigid two column load frame
- Double acting high precision actuator
- High performance servo valve allows sinusoidal loading frequencies up to 70 Hz
- Hydraulic crosshead positioning
- Hydraulic crosshead clamping
- Fully customizable to suit a large range of testing applications
- Independent environmental chamber eliminating the transfer to mechanical vibrations to testing machine
- Extra large version UTM-130XL available, designed to accomodate the Extra Large Four Point Bend Jig
- Environmental chambers for temperature ranges from -25 to + 60°C, from -50 to + 100°C and -40 to + 100°C (for UTM 130 Extra large model only).

ASPHALTQUBE

Modular Electro-mechanically operated Asphalt tester

ADVANCED SERIES

Modular Asphalt Testers to perform*:

- Permanent deformation
- Cyclic compression
- Indirect tensile stiffness
- Indirect tensile fatigue
- Uniaxial fatigue
- Crack propagation
- Dynamic complex modulus
- Triaxial compression
- 2-point bend
- 4-point bend

For the full accessory list see page 370-372

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

AsphaltQube is a fully integrated standard testing system based on the revolutionary EmS Electro-mechanical Servoactuated technology, suitable for QC / QA tests.

79-PV72Q02/I2

MAIN FEATURES

» Brand new technology including the new revolutionary EmS actuator

» Easy and versatile with his fully integrated modular system, that includes a 15 kN capacity actuator

» Enhanced environmental cabinet that grants a wide temperature range with fast and accurate temperature control based on the new ECU Peltier technology.

» Temperature ranges: +2 to 60°C or -10 to +60°C

» Rapid cooling: from an ambient temperature +23°C to +4°C in under 30 minutes granting NCHRP 9-29 conformity. Can reach temperatures down to -10°C.

» All-in-one touchscreen PC (optional)

* With the suitable accessories see page 370-372

AMPT PRO

Servo-hydraulic asphalt Mixture Performance Tester

AMPT Pro has been designed with the latest technologies and product developments to ensure that it surpasses any other product on the market.

79-PV71A12/I2

MAIN FEATURES

» The new Hydraulic Power Supply (HPS) uses inverter technology coupled with a high performance labyrinth bearing actuator to deliver 19 kN of force

» Interchangeable transducers and load cells with "plug and play" signal conditioners allowing for quick and easy transition of test set-ups

» Temperature range -10 to +70°C

» Rapid cooling: from an ambient temperature +23°C to +4°C in under 30 minutes granting NCHRP 9-29 conformity. Can reach temperatures down to -10°C.

» All-in-One computer control with the latest All-in-One touchscreen PC technology (optional)

*with the suitable accessories

AMPTQUBE®

Electro-mechanically operated Asphalt Mixture Performance Tester

AMPTQube, based on the revolutionary EmS Electro-mechanical Servoactuated technology is suitable for QC / QA tests. AMPTQube grants a level of testing accuracy, quality, performance and range normally only achievable from complex and expensive machines.

79-PV71Q02/I2

MAIN FEATURES

» Brand new technology including the revolutionary EmS actuator

» Easy and versatile with fully integrated modular system, that includes a 15 kN capacity actuator

» Interchangeable transducers and load cells with "plug and play" signal conditioners allowing quick and easy transition of test set-up.

» Temperature range +2 to +60°C.

» Rapid cooling: from an ambient temperature +23°C to +4°C in under 30 minutes. granting NCHRP 9-29 conformity. Can reach temperatures down to -5°C.

» All-in-One computer control with the latest All-in-One touchscreen PC technology (optional)

» Granting high quality to NCHRP 9-29 (all temperatures including 4 ° C are restored in less than 5 minutes after sample setup)

*with the suitable accessories

ADVANCED SERIES

UTM, ASPHALTQube, AMPT Pro/AMPTQube test accessories

SEMI-CIRCULAR BEND SETS (SCB TEST)

STANDARD

- ASTM D8044

STANDARD

- AASHTO TP105 (With UTM-30 only)

STANDARD

- AASHTO TP124

STANDARD

- EN 12697-44

TRIAXIAL TEST - UNIVERSAL TRIAXIAL CELL

STANDARD

- AASHTO T307/TP46
- EN 12697-25B
- AASHTO T342/TP62,T378/TP79 (with UTM-30 and UTM-130 only)

AUTOMATIC TRIAXIAL CELL

STANDARD

- EN 12697-25B
- AASHTO TP107,T342/TP62, T378/TP79 (with UTM-30 and UTM-130 only)

ASPHALTQUBE TRIAXIAL CELL

STANDARD

- EN12697-25B
- AASHTO T378/TP79

INDIRECT TENSILE RESILIENT MODULUS

STANDARD

- AASHTO TP31
- ASTM D4123
- EN 12697-26C
- BS DD213
- AS 2891.13.1

INDIRECT TENSILE FATIGUE)

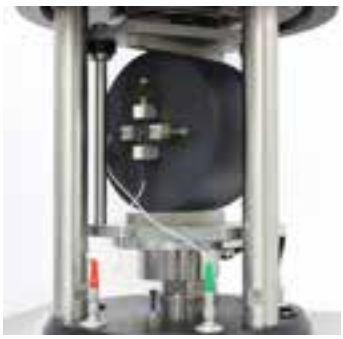
STANDARD

- EN 12697-24E

INDIRECT TENSILE WITH ON-SAMPLE DEFORMATION MEASUREMENT

STANDARD

- ASTM D7369
- AASHTO T322/TP9
- NCHRP 1-28A



This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

Application color guide: suitable for
- all testers including AMPTs
- ASPHALTQUBE
- UTM machines only

DISK-SHAPED COMPACTION TENSION TEST SET

STANDARD

- ASTM D7313

DYNAMIC MODULUS TEST SET

STANDARD

- AASHTO T342/TP62
- AASHTO T378/TP79 (NCHRP 9-29).

UNIAXIAL FATIGUE (S-VECD) TEST SETS

STANDARD

- AASHTO TP107/S-VECD
- EN12697-26D, 26E

OVERLAY TEST JIG

STANDARD

- Tex 248-F
- ASTM WK 26816

STANDARD

- AASHTO T378/TP79 (NCHRP 9-29)

CYCLIC AND PERMANENT DEFORMATION COMPRESSION

STANDARD

- EN 12697-25A
- BS 598-111
- AS2891.12.1

DYNAMIC MODULUS SMALL DIAMETER TEST SET

STANDARD

- AASHTO T378/TP79 (NCHRP 9-29)

SMALL DIAMETER UNIAXIAL FATIGUE (S-VECD) TEST SET

ADVANCED

ADVANCED SERIES

UTM, ASPHALTQube, AMPT Pro/AMPTQube test accessories

TSRST AND UTSST TEST SET

STANDARD

- EN 12697-46
- AASHTO TP10, with UTM-30 and UTM-130 only
- ASTM WK 53284 with UTM-130 only

FOUR POINT BEND TEST

STANDARD

- AASHTO T321
- ASTM D7460
- AG:PT/T233
- AT:PT/T274
- AS3:2000
- EN 12697-24C
- EN 12697-26D
- ASTM D8237

GAUGE POINT FIXING JIG

STANDARD

- NCHRP 9-29
- AASHTO T378/TP79
- AASHTO T342/TP62
- AASHTO TP107/S-VECD

The innovative AMPT Gauge Point fixing makes it quick and easy to accurately fix gauge points for on-specimen transducers.
This eliminates potential errors and saves time.

TRAPEZOIDAL TWO POINT BEND

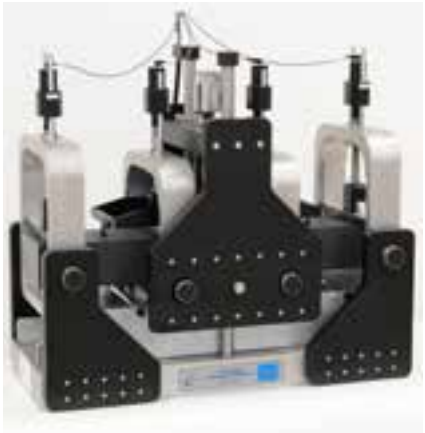
STANDARD

- EN 12697-24 Annex A
- EN 12697-26 Annex A

FOUR POINT BEND TEST EXTRA-LARGE VERSION

STANDARD

- EN 12697-24C
- EN 12697-26D, with UTM 130XL only



PULL-OFF AND TENSILE ADHESION TEST STANDARD

STANDARD

- EN 12697-48
- TP Asphalt-StB part 81

Application color guide: suitable for

- all testers including AMPTs
- ASPHALTQUBE
- UTM machines only

Stand-alone asphalt testers

STANDARD

AASHTO T321 ▸ EN 12697-24 Annex D
EN 12697-26 Annex B ▸ ASTM D7460 ▸ ASTM D8237

4P3

79-PV74A02/I2
SERVO-PNEUMATIC FOUR POINT BEND APPARATUS

MAIN FEATURES

» Digital servo-controlled pneumatic actuator provides accurate control of loading waveshape
» Innovative "floating straight-edge" on-specimen transducer eliminates errors due to frame compliance
» Backlash free rotation and translation on all load and reaction points
» Sinusoidal or haversine controlled stress loading
» Controlled force, motorised specimen clamping
» Non-linear regression data fitting ensures reliable determination of phase and modulus
» Loading frequency up to 60 Hz (load limitation applies at higher frequency)
» Load capacity up to 5kN dynamic

The Servo-Pneumatic Four Point Bend Apparatus stand-alone features a pneumatic actuator which is digitally controlled by a pneumatic servo-valve to provide accurate loading in both stress and strain control modes.

STANDARD

EN 12697-44 ▸ ASTM D8044 ▸ AASHTO TP124

34-V1172/SCB
SCB TESTER - STAND-ALONE SEMI-CIRCULAR BEND TEST SYSTEM

MAIN FEATURES

» Complete stand-alone test system
» MULTISPEED Compression Testing Machine with digital control and touchscreen display panel
» Preset testing procedures following most common SCB configurations
» Auxiliary linear displacement transducer
» Automatic closed loop control for test speed
» Rapid approach and return function with soft contact (typically 5N)
» Programmable pre-loading phase (typically 45N)
» Programmable actuator travel limits
» The software can acquire, elaborate data and create multiple reports in Excel format, with all data and graphs of the selected samples
» Supplied complete with the Semi-circular bend jig
» Maximum capacity 50 kN

The Semi-Circular Bend Tester features a rigid two-column load frame with easily adjustable crosshead.
Automatic control of the test speed/travel by the microprocessor controller. The firmware allows calibrating the transducers and setting up to 10 test profiles and saving data onboard. Real time test graphs and transducer data are displayed on the touchscreen.

IMACS2

IPC Global's ultimate controller for dynamic testing machines

79-PV70I02

MAIN FEATURES

- » Ultimate precision — most advanced control & data acquisition with industry leading 24-bit resolution and up to 200kHz sample rate
- » Smart 'Plug and Play' transducers — quick, easy and avoids set-up errors
- » Dependable — Touchscreen control protects data in case of PC shut-down
- » Breathe new life into any legacy testing system - a genuinely universal multi-purpose controller
- » Closer analysis with powerful advanced data processing
- » No compromise on specification or selection of components
- » Worry-free seamless migration — compatible with UTS and UTS Neutron
- » Designed for the future and expandable in every way

Whether you are performing cutting-edge research on new materials or routine materials quality tests, optimum control and test precision are essential. By harnessing advances in electronics and employing ingenious hardware and software design, our unique controller will address all testing needs in terms of performance, accuracy and flexibility.

Continuing our pioneering tradition of innovation and cutting-edge design

Derived from the acclaimed, trusted and well-loved IPC Global IMACS controller's heritage, you can have total confidence in the new world-class IMACS2 control and data-acquisition. The really impressive specification including 24bit data resolution, up-to 200kHz data sampling, plus 5 to 25kHz loop closure and in-built color display will provide a level of control, waveform fidelity and purity of data that is second to none. You can be assured that your tests are performed with minimum variability, precisely to specification and results are totally accurate with no peak, trough or failure point being missed.

Modular expandability

IMACS2 has been designed to be modular and scalable so you can add additional axes of control and data acquisition channels when required. The smart "Plug & Play" transducers will eliminate set-up errors and save valuable time. Plug-in any compatible transducers and the controller knows what to do.

An innovative double-control facility will be available to allow users to set-up tests directly on the controller as well as from a PC ensuring valuable test continuity in the event of PC disconnection.

Future proof

The extremely powerful platform is designed to allow continuous additions of new functions which will be made available to the users ensuring the controller is up-to-date with the very latest technology and innovations. Right-now, in spite of the cutting-edge performance, we are only using a small portion of its power. The potential for further development is practically unlimited.

UTS NEUTRON
Universal Testing Software

MAIN FEATURES

» User programmable - Total flexibility capable to do anything you'll need

» Wizard - Follow the step-by-step path to quickly and simply make the changes you need

» Worry-free seamless migration - Compatible with IMACS and IMACS2. Users can import existing UTS data to generate new reports

» Multiple languages - Custom language configurator tool

» Advanced reporting - Robust reporting and easy custom test creation

Totally versatile

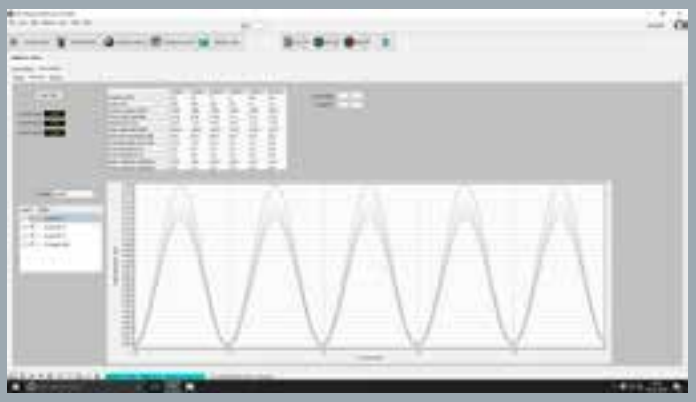
UTS Neutron has been developed to provide the ultimate in flexible yet easy materials testing software for all types of users.

No two customers are the same, and nor are their testing requirements. Listening to customer feedback has resulted in a software that delivers increased flexibility, versatility and the right level of functionality for ALL user levels.

Totally configurable user-level access-rights

Choose exactly the level of access you want for each of your users and then on entering their username and password, each user will only be given access to make the changes required to complete their work.

Three licence levels



ESSENTIAL

for running tests to international standards from our extensive library with the facility to make changes to setting.

DEVELOPER

for the most advanced users who want totally flexibility to program any test from scratch.

PERFORMANCE

for those wanting to make changes to existing tests using graphical block programming.

Asphalt permeability apparatus

STANDARD

▸ EN 12697-40

80-B0093/E
RADIAL FLOW FALLING HEAD PERMEAMETER

Consisting of an acrylic tube with an internal diameter of 125 mm, marked from 1 to 5 liters capacity, with an internal rubber ball and rod, the permeameter is fitted on a wooden base plate with a sealing gasket.
Weight: 8 kg approx.

80-B0093/E

80-B0093/A
PERMEAMETER FOR IN-SITU DRAINABILITY AUTOSTRADE (ITALIAN HIGHWAYS) METHOD

This version is for measuring the time water takes to percolate through draining pavements by the Autostrade Italian Highways method and has a transparent cylinder 150 mm diameter by 390 mm high.
Weight: 6 kg approx.

80-B0093/A

80-B0093
PERMEAMETER FOR IN-SITU DRAINABILITY

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.
Weight: 21 kg approx.

80-B0093

Particle loss and resistance to fuel

STANDARD

▸ EN 12697-17 ▸ EN 12697-43 ▸ EN 1097-2 ▸ ASTM C131

LOS ANGELES MACHINE FOR ASPHALT TESTS (CANTABRO TEST)

MAIN FEATURES

» High stiffness welded steel frame

» High resolution graphical display 128x80 pixels and 6 key membrane keyboard

» Double test procedure: it is possible to set the target revolutions / drops or the total working time

» The machine can be mounted inside a noise reduction and CE compliant safety cabinet with door opening switch

The EN 12697-17 method (Cantabro test) concerns the determination of the particle loss (abrasion) of porous asphalt mixtures and the EN 12697-43 concerns the determination of the resistance of a bituminous mixtures or pavement to aviation fuel. Both procedures involve, within other standard laboratory tests, the abrasion in a Los Angeles tester conforming to EN 1097-2 without steel balls. Furthermore the EN 12697-17 prescribes a chamber or enclosure for the Los Angeles machine as the temperature shall remain constant with an uncertainty of 2°C.
This condition can be easily obtained by the soundproof and security cabinet 48-D0500/CB2 which is however necessary to comply with CE directive.
It is the same machine used for testing aggregates.
For detailed description please see page 149

48-D0500/G
Los Angeles abrasion machine with graphic display and membrane keyboard. 230 V, 50 Hz, 1 ph

48-D0500/GY
As above but 220 V, 60 Hz, 1 ph

48-D0500/GZ
As above but 110 V, 60 Hz, 1 ph

Safety cabinets

48-D0500/CB1
CE compliant safety cabinet with door opening switch for Los Angeles machine.

48-D0500/CB2
Noise reduction and CE compliant safety cabinet with door opening switch for Los Angeles machine.

Skid resistance and friction tester

STANDARD

▸ EN 13036-4 ▸ EN 1097-8 ▸ ASTM E303

A skid resistance tester is used in pavement testing conforming to EN 13036-4 and ASTM E303 for determining the Skid Resistance, i.e. the required property of a surface subjected to traffic to maintain the adhesion of a vehicle tyre.
It is also used for other measurements such as:
- the determination of the Polished Stone Value (PSV) conforming to EN 1097-8
- testing Paving stones and Blocks conforming to EN 1341,EN 1342 and EN 1338

For complete and detailed information please see page 152

48-PV0190/ASTM
Skid resistance and friction test set(Skid tester) conforming to ASTM E303 standard, including additional scale for PSV, 3 rubber sliders for site use, thermometer, washing bottle, tool set with case for machine assembly, rule, carrying case and traceable certificate of conformity to ASTM E303.

Accelerated polishing machine (PSV)

STANDARD

▸ EN 1341 ▸ EN 1342 ▸ EN 1343
▸ EN 1097-8

The Polished Stone Value (PSV) of a material used as road surfacing is a measure of how rapidly it becomes polished under the action of vehicle tyres. This machine is used to create accelerated polishing, in conjunction with the Skid tester, conforming to Standards, of stone chippings set onto the periphery of a special revolving wheel.

For complete and detailed information please see page 151

48-PV5262
Accelerated polishing machine. 230 V, 50-60 Hz, 1 ph

48-PV5264
As above but 110 V, 60 Hz, 1 ph

Accessories

Please see page 151

Bulk density of laboratory compacted asphalt

STANDARD

▸ EN 12390-7 ▸ ASTM C127
▸ AASHTO T85 ▸ EN 12697-6 ▸ ASTM D1188
▸ ASTM D2726 ▸ AASHTO T166

11-D0612/C
SPECIFIC GRAVITY FRAME FOR ASPHALT

This apparatus is used, together with a suitable electronic balance, for determining the specific gravity of laboratory compacted asphalt specimens. The balance is not included and should be selected according to the weighing range required. See page 156.
The frame has to be completed with a suitable density basket for use with asphalt specimens and aggregates.

Accessories

11-D0612
Density basket, stainless steel, 200 mm diameter x 200 mm high, 3.36 mm mesh size (No. 6 ASTM).

55-D1403
Wax melting pot. 230 V, 50-60 Hz, 1 ph.

86-D0805
Paraffin wax, 1 kg

55-D1403

Indentation penetrometer

STANDARD

▸ EN 12697-20 | EN 13108-6

MAIN FEATURES

» New weight positioning system that allows transition, in a very user-friendly and precise way, from no-load to pre-load phase, then to load phase without the need to add/remove weights from the apparatus

» Four-column high stiffness frame

» Piston position indicator, making adaptation of the penetrometer for samples of different heights easier

» Stainless steel water bath included, for sample conditioning

» Water drain with drainage pipe included in the machine

Ordering information

80-B0163/C
Asphalt indentation penetrometer.

Accessories

80-B0163/1
Cube mould, 70.7 mm.

80-B0163/2
Penetration test mould, 69 mm.

86-D1408/D
Digital immersion heater-agitator. 230 V, 50 Hz, 1 ph.

Detail of the weight positioning system showing, from left to right, no-load phase, pre-load phase (25 N) and load phase (525 N). The system allows transition from the no-load to the pre-load phase, then to load phase in a very fast, precise and safe way: by rotating the lower part, the load conditions are accurately applied, and the operator doesn't have to add or remove any heavy weights to/from the apparatus.

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 (approx.) cubes and Marshall samples (the steel base plate for Marshall samples is included).

The new CONTROLS model incorporates some improved features that increase the user-friendliness and the operability of the machine, like the new weight positioning system which makes passing from the no-load to the pre-load and then to the load phase very easy and precise, without the need to add/remove weights to/from the apparatus. Other features include the four-column frame structure that enables precise weight positioning; the piston position indicator that makes adaptation of the penetrometer for samples of different heights easier (70mm cubes, Marshall specimens); and the water drain facility at the end of the test.

The Asphalt indentation penetrometer is supplied with a stainless steel water bath, 500 N weights, interchangeable 1 and 5 cm^2 pistons, a 30 x 0.01 mm dial gauge, steel plate with dial gauge holder, and a calibration cylinder that conforms to EN 12697-20, complete with certificate.

A range of accessories for creating 70 mm mastic asphalt cubes and controlling water temperature are available, including the Digital immersion heater-agitator 86-D1408/D that can keep water at the required testing temperature in conformance with the testing standard (22 or 40 °C). See Accessories.

Dimensions: 430 x 530 x 955 mm (700 mm without weights)(wxdxh)
Weight: 115 kg approx.

80-B0163/1

86-D1408/D

80-B0163/2

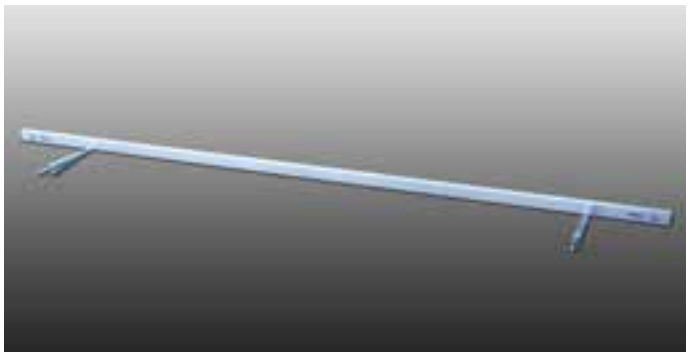
STANDARD

- EN 13036-7

80-B0185/B
MOT STRAIGHTEDGE

Used to measure irregularities in road pavement. Made from aluminum alloy, 3 m length. Complete with two wedges.

Weight approx. 10 kg



Accessories

80-B0185/B1
Carrying canvas for MOT Straightedge.

80-B0187/A
TRAVELLING BEAM DEVICE WITH RECORDING UNIT

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 complete with a recording unit to obtain a graph of vertical deviations.

Technical specifications

- Beam length: 3 m
- Scale: 2 mm increments up to 10 mm; 5 mm increments from 10 to 25 mm
- Max vertical deviation: ±25 mm
- Weight: 55 kg approx.

80-B0187/A

Spare parts

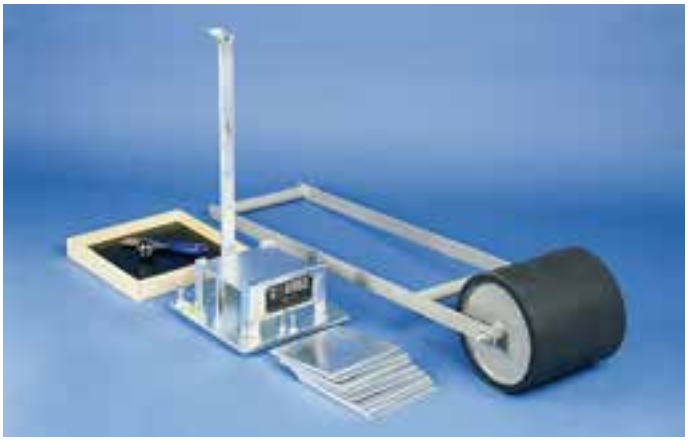
80-B0178/2
Pack of 10 chart rolls. Each roll will provide a run of approx. 1 km.

80-B0187/3
Fibre-tipped pen.

STANDARD

- EN 12272-3

80-B0178/A
VIALIT ADHESION TEST APPARATUS



Used to assess the adhesion property of aggregates to bitumen. The method is a check on the adhesion of aggregates to be applied to the surface of wearing course rolled asphalt.

The apparatus consists of a metal basement with three vertical pointed rods to hold the test plate; vertical rod 50 cm high with a shot at the upper end for the steel ball to drop; a 512 g steel ball; a supply of 6 metal test plates; a hand operated rubber lined roller with lead shots ballast. The test plate, coated by bitumen on one face and spread by the aggregate chippings in a standard way is rolled by the roller and then placed on the three-point support of the basement.

The steel ball drops three times from the shot and the loose chippings are counted and checked.

Weight approx.: 40 kg

77-B0202/B
PAVEMENT CORE DRILLING MACHINE

MAIN FEATURES

- » 6 HP, 4-stroke high quality petrol engine
- » Coring range up to 200 mm diameter
- » Robust, compact and portable
- » Vertical screw feet
- » Complete with strap wrench and spanner

For complete information please see page 355

77-B0202/B with core bit

STANDARD

▸ AASHTO T256

80-B0180
BENKELMAN BEAM APPARATUS

This apparatus is used to measure the deflection of flexible pavements under the action of moving wheel loads.

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.

The probe is 2440 mm long and the back extension is 1220 mm. The apparatus is manufactured from aluminum and chrome finished metals.

Weight: 15 kg approx

80-B0180 with 80-B0181

Accessories

80-B0181
Wooden carrying case.

80-B0180/1
Spare gauge with bracket.

80-B0180/2
Adjustable feet for Benkelman beam, complete with two spirit levels.

Calibration device

80-B0180/3
Calibration device for 80-B0180 Benkelman beam apparatus.
For verifying the accuracy of the apparatus.
Weight 5 kg approx.

80-B0180/3 Calibration device

STANDARD

▸ NF P94-117-1

80-B0180/B1
ALUMINUM BEARING PLATE 600MM DIAMETER

For complete information and details see page 139

80-B0180/B1 with accessories

STANDARD

▸ EN 13036-1 ▸ ASTM E965 ▸ NF P98 216-1

80-B0179
SAND PATCH APPARATUS

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 test apparatus comprises the following parts:
- Spreader disc with rubber-covered surface
- 2 containers with screw tops and pouring holes for glass sand or glass spheres
- Three plastic measuring cylinders of 10, 25 and 50 ml capacity
- Screw-adjusted dividers
- Brass measuring cylinder
- 300 mm rule
- Brush
- Wind shield
- Kneeling pad

Accessories

For EN 13036-1
80-B0179/5
Solid glass spheres, 250/180 µm. 25 kg pack.

For ASTM E965
80-B0179/1
Natural sand, 300/150 µm. 10 kg bag.

80-B0179/2
Natural sand, 150/75 µm. 10 kg bag.

For NF P98 216-1
80-B0179/3
Natural sand, 315/160 µm. 10 kg bag.

Spare parts

80-B0179/30
Brass measuring cylinder.

80-B0179/31
Spreader disc, covered with rubber.

80-B0179

STANDARD

▸ EN 12272-1 ▸ BS 598:108

80-B0176
RATE OF SPREAD APPARATUS

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. An additional tray can be ordered with the code 80-B0176/1.

Weight: 850 g approx.

80-B0176

Slurry seal mixtures test apparatus

STANDARD

▸ EN 12274-5 ▸ ASTM D3910

80-B0192 series
PLANETARY STIRRER FOR ABRASION TESTING

This machine is used for determining the resistance of slurry mixtures to abrasion. It consists of a mechanical planetary stirrer equipped with a weighted rubber hose abrasion head and has to be completed with a set of moulds - see Accessories.

Weight: 32 kg approx.

Ordering information

80-B0192
Planetary stirrer. 380 V, 50 Hz, 3 ph.

80-B0192/Z
As above but 220 V, 60 Hz, 3 ph.

Accessories

80-B0192/1
Set of moulds, 295 mm diameter, 6.3, 10.0, 13.0 and 19.0 mm high.

80-B0192

STANDARD

▸ ASTM D3910 ▸ EN 12274-4

80-B0193
COHESION TESTER

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. The tester has to be used with a suitable square mould - see Accessories.

Weight: 20 kg approx.

80-B0193

Accessories

Square moulds with four truncated conical holes to prepare the sample for testing

80-B0193/10
Square mould, 140 x 140 x 6.3 mm.

80-B0193/11
Square mould, 140 x 140 x 10 mm.

80-B0193/12
Square mould, 200 x 200 x 13 mm.

80-B0193/13
Square mould, 250 x 250 x 19 mm.

Air compressor

86-D2015
Laboratory air compressor. 230 V, 50 Hz, 1 ph.

86-D2015/Y
As above but 220 V, 60 Hz, 1 ph.

86-D2015/Z
As above but 110 V, 60 Hz, 1 ph.

STANDARD

▸ EN 1097-6 ▸ EN 12274-3

48-D0440
SAND ABSORPTION CONE AND TAMPER FOR CONSISTENCY TESTING

The cone and tamper are manufactured according to specifications and can also be used for determining the specific gravity and absorption of fine aggregates.
See page 157

Weight: 250 g approx.

48-D0440

BITUMEN TESTI

81 Bitumen and bituminous binders

Bituminous materials, a by-product of the oil distillation process, look set to remain as a constituent material of road paving for some considerable time to come, being used to withstand the flexural and compressive stresses caused by traffic. Due to the ever increasing intensity of today's traffic conditions there is a demand for higher levels of performance from asphalt. This section includes a wide range of testing equipment to fulfill all Standard requirements.

Contents

BITUMEN TESTING

81

Bitumen and bituminous binders

Samplig bitumen and oil penetrometer

STANDARD

▸ ASTM D140 ▸ AASHTO T40

81-B0010
BACON SAMPLER

Used to obtain bitumen or oil samples from various levels.

Made from brass.

- Dimensions: 80 mm diameter x 250 mm long
- Weight approx.: 1.5 kg

Bitumen preparation

81-B0099/B
AIR BATH

Used for softening bituminous materials before tests. The stainless steel vessel can receive up to 600 g of bitumen. Built-in thermoregulator. Heat protection.

- Power: 600 W
- Dimensions: 170x230x300 mm
- Weight approx.: 3 kg

81-PV0007
LABORATORY MIXER-EMULSIFIER

Ideal for the laboratory preparation of polymer modified bitumen samples and for emulsifying, homogenizing, disintegrating and dissolving. Complete with 5 L capacity bowl and mantle heater. 230 V, 50-60 Hz, I ph.

- Power: 250 W (mixer), 600 W (heater)
- Overall dimensions: 350 x 500 x 940 mm (w x d x h)
- Weight: 30 kg approx.

Penetration of bituminous materials

STANDARD

▸ EN 1426 ▸ ASTM D5 ▸ AASHTO T49

STANDARD DIGITAL PENETROMETERS

81-B0100/D with Needle, Mirror, Glass transfer dish, Sample cup and thermometer

81-B0101/E with Needle, Mirror, Glass transfer dish, Sample cup and thermometer

MAIN FEATURES

» Digital penetration measurement

» Complete with micrometric vertical adjustment

» Semi-automatic version with automatic controller and adjustable electronic timer of the fall time

» Digital circulation water bath with cooling coil and immersion probe available.

» The electronic timer allows the user to set up and read the fall time of the needle during testing

Available in two versions - digital and digital semi-automatic - the penetrometer has a cast iron base with levelling screws, a 0.01 mm precision digital penetration measurement gauge and release button, and an automatic zeroing function. The semi-automatic model 81-B0101/E is supplied complete with a controller which automatically releases the plunger using a magnetic device. Needles, cups, thermometer and mirror are not included and have to be ordered separately - see Accessories.

Tests should be performed with the penetration cup placed in thermostatically-controlled water, using a device such as the 81-PV0102 Digital circulation water bath with conditioning vessel. See Accessories.

Weight: 8.5 kg approx.

81-B0100/D
Digital standard penetrometer complete with micrometric vertical adjustment

81-B0101/E
Digital electronic semi-automatic penetrometer complete with micrometric vertical adjustment and adjustable electronic timer of the fall time, according to EN 1426, ASTM D5, AASHTO T49. 230 V, 50-60 Hz.

81-B0101/EZ
As above but 110 V, 60 Hz, 1 ph

Accessories

Also suitable for PIVOT Automatic penetrometer (page 386)

Penetrometer needles

81-B0113
Penetration needle 2.5 ± 0.05 g. made from hardened polished stainless steel. Univocally traceable by engraved serial number. Conforming to ASTM D5 and EN 1426. Supplied with conformity certificate.

81-B0113/A
Same as above set of 3.

81-B0113/1
Verified penetrometer needle 2.5 ± 0.5 g. Fully hardened, tempered and polished stainless steel. Conforming to ASTM D5 and EN 1426. Supplied complete with official UKAS Verification Certificate

81-PV0113/AM
Magnetic penetrometer needles for PIVOT automatic penetrometer, 2.5 ± 0.05 g. Set of 3.

Sample cups

81-B0110/A
Sample cup, diameter 55x35 mm. Set of 6 pieces

81-B0110/B
Sample cup, diameter 70x45 mm. Set of 6 pieces

Glass transfer dish

81-B0109
Glass transfer dish with support, 100 mm diameter x 100 mm high

Mirror

81-B0100/1
Mirror with articulate holder. To make easy the surface contact between the needle and the sample.

Thermometers

82-B0100/6MF
IP 38 C Thermometer, range from +23 to +26°C, 0.1°C graduation, mercury free

82-B0125/2MF
ASTM 17C thermometer, range from +19 to +27°C range, 0.1°C graduation, mercury free

82-B0122/4MF
ASTM 563 C thermometer, range from -8 to +32°C range, 0.1°C graduation, mercury free

Water bath with digital thermoregulator and immersed PT100 probe

81-PV0102
Water bath including heating controller and cooling coil, immersion temperature probe, internal support grid and connections to mains water or water chiller. Temperature range 25 to 60 ± 0.1 °C. 230 V, 50-60 Hz, 1 ph

81-PV0102/Z
As above but 110 V, 60 Hz, 1 ph

Simple water bath

81-PV0102/A
Water bath complete with internal water coil, support for specimen and water connections. To be used with external chiller series 81-PV0102/CHx

Water chiller

81-PV0102/CH
Water chiller, 7.5 l capacity, with electronic temperature controller with ± 0.1 °C accuracy and fluid temperature range between 5 and 30°C. Suitable for chilling penetrometer water baths or temperature controlled setting time tests. 350 W, 230 V, 50-60 Hz, 1 ph
Overall dimensions: 415X300X420mm
Weight approx.: 15 kg

81-PV0102/CHZ
As above but 110 V, 60 Hz, 1 ph

Standard penetration cone

81-B0115
Standard penetration cone conforming to ASTM D217 and EN 13880-2

81-B0100/D and 81-PV0102 thermostatically controlled water bath with thermoregulator and immersion probe

81-B0101/E Digital electronic semi-automatic penetrometer and 81-PV0102 digital water bath with thermoregulator and immersion temperature probe

81-PV0102/CH

81-B0101/E with Needle, Mirror, Sample cup and 81-PV0102/A Digital circulation water bath.

ADVANCED SERIES

Fully Automatic Penetrometer
81-PV0103

STANDARD

EN 1426 · ASTM D5 · AASHTO T49
JIS K 2207 · IP 49 · DIN 52210
AFNOR T66-004 · ASTM D217

Pivot Automatic penetrometer with 81-PV0102 water bath with thermoregulator and 81-PV0102/CH chiller

PIVOT

A compact instrument, microprocessor controlled, using the latest technologies and programming tools. It includes a 6" lateral touchscreen display, intuitive and easy to use, which shows the penetration/time curve and can display and average up to 6 tests.

The instrument reaches the test start point automatically, and it is supplied with an integrated LED lamp. The device also has the possibility to recall the vertical position for repeated tests.

The test should be performed placing the penetration cup in thermostatically controlled water, using a suitable device as our water bath with thermoregulatory and immersed probe (see accessories page 385).

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more info visit **www.controls-group.com** or link directly to the QRCode

MAIN FEATURES

» Fully automatic operation. The entire test cycle (rapid approach, starting point determination, penetration and return to the initial position) is automatically performed by simply pressing the start button on the touch screen display

» Rapid approach and automatic starting point determination to eliminate any operator inaccuracy during needle position

» Penetration measurement via contactless displacement transducer, with 0.01 mm resolution

» Penetration range: 0 to 50 mm

» Programmable penetration time: 0 to 9999 sec.

» Programmable delay time: 0 to 999 sec.

» Real time display of penetration/time curve

» 6" color touchscreen display, easy to use thanks to the user friendly software

» High precision vertical movement by stepper motor

» Eight programmable reference positions for the holder assembly

» Up to 6 tests simultaneously displayed

» Saves time and delivers first class results

Automatic ring and ball apparatus

STANDARD

EN 1427 ▸ ASTM D36 ▸ AASHTO T53

MAIN FEATURES

» Microprocessor controlled

» Full automatic testing procedure for both test with water or glycerol as heating fluid

» Large graphic display

» RS232 port for PC or printer

» Memory up to 50 tests

This advanced 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 PT100 sensor placed in a central position. During operation a magnetic stirrer with adjustable speed assures temperature uniformity in the vessel. The temperature gradient is strictly maintained throughout the test by the electronic system which conforms with the Standards.

Safety features

The hot plate is automatically turned off at the end of the test. The apparatus is also fitted with an emergency stop button. The test is automatically interrupted if the probe fails or is not correctly positioned. The hot plate will not be damaged or affected by accidental leakages of water or glycerol, or if the beaker breaks.

Specifications

The apparatus comprises the following parts:

- Heater and magnetic stirrer with speed control
- Temperature probe
- Glass beaker, test rings and ball support
- Application and centering device for steel balls
- Light barrier system
- Microprocessor system and large graphic display with membrane keyboard
- RS232 port for PC or printer

Firmware

Main menu:

- Test on boiled, distilled or deionized water for softening point between 30 and 80° C
- Test on glycerol for softening point above 80 and up to 150° C
- Test configuration set-up
- File management
- Date and time
- Operator name, test number, general notes
- Language selection
- Test parameters conforming to the type of test: up to 80° C or above 80 up to 150° C, hot plate pre-heating temperature thermocouple calibration
- Magnetic stirrer speed adjustment from 0 to 150 rpm
- Baud rate selection 38400 for PC and 9600 for printer

Physical specifications

- Power: 750 W
- Overall dimensions: 530 x 300 x 280 mm (w x d x h)
- Weight: approx.16 kg

Ordering information

81-PV0143
Automatic ring and ball apparatus. 230 V, 50-60 Hz, 1 ph.

81-PV0143/Z
As above but 110 V, 60 Hz, 1 ph.

Accessories

82-P0172/1
RS232 cable

82-P0172/M
Serial printer 110-230V, 50-60Hz, 1 Ph

Spares

81-PV0145/1
Brass ring

81-PV0145/2
Steel ball

81-PV0145/3
Ball centering guide

81-PV0143/1
600 ml beaker

Softening Point Of Asphalt

STANDARD

▸ EN 1427 ▸ ASTM D367 ▸ AASHTO T53

81-B0145/A

STANDARD RING AND BALL APPARATUS

This set of equipment is used for determining the softening point of bituminous materials and comprises:

- **81-PV0145/1** Two brass rings
- **81-PV0145/2** Two 9.5 mm diameter steel balls
- **81-PV0145/3** Two ball centering guides
- **81-PV0143/1** Glass vessel
- **81-PV0145/5** Pouring plate
- **81-PV145/6** Ring holder/assembly
- **82-D1200/1MF** Glass thermometer, -2 to +80 °C range, 0.2 °C graduations, IP61C, ASTM 15C, mercury free

Total weight: 1 kg approx.
Note: *all the above items can also be purchased individually.*

The test has to be performed using specific liquids and a suitable hot plate selected from the listed accessories. We offer three hot plate solutions:

- **10-D1402/D** Standard hot plate, 185 mm diameter, 1500 W. The most economical solution, conforming to ASTM standards.
- **81-B0145/C1** Hot plate with centering/protection device for 81-B0145/A Ring and Ball apparatus. A more professional solution.
- **81-B0145/D** Hot plate with magnetic stirrer, conforming to both ASTM and EN standards which require the water to be stirred for better temperature uniformity

81-B0145/A

81-B0145/A with 10-D1402/D Hot plate, conforming to ASTM standard

81-B0145/A with 81-B0145/C1 Hot plate with centering/protection device, conforming to ASTM standard

81-B0145/A with 81-B0145/D Hot plate with magnetic stirrer, conforming to EN and ASTM standards

Ordering information

81-B0145/A
Ring and ball apparatus, including ring holder/assembly, two brass rings, two brass ball centering guides, two steel balls, pouring plate, glass vessel and glass thermometer.

Accessories

Hot plates

10-D1402/D
Hot plate, 185 mm diameter.
230 V, 50-60 Hz, 1 ph.
Power: 1500 W
Overall dimensions:
260 x 260 x 135 mm
Weight: 3 kg approx.

10-D1402/DZ
As above but 110 V, 60 Hz, 1 ph.

81-B0145/C1
Hot plate with centering/protection device. 230 V, 50-60 Hz, 1 ph.
Power: 700 W
Overall dimensions: 170 x 320 x 130 mm
Weight: 2.3 kg approx.

81-B0145/C1Z
As above but 110 V, 60 Hz, 1 ph.

81-B0145/D
Hot plate with magnetic stirrer.
Electronic stirrer adjustment from 100 to 1200 rpm, aluminum plate. 230 V, 50-60 Hz, 1 ph.
Power: 700 W
Overall dimensions: 170 x 230 x 150 mm
Weight 3 kg approx.

Spare parts

81-PV0145/1
Brass ring.

81-PV0145/2
Steel ball, 9.5 mm diameter.

81-PV0145/3
Ball centering guide.

81-PV0143/1
Glass vessel, 600 ml.

82-D1200/1MF
Glass thermometer, -2 to +80 °C range, 0.2 °C graduations, IP 60C, ASTM 15C, mercury free.

82-D1200/2MF
Glass thermometer, +30 to 200 °C range, 0.5 °C graduations, IP 61C, ASTM 16C, mercury free.

Water in bitumen and bitumen emulsions

STANDARD

▸ ASTM D95 ▸ ASTM D244 ▸ AASHTO T55 ▸ AASHTO T59 ▸ IP 74/77 ▸ NLT 123 ▸ CNR 101

WATER IN BITUMINOUS MATERIALS TEST SET (DEAN-STARK)

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

- 10 ml glass still
- Glass receiver
- Glass condenser
- Electric heater with thermoregulator

Power: 250 W
Weight: 4 kg approx.

81-B0155/A / 81-B0155/B

Ordering information

81-B0155/A
Water in bituminous materials test set (Dean-Stark). 230 V, 50-60 Hz, 1 ph.

81-B0155/AZ
As above but 110 V, 60 Hz, 1 ph.

Spares

81-B0155/1
Glass still, 10 ml.

81-B0155/2
Glass receiver, 500 ml.

81-B0155/3
Glass condenser.

STANDARD

▸ EN 1428 ▸ EN 12847 ▸ ASTM D244 ▸ NF T66 - 023 ▸ NLT 60 - 113

WATER IN BITUMEN EMULSIONS TEST SET

Identical to the model 81-B0155/A except for the glass still which has a 25 ml capacity with 0.1 ml graduations.

Ordering information

81-B0155/B
Water in bitumen emulsions test set.
230 V, 50-60 Hz, 1 ph.

81-B0155/BZ
As above but 110 V, 60 Hz, 1 ph.

Spares

81-B0155/B2
Glass still, 25 ml.

Residue on sieving and mixing stability

STANDARD

▸ EN 1429

RESIDUE ON SIEVING OF BITUMINOUS EMULSIONS

The test is performed using the following sieves:

15-D7595
Stainless steel test sieve, 75 mm diameter, 0.16 mm openings.

15-D7545
Stainless steel test sieve, 75 mm diameter, 0.5 mm openings.

15-D7504
Pan and cover for 75 mm diameter sieves.

Weight of each sieve: 100 g approx.

15-D7545, 15-D7595 and 15-D7504

STANDARD

▸ EN 12848

MIXING STABILITY WITH CEMENT OF BITUMINOUS EMULSIONS

The test is performed using the following sieves:

15-D7595
Stainless steel test sieve, 75 mm diameter, 0.16 mm openings.

15-D7585
Stainless steel test sieve, 75 mm diameter, 2 mm openings.

15-D7504
Pan and cover for 75 mm diameter sieves.

Weight of each sieve: 100 g approx.

Storage stability of asphalt emulsions

STANDARD

▸ NF T66-022

81-B0114
APPARATUS FOR THE DETERMINATION OF STORAGE STABILITY OF EMULSIONS.

- 230 V, 50-60 Hz, 1 ph

The test is based on settlement measurement conforming to NF T66-022 Standard. It consists of a 12 V current source, vessel, cylindrical electrode and holder.

- Overall dimensions: 200x200x520 mm
- Weight approx.: 4 kg

81-B0114

Degree of solubility of bituminous binders

STANDARD

▸ EN 12592 ▸ ASTM D2042

TEST SET FOR THE DETERMINATION OF SOLUBILITY

The set is available in two versions:

81-B0148
Test set for the determination of solubility conforming to ASTM D2042, comprising:
86-D1044
Filter flask, 500 ml capacity
86-D1189
Funnel for Gooch crucible
86-D1188
Gooch crucible
86-D1188/1
Rubber ring for Gooch crucible
86-D1188/2
Filter discs, fiberglass, 25 mm diameter, pack of 100
Weight: 0.6 kg approx.

81-B0148/A
Test set for the determination of solubility conforming to EN 12592, comprising:
86-D1044
Filter flask, 500 ml capacity
86-D1189
Funnel for Gooch crucible
86-D1188/3
Gooch crucible porosity 4 septum filter
86-D1188/1
Rubber ring for Gooch crucible
86-D1188/4
Glass powder, 1 kg
Weight: 1.6 kg approx.

Particle charge of emulsified asphalt

STANDARD

▸ EN 1430 ▸ ASTM D244 ▸ CNR 99
▸ NLT-194

81-B0129/E

PARTICLE CHARGE TESTER

Used to identify particle charge of emulsions. The apparatus comprises a digital milliammeter, a variable resistor and two stainless steel electrodes.

Overall dimensions: 140 x 200 x 270 mm
Weight: 2.2 kg approx.

Ordering information

81-B0129/E
Particle charge tester. 110-230 V, 50-60 Hz, 1 ph.

Emulsified asphalt - residue by distillation

STANDARD

▸ EN 1431 ▸ ASTM D244
▸ AASHTO T59 ▸ CNR 100

81-B0153
EMULSIFIED ASPHALT DISTILLATION APPARATUS

This apparatus is used to examine asphalt emulsions composed principally of a semi-solid or liquid asphaltic base, water and an emulsified agent. It consists of an aluminum-alloy still with ring burner, a glass connecting tube with water-cooled condenser, a 100 ml capacity graduated cylinder, support stands, holders and two thermometers with -2 to +300°C range.

Weight: 9 kg approx.

Breaking point-Fraas method

STANDARD

▸ EN 12593

81-B0158
BREAKING POINT APPARATUS

The apparatus is for determining the Fraas breaking point of solid and semi-solid bitumen. This breaking point is the temperature at which bitumen first becomes brittle, as indicated by the appearance of cracks when a thin film of the bitumen on a metal plaque is cooled and flexed in accordance with specified conditions.

The apparatus consists of a bending device, a plaque measuring 41x20x0.15 mm made of flexible stainless steel, a cooling device, a thermometer IP 42C, a plate and a stand.

Weight: 3 kg approx.

Accessories

70-C9902/2
Dry ice maker.

Spares

81-B0158/1
Spare stainless steel plaques. Pack of 10.

82-B0158/3MF
Thermometer IP 42C, mercury free. -38°C to +30°C range.

81-B0148

81-B0153

81-B0158

Settling tendency of bitumen emulsions

STANDARD

▸ EN 12847 ▸ ASTM D6930

81-B0134
STOPPERED GLASS GRADUATED CYLINDER

Used for determining settling tendency of bitumen emulsions.

600 ml capacity, with one division mark at 500 ml. Complete with two closeable side tubes.

Weight: 1 kg approx.

Note: *To perform the test the 81-B0155/B Water in bitumen emulsions test set is also required.* *See page 389*

Penetration power of bitumen emulsions

STANDARD

▸ EN 12849 ▸ IP 487

81-B0136
GLASS TUBE WITH FUSED-ON GLASS FILTER

Used for determining the penetration power of bitumen emulsions.

41.5 mm inside diameter, approx.115 mm total height, fitted with glass filter disc pore size between 160 and 250 µm

Weight: 1 kg approx.

81-B0136 *81-B0134*

Distillation of cut-back asphaltic products

STANDARD

▸ ASTM D402 ▸ AASHTO T78 ▸ NF T66-003 ▸ UNE 7072 ▸ UNE 7112

APPARATUS FOR DISTILLATION OF CUT-BACK ASPHALT

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

- Distillation flask
- Condenser
- Adapter
- Shield
- Shield and flask support
- Electric heater with thermoregulator
- Cylinder receiver
- Thermometer, -2 to +400°C range

Weight: 6 kg approx.

Ordering information

81-B0150/E
Apparatus for distillation of cut-back asphalt. 230 V, 50-60 Hz, 1 ph.

81-B0150/EZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

82-B0150/10MF
Low distillation thermometer, -2 to +300°C range, 1 °C graduations, IP 5C, ASTM 7C, mercury-free.

81-B0150/12
Crow receiver, 25 ml capacity.

81-B0150/13
Crow receiver, 50 ml capacity.

81-B0150/14
Crow receiver, 100 ml capacity.

Spares

81-B0150/1
Distillation flask.

82-B0150/11MF
High distillation thermometer,-2 to +400°C range, 1 °C graduations, IP 6C, ASTM 8C, mercury-free.

81-B0150/E

Breaking value of cationic bitumen emulsions: mineral filler method

STANDARD

▸ EN 13075-1 ▸ IP 494

81

81-B0139
TEST SET FOR THE DETERMINATION OF THE BREAKING VALUE OF CATIONIC BITUMEN EMULSIONS

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 test is performed with a set of items comprising:

- Feeding pan
- Two enamel dishes
- Nickel spatula
- Support base and clamp

The above set corresponds to the basic "Equipment for manual procedure" described by the EN 13075-1 standard.

To perform the test conforming to the "Semi-automatic procedure", the set has to be used with a Stirrer motor (81-B0139/D) and an Adjustable filler feeder (81-B0139/F) - see Accessories.

Weight: 1.5 kg approx.

81-B0139

Accessories

81-B0139/D
Electric stirrer complete with stirring paddle, adjustable rotating speed up to 1300 rpm, complete with support base. 110-230 V, 50-60 Hz, 1 ph.

81-B0139/C
Stainless steel metal can, 500 ml capacity.

81-B0139/F
Adjustable filler feeder. 110-230 V, 50-60 Hz, 1 ph.

81-B0139/3
Reference filler, 12.5 kg bag, conforming to EN 13075-1 and EN 13075-2..

81-B0139/F

81-B0139/D

Density / relative density of bitumen

STANDARD

▸ EN-ISO 3838

HUBBARD-CARMICK PYKNOMETERS

Used for determining the density or relative density of bitumen.

86-D1115
Hubbard-Carmick specific gravity bottle, 24 ml capacity.
Weight: 20 g approx.

86-D1120
Hubbard-Carmick specific gravity bottle, 25 ml capacity.
Weight: 20 g approx.

86-D1115, 86-D1120

Flash and fire point by Clevenland open cup

STANDARD

▸ EN 22592 ▸ ISO 2592 ▸ ASTM D92 ▸ AASHTO T48 ▸ IP36

81-B0130/C

CLEVELAND FLASH TESTER

Used for determining the flash and fire point of petroleum products, this tester consists of a brass cup mounted on an electric heater with a temperature controller. Conforming to the CE European directives, it is supplied complete with double line-fuse, hot plate control system and a thermometer with -6 +400°C range. 230 V, 50-60 Hz, 1 ph.

Power: 600 W
Weight: 5 kg approx.

81-B0130/C

Spare parts

81-B0130/1C
Brass cup.

82-B0130/2MF
Thermometer, -6 to +400°C range, IP 28C, ASTM 11C, mercury-free.

81-B0130/C Brass cup mounted on the electric heater

Flash point by Tag open cup tester

STANDARD

▸ ASTM D1310 ▸ ASTM D3143

81-B0138/A
TAG OPEN CUP FLASH POINT TESTER

Used for determining the flash point of volatile flammable materials. The tester conforms to CE requirements and consists of:

- Electric furnace with electronic control of heating power
- Flame rotating ignition device (LPG supply is required)
- Glass cup
- Insulating plate
- Support and clamp for thermometer
- Gauge
- Stainless steel frame
- Double line-fuse

Thermometers are not included - see Accessories.

230 V, 50-60 Hz, 1 ph.

Power: 600 W
Dimensions: 250 x 170 x 400 mm (wxdxh)
Weight: 4 kg approx.

81-B0138/A

Accessories

82-B0138/A1MF
Thermometer, -38 to +42°C range, IP 20C, ASTM 33C, mercury-free.

82-B0135/1MF
Thermometer, -5 to +110°C range, IP 15C, ASTM 9C, mercury-free.

82-B0138/A3MF
Thermometer, +90 to 170°C range, IP 59C, ASTM 35C, mercury-free.

Standard Tar/Brta viscosity

STANDARD

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

STANDARD TAR VISCOMETERS

Used for determining the viscosity of cut-back bitumen and road oil. The apparatus, housed in a stainless steel case, consists of a tank fitted with a thermostat, a rheostat, an agitator, an immersion heater to take the water to the required temperature and a cooling coil for connection to the water supply. The temperature is checked by a 0-45°C thermometer. The apparatus is supplied with a metal cup cover and stopper holder.

Cups have to be ordered separately - see Accessories. (EN 13357 requires the 4 and 10 mm cups, EN 12846 requires the 2, 4 and 10 mm cups.)

Power: 300 W
Overall dimensions: 262 x 262 x 550 mm
Weight: 10 kg approx.

Ordering information

81-B0122/C
Digital standard tar viscometer. 230 V, 50-60 Hz, 1 ph.

81-B0122/CZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

Cups

81-B0122/B2
Cup, 10 mm diameter.

81-B0123/B2
Cup, 4 mm diameter.

81-B0124/B2
Cup, 2 mm diameter.

Go/No go gauges

81-B0122/B1
Go/No go gauge for 10 mm orifice.

81-B0123/B1
Go/No go gauge for 4 mm orifice.

81-B0124/B1
Go/No go gauge for 2 mm orifice.

Thermometer

82-B0122/3MF
Thermometer, 0 to 45°C range, 0.2°C graduations, IP 8C, mercury-free.

Graduated cylinder

86-D1003
Graduated cylinder, 100 ml capacity

81-B0122/C with 86-D1003 and thermometer

Engler viscosity

STANDARD

▸ ASTM D490 ▸ ASTM D1665 ▸ AASHTO T54 ▸ BS 2000 ▸ NF T66-020 ▸ CNR 102

ENGLER VISCOMETERS

Used to determine the specific viscosity of tars and their products. It includes a contact thermoregulator and stirring device.

The thermometer is not included - see Accessories.

Power: 300 W
Dimensions: 262 x 262 x 550 mm
Weight: 10 kg approx.

Ordering information

81-B0120/B
Engler digital viscometer. 230 V, 50-60 Hz, 1 ph.

81-B0120/BZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

Thermometers

82-B0121/1MF
Thermometer, +18 to 28°C range, 0.2°C graduations, ASTM 23C, mercury-free.

82-B0121/2MF
Thermometer, +33 to 54°C range, 0.2°C graduations, ASTM 24C, mercury-free.

82-B0121/3MF
Thermometer, +95 to 105°C range, 0.2°C graduations, ASTM 25C, mercury-free.

82-B0121/4MF
Thermometer, +10 to 55°C range, 0.5 °C graduations, immersion 93 mm, IP 76C, mercury-free.

Flask and strainer

81-B0120/2
Kohlraush calibration flask, 200 ml capacity.

81-B0120/4
Strainer No. 50 ASTM.

81-B0120/1
Testing flask, 50 ml capacity.

81-B0120/B with thermometer and testing flask

Saybolt viscosity

STANDARD

▸ ASTM D88 ▸ ASTM D7496 ▸ AASHTO T72

SAYBOLT VISCOMETERS

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) with diathermic oil.

The viscometers, available in two versions - single and two-tube - include a bath, Furol and Universal orifices, key, control box, stirring device, cooling coil, 60 ml flask and digital thermoregulator. The funnel, thermometers, withdrawal tube and diathermic oil are not included and have to be ordered separately - see Accessories.

81-B0121

Product code	81-B0121 81-B0121/Z	81-B0121/A 81-B0121/AZ
Model	Single tube	Two tubes
Power, W	300	500
Dimensions, mm (w xdxh)	260 x 260 x 500	420 x 260 x 500
Weight, kg (approx.)	7	10

Ordering information

81-B0121
Saybolt digital viscometer. 230 V, 50-60 Hz, 1 ph.

81-B0121/Z
As above but 110 V, 60 Hz, 1 ph.

81-B0121/A
Saybolt two-tube digital viscometer. 230 V, 50-60 Hz, 1 ph.

81-B0121/AZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

Thermometers

82-B0125/2MF
Saybolt thermometer,+19 to 27°C range, 0.1°C graduations, ASTM 17C, mercury-free.

82-B0125/3MF
Saybolt thermometer +34 to 42°C range, 0.1°C graduations, IP 23C, ASTM 18C, mercury-free.

82-B0125/4MF
Saybolt thermometer +49 to 57°C range, 0.1°C graduations, ASTM 19C, mercury-free.

82-B0125/5MF
Saybolt thermometer +57 to 65°C range, 0.1°C graduations, ASTM 20C, mercury-free.

82-B0125/6MF
Saybolt thermometer +79 to 87°C range, 0.1°C graduations, 250 mm length ASTM 21C, mercury-free.

82-B0125/7MF
Saybolt thermometer +95 to 103°C range, 0.1°C graduations, ASTM S22C, mercury-free.

81-B0121/A

Filter funnel and withdrawal tube

81-B0125/13
Filter funnel with wire mesh and clip.

81-B0125/14
Withdrawal tube.

75-B0165/5
Diathermic oil can of 18 kg

Spares

81-B0125/1
Saybolt viscosity flask, 60 ml capacity.

81-B0125/10
Universal orifice for Saybolt viscometer.

81-B0125/11
Furol orifice for Saybolt viscometer.

Kinematic Viscosity

STANDARD

▸ ASTM D2170 ▸ AASHTO T201 ▸ EN 12595

CANNON-FENSKE OPAQUE VISCOMETERS

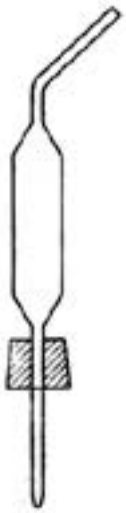
Used for the determination of kinematic viscosity of liquid asphalts (bitumen) and road oils at 60° C, and distillation residue of liquid asphalts and asphalt cements at 135°C. Cannon-Fenske Opaque models are suitable for opaque liquids. Supplied complete with calibration certificate.

Code	Capillary No.	Approx. Constant cSt/S	Kinematic viscosity range cSt
81-B0116/1	150	0.035	7 to 35
81-B0116/2	200	0.1	20 to 100
81-B0116/3	300	0.25	50 to 250
81-B0116/4	350	0.5	100 to 500
81-B0116/5	400	1.2	240 to 1200
81-B0116/6	450	2.5	500 to 2500
81-B0116/7	500	8	1600 to 8000
81-B0116/8	600	20	4000 to 20,000

To determine the kinematic viscosity, all the above Cannon-Fenske viscometers must be placed into the 81-PV0116/F Viscometer bath using the holder 81-B0116/H1, included in PV0116/F).
See accessories.

81-B0116/1 to 81-B0116/8

81-B0116/10 to 81-B0116/16



81-B0116/20 to 81-B0116/27

ZEITFUCHS CROSS-ARM VISCOMETERS

Used for the determination of kinematic viscosity of liquid asphalts (bitumen), road oil and distillation residues of liquid asphalts and asphalt cements at 135°C. Supplied complete with calibration certificate.

Code	Capillary N0.	Approx. Constant cSt/S	Kinematic viscosity range cSt
81-B0116/10	4	0.1	20 to 100
81-B0116/11	5	0.3	60 to 300
81-B0116/12	6	1.0	200 to 1000
81-B0116/13	7	3.0	600 to 3000
81-B0116/14	8	10.0	2000 to 10000
81-B0116/15	9	30.0	6000 to 30000
81-B0116/16	10	100.0	20000 to 100000

For determining the kinematic viscosity, all the above Zeitfuchs viscometers must be placed into the 81-PV0116/F Viscometer bath using the holder 81-B0116/H2.
See accessories.

BS U-TUBE MODIFIED REVERSE FLOW VISCOMETERS

Used for the determination of kinematic viscosity of liquid asphalts (bitumen), road oil and distillation residues of liquid asphalts and asphalt cements at 135°C. Supplied complete with calibration certificate.

Code	Capillary N0.	Approx. Constant cSt/S	Kinematic viscosity range cSt
81-B0116/20	4	0.1	6 to 100
81-B0116/21	5	0.3	18 to 300
81-B0116/22	6	1.0	60 to 1000
81-B0116/23	7	3.0	180 to 3000
81-B0116/24	8	10	600 to 10000
81-B0116/25	9	30	1800 to 30000
81-B0116/26	10	100	6000 to 100000
81-B0116/27	11	300	18000 to 300000

For determining the kinematic viscosity, all the above BS U-Tube viscometers must be placed into the 81-PV0116/F Viscometer bath using the holder 81-B0116/H3.
See accessories.

Dynamic Viscosity

STANDARD

▸ ASTM D2171 ▸ EN 12596

CANNON-MANNING VACUUM VISCOMETERS

Used for determining the viscosity of bitumen at 60° C. Supplied complete with calibration certificate.

Code	Capillary No.	Viscosity range
81-B0117/1	6	0.036 to 0.8
81-B0117/2	7	0.12 to 2.4
81-B0117/3	8	0.36 to 8
81-B0117/4	9	1.2 to 24
81-B0117/5	10	3.6 to 80
81-B0117/6	11	12 to 240
81-B0117/7	12	36 to 800
81-B0117/8	13	120 to 2400
81-B0117/9	14	360 to 8000
81-B0117/10	15	1200 to 24,000
81-B0117/11	16	3600 to 80,000

To determine the dynamic viscosity, the Cannon-Manning viscometers must be placed into the 81-PV0116/F Viscometer bath using the holder 81-B0117/H1. A pressure regulator and vacuum manifold is also required. See accessories

ASPHALT INSTITUTE VACUUM VISCOMETERS

Used for determining the viscosity of bitumen at 60° C. Supplied complete with calibration certificate.

Code	Capillary No.	Viscosity range
81-B0117/15	25	42 to 800
81-B0117/16	50	180 to 3200
81-B0117/17	100	600 to 12,800
81-B0117/18	200	2400 to 52,000
81-B0117/20	400	9600 to 140,000
81-B0117/21	800	38,000 to 5,800,000

To determine the dynamic viscosity, the Asphalt Institute viscometers must be introduced into the 81-PV0116/F Viscometer bath using the holder 81-B0117/H2.
A pressure regulator and vacuum manifold is also required. See accessories

STANDARD

▸ ASTM D2171 ▸ EN 12596

VISCOMETER BATH

81-PV0116/F
Viscometer bath.
230 V, 50-60 Hz, 1 ph.

81-PV0116/FZ
As above, but.
110 V, 60 Hz, 1 ph.

It is used in the determination of both the kinematic and dynamic viscosity. Used to maintain the capillary type viscometers at a uniform temperature. The bath consists of a cylindrical glass vessel with a stainless steel cover with 50.8 mm diameter holes, motor stirrer, refrigerating coil with water connections, heating system, contact thermometer, external protection and insulating base.

Thermometers and viscometers are not included.

- Temperature: room temp. +5°C to 150° C
- Power: 2000 W
- Temperature stability: +/-0.03°C
- Temperature sensor: PID
- Jar capacity: approx.20 liters
- 5 viscometer tubes
- Weight: approx.12 kg

Accessories

Holders for using viscometers with 81-PV0116/F Viscometer bath

81-B0116/H2
Holder for Zeitfuchs Cross-Arm viscometers

81-B0116/H3
Holder for U-Tube viscometers

81-B0117/H1
Holder for Cannon-Manning viscometers

81-B0117/H2
Holder for Asphalt Institute viscometers

Pressure regulator and Vacuum manifold

(for Dynamic viscometers)
81-B0116/B
Viscometer vacuum regulator. Used for precise pressure control. 230 V, 50-60 Hz, 1 ph.

81-B0116/C
Vacuum manifold. Used for applying a vacuum to the viscometers placed in the bath.

Kinematic and Dynamic viscosity thermometers

82-B0116/40MF
Kinematic viscosity thermometer, range 58.5 to 61.5°C, type, IP 35C, ASTM 47C, mercury-free.

82-B0116/45MF
Kinematic viscosity thermometer, range 133.5 to 136.5°, type, IP 93C, ASTM 110C, mercury-free.

ADVANCED SERIES

Ductilometers

DUCTIMETER

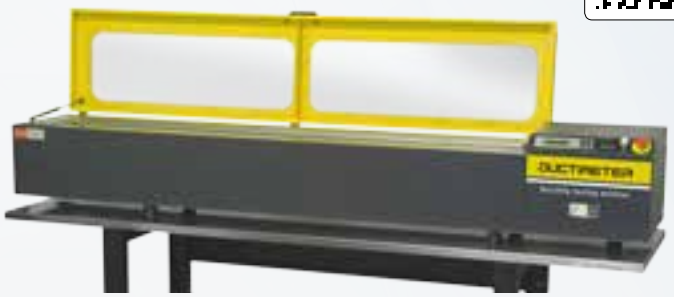
The ductility test is performed for determining the ductility of bituminous materials by measuring the elongation before breaking when two ends of briquette specimens are pulled apart at a specified speed and temperature.

We offer three different versions:

STANDARD VERSION

STANDARD

EN 13398 ▸ ASTM D113 ▸ AASHTO T51 ▸ ASTM D6084



HIGH PERFORMANCE VERSION FOR FORCE DUCTILITY TEST

STANDARD

EN 13398 ▸ ASTM D113 ▸ AASHTO T51 ▸ EN 13589 ▸ EN 13703 ▸ ASTM D6084 ▸ AASHTO T300

RESEARCH VERSION FOR FORCE DUCTILITY TEST ON STANDARD AND MODIFIED BITUMEN

STANDARD

EN 13398 ▸ ASTM D113 ▸ AASHTO T51 ▸ EN 13589 ▸ EN 13703 ▸ ASTM D6084 ▸ AASHTO T300

COMMON FEATURES

- 4 tension line (briquette capacity) x 1500 mm
- Easy and free access to the large testing space
- Closed-loop PID temperature control system
- Double drive screw rod
- Stainless steel insulated water bath
- Exclusive in-built thermoregulation system compensating the exchange of heat and cooling, resulting in a very strict temperature control, optimized by the connection to chiller (optional)
- Adjustable speed range from 5 to 100 mm/min
- High carriage return speed of 500 mm/min for greater productivity
- Elongation measurement by encoder

Detail of water bath. Easy and free access to the large testing space, common to all versions

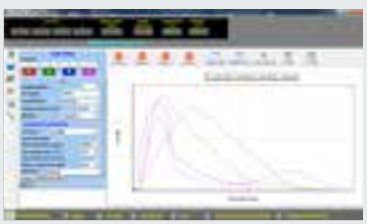
ADDITIONAL FEATURES OF THE HIGH PERFORMANCE VERSION

- PC-controlled using dedicated software
- Includes a system for measuring forces up to 1200 N (4 x 300 N, 2 x 500 N)
- Temperature range at 25°C and from 4 to 30°C with water chiller
- Real time load and displacement graphics via PC

ADDITIONAL FEATURES OF THE RESEARCH VERSION

- Adjustable speed range from 1 to 200 mm
- Temperature range from -10 to 60°C with water chiller
- Elongation measurement by optical system
- System for measuring forces up to 2000 N (4 x 500 N)
- Extensive use of stainless steel for frame, cover and tank

Detail of load cells and briquette moulds of High performance and Research ductimeters



This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more info visit **www.controls-group.com** or link directly to the QRCode

Determination of flexural creep stiffness

STANDARD

▸ ASTM D6648 ▸ AASHTO T313 ▸ EN14771

81-PV5902

MAIN FEATURES

» Durable, corrosion-resistant construction

» Computerized control, data acquisition and analysis

» PID temperature controller with digital display

» Two independent platinum RTDs for precise temperature control

» Mechanically-refrigerated cooling bath with environmentally-safe non-CFC coolant

» Integral LVDT and temperature compensated load cell for accurate test results

» Includes complete calibration kit with carrying case

» Includes ASTM/AASHTO-compliant specimen moulds

» PC and software included

81-PV5902
BENDING BEAM RHEOMETER (BBR)

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. The system is supplied complete with PC and testing software.

Ordering information

81-PV5902
Bending Beam Rheometer (BBR). 230 V,50-60 Hz, 1 ph.

81-PV5904
As above but 115V, 50-60 Hz, 1 ph.

Spares

81-PV059/1
Extra aluminum beam mould.

81-PV059/2
Set of 36 plastic strips for BBR moulds.

Technical specifications

- Load frame: integral stainless steel frictionless construction
- Loading shaft: in-line stainless steel with blunt point
- Load cell: 500 g (temperature-compensated)
- Mechanical overload protection: standard
- Test cycle times:cycle times for pre-load, recovery and test load are completely operator-adjustable
- Test weights: calibrated and traceable
- Sample supports: 25 mm (0.98 in.) diameter stainless steel spaced101.6 mm (4.00 in.) apart
- LVDT displacement transducers:6.35 mm (0.25 in.) calibrated range to provide 2 µm resolution throughout testing and verification range
- Cooling unit: included (non-CFC refrigerant)
- Recommended cooling bath fluid: non-flammable ethylene glycol mixture
- Operating temperature: ambient to -40 °C (-40°F)
- Temperature measurement: Platinum RTD
- Compressed air requirement: 0.34 MPa (50 psi) clean, dry air supply required

Test load

- Variable test range from 0 to 200 g standard
- System maintains required test load to within±0.5 g throughout the test cycle

Testing software

- Display of load, displacement and bath temperature provides ease of setup and operation
- Real time displacement, loading, and temperature graphs are displayed during the test cycle and can be re-scaled as needed for easy viewing

Shipping weight:115 kg approx.

Sample supports (moulds) and Calibration kit

RTFOT **Rolling thin-film oven**

Determination of the resistance to hardening under the influence of heat and air

STANDARD

▸ ASTM D2872 ▸ AASHTO T240 ▸ EN 12607-1

MAIN FEATURES

» Touchscreen display with 4.5" color control panel, including timer function, visual warnings and digital air flow indicator.

» Full conformity to temperature specifications (time to reach target temperature after switch on, target temperature adjustment after samples insertion) from the Standards

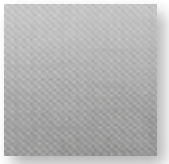
» Carousel rotation with closed-loop controlled speed

» Safety features: Automatic over-temperature switch, door switch, pilot lamp and alarm for door open with fan still running; magnetothermic switch

» High quality stainless steel structure, internal and external

» Door with double-glazed window

» Door locking system allowing easy opening also with busy hands



Detail of external stainless lining "linen patterned" resistant to scratches and shocks

BITUMEN OVENS FOR ROLLING THIN-FILM OVEN TEST (RTFOT)

Two versions are available:

81-PV1612
conforming to ASTM/AASHTO standards

81-PV1622
conforming to EN standard

The only difference between the two models is the inside dimension of the testing chamber.

These ovens are used for measuring the effect of heat and air on a moving film of semi-solid bituminous materials. The internal chamber is made from stainless steel, insulated with fiberglass or similar, with an external frame made from engine-turned stainless steel and a door with a centrally located window. Special attention has been given to the safety features which conform to CE requirements. The oven is supplied complete with digital flow meter, ASTM 13C thermometer and 8 heat resistant glass containers (64 mm high x 140 mm diameter). The oven must be connected to a compressed air source supplying 2 bar maximum pressure. If not available in the laboratory we recommend the 81-PV0161/12 Diaphragm pump. See accessories.

The ASTM and EN versions are basically identical except for a small difference of the internal dimensions of the testing chamber.

Power: 3000 W
External dimensions: 750 x 750 x 900 mm (w x d x h)
Weight: approx. 50 kg

Door locking system allowing easy opening also with busy hands

Ordering information

ASTM/AASHTO versions:

81-PV1612
RTFOT, Bitumen oven for rolling thin film oven test. ASTM version. 230 V, 50 Hz, 1 ph.

81-PV1613
As above but 220 V, 60 Hz, 1 ph.

81-PV1614
As above but 110 V, 60 Hz, 1 ph.

EN version:

81-PV1622
RTFOT, Bitumen oven for rolling thin film oven test. EN version. 230 V, 50 Hz, 1 ph.

Accessories

Diaphragm pump

81-PV0161/12
Diaphragm pump 6 liters/min at 2.4 bar. 110-230 V, 50-60 Hz, 1 ph.

Description

Free air displacement 6 liters/min, maximum pressure 2.4 bar (when used as an air compressor).
Power: 65 W
Weight: approx. 1.9 kg

81-PV0161/13
Scraper for RTFOT bottle

81-PV0161/14
Metal rack for holding/cooling RTFOT bottles

81-PV0161/15
RTFOT bottle tong

Spares

81-PV0161/10
Spare glass container

82-PV0160/10MF
IP 47C, ASTM 13C Thermometer, +150 to +175°C, 0.5°C divisions.

Rotary evaporation apparatus for determining the resistance to hardening under the influence of heat and air: RFT method

STANDARD

- EN 12607-3

RFT test method description

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.

General description

The rotary evaporator is equipped with a distillation flask, a variable speed motor capable of rotating the distillation flask at a rate adjustable from 20 to 270 rpm, a condenser, solvent recovery flask, and a heated oil bath. The angle of the distillation flask from the horizontal to the bath is approximately 15°. Supplied complete with a 1000 ml distillation flask.

The Rotary evaporator is also used for the determination corcerning ASTM D5404 and AASHTO TP2. See page 333.

Ordering information

75-PV1650
Rotary evaporation apparatus. 230 V, 50 Hz, 1 ph.

75-PV1650/Z
As above but 110 V, 60 Hz, 1 ph.

Accessories

EN 12697-3

75-B0165/5
Diathermic oil. 18 kg can

75-B0165/4
Glass flask 1 liter capacity with rubber stopper

75-B0165/3
Glass tubing with three way valve and transparent flexible hose for solution intake

86-D2003
Dual stage high vacuum pump. 230 V, 50 Hz, 1 pf. (For 110 V, 60 Hz ask model 86-D2003/Z)

86-D2004/1D
Vacuum regulator with digital gauge, 0.001 bar resolution. 230 V, 50-60 Hz, 1 ph. (For 110 V, 60 Hz ask model 86-D2004/1DZ)

86-D2064
Rubber tube for vacuum, 6.5/16.5 int./ext. mm diameter, 2 m

75-B0165

Effect of heat and air and loss on heating of oil and bituminous compounds: thin-film oven test (TFOT)

STANDARD

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

TFOT bitumen oven

Used for determining the loss in mass (exclusive of water) of oil and bituminous compounds and the effect of heat and air on a film of semi-solid bituminous material. The oven has to be used with the correct accessory depending on which testing standard is being followed:

- For EN 13303, ASTM D6, AASHTO T47, BS 2000, NF T66-011, CNR No. 50 select accessory 81-B0160/1;
- For EN 12607-2, ASTM D1754, AASHTO T149, UNE 7110 select accessory 81-B0160/2.

See Accessories.

Technical specifications

- Internal chamber made from stainless steel
- Insulation with fiberglass or similar
- External frame made from enameled steel
- Temperature control by contact thermometer
- Door with double panel window
- Power: 1300 W
- Inside dimensions: 330 x 330 x 330 mm
- Outside dimensions: 500 x 500 x 900 mm
- Weight: 35 kg approx.

Ordering information

81-B0160/C
TFOT bitumen oven. 230 V, 50 Hz, 1 ph.

81-B0160/CY
As above but 220 V, 60 Hz, 1 ph.

81-B0160/CZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

81-B0160/1
Rotating shelf with 9 containers measuring 55 mm diameter x 35 mm height.

81-B0160/2
Rotating shelf, 250 mm diameter.

82-PV0160/10MF
IP 47C, ASTM 13C Thermometer, +150 to +175°C, 0.5°C divisions.

81-B0160/C

81-B0160/1 and 81-B0160/2

ADVANCED SERIES

Pressure Ageing Vessel
81-PV2600

ADVANCED SERIES

Vacuum Degassing Oven
81-PV2610

Long Term Ageing Conditioning of Asphalt Binder

Pressure Ageing Vessel PAV and Vacuum Degassing Oven VDO

PAV

STANDARD
ASTM D6521 ▸ AASHTO R28 ▸ EN 14769

The Pressure Ageing Vessel (PAV) has been developed to simulate in-service ageing of asphalt binder after 5 to 10 years. The binder is exposed to high pressure and temperature for 20 or 65 hours (selectable up to 99) to simulate the effect of long-term oxidative ageing.

This conditioning process is intended to provide an evaluation of the relative resistance of asphalt binders to oxidative ageing at selected elevate temperatures and pressures. It is normally performed after an initial conditioning using a Rolling Thin Film Oven (RTFOT).

The apparatus consists of a stainless steel (AISI 304 with ASME and CE certifications) pressure vessel with encased band heaters and integral pressure and temperature controls. Data logs of both temperature and pressure are saved on USB stick or transferred to PC at the end of the test.

The user friendly software allows the operator to view the vessel temperature and pressure in real time, both as set targets and actual values, with a high rate of refresh. It is also possible to view, in real time, the temperature and pressure graphs.

Most standards also require the Vacuum Degassing Oven (VDO see next page) mandatory to remove air bubbles created during accelerated oxidative ageing to make the aged binder suitable for further tests as BBR, DSR, Penetration, Ductility etc.

MAIN FEATURES

- Platinum RTD temperature internal measurement to +/- 0.1° C
- Freely selectable test temperatures from 80° to 120°C, PID controlled to +/- 0.5°C
- Efficient heating system allowing the test temperature to be achieved in one hour, exceeding the Standards' specification
- Programmable pre-heating functions (limited to 60° C to avoid accidental burns during sample rack positioning) for time optimization
- Testing time up to 99 hours
- Pressure monitored by transducer and controlled to 2.1 +/- 0.1 MPa
- User friendly software allows real time readout of vessel temperature and pressure
- 6" color touchscreen reclinable display
- Temperature and pressure calibrations performable by the user
- Network ready for remote monitoring of the test status from PC, tablet or smartphone
- CE and ASME certified pressure vessel
- Electrically locked top cover, to avoid direct exposure of the pressure vessel during the test
- Forced ventilation cooling system allowing quick cooling of sample rack to avoid accidental burn
- Over temperature limit switch
- Over pressure relief valve

81-PV2600
Pressure ageing vessel (PAV), to simulate ageing of asphalt binder. 230V, 50-60 Hz, 1 ph.

81-PV2600/Z
Samer as above but 110v, 60 Hz, 1 ph.

The PAV requires a suitable compressed air tank, 2.1MPa minimum pressure. This could be for example an air compressor or commercial bottled air, depending on reference standards.

- Dimensions (lxwxh): 430 x 660 x 480 mm
- Weight approx.: 90 kg

Accessories

81-PV2600/1
Spare sample container (TFOT pan) for PAV

81-2600/2
Spare sample rack for PAV

Pressure transducer calibration menu

Detail of inclinable touchscreen display

VDO

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more info visit **www.controls-group.com** or link directly to the QRCode

MAIN FEATURES

- » Designed to remove air bubbles created during accelerated oxidative ageing of asphalt binder by the PAV
- » Platinum RTD temperature internal measurement to +/- 0.1° C
- » Selectable test temperature (from ambient to 200° C) controlled to +/- 4.0°C
- » Integrated vacuum pump
- » Vacuum monitored by transducer and controlled to 15 +/-0.1 kPa absolute pressure
- » Digital touchscreen 6" color display for temperature, vacuum, set points and actual values
- » Over temperature limit switch
- » Network ready for remote monitoring of the test status from PC, tablet or smartphone

The apparatus consists of a stainless steel vacuum vessel with encased band heaters and integral vacuum and temperature controls. The vacuum chamber can accept either eight 55x35 mm or four 70x45 mm (available as accessories) sample containers. The instrument is supplied complete with temperature traceable calibration certificate, 8 aluminum 55x35 mm sample containers, a sample holder and operator's manual.

- Dimensions (lxwxh): 430 x 440 x 480 mm
- Weight approx.: 30 kg

81-PV2610
Vacuum Degassing Oven (VDO) conforming to ASTM D6521, AASHTO R28 and EN 14769. 230 V, 50-60 Hz, 1 ph

81-PV2610/Z
as above but 110 V, 60 Hz, 1 ph

Accessories

81-PV2610/1
Set of eight 55x35 mm sample containers for VDO

81-PV2610/2
Set of four 70x45 mm sample containers for VDO

81-PV2610/1

81-PV2610/2

Rotational viscometers

STANDARD

▸ ASTM D2196 ▸ ASTM D4402 ▸ AASHTO T316 ▸ EN 13302

81-PV0118/C Standard version

81-PV0118/B High performance version

Apparent viscosity of unfilled asphalt is evaluated by a rotational viscometer which measures the torque generated by a calibrated spindle rotating at a selected speed into a bitumen sample heated at precise temperature in the range between ambient temperature to 260°C. The measured relative resistance to rotation is converted, by a factor, in viscosity units, cP or mPa·s.

We offer two versions:

81-PV0118/C Standard rotational viscometer and

81-PV0118/B High performance rotational viscometer, featuring a superior level of test automation

COMMON FEATURES

» Data displayed: selected speed, selected spindle, viscosity reading, percentage of full scale, relative and absolute viscosity

» Unit converter SI to CGS

» AUTO-TEST with sound and visual malfunction alarm

» AUTO-RANGE function

» User-enabled calibration

» 10 languages options

» Repeatability: 0.2%

» Accuracy 0,1% of full scale

ADDITIONAL FEATURES OF THE 81-PV0118/B VERSION

» Display of Sample temperature, Shear rate and Shear stress (with coaxial spindles), Density (entered by the user) Step program status, Analysis and visual characteristics (flow curves), Viscosity reading: Dynamic (cP or mPa·s) or Kinematic viscosity (cSt)

» Program features:

Time to torque=target torque pre-setting device

Time to stop=target time pre-setting device

10 working memories

Customizable options

Programmable

Multistep

Ramp

81 – PV0118/C

Rotational viscometer supplied with stand, boss head, spindle protection, spindle rack, power supply cable. 100-240V, 50-60 Hz, 1Ph

81-PV0118/B

Rotational Viscometer, high performance version, calibration certificate, USB, WIFI, Bluetooth, temperature sensor, datalogger software and power supply cable. Viscosity range100-40 000 000cP, rotational speed 0.01-200rpm. Conforming to ASTM D2196, ASTM D4402, AASHTO T316, EN 13302. 100-240V, 50-60 Hz, 1ph

Technical specifications	81-PV0118/C	81-PV0118/B
Viscosity range (cP)	100-13.000.000	100-40.000.000
Rotational speed range (r.p.m.)	0.3-100	0.01-200 18 selectable
Resolution: Using low viscosity adapter For lower than 10000 Equal to or above 10000	 cP 0.01 cP 0.1 cP 1	 cP 0.01 cP 0.1 cP 1
Repeatability	0.2%	0.2%
Thermometer features: -Thermometer margins -Resolution -Precision Type of probe	 N.A.	 0 to + 100°C 32°F to 212°F 0.1°C, 0.2°F ±0.1°C PT100

Accessories for both versions

Temperature control unit

The temperature control unit consist of a heating chamber that is used to work in conjunction with rotary viscometers at high temperatures. Viscosity of solid road unfilled asphalts has to be measured at temperatures ranging from 34°C to 260°C according to the Specifications of ASTM D4402. The heater contains the container with sample in which a suitable spindle is immersed and driven by the rotary viscometer to measure viscosity. A digital microprocessor control unit grants the required accuracy of test temperature.

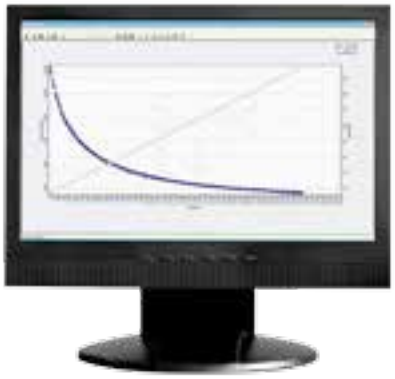
81-PV0118/T
Temperature control unit with temperature range from ambient plus 5°C to 300°C. 220-240V/50-60Hz/1ph

81-PV0118/TZ
As above but 110V/60Hz/1ph

81-PV0118/2
Aluminum disposable test chamber

81-PV0118/3
Stainless steel reusable test chamber

81-PV0118/4
Set of 4 stainless steel spindles,
Viscosity ranges:
- TR8, 50-170 K ,
- TR9, 250-830 K
- TR10, 500-1.7 M
- TR11, 1K-3.3 m



Software for High Performance Rotational Viscometer

Elastic recovery apparatus by torsion method

STANDARD
▸ NLT 329 ▸ INVIAS E 727 ▸ M-MMP-4-05-024 ▸ IRAM 6830

81-B0149
ELASTIC RECOVERY APPARATUS

Used for determining the degree of elasticity of modified asphalt used in road construction by the elastic recovery by torsion method.
The equipment basically consists of a metal cylinder Ø 25.4 x 100 mm long, a guide support with a scale graduated from 0 to 180°, a water bath and a container for the sample.

The test consists of inducing angular deformation by means of a steel cylinder of specific dimensions, embedded into a sample of modified asphalt, in order to observe its recovery capacity

Accessories:

82-B0125/2MF
Saybolt thermometer, +19 to 27°C range, 0.1°C graduations, ASTM 17C, mercury free.

Rheological properties of asphalt binders

81-PV6202

ADVANCED SERIES

STANDARD

AASHTO T315 · AASHTO T316, T350 · AASHTO M320 · AASHTO M332 · AASHTO R29 · ASTM D7175 · ASTM D4402 · ASTM D7405 · EN 13302 · EN 13702-1 · EN 13702-2 · EN 14770 · EN 14896

DSR

DSR, DYNAMIC SHEAR RHEOMETER

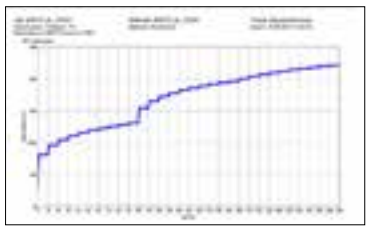
Dynamic Shear Rheometers (DSR) performs the critical rheological characterization analysis required for SuperPave Performance Grade (PG) classification of asphalt binders.

The behavior of the binder under various temperature and loading conditions is measured to predict the performance of binders at anticipated climatic conditions.

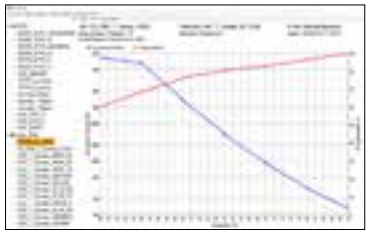
The DSR test uses a thin asphalt binder sample sandwiched between two circular plates. The lower plate is fixed while the upper plate oscillates back and forth across the sample to create a shearing action. DSR tests are conducted on unaged, RTFO aged and PAV aged asphalt binder samples. The test is largely software controlled.

81-PV6102 and **81-PV6202** are able to perform SuperPave performance grading according to AASHTO T315 and ASTM D7175, Viscosity determination of asphalt binder in according to AASHTO T316 and ASTM D4402 and determine Multi Stress Creep Recovery (MSCR) according to AASHTO T350 and ASTM D7405.

MAIN FEATURES



MSCR - Test



G and phase angle δ*

- Performance Grade (PG) determination test.
- Determination of deformation properties of bitumen with Multiple Stress Creep Recovery test (MSCR – Test).
- Determination of complex shear modulus G* and phase angle δ of road bitumen at different temperatures.
- Precise and stable temperature control unit (Peltier unit).
- Excellent temperature stability and accuracy.
- Meet and exceed AASHTO, ASTM and EN Standards.
- Simple to use.

81-PV6102

81-PV6202

Technical Specification

Rheometer

- Torque range 0,1 to 150 mNm
- Torque resolution 0,001 mNm
- Speed range 0 to 2000 rpm
- Speed resolution 0,015 rpm
- Rotation angle range -50° to 300°
- Angle resolution 0.001°
- Frequency 0.001 to 100 Hz
- Viscosity range 0.1 to 7x107 Pas
- Complex shear modulus 0.1 to 4x106 kPas
- Phase angle range 0 to 90°

Temperature control unit (Peltier unit)

- Maximum temperature 180°C
- Minimum temperature -10°C
- Temperature accuracy </= 0.1 K, range 5°C to 90°C
- Interface USB 2.0

Software manager

- Prepared jobs for automatic and fast execution of all bitumen tests
- Automated evaluation and analysis of measuring results in accordance with AASHTO
- With estimation of Performance Grade
- Different test types for original binders, RTFO and PAV
- Grade Determination and PASS/ FAIL conditions
- Bitumen Wizard

Technical Specification

Rheometer

- Torque range 0,1 to 150 mNm
- Torque resolution 0,001 mNm
- Speed range 0 to 2000 rpm
- Speed resolution 0,015 rpm
- Viscosity range 1 to 3 x 10^9 mPas
- Complex shear modulus 0.1 to 4 x 10^6 kPa
- Phase angle range 0 to 90°
- Frequency 0.001 to 100 Hz
- Normal force range -30 to 30 N
- Normal force resolution 0.01 N
- Automatic gap setting yes
- Gap resolution 1 µm

Temperature control unit (peltier unit)

- Maximum temperature 180°C
- Minimum temperature -15°C
- Temperature accuracy </= 0.1 K, range 5°C to 90°C
- Interface USB 2.0

Software manager

- Prepared jobs for automatic and fast execution of all bitumen tests
- Automated evaluation and analysis of measuring results in accordance with AASHTO
- With estimation of Performance Grade
- Different test types for original binders, RTFO and PAV
- Grade Determination and PASS/ FAIL conditions
- Bitumen Wizard

Lighted chambers

Peltier unit: Peltier control unit, peltier temperated basic plate, basic plate support, adapter, exchange grip, exchangeable plate (ø 25mm), measuring plate P3 (ø 25mm), measuring plate P4 (ø 8mm).

Set of trimming tools, set of rubber moulds, 20 ml calibration liquid NF 5000000, interface cables, USB adapter, user manual

Software Manager for Bitumen tests

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more info visit **www.controls-group.com** or link directly to the QRCode