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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.

ASPHALT TESTING

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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

PAVELAB 50

STANDARD

► ASTM D8179 ► EN 12697-1

Operating principle

The asphalt sample (maximum 3.5 kg) is placed in a washing drum lined with a sintered 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 as 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 \pm 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

75



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

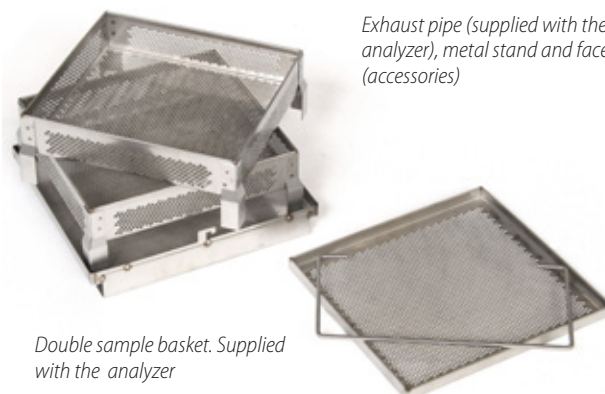
Auxiliary top pan digital balance, 10.000 g capacity, 0.1 g sensitivity, for connection to Asphalt binder analyzer via the RS 232. 230 V, 50-60 Hz, 1 ph

```
*****
Controls
Ignition Machine 88008
*****
11/11/88      18:02:23
Record n.      002
ID Test:       0000000000
Operator:      OPERATORE1
*****
Tray weight:   3546.8g
Sample wt. :   1428.2g
Combined wt:   4974.2g
*****
TEST RESULTS
Test time :    49min
Final weight   1361.8g
Weight loss:   66.4g
% Wt. loss :   4.65%
% bit.on aggr. 4.876%
Corr. Factor:  0.00%
Notes :-----
Notes+:-
*****
```

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/I

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



75-B0024/N with sieves

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 disintegrated 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

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

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

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

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

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-B0023/1

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 ml 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 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 CO₂ 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-Jacketed 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

75

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

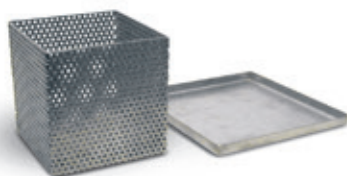


Test bottles 75-B0011/A with
75-B0011/A2 glass rod

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 m³/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

- 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

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

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



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.

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.

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	34-V1072
		76-B0030/A	34-V1172
		76-B3802	70-T1082 70-T1192
ASTM D5581	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	70-T1082
ASTM D6927		34-V1072	70-T1192
ASTM D6931		34-V1172	
ASTM D8225			
EN 12697-12	Determination of the water sensitivity	76-B3802	70-T1082
EN 12697-23	Determination of the indirect tensile strength	34-V1072	70-T1192
EN 12697-34	Marshall test	34-V1172	

*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 (h x l x d): 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 capacity 110 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 display 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 data-base (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-B0033/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. To be completed with suitable pair of loading strips. 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 116 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

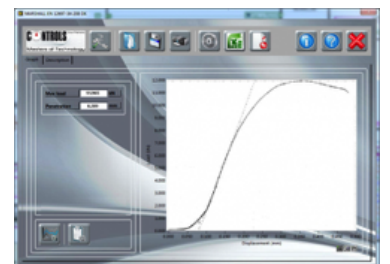
Stability head for 71.4 mm diameter specimens



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 sys-

tems 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.

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.

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



34-V1072 With Marshall test accessories (Analog mode)



34-V1072 With Marshall test accessories (Digital mode)



MULTISPEED 34-V1172 equipped with Marshall digital testing accessories



Water baths

STANDARD

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

Used to condition Marshall ($60 \pm 1^\circ\text{C}$) and other asphalt specimens (e.g. tar specimens at $37.8 \pm 1^\circ\text{C}$) 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 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, $^\circ\text{C}$	Ambient to 60	Ambient to 60	Ambient to 95	+5 to + 60
Accuracy, $^\circ\text{C}$	± 1	± 1	± 1	± 1
Power, W	1200	1200	2500	2000
Recirculating pump	76-B0066/B only	76-B0067/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



76-B0066/A, 76-B0066/B



65-D1409/A

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

76-B0088

PRD (Percentage Refusal Density) mould.

PRD Split mould and baseplate

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

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 UNI-FRAME 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

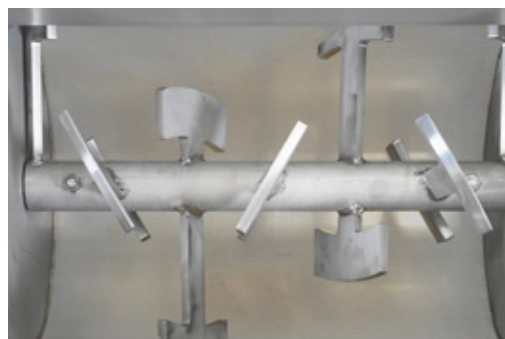
► EN 12697-35

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 to 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

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



Aggregate loading



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

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-B0072



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



Electromechanical multisize slab compactors



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.



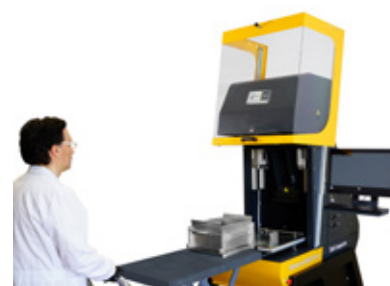
77-PV41A02 series



Detail of segment head incorporating vibration unit



77-PV41C05 series



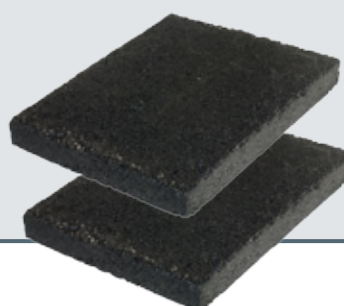
Detail of the vertical sliding cover for easy access and three side view



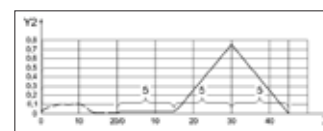
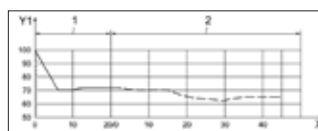
Detail of segment head and mould

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



500 x 400 mm slab and lead rolled ball screw system



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

PreSBBOX, 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 PreSBBOX 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 PreSBBOX prisms have identical properties with uniform air voids distribution and particle orientation ensuring consistent and repeatable test results.

Specimens cut from the PreSBBOX



- Prismatic specimen produced by the PreSBBOX



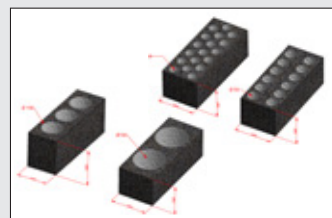
- Up to four 70mm wide prismatic specimens



- Up to six 50mm wide prismatic specimens



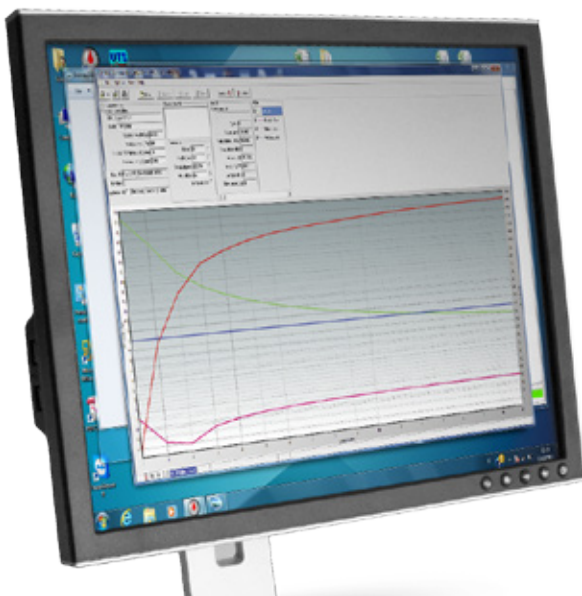
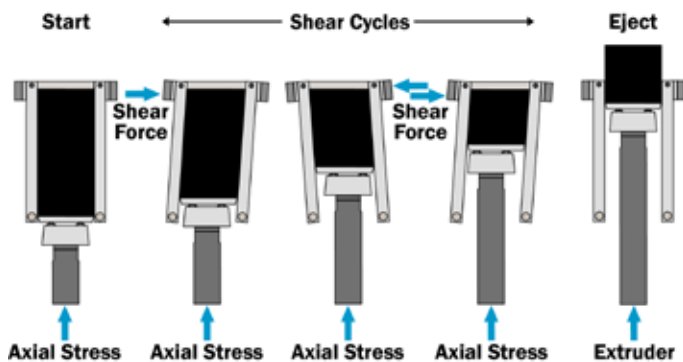
- Up to four 100mm diameter cylindrical specimens



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



- Up to two 150mm diameter cylindrical specimens for Texas Overlay Test specimens



PreSBBOX mould heater



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: $\pm 1\%$ 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

77



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.

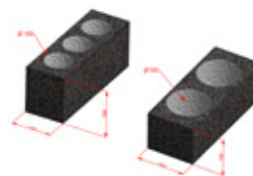
Technical specifications

- 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

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

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.

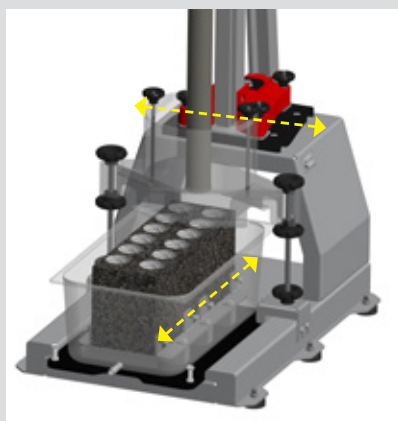
83-C0320

As above to take 50 mm diameter sample.

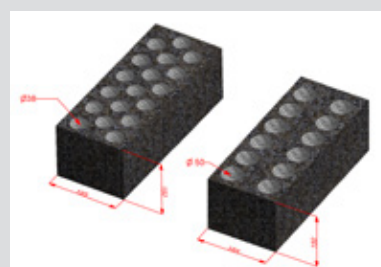
83-C0319

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.



KorBit, Core drilling machine

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 Gytratory 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



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



Fully electro-mechanical gyratory compactors

78-PV20G02

Available in two versions:
GALILEO and
GALILEO Research

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.



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



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

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



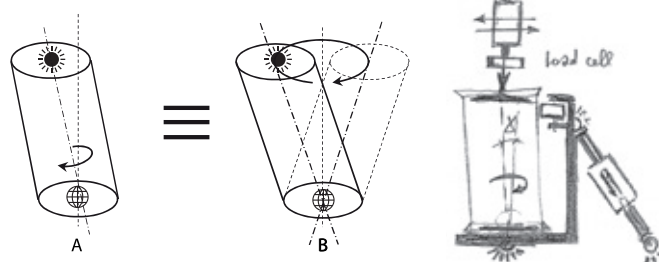
MAIN FEATURES

- » 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 $0-3^\circ \pm 0.01$

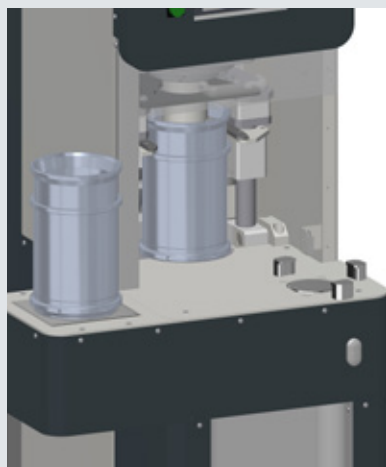
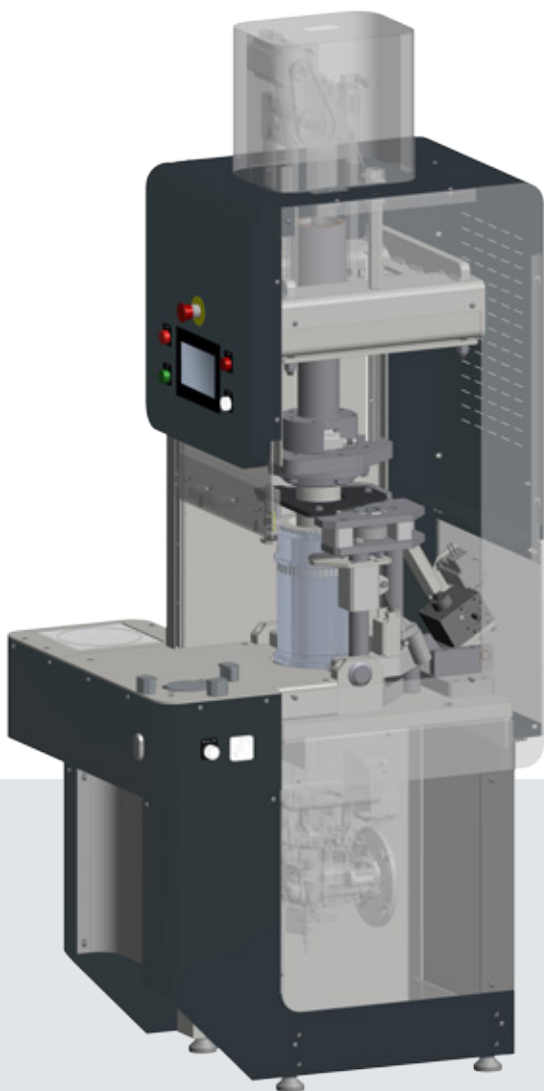
The "ORBITAL" patent-pending, smart intelligent-easy mechanism is the heart of the gyratory compactors and we modestly believe it is worthy of the name of the famous scientist Galileo

Additional features of the GALILEO Research version

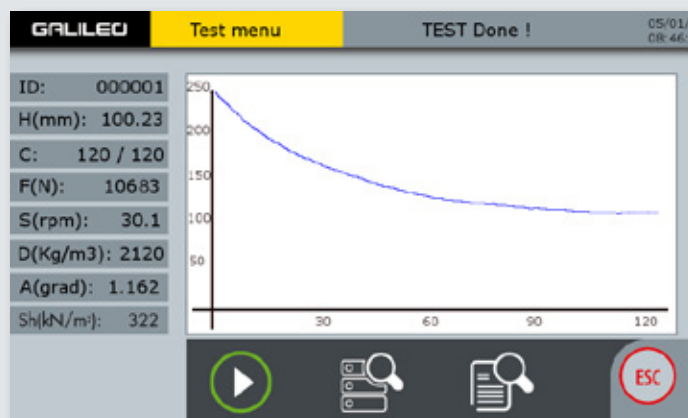
- Perfect gyratory angle with real time closed loop automatic angle adjustment recovering compliance and minor strains independently from the vertical loads
- Easy and accurate motorised regulation of the gyratory angle set and displayed from the control panels
- Possibility to automatically set the 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 $0-3^\circ \pm 0.005$



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.



GYRUCOMP Gyratory compactors

78

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.



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.

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
- » High productivity
- » 2 years full warranty

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

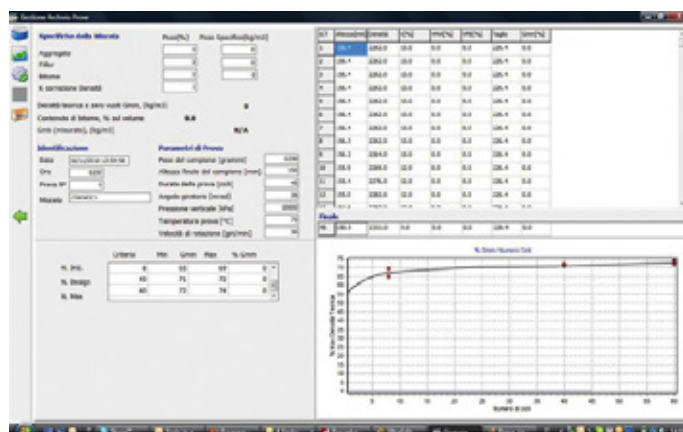
The very rigid but lightweight frame is due to the unique body design, resulting in high rigidity values exceeding the EN 12697-31 Standards

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

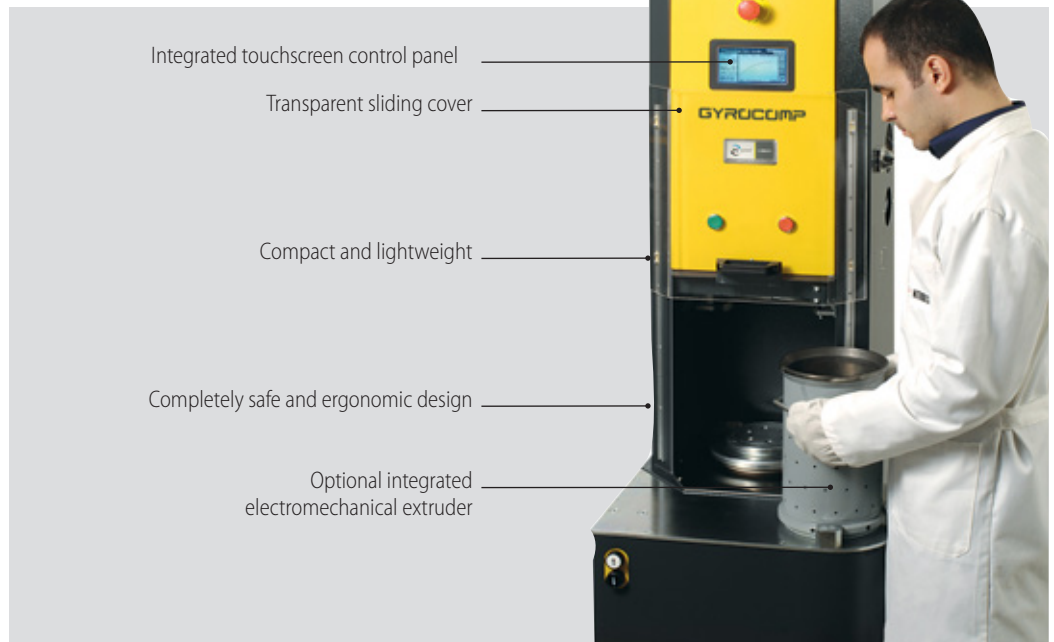
78-PV2522

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.



78-PV2522

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 1 µm, 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, Internal angle measurement apparatus



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



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

78-PV0255

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

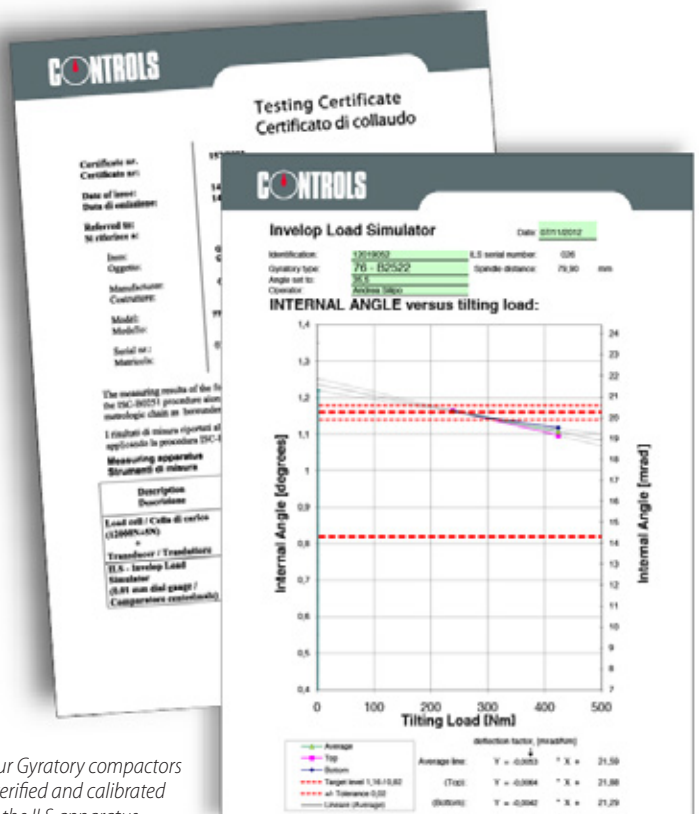
Accessories

78-PV0255/1

Calibrator blocks for ILS, set of two different angles, supplied with factory certificate



78-PV0255 complete set



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



Double Wheel Trackers



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



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

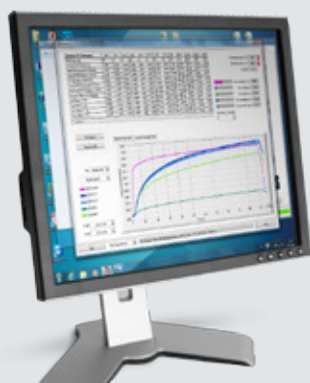
- » AASHTO T324 » EN 12697-22 (small size device)

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.

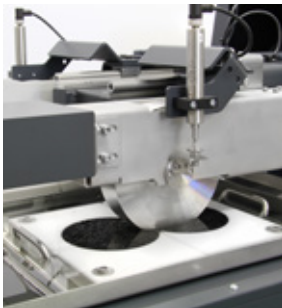



The two methods according AASHTO T324 and EN 12697-22 "small size device" are practically identical except for:

- 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 ($\pm 0.5^\circ\text{C}$)
- » Accurate temperature control ($\pm 0.5^\circ\text{C}$) 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** PV31A15** PV31A26 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, interchangeable 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 $\pm 0.5^{\circ}\text{C}$ 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® AMPTPRO

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.





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 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



79-PV70B12/I2

UTM 130

Servo-Hydraulic Universal
Testing Machines, 130 kN capacity



79-PV70C05/I2

UTM 130 XL

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 accommodate 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).



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



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

Modular Electro-mechanically operated Asphalt tester



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

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



UTM, ASPHALTQube, AMPT Pro/AMPTQube test accessories

SEMI-CIRCULAR BEND SETS (SCB TEST)

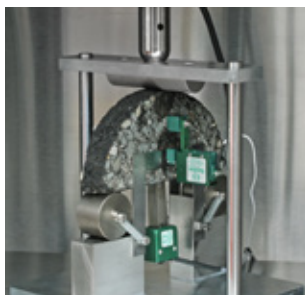
STANDARD

- ▶ ASTM D8044



STANDARD

- ▶ AASHTO TP105 (With UTM-30 only)



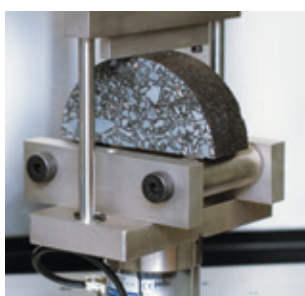
STANDARD

- ▶ 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

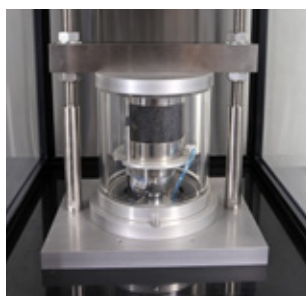
- ▶ EN 12697-25B ▶ AASHTO TP107, T342/TP62, T378/TP79 (with UTM-30 and UTM-130 only)



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

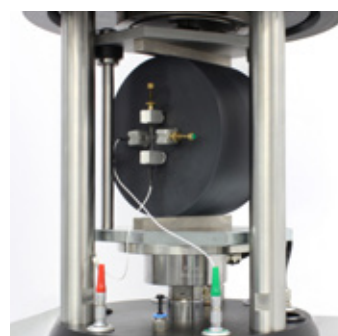
- ▶ EN 12697-24E



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

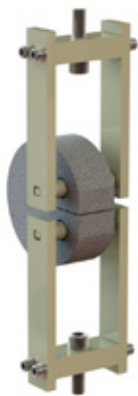


UTM machines only

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





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

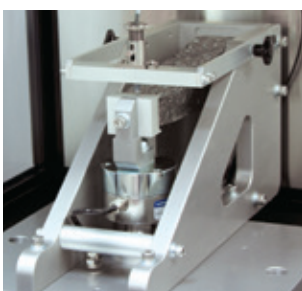
The innovative AMPT Gauge Point fixing makes it quick and easy to accurately fix gauge points for on-specimen transducers. This eliminates potential errors and saves time.



TRAPEZOIDAL TWO POINT BEND

STANDARD

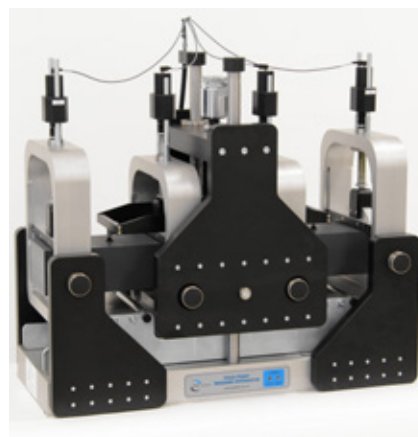
- ▶ EN 12697-24 Annex A ▶ EN 12697-26 Annex A



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
■ UTM machines only

■ ASPHALTQUBE

Stand-alone asphalt testers

STANDARD

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

LP3

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

79

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



79-PV70102

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.

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



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

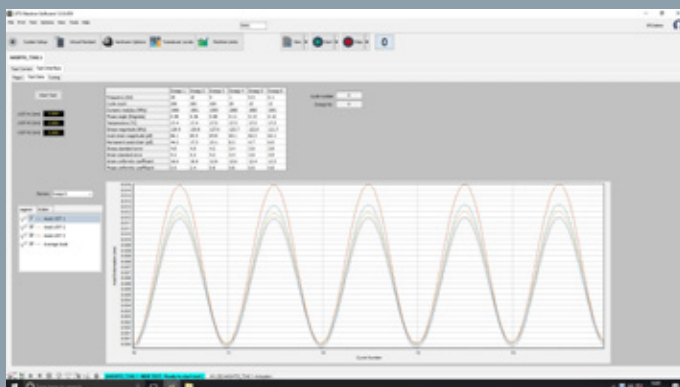
UTS Neutron has been developed to provide the ultimate in flexible yet easy materials testing software for all types of users.

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

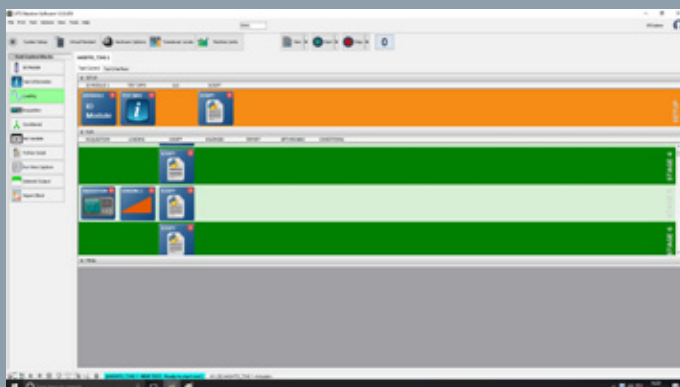
Choose exactly the level of access you want for each of your users and then on entering their username and password, each user will only be given access to make the changes required to complete their work.

Three licence levels



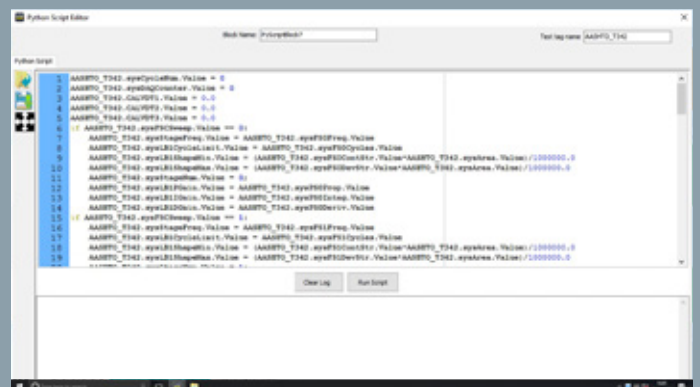
ESSENTIAL

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



PERFORMANCE

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



DEVELOPER

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

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 AUTOSTRADA (ITALIAN HIGHWAYS) METHOD

This version is for measuring the time water takes to percolate through draining pavements by the Autostrada 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.



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).

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

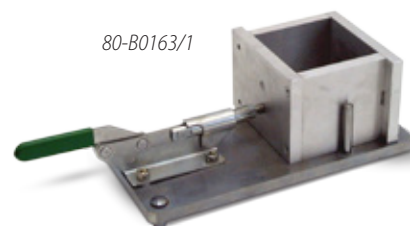
safe way: by rotating the lower part, the load conditions are accurately applied, and the operator doesn't have to add or remove any heavy weights to/from the apparatus.

The 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.

weights, interchangeable 1 and 5 cm² 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.



86-D1408/D

80-B0163/2

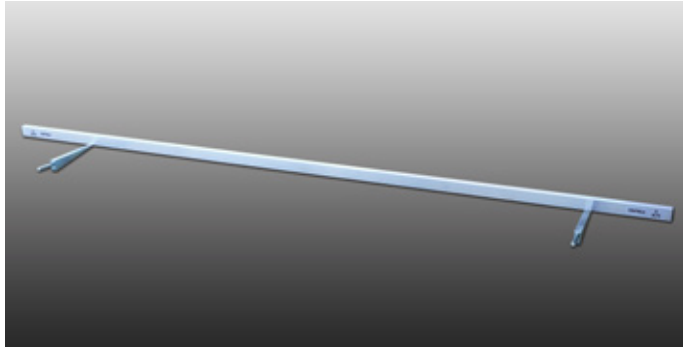
STANDARD

► 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

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.

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.



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.