



Full  
conformity to  
**ASTM D8159-2018**  
**EN 12697-1**

ADVANCED PAVEMENTS TESTING SYSTEMS

# PAVELAB 50

**PaveAnalyzer**

Automatic Closed-system Asphalt Analyzer



**PAVELAB50** PaveAnalyzer

**ASTM D8159-2018  
and EN 12697-1  
Automated Extraction  
of Asphalt**





For separation and extraction of bitumen, filler and aggregates from asphalt samples by use of solvents

75-PV50A25

### Standards

ASTM D8159-2018 | EN 12697-1

These tests methods are used for quantitative determinations of bitumen in hot-mixed paving mixtures and paving samples for specification acceptance, service evaluation, control and research.

These methods prescribe the solvent or solvents that can be used for the binder extraction and recovery.

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

We are proposing several models of extraction system, including the Automatic Closed-system Asphalt Analyzer.

### Operating Principle

The asphalt sample (maximum 3.5 kg) is placed in a washing drum lined with a sintered multilayer mesh with openings 0.063, 0.075 or 0.090 mm wide and it is fitted into the washing chamber. Bitumen and filler are separated from the sample by washing with solvent and ultrasonic motion. The 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.

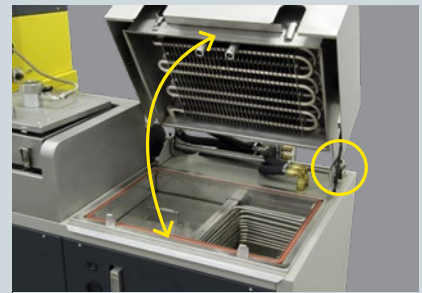
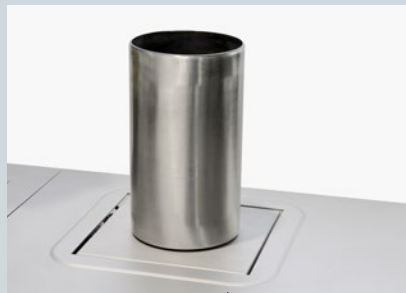
The PaveAnalyzer shall be connected to a suitable water cooling unit to feed the three different cooling coils of the apparatus.

**Distinguishing features of the new generation**

7" touch screen **swinging panel** displays the operating stage and recorded data. Machine software enable the test parameters set-up.

Machine version incorporating balance also available (model 75-PV50A25). The sample can be weighted at the end of each stage and related data are recorded and used for automatic result calculation. All results, including those of previous tests, can be recalled for printout reports by the printer 82-P0172/B.

The condenser cleaning operations are facilitated by an **hinged opening** of the lid.



Removable washing drum

Fast connection for rotary evaporator flask, for bitumen solution sampling

Clean and dirty solvent tanks drainage valves

Level indicators are made of a high resistance material in order to be compatible with an **extensive range of solvents**.

**Note**

The user can configure the machine for use with the following solvents:

- Perchloroethylene (tetrachloroethylene)
- Trichloroethylene
- Dichloromethane (methylene chloride)

The machine can also be used with asphalt samples containing rubber granules recycled from end of life tyres.

**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, conforming to latest anti-pollution requirements.

- 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 option.
- Extraction time reduced to approx. 55 minutes (including drying).

> **No toxic fumes in the laboratory conforming to latest anti-pollution requirements.**

- > **7" touch screen swinging panel.**
- > **Version incorporating a balance for an accurate measurement of asphalt sample (10 kg ±0.1 g) also available.**
- > **High extraction capacity: up to 300g of filler for each extraction.**
- > **Automatic sample drying after extraction.**
- > **Silent operation.**



### Technical specifications

- Maximum sample size: 3.5kg
- Centrifuge rotation speed: 6000 rpm
- External cup nominal dimensions: 120 x 200mm (diameter x height)
- Maximum filler capacity: approx. 300g
- Extraction time (including drying of aggregate and filler): approx. 55 minutes
- Solvent used per extraction: approx. 10 liters (recycled)
- Power rating: 6 kW (excluding water cooling system)
- Overall dimensions: approx. 1400 x 750 x 1500 mm (w x d x h)
- Weight: approx. 240 kg

The PAVELAB50 Automatic Closed-system Asphalt Analyzer consists of the following:

#### Machine body

Steel sheet, powder coated with epoxy resin. Wheel mounted.

#### Washing chamber

High quality stainless steel fitted with ultrasonic equipment, heating system, driving device for the rotation of the washing drum, valves, connections, etc.

#### Washing drum (Separate accessory)

Lined with three layer sintered, high resistance screening mesh, 0.063 or 0.075 or 0.090 mm opening. This unit includes seating, support and closing ring for the cover. Each model should be fitted with the appropriate cover.

#### Centrifuge

High speed centrifuge for 120 mm diameter cup, complete with safety switch.

#### Condenser

Stainless steel tank complete with cooling coil for condensation of solvent vapour during the drying operation.

#### Forced air circulation pump

For drying aggregate and filler.

#### Recovery/distillation unit

Double chamber: one for distillation, one used as a reservoir. The distillation chamber comprises a base and upper heater providing solvent recovery up to approx. 30 liters/hour, and cooling coils above the chamber, incorporated in the cover. Both chambers are fitted with drain valves.

#### Sampling device for Rotary evaporator

A fast connection for the Rotary evaporator flask for bitumen solution collection is also available. See Accessories 75-PV5X100 in main catalogue.

#### 7" Touchscreen control panel

For controlling and operating the machine.

#### Balance option

For the accurate measurement of asphalt samples (model 75-PV50A25 only).

#### Water cooling system

The machines have to be connected to a suitable water cooling system which is not included and have to be ordered separately.

#### Safety features

The machine stops immediately if a lack of water, electric motor malfunctions etc. are detected and the reason for the stoppage is shown on the control panel display. The doors are locked when the test is running.



Placing the washing drum into the machine



Detail of centrifuge inlet



Placing the centrifuge cup into the centrifuge unit



Detail of 75-PV5 X100 fast connection for Rotary evaporator flask, for bitumen solution sampling



**Ordering information**

Two versions of the PaveAnalyzer are available:

- **models 75-PV50A15** and **75-PV50A16** without accessories.
- **models 75-PV50A25** and **75-PV50A26** without accessories but supplied with integrated balance.

**Standard version**

**75-PV50A15**

PAVELAB 50 Automatic Closed-system Asphalt Analyzer for separation and extraction of bitumen, filler and aggregates from asphalt samples by use of solvents. 380 V, 50-60 Hz, 3 ph.

75-PV50A16

Same as above but 220 V, 60 Hz, 3 ph.

**Version incorporating balance**

**75-PV50A25**

PAVELAB 50 Automatic Closed-System Asphalt Analyzer for separation and extraction of bitumen, filler and aggregates from asphalt samples by use of solvents. Complete with integrated scale. 380 V, 50-60 Hz, 3 ph.

75-PV50A26

Same as above but 220 V, 60 Hz, 3 ph.



Detail of control panel display



**Accessories**

Washing drums cup and closing lid

**75-PV50/KIT**

Kit of accessories complete with:

75-PV5X010

washing drum, 0.063 mm mesh

75-PV5X040

closing lid for washing drums

75-PV5X150

centrifuge cup, 120 mm diameter

75-PV0005/2

lining paper for centrifuge cup. Pack of 100.



75-PV5X010



75-PV5X040



75-PV5X150

#### Alternative washing drum

##### **75-PV5X020**

Washing drum, 0.075 mm mesh

##### **75-PV5X030**

Washing drum, 0.090 mm mesh

##### **75-PV5X010/C**

Washing drum, 0.063 mm mesh with traceable certificate of wire mesh opening

##### **75-PV5X020/C**

Washing drum, 0.075 mm mesh with traceable certificate of wire mesh opening

##### **75-PV5X030/C**

Washing drum, 0.090 mm mesh with traceable certificate of wire mesh opening

#### Solvent testing device

##### **75-PV5X110**

Testing device to verify the stability of recycled solvent from the pH value.

##### **75-PV5X120**

Solvent stabilizer. 1000 ml bottle. For stabilization of recycled solvent.

#### Solvent pump

##### **75-PV5X200**

Solvent pumping device for safe solvent filling

#### Water cooling system

##### **75-PV5X145**

Water cooling system providing water between 10 and 15°C, flow rate 5 litres/min, pressure 3 bar. 380 V, 60 Hz, 3 ph.

##### **75-PV5X146**

As above but 220 V, 60 Hz, 3 ph.

##### **75-PV5X170**

Upgrade with additional electrovalve when using cooling tap water

##### **75-PV5X180**

Fast connections for cooling pipes

#### Centrifuge cup

##### **75-PV5X150**

Centrifuge cup, 120 mm diameter.

##### **75-PV0005/2**

Lining paper for centrifuge cup. Pack of 100.

##### **75-PV5X160**

Device for the extraction of the centrifuge cup.

#### Connection

##### **75-PV5X100**

Fast connection for rotary evaporator flask, for bitumen solution sampling (to be ordered at time of order).

#### Printer

##### **82-P0172/B**

24 column serial printer. External battery charger and batteries included. 110-230 V, 50-60 Hz, 1 ph.



75-PV5X145

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