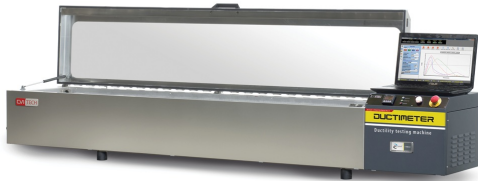


DATA SHEET

Research Ductilometer for Force Ductility Test on Standard and Modified Bitumen - DUCTIMETER



Ductility testing machine DUCTIMETER - Research version model 81-PV10B12

General description

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

Water bath

Insulated stainless steel water bath with a heating system located over the entire base surface and a stainless steel cooling coil (for connection to water mains or chiller) distributed over the three side walls assuring temperature uniformity without water turbulence inside the bath. All parts in contact with water are made of stainless steel.

Carriage displacement

Double-screw rods and mobile carriage enable test speeds from 3 to 200 mm/min. The system also permits the fast return of the carriage at the end of the test (500 mm/min) to reduce dead time and increase productivity. The carriage return is automatic, manual intervention is not required.

Temperature control

- A closed-loop PID system assures constant temperature from -10 to +60°C, with a water chiller (see accessories)
- Stainless steel cooling coil
- Plate-type base heaters give better temperature uniformity
- The thermoregulation system is based on control of the heater (which increases the temperature of the bath) and the control of the flow rate of the cooling coil by an electro-valve. This important feature assures control of the temperature within strict limits and permits the use of suitable standard water chillers.

Load and elongation measurement

Automatic measurement of the elongation by an encoder. Includes a system for measuring forces up to 2000 N (4 x 500 N) with load cells (see accessories).

Testing software

- Selection of test parameters (speed, temperature etc.) by PC. The test temperature, however, can be set in advance using the control panel of the machine.
- Test control by PC: Start-Stop-Carriage return
- Specimen failure recognition

DATA SHEET

- Real-time display of load/elongation graph with advanced visualization options (single or multi-graph)
- Data acquisition and processing conforming to Standards
- Function for multiple test data comparison
- Storage of test data

Machine control

By PC (not included)

Water cooling

This model is proposed without a chiller for use with a suitable cooling system that could be available in the laboratory. It is important, however, that this unit is capable of delivering a flow rate of 6 litres/min, 1 bar, at the minimum temperature of 2°C.

See-through cover

Essential for better temperature control of the bath.

Main features

- 4 tension line (briquette capacity) x 1500 mm
- Easy and free access to the large testing space
- Double drive screw rod
- Closed-loop PID temperature control system
- Stainless steel insulated water bath
- Exclusive in-built thermoregulation system compensating the control, optimized by the connection to chiller (optional)
- High carriage return speed of 500 mm/min for greater productivity
- Adjustable speed range from 1 to 200 mm
- PC-controlled using dedicated software
- Includes a system for measuring forces up to 4x500 N with load cells
- Temperature range from -10 to 60°C
- Elongation measurement by optical system
- Real-time load and displacement graphics via PC
- Includes a system for measuring forces up to 2000 N (4 x 500 N)
- Extensive use of stainless steel for frame, cover and tank

Standards

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

Specifications

Models	81-PV10C12 81-PV10C14
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DATA SHEET

Conforms to Standards	EN 13398 EN 13589 EN 13703 ASTM D113 ASTM D6084 AASHTO T51 AASHTO T300
Machine control by	PC with dedicated software (PC not included)
Thermostatically controlled water bath temperature	From -10 to 60°C with water chiller. PID closed-loop control
Temperature control system	Heater and cooling coil for connection to cold water or water chiller
Structure	Extensive use of stainless steel for frame, tank, cooling coil and cover
Briquettes capacity	4
Max carriage travel	1500 mm
Testing speed	Adjustable from 1 to 200 mm/min
Elongation measurement by	Optical system
Max. load and tension load measurement	2000 N (4 x 500 N) by load cells
Tension load/elongation graph	Real-time graphs by PC
Carriage return speed	500 mm/min
Power rating (approx.)	1200 W
Transparent cover	Included
Overall dimensions	(L x d x h) 2434 x 412 x 385 mm
Weight approx.	100 kg



Detail of the ductilometer's test area with frame and tank all stainless steel made



Software for ductility test

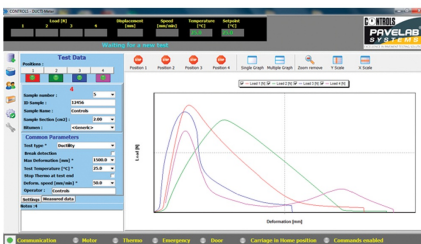
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Briquette placed in the machine

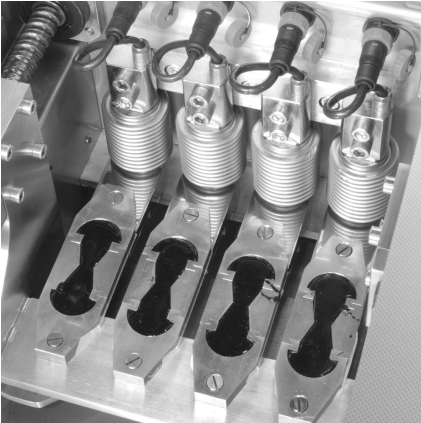


Briquette moulds



Software screenshot

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Ductility test setup



Water chiller 81-PV1002

Products

81-PV10C12

DUCTIMETER, Research Ductility testing machine, 4 briquettes capacity, 1500 mm carriage travel. 230V/50-60/Hz/1ph

81-PV10C14

DUCTIMETER, Research Ductility testing machine, 4 briquettes capacity, 1500 mm carriage travel. 110V/60/Hz/1ph

Accessories and consumables

81-B0141

Ductility mould to EN 13398

81-B0141/A

Briquette mould conforming to ASTM D6084 and AASHTO T300

81-B0141/B

Briquette mould conforming to ASTM D113 and AASHTO T51

81-B0141/E

Briquette mould conforming to EN 13589

DATA SHEET

81-B0142

Ductility mould plate

81-PV10010

Support base for ductility machines

81-PV10020

High precision strain gauge load cell 0-500 N cap.

81-PV1012

Water chiller, flow rate 6 l/min at 1 bar, -20°C min. temperature - 3000 W cooling capacity. 230V/50-60Hz/1ph

81-PV1014

Water chiller, flow rate 6 l/min at 1 bar, -20°C min. temperature - 3000 W cooling capacity. 110V/60Hz/1Ph