MICROTRAC
a VERDER company

MERCURY POROSIMETER

BELPORE Series

The BELPORE mercury porosimeter series for low-pressure (LP), medium-pressure (MP) and high-pressure (HP) reliably and reproducibly measures pore diameters from 1mm to 3.6nm.

The knowledge of porosity, pore sizes and pore volume is of fundamental importance for the characterization of porous materials. Mercury porosimetry is the most widely used method for determining the pore size distribution of accessible macro- and mesopores in solids.

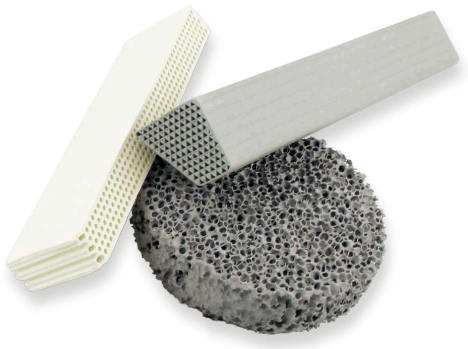
The technique is based on the pressure-dependent intrusion of mercury as a non-wetting liquid into a porous material. Using the Washburn equation, the corresponding pore size is calculated from the applied pressure.

Microtrac, as a provider of state-of-the-art solutions in the field of particle characterization and gas adsorption, has now expanded its extensive portfolio with a series of devices specifically for the field of mercury porosimetry.

The BELPORE porosimeter series consists of state-of-the-art instruments for measuring pore size distribution, pore volume, specific surface area, porosity, density and particle distribution of finely divided and porous materials.

PLEASE NOTE: BELPORE – A HUGE STEP AFTER PASCAL EVO

The BELPORE series consists of the safest and most versatile mercury intrusion porosimeters on the market. Greatly improved, its roots reach back to the discontinued Pascal Evo (140, 240 and 440) series, formerly distributed by Thermo Fisher and Porotec.
The new BELPORE product range is now exclusively available via Microtrac.



FEATURES

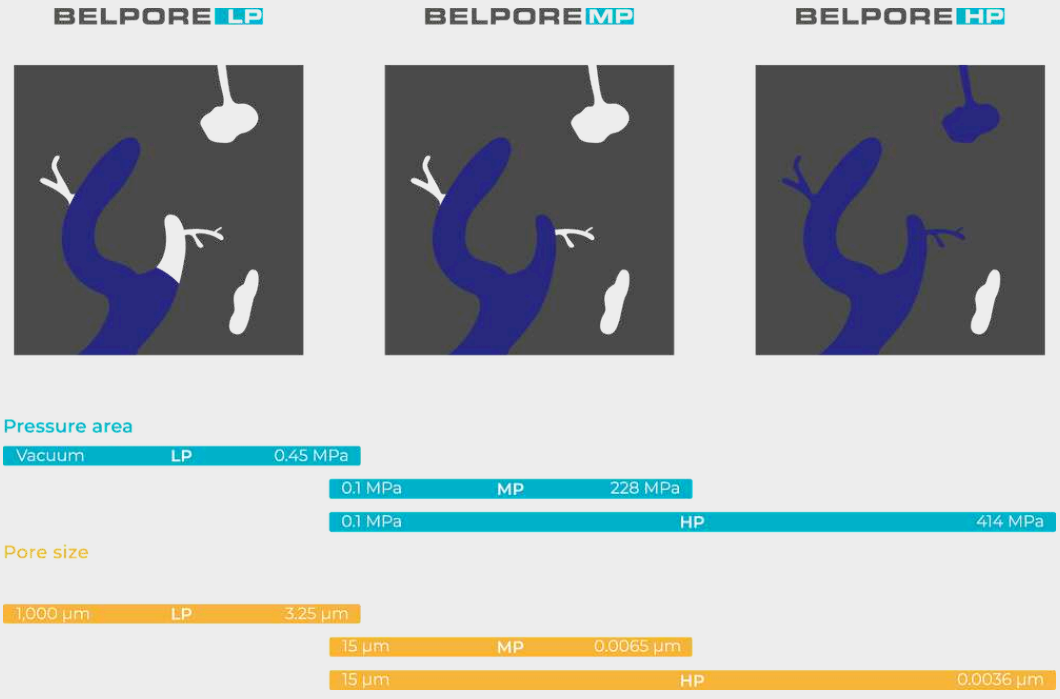
- Fully automatic vertical filling under constantly high vacuum
- High resolution enables detection of up to 20,000 measuring points
- Safe and full functionality without gas connection and liquid nitrogen
- Low space requirement due to compact design
- Vertical arrangement of the dilatometers ensures safe handling
- Efficient re-use of mercury via cleaning set
- All devices are CE-certified

BELPORE HP / BELPORE MP

BELPORE LP

The three mercury porosimeters from Microtrac cover different pore ranges:

- BELPORE LP (1,000 - 3.25 µm)
  Degassing, Hg filling, low-pressure porosimetry
- BELPORE MP (15 - 0.0065 µm)
- BELPORE HP (15 - 0.0036 µm)
  MP & HP: High-pressure porosimetry



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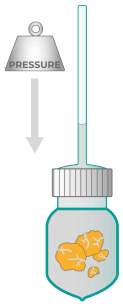
DILATOMETERS & ACCESSOIRES

AVAILABLE ACCESSORIES

- Dilatometer (sample vessels) in different sizes for the BELPORE-Series
- Ultra-Macorpore Set (UMP)
  Extends the measuring range of the BELPORE LP for pore & particle size determination
- Porosimeter calibration set
  For easy calibration of capacitive volume measurement
- Mercury cleaning set
  Enables the efficient reuse of mercury

Dilatometers in various sizes for measuring porous material



The professional dilatometer offers an easy and safe handling via screw cap and integrated opening aid.

	Standard	Professional	UMP (Ultra Macropore)
Capillary diameter	3 mm // 6 mm	3 mm	6 mm
Sample type	Powder // solids	Powder // solids	Powder, solids
Max. size of solid sample (d x h)	12 x 46 mm // 25 x 25 mm	11 x 35 mm	25 x 25 mm
Compatible with	LP, MP, HP // LP, MP	LP, MP, HP	LP
Dilatometer volume	15 cm^3 // 35 cm^3	8 cm^3	50 cm^3

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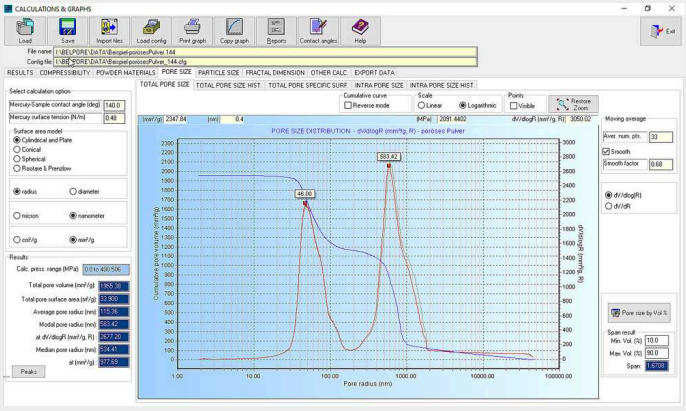
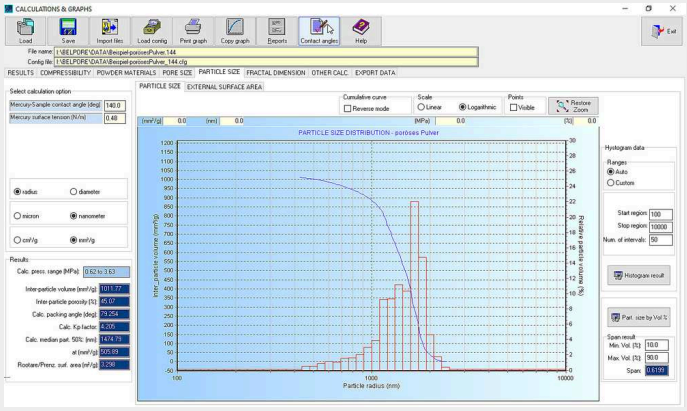
CONTROL & EVALUATION SOFTWARE

The PoreInspect software for the BELPORE porosimeter series of Microtrac offers a variety of functions. The software monitors and controls up to 4 measuring instruments connected via LAN completely independently with a PC and allows for individual control of all instrument parameters in real-time.

The data evaluation of the PoreInspect software not only takes the exact blank value correction into account, but also allows for a check and correction of possible sample compressibilities, guaranteeing most reliable results. Extensive evaluation options enable the selection of different pore models and their presentation as graphics and histograms. The calculations are freely selectable depending on the application and include, for example, the representation of fractal dimensions as well as calculations of tortuosity and permeability. Overlay, statistical evaluations, the creation of a method catalogue and data export are further features. The stored raw data is available at any time.



Evaluating pore size with the PoreInspect Software



Evaluating Particle size with the PoreInspect software

MERCURY POROSIMETER BELPORE SERIES

TYPICAL APPLICATIONS

chemicals

battery materials

ceramics

To find the best solution for your particle characterization needs, visit our application database

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TECHNICAL DATA

Function	LP: Degassing, Hg filling, low-pressure porosimetry MP & HP: High-pressure porosimetry
Pressure range	LP: Vacuum up to 450 KPa MP: 0.1 - 228 MPa HP: 0.1 - 414 MPa
Resolution LP	0.001 kPa in measuring range: vacuum to 0.1 kPA / 0.01 kPa in measuring range 0.1 - 450 kPA
Resolution MP	0.001 MPa in measuring range 0.1 - 100 MPa / 0.01 MPa in measuring range 100 - 228 MPa
Resolution HP	0.001 MPa in measuring range 0.1 - 100 MPa / 0.01 MPa in measuring range 100 - 414 MPa
Pressure detection accuracy	better than 0.1% F.S.
Pore size diameter	LP: 180 - 3.25 µm (UMP: 1,000 - 3.8 µm) MP: 15 - 0.0065 µm HP: 15 - 0.0036 µm
Particle size diameter	LP: 330 - 15 µm (UMP: 3,000 - 15 µm) MP: 40 - 0.015 µm HP: 40 - 0.01 µm
Max. detectable volume	LP & MP: 0.5 cm^3 - 2 cm^3 HP: 0.5 cm^3
Volume detection accuracy	better than 1% F.S.
Max. number of measuring points	10.000 intrusion 10.000 extrusion
Weight	LP: 55 kg (121 lbs) MP & HP: 68 kg (150 lbs)
Dimensions (W x D x H)	LP: 40 x 67 x 80 cm MP & HP: 40 x 67 x 80 cm

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FUNCTION PRINCIPLE

“Pascal” is not only a pressure unit, in the BELPORE mercury porosimeter it also stands for the equilibrium-controlled and optimized handling of the pressure build-up through the so-called “Pressurization by Automatic Speed-up and Continuous Adjustment Logic”, or P.A.S.C.A.L. for short. This automatic control is regulated by the real pore system and permits shorter measuring times under guaranteed equilibrium conditions as well as the detection of all pores within the specification - and this with up to 20,000 measuring points per analysis. Since only three types of dilatometers are sufficient for all measurement tasks and neither gases nor liquid nitrogen are required, running costs can be kept significantly low.

In addition, the BELPORE LP low-pressure mercury porosimeter is easy to use and has an extended measuring range up to pore sizes of 1 mm. The vertical venting and filling with mercury on the BELPORE LP allows the degassing pressure to be adjusted, making it possible to measure moist samples without changing the moisture content of the material. In this way, even moist concrete samples and solvent-containing porous green bodies can be measured unaltered.

www.microtrac.com/belpore