

Liquid Extrusion Porosimeter

Description

The PMI Liquid Extrusion Porosimeter is a unique instrument with the ability to measure through-pore volume, volume distribution and liquid permeability without using mercury. The instrument is employed for characterization of porous materials used in many industries such as biotech, pharmaceutical, filtration, food, and environment. It produces no harmful effects on personnel or environment.

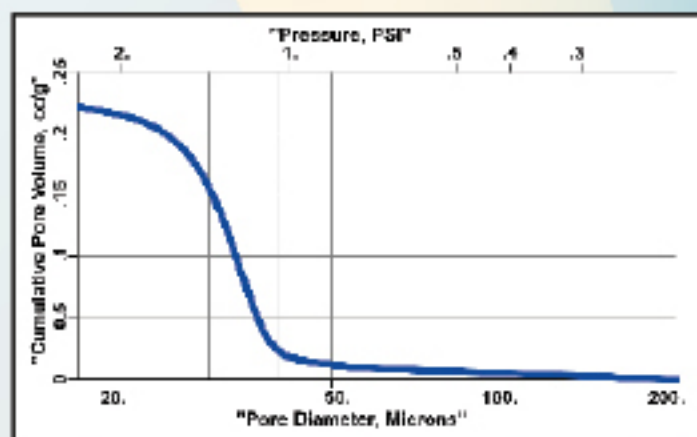


Principle

The sample is placed on a membrane in the sample chamber. The membrane is such that its largest pore is smaller than the smallest pore to be tested. The pores of the sample and the membrane are filled with a wetting liquid. The pressure of a nonreacting gas is increased on the sample to extrude the liquid from the pores. The differential pressure, p , required to displace liquid from a pore is related to its diameter, D , surface tension of the liquid, γ , and contact angle of the liquid, θ .

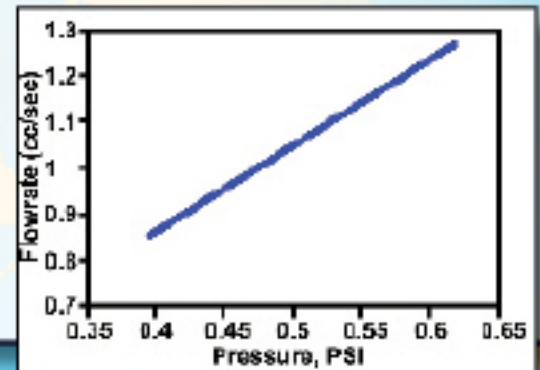
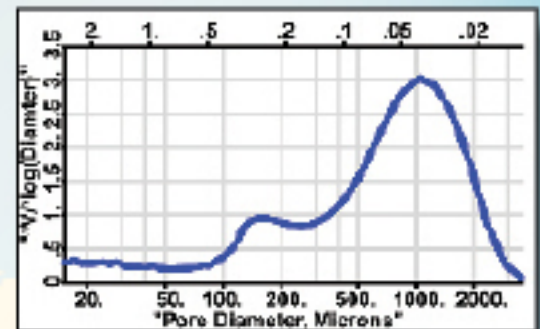
$$p = 4 \gamma \cos \theta / D$$

The displaced liquid passes through the liquid-filled pores of the membrane and its volume is measured, while the liquid-filled pores of the membrane prevent the gas from passing through because of insufficient pressure. The gas pressure gives the pore diameter. The volume of displaced liquid gives the pore volume. Measurement of liquid flow rate without the membrane under the sample yields liquid permeability of the sample.



Features

- One Instrument performs like two. Measures liquid permeability like a permeameter and pore volume like a Mercury Intrusion Porosimeter.
- No toxic material like mercury is used. No health hazard. No disposal-related cost.
- Fully automated. Simple to use. Very little operator involvement.
- Highly reproducible & accurate.
- A wide variety of samples can be investigated.
- Pressure required almost an order of magnitude less than that required for mercury intrusion.
- Can be used for pressure sensitive materials.
- Only instrument capable of measuring through-pore volume.
- Effects of application environment measurable. (stress, temperature, chemical environment).
- Capable of measuring very large pores (up to 1000 microns).



Specifications

Pressure Range

0 - 100 psi (Others Available)

Pore Size Range

1000 μm - 0.05 μm

Resolution

1 in 20,000

Intrusion Volume Range

0.01 cc

Sample Size

1.5" Diameter, 1" Thick
(Others Available)

Other Products

Average Fiber Diameter Analyzer
Bubble Point Tester
Capillary Flow Porometer
Capillary Condensation Flow Porometer
Complete Filter Cartridge Analyzer
Clamp-On Porometer
Compression Porometer
Custom Porometer
Cyclic Compression Porometer
Envelope Surface Area Analyzer
Filtration Media Analyzer
High Flow Porometer
Integrity Analyzer

In-Plane Porometer
Microflow Porometer
Nanopore Flow Porometer
QC Porometer
Diffusion Permeameter
Gas Permeameter
Liquid Permeameter
Vapor Permeameter
Water Vapor Transmission Analyzer
Liquid Extrusion Porosimeter
Mercury/Nonmercury Intrusion Porosimeter
Vacuapore
Water Intrusion Porosimeter (Aquapore)

BET Lquisorb
BET Sorptometer
Gas Pycnometer
Mercury Pycnometer

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