THE PMI COMPRESSION LIQUID EXTRUSION POROSIMETER

Porous Materials, Inc.

Not just products...*solutions!*

Description

The PMI Compression Liquid Extrusion Porosimeter has the ability to test samples under compressive stress. 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. Pressure on the inner piston rod is set to apply desired compressive stress on the sample. The outer piston rod is activated to apply desired pressure on o-rings. The inner piston rod is activated to apply desired
compressive stress on the sample. 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 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.

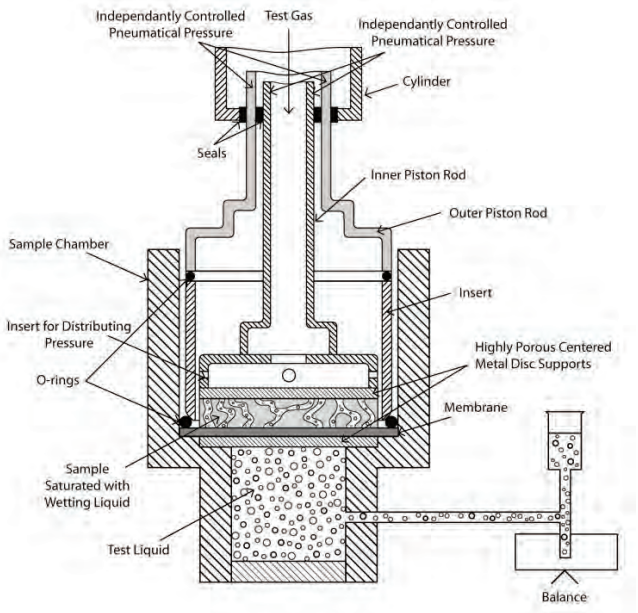


Figure 2

Principle behind the Compression Liquid Extrusion Porosimeter

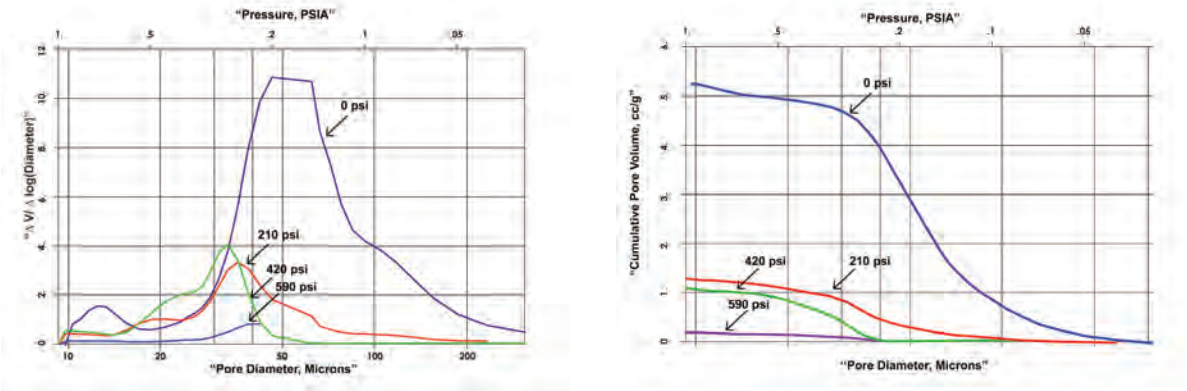


Figure 3
Typical results from PMI software

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)

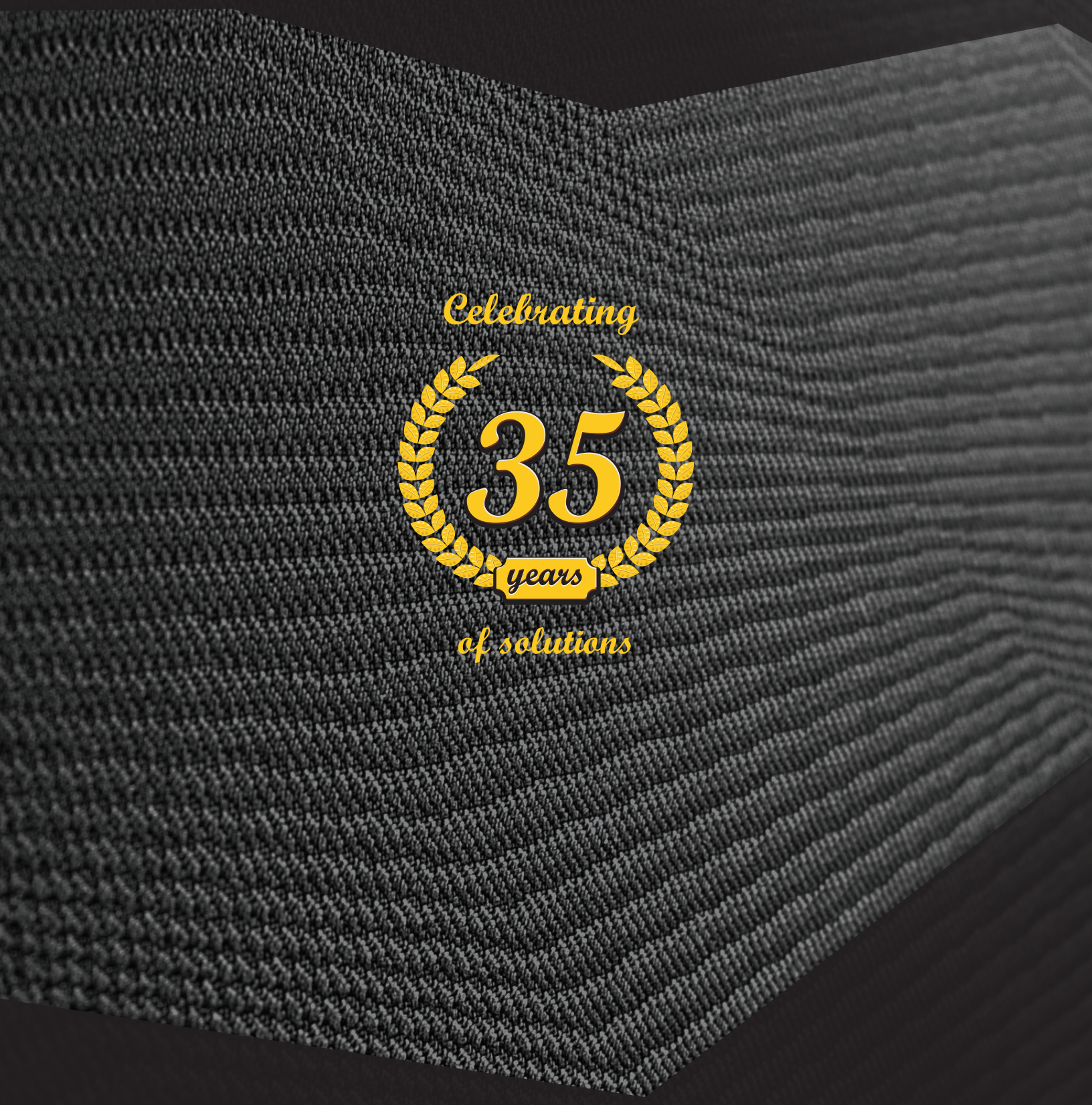
Specifications*

- 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)
- Compressive Stress: up to 1000 psi

* *Other specifications for this machine are available. Specifications are subject to change without notice.*

20 Dutch Mill Rd, Ithaca, NY 14850, USA
Toll Free (US & Canada): 1-800-TALK-PMI (1-800-825-5764)
Phone: 607-257-5544 Fax: 607-257-5639
Email: info@pmiapp.com www.pmiapp.com

The most advanced, accurate, easy to use and reproducable porometers in the world.



PMI
Porous Materials, Inc.

20 Dutch Mill Rd, Ithaca, NY 14850, USA
Toll Free (US & Canada): 1-800-TALK-PMI (1-800-825-5764)
Phone: 607-257-5544 Fax: 607-257-5639
Email: info@pmiapp.com www.pmiapp.com