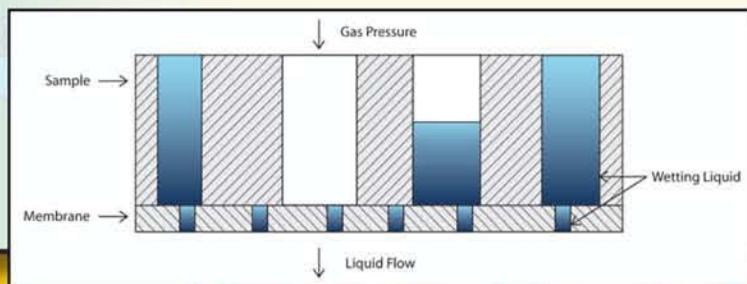


# Compression Liquid Extrusion Porosimeter

## 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.

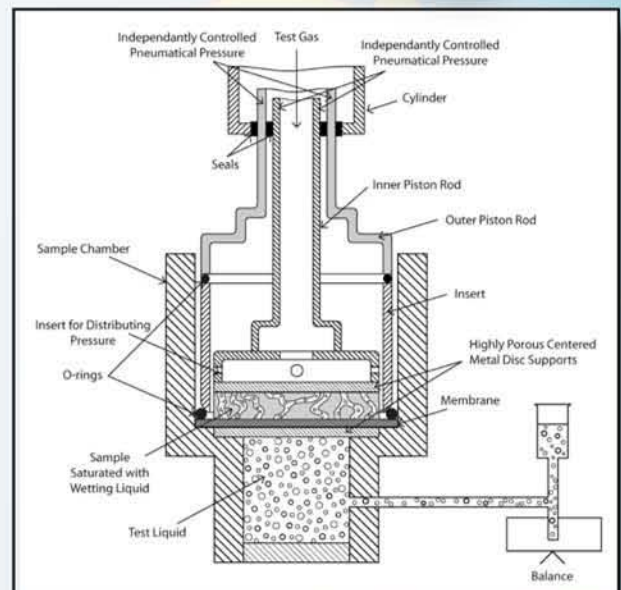


## Principle

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,  $\gamma$ , and contact angle of the liquid,  $\theta$ .

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

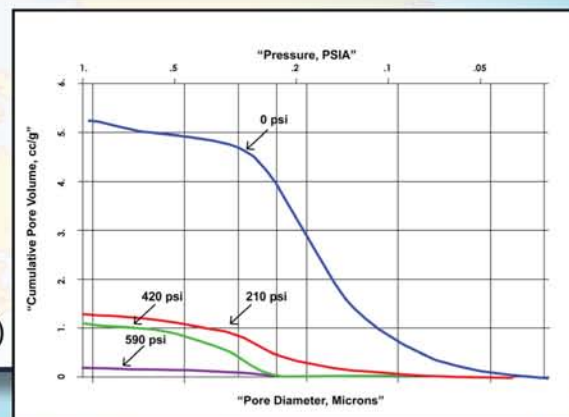
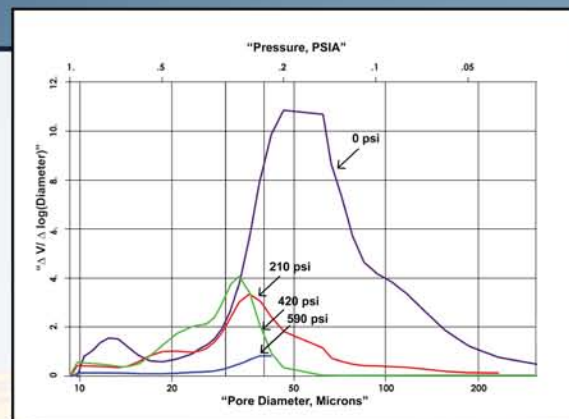
The gas pressure gives the pore diameter. The volume of displaced liquid gives the pore volume. Measurement of liquid flow rate without the membrane under the sample yields liquid permeability of the sample.





## 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  $\mu\text{m}$  - 0.05  $\mu\text{m}$

### 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 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 Liquisorb  
BET Sorptometer  
Gas Pycnometer  
Mercury Pycnometer

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