

# Cartridge Bubble Point Tester

## Description

The cartridge bubble point tester accommodates cartridges having a wide range of sizes, facilitates quick and easy loading and unloading of cartridges, performs speedy high volume testing, measures pores on all sides of the cartridge, conserves the wetting liquid by circulating from a storage tank, and ventilates the sample chamber. It has many applications through the filtration industry.

## Principle

A wetting liquid spontaneously fills the pores of a porous material. Wetting liquids is less than the surface free energy of the filtration media with air. The wetting liquid can be removed from the pores by increasing differential pressure of a nonreacting gas on the sample. The testing technique involves measurement of gas flow rates through a wet sample as a function of differential pressure. The gas pressure needed to displace a wetting liquid from the largest pore is related to the pore diameter.

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

where, p is differential inert gas pressure on the wetting liquid in the pore,  $\gamma$  is the surface tension of the wetting liquid,  $\theta$  is the contact angle of the wetting liquid with the pore surface of the filtration media, and D is pore diameter.

## Application

The measured differential pressure yields the largest through pore throat diameter. The table below shows the range of wetting liquid sample sizes.

## Pore Size Detectable

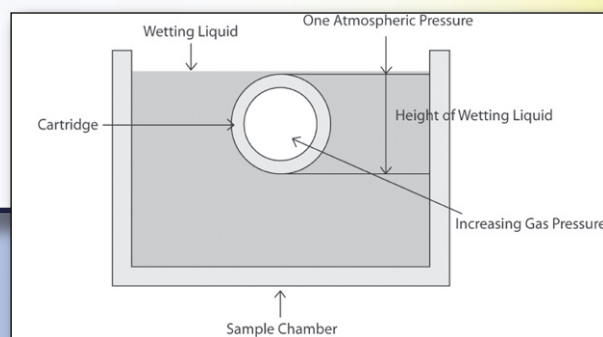
Fluid	Surface Tension, Dynes/cm	Minimum Pore Size, $\mu\text{m}$	Maximum Pore Size, $\mu\text{m}$
Water	72	1	800
Mineral Oil	34.7	0.7	700
Petroleum Distillate	30	0.6	700
Denatrued Alcohol	22.3	0.5	600
Silwick	20.1	0.4	500
Porewick	16	0.33	400
Galwick	15.9	0.3	400

Any other wetting fluid can also be used for testing.



## Unique Features

- **Accommodation of a Wide Range of Cartridge Sizes**
  - Deep sample chambers, detachable head attachments, and movable clamping heads make this an extremely versatile machine
- **Quick Loading & Unloading of Cartridge for Speedy Testing**
  - The cartridges are loaded in the sample chamber simply by using two levers. The horizontal lever is used to move the clamping head forward and backward to allow for cartridge length, and the rotating lever is used to lock the cartridge
- **High Volume Testing**
  - The machine has two sample chambers, and each is provided with a horizontal lever and a rotating lever for quick and easy loading and unloading
- **Automatic Wetting of Sample**
  - The wetting liquid is automatically added to the sample chamber by an inlet inside the chamber. Enough liquid is added to adequately cover the entire sample
- **Testing of Pores on All Sides of the Cartridge**
  - A rotating cartridge holder allows for even and equal testing on all sides of the sample. The speed at which the samples rotate can be adjusted by the user.
- **Conservation of Wetting Liquid**
  - The liquid is automatically drained from the sample chamber and pumped to a storage tank, which is then used to fill the sample chamber again
- **Ventilation of the Test Chamber**
  - A ventilation fan constantly removes vapor of the wetting liquid from the sample chamber. The vapor is disposed off in an appropriate manner, and the operator is prevented from inhaling the vapor from the wetting liquid
- **Fully Automated Operation**
  - Little user involvement is needed



## Other Products

Advanced Capillary Flow Porometer  
Average Fiber Diameter Analyzer  
Capillary Flow Porometer  
Capillary Condensation Flow Porometer  
Complete Filter Cartridge Analyzer  
Clamp-On Porometer  
Compression Porometer  
Cyclic Compression Porometer  
Envelope Surface Area Analyzer  
Filtration Media Analyzer  
High Flow Porometer  
Integrity Analyzer  
In-Plane Porometer

Multipoint Simultaneous Pore Structure Analyzer  
Microflow Porometer  
Multi-Chamber and Multi-Mode Porometer  
Nanopore Flow Porometer  
QC Porometer  
Diffusion Permeameter  
Gas Permeameter  
Gas Diffusion Analyzer  
Liquid Permeameter  
Vapor Permeameter  
Water Vapor Transmission Analyzer  
Liquid Extrusion Porosimeter  
Mercury/NonMercury Intrusion Porosimeter

Water Intrusion Porosimeter (Aquapore)  
BET Liquisorb  
BET Sorptometer  
Gas Pycnometer  
Mercury Pycnometer

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