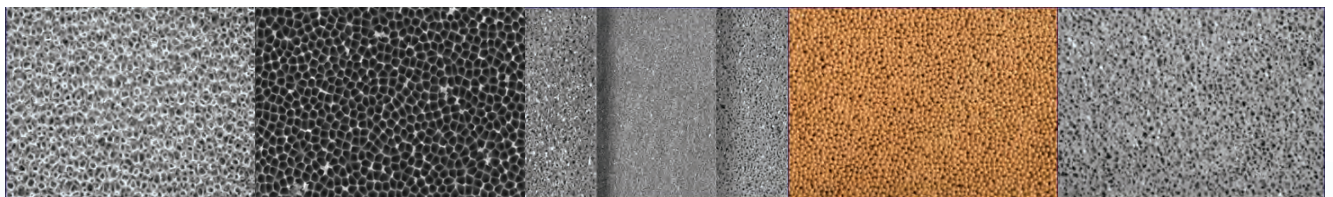




TECHPoro CAPILLARY FLOW POROMETER

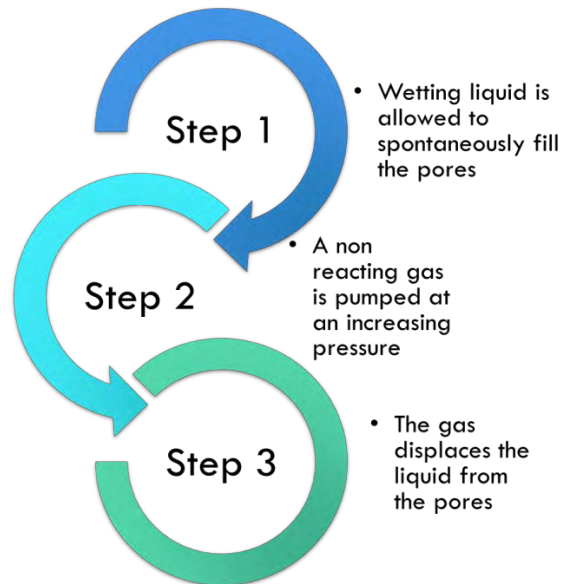


TECHPoro INTRODUCTION

Tech Inc. an expert in the field of laboratory equipment for porous materials and membranes offers the TECHPoro Capillary flow porometer series to provide accurate porosity and pore size measurement from a wide range of porous materials and media. The TECHPoro series of porometers are designed to capture the flow characteristics of multiple test fluids through the test sample to arrive at the correct pore characteristics of the sample. Each porometer is equipped with an array of flow sensing, pressure sensing and regulating devices along with easy to use sample holders. Each porometer includes specially developed software, automated data acquisition and report generation modules. Every porometer is custom built to suit the pore size range, sample shape, size and material required by the user. Tech Inc. offers the user with multivariate options of upgrades and add-on to provide the best porometer for the required application.

TECHPoro PRINCIPLE

The TECHPoro works on the principle of capillary flow porometry.



The size of displaced pores decreases from large to small with increasing pressure. The through pore distribution is obtained by measuring both the pressure and flow rate of the gas. Most constricted path of the pores are called pore throat. TECHPoro measures the diameter of the pore throat.

TECHNIQUE OF MEASUREMENT

WET CURVE

A graph of flow rate vs applied pressure is plotted when the sample is wet and hence it is called wet curve.

DRY CURVE

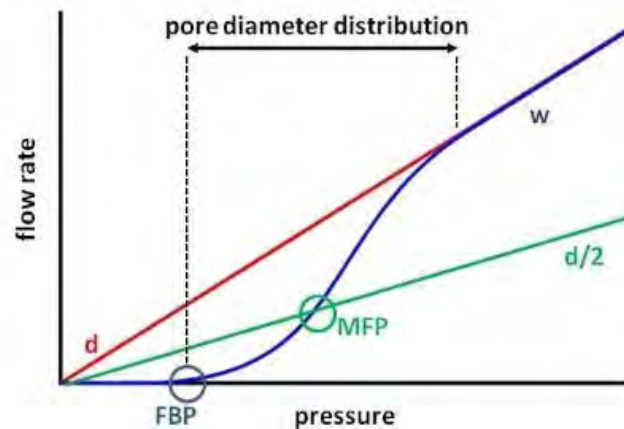
Same graph is plot when the sample is in dry state and hence it is called dry curve.

HALF DRY CURVE

The flow and pressure values are halved to obtain the half dry graph.

From the three curves the maximum, mean and minimum pore sizes are obtained.

- The point at which the gas flow is recorded refers to the first bubble point or largest pore size.
- The point at which the wet curve and half dry curve meet corresponds to the mean pore size.
- The point at which the wet and dry curve meet corresponds to the smallest pore size.



PORE CHARACTERISTICS

BUBBLE POINT

The pressure at which first continuous gas bubbles are detected is referred as bubble point

PORE SIZE

The pore size is measured using Washburn equation:

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

Where,

D : pore diameter

γ : surface tension of liquid

Θ : contact angle of liquid

p : differential gas pressure

PORE DISTRIBUTION

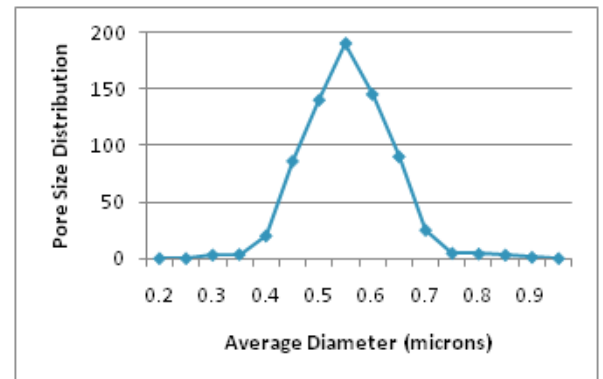
Pore distribution is calculated as follows:

$$f = \frac{d\left[\left(\frac{f_w}{f_d}\right) * 100\right]}{dD}$$

Where,

f_w : flow rate through wet sample

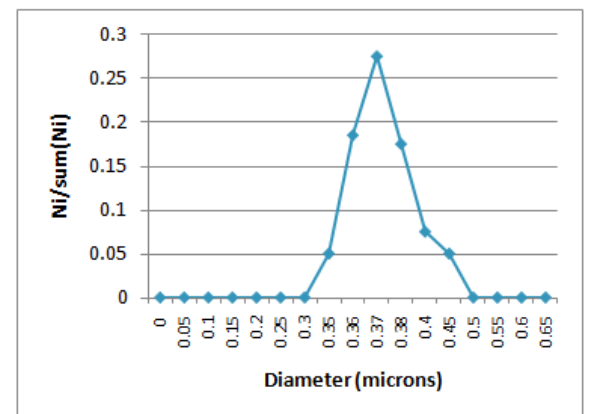
f_d : flow rate through dry sample



PORE DENSITY

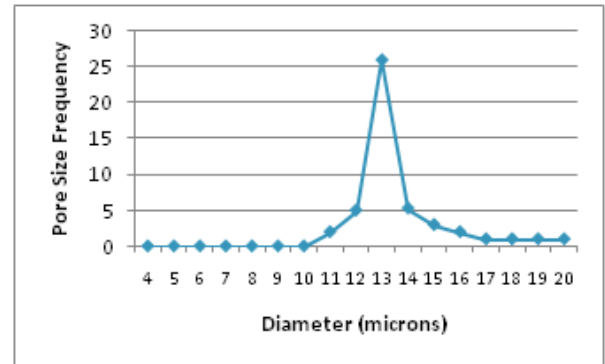
Pore Density can be expressed in terms of fractional pore number distribution, f_N

$$f_N = \frac{d\left[\left(\frac{N_i}{\sum_i N_i}\right)\right]}{dD}$$
$$= \frac{[(f_{i+1}/\sum_i f_i) \times 100 - (f_i/\sum_i f_i) \times 100]}{[-(D_{i+1} - D_i)]}$$



PORE FLOW % DISTRIBUTION

Pore Flow Distribution is the percentage flow through pores in a given size range. It is also called pore size frequency.



TECHNICAL SPECIFICATIONS

PARAMETER	TECH Poro - AL - 500	TECH Poro - LL - 1000
Standard	ASTM - F - 316 - 03	ASTM - F - 316 - 03
Measuring principle	Capillary flow porometry Air /Liquid	Capillary flow porometry Liquid/Liquid
Pore size (min)	50 KDa	5 KDa
Pore size (max)	2000 KDa	400 KDa
Pressure range	500 psi max	500 psi max
Sample size standard	6 mm on 25 mm dia	6 mm on 25 mm dia
MOC of cell	SS 316	SS 316
Pressure sensors	Provided	Provided
Pressure regulator	Provided	Provided
Flow meter	Provided	-
Weighing balance	-	Provided

Clamping arrangement	Manual - Standard Automatic (optional)	Manual - Standard Automatic (optional)
Wetting liquid	TECHflo (50 mL included)	TECHflo (50 mL included)
Software	Included (max pore size, mean pore size, pore distribution)	Included (max pore size, mean pore size, pore distribution)
System requirement (customer scope)	RAM 4 GB or higher Windows 8 or higher	RAM 4 GB or higher Windows 8 or higher

APPLICATIONS



Filtration & Separation Industry



Membrane Industry



Chemical Industry



Paper and Print Industry



Medical Industry



Bio-Medical Industry



Battery and Fuel Cell Industry



Textile Industry



Motor Industry



Ceramic Industry



Petrochemical Industry



Oil and Gas Industry

TECH INC OFFERS...

MEMBRANE CASTING EQUIPMENT

Flat Sheet Membrane Casting Machine
Flat Sheet Membrane Roll Casting Machine
Hollow Fiber Membrane Casting Machine
Large scale Hollow Fiber Membrane Casting Machine
Large scale Automatic Roll Casting of Flatsheet
Large scale Interfacial Polymerisation Coating machine

MEMBRANE DISTILLATION AND CONTACTORS

Membrane Distillation Skid
Membrane Distillation Stack

MEMBRANE TESTING EQUIPMENT

FO & RO Test Skid	Contact Angle
UF Membrane Test Skid	Membrane Strength
Lab Scale MBR	Pore size/Porosity

MEMBRANE TEST CELLS

Rectangular Cell
Circular Cell
MD Cells
FO/RO Cells

STIRRED CELLS

High Pressure Stirred Cell
Low Pressure Stirred Cell
Solvent Stirred Cell

CONTACT INFORMATION

No.32, 3rd Main Road,
Indian Bank Colony,
Ambattur, Chennai-600053

Phone : 044-65284142
Mobile: 9790857167
Fax : 044-42189346

Email: sales@membraneresearch.in
Website: www.membraneresearch.in