

AutoPore IV Mercury Porosimeter Applications

Pharmaceuticals – Porosity and surface area play major roles in the purification, processing, blending, tableting, and packaging of pharmaceutical products as well as a drug's useful shelf life, its dissolution rate, and bioavailability.

Ceramics – Pore area and porosity affect the curing and bonding of greenware and influence strength, texture, appearance, and density of finished goods.

Adsorbents – Knowledge of pore area, total pore volume, and pore size distribution is important for quality control of industrial adsorbents and in the development of separation processes. Porosity and surface area characteristics determine the selectivity of an adsorbent.

Catalyst – The active pore area and pore structure of catalysts influence production rates. Limiting the pore size allows only molecules of desired sizes to enter and exit, creating a selective catalyst that will produce primarily the desired product.

Paper – The porosity of print media coating is important in offset printing where it affects blistering, ink receptivity, and ink holdout.

Medical Implants – Controlling the porosity of artificial bone allows it to imitate real bone that the body will accept and allow growth of tissue.

Electronics – By selecting high surface area material with carefully designed pore networks, manufacturers of super-capacitors can minimize the use of costly raw materials while providing more exposed surface area for storage of charge.

AutoPore IV Advantages

- Ability to measure pore diameters from 0.003 to 360 μm
- Available with two low- and one high-pressure ports or four low- and two high-pressure ports for increased sample throughput
- Available in 33,000 psi or 60,000 psi models
- Quiet, high-pressure generating system
- Upgradeable without the need for more lab space
- Enhanced data reduction package; includes tortuosity, permeability, compressibility, pore-throat ratio, fractal dimension, Mayer-Stowe particle size, and more
- Equilibration by sample-controlled, rate of intrusion
- Operates in scanning and time- or rate-equilibrated modes
- Collects extremely high-resolution data; better than 0.1 μL for mercury intrusion and extrusion volume
- Controlled evacuation prevents powder fluidization

Aerospace – Surface area and porosity of heat shields and insulating materials affect weight and function.

Fuel Cells – Fuel cell electrodes require controlled porosity with high surface area to produce adequate power density.

Geoscience – Porosity is important in groundwater hydrology and petroleum exploration because it relates to the quantity of fluid that a structure can contain as well as how much effort will be required to extract it.

Filtration – Pore size, pore volume, pore shape, and pore tortuosity are of interest to filter manufacturers. Often, pore shape has a more direct effect upon filtration than pore size because it strongly correlates with filtration performance and fouling.

Construction Materials – Diffusion, permeability, and capillary flow play important roles in the degradation processes in concrete, cement, and other construction materials.

