

Gemini VII Applications

Gemini VII Advantages

- ✓ Low cost
- ✓ System verification tests
- ✓ Fully automatic operation
- ✓ High throughput – up to four Geminis can be operated with single computer
- ✓ Capable of measuring low surface area materials
- ✓ Keypad- or computer-operated with Windows-driven software
- ✓ Choice of analysis mode (scan or equilibrate)
- ✓ No pressure overshoot
- ✓ Common mode rejection of free-space error effects
- ✓ No thermal-diffusion errors
- ✓ Optional stainless-steel Dewars
- ✓ 21 CFR Part 11 software option
- ✓ IQ/OQ Validation service (optional)

Typical Gemini Applications

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

Ceramics – Surface area and porosity affect the curing and bonding of greenware and influence strength, texture, appearance, and density of finished goods. The surface area of glazes and glass frits affects shrinkage, crazing, and crawling.

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

Activated Carbons – Surface area and porosity must be optimized within narrow ranges to accomplish gasoline vapor recovery in automobiles, solvent recovery in painting operations, or pollution controls in wastewater management.

Carbon Black – The wear lifetimes, traction, and performance of tires are related to the surface area of carbon blacks used in their production.

Catalyst – The active surface 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.

Paints and Coatings – The surface area of a pigment or filler influences the gloss, texture, color, color saturation, brightness, solids content, and film adhesion properties. The porosity of a print media coating is important in offset printing where it affects blistering, ink receptivity, and ink holdout.

Projectile Propellant – The burn rate of propellants is a function of surface area. Too high a rate can be dangerous; too low a rate can cause malfunctions and inaccuracy.

Medical Implants – Controlling the porosity of artificial bone allows a better imitation of real bone that is more acceptable to the body for tissue growth.

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.

Cosmetics – Surface area is often used by cosmetic manufacturers as a predictor of particle size when agglomeration tendencies of the fine powders make analysis with a particle-sizing instrument difficult.

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

Fuel Cells – Fuel cell electrodes require high surface area with controlled porosity 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.

