PMI AUTOMATED
Combined Catalyst System
BET/ Porosimeter/ Helium Pycnometer
(All in one system)

AMP-2K-1-BET-201A-PYC-G100A

PMI

Porous Materials, Inc.

Not just products...solutions.

Sorptometer Principle

When clean surface is exposed to a gas, an adsorbed film forms on the surface. Adsorbed films also form on the surface of pores within a material and vapor can condense in the pores. At a constant temperature, the amount of adsorbed/condensed gas on a surface depends on the pressure of the gas. Measurement of the amount of adsorption/condensation as a function of pressure can give information on the pore structure. The PMI Sorptometers use gas adsorption/condensation to analyze pore characteristics.

Sorptometer Features

- *In situ outgassing: No need for sample transfer*
- *Automated Control*
- *Pore Structure Characteristics:*
  - *Mean Pore Size*
  - *Pore Size Distribution*
  - *Total Pore Volume*
  - *Single Point Surface Area*
  - *Multi-Point Surface Area*
  - *Adsorption & Desorption Isotherms*
- *Sample Characteristics:*
  - *Pore Size Range (5Å-1 micron)*
  - *Surface Area Range(in m²/g) >0.01*
  - *Dead-end & Through-pores*

Sorptometer Specifications

- Accuracy: At least ± 5%
- Sample Holder: Capacity More than 5ml
- Surface Area Range: 0.1 m² and higher
- Reproducibility: At least ± 5%
- Operating Temperature: 15°C - 40°C
- Regeneration System
- Heater Temperature Range: Ambient to 300°C
- Accuracy: ± 5%
- Standards: The equipment confirms to: ASTM D-3037

Sorptometer Application

PMI's BET Sorptometer has a multitude of applications in industries worldwide. Some applicable industries include Rubber, Automotive, Chemical, Ceramic, Paper, Battery Separator, Fuel Cells, Filtration, Pharmaceuticals, and Powder Metallurgy.

Porosimeter Description

The PMI Automated Mercury Intrusion Porosimeter is a versatile and accurate instrument used to determine properties such as porosity, pore size distribution, average pore size and total pore volume of samples. With unlimited user-defined data-points, automated data collection and reduction, and the least mercury exposure of any porosimeter on the market, PMI's is a versatile and accurate instrument used to date is safe, reliable, and precise.

Porosimeter Principle

The PMI Automated Mercury Intrusion Porosimeter is a versatile and accurate instrument used to determine pore volume. The Automated Mercury Intrusion Porosimeter fills the penetrometer and sample chamber with mercury under high pressure and takes a volume reading. Gradually, increasing amounts of pressure are applied on the nonwetting liquid. For each incremental increase in pressure, the change in intrusion volume is equal to the volume of the pores whose diameters fall within an interval that corresponds to the particular pressure interval. Generates intrusion as well as extrusion curves. The PMI Porosimeter consists of a low pressure section, a high pressure section, and penetrometers connected to the sample chambers. The low pressure section includes the mercury reservoir and the mercury trap, and can be opened to the atmosphere or evacuated. The high pressure section includes a pressure generator that uses isopropyl alcohol as the hydraulic uid to pressurize mercury. The sample is placed inside a stainless steel cell that has a hole on one of its sides for evacuation and entry of mercury into the cell. The cell is closed with a lid and placed in the sample chamber. Intrusion volume of mercury is measured by noting changes in mercury level in the penetrometer with a magnetic sensor. Exposure to mercury is negligible due to the unique design of the instrument. The unique design also permits use of nonmercury nonwetting liquids for intrusion. Another instrument design uses water as the nonwetting liquid and uses absolutely no mercury. The instrument is known as the Aquapore.

Porosimeter Application

Used in various industries ranging from automotive and pharmaceutical to paper, the Mercury Intrusion Porosimeter can test samples such as brake pads, catalytic converter materials, coated papers, civil or concrete field and powder precursors.

Porosimeter Features

- Windows-based software handles all control, measurement, data collection, and report generation; manual control also possible
- Unlimited user-defined data points based on pressure, volume, or a combination
- Displays both intrusion and extrusion curve
- Real-time graphical test display shows testing status and results throughout operation
- Minimal maintenance required
- Automatic mercury refill and clean up
- Pressure generator features continuous and stepwise scanning

Porosimeter Specifications

- Pore Size Range: 0.01-400 microns or wider
- Pressure increment mode: Step and continuous
- Sample Chamber Sizes:
  o   Sample Chamber 1: 1" diameter & 1" Tall sample chambers tested up to 2,000PSI
- Accuracy: ±1% of full scale or better of intrusion volume, ±0.1mm_ resolution
- Pressure Range: Vacuum to 2,000 psi
- Pressure Transducer Range: 0 - 2,000 psi
- Pressure Transducer Accuracy: ±0.15%
- Transducer Hysteresis: ±0.10%
- Resolution: 1 in 2,000
- Power Requirements: 220 VAC, 50/60 Hz (Others available)

Pycnometer Principle

PMI's Automated Gas/Helium Pycnometer is used to determine the true volume and true density of powders and bulk solids using high-precision volume measurements and density calculations. The true volume of a solid is calculated from the measured drop in pressure when a known amount of gas is allowed to expand into a chamber containing the sample. Thus, the true volume obtained by pycnometry includes any pore volume accessible to the gas. Helium is the preferred gas, because it exhibits ideal gas behavior. The Gas/Helium PMI pycnometer measures the true volume and density of solid powders such as calcinated petroleum coke.

Pycnometer Features

- Conforms to EN 15150 Standards
- Automated Control
- Non-destructive measurement
- Stainless steel embodiment
- Fully automated and simple to use
- Highly reproducible & accurate results
- Low required pressures; works with compressed air
- No need for liquid nitrogen
- Mercury-free, non-toxic wetting liquids reduces disposal related costs
- Compatible PC & software to be supplied along with the machine
- Samples are conditioned to remove any trapped air and contaminants
- Option to purge by a suitable method
- Pore Structure Characteristics:
  - Mean Pore Size
  - Pore Size Distribution
  - Total Pore Volume
  - Single Point Surface Area
  - Multi-Point Surface Area
  - Adsorption & Desorption Isotherms

Pycnometer Application

Gas/Helium pycnometery measures the true volume and density of samples like coal, char and ash particles, etc.

Pycnometer Specifications

- Sample size: 100 cc standard, other sample size are available

- Pressure: 15 psi

- Accuracy: at least 0.1 %

- Resolution: 1 in 60,000

- Repeatability : up to 0.1 %

- Power Requirements: 220 VAC, 50-60 Hz

Sales & Service

Our sales team is dedicated to helping our customers find which machine is right for their situation. We also offer custom machines for customers with unique needs. To find out what we can do for you, contact us. We are committed to customer support including specific service products, short response times & customer specific solutions. To quickly & flexibly meet our customer's requirement, we oller a comprehensive range of services.

Customize your machine today!