ACCUPYC

THE FASTEST, EASIEST, MOST ACCURATE MEASUREMENT OF TRUE DENSITY

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ACCUPYC
GAS PYCNOMETER FOR TRUE DENSITY OF SOLIDS

The AccuPyc gas pycnometer from Micromeritics is trusted around the world to provide the most reliable measurements of true density. More labs choose an AccuPyc than any other commercial gas pycnometer. The AccuPyc delivers the highest available accuracy and repeatability in a system that is fast and easy for any operator to use.

GAS DISPLACEMENT PYCNOMETRY

Gas pycnometry is used to determine the true — or skeletal — density of solid materials and slurries. A sample is placed in a chamber of known volume, which is sealed and pressurized. The gas fills the empty spaces within and between the sample particles. The sample chamber is then expanded to an adjoining reference chamber of known volume. The change in pressure is used to calculate the volume of the sample. True density is calculated from the sample mass and the volume it occupies. This method is useful for determining the true density of materials, even those with small pores and irregular shapes.

DEFINING DENSITY

The AccuPyc provides an accurate determination of the True (Absolute) Density by gas pycnometry. This is important for porous and particulate materials because it excludes empty spaces associated with pores and interparticle voids. For materials with closed pores, those pores are included in the volume measurement and the density reported is a Skeletal (Apparent) Density.

The GeoPyc is a helpful complement to the AccuPyc as it directly measures the: Bulk Density, the Envelope Density including pores, and the T.A.P. density incorporating consolidation stresses. Bulk and envelope density measurements from the GeoPyc can be used with true density from the AccuPyc to report pore volume and porosity.

RELEVANT APPLICATIONS

BATTERY MATERIALS

The density of battery cathode and anode materials is directly related to their porosity, which affects the amount of energy that can be stored per unit volume. Density is also an effective indicator of the purity and composition of the electrode materials, which is crucial for increasing battery capacity.

PHARMACEUTICALS

Monitor and control composition of API's and excipients by measurement of product density. Differences in polymorphic, hydrated, and amorphous forms of products, as well as purity, can be detected through density measurements.

METAL POWDERS

Track the purity of raw materials through density measurement. Detect the presence of occluded porosity developed during sintering processes that impact final product strength.

COATINGS

Determine total solids content of liquid coatings to predict coverage. Monitor density of dry pigments and powder coatings to verify composition. Detect density differences in cast films that indicate changes in crystallinity and mechanical performance.

MINING

Determine total pore volume and porosity of core samples to quantify total storage capacity. Quickly assess the composition of the solids used in drilling fluids.

CATALYSTS

Determine correct composition of catalyst supports and finished products including crystallinity, porosity, and formulation.

POLYMERS AND COMPOSITES

Determine the ratio of open and closed cell foams, which impacts heat transfer, gas transport, sound damping, mechanical energy dissipation, and buoyancy. Differentiate relative amounts of crystalline and amorphous phases of thermoplastic polymers. Design and produce composite materials with precise control of fiber loading, void content, mixing uniformity, and fiber impregnation.

ACCUPYC
FEATURES

LEARN MORE →

Hinged Self-Aligning Lid
provides frustration-free operation and ensures repeatable chamber volume.

Intuitive Breeze Interface
makes it easy to measure samples and review results with or without a PC.

AccuTemp Temperature Control
drives density repeatability by controlling temperature to ± 0.025°C from 4°C to 60°C*.

MIC Net
empowers your lab to operate as one by synchronizing results and methods across AccuPyc instruments. Laboratory network connection provides simple data retrieval and LIMS integration.

Convenient USB
access for data transfer or peripheral device integration. Even more ports at the back of the instrument.

On-Board Reference Material Storage
keeps what you need, where you need it.

* ATC models 4°C to 60°C, TS models 20°C fixed

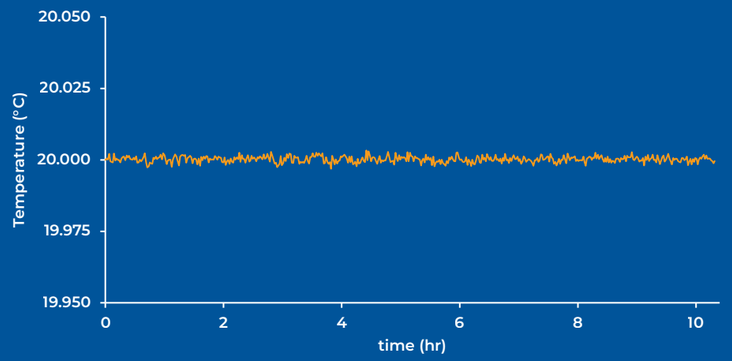
ACCUPYC
ADVANCED GAS PYCNOMETER

NOT JUST FAST, THE **FASTEST**

A more stable system that equilibrates faster and exchanges gas more efficiently leads to shorter run times. Complete measurements in **20% to 30% less time** than any other pycnometer.

GET THE SAME RESULTS ANYTIME, ANY PLACE WITH ACCUTEMP

Every AccuPyc includes AccuTemp that guarantees temperature stability to ±0.025 °C or better. The most stable temperature ensures the most repeatable, reliable density measurement every time.



UNPARALLELED MEASUREMENT GAS FLEXIBILITY

Measure solid density with nitrogen, air, argon, and more with **no additional steps, calibrations, or compromise**. Advanced technology proven in Micromeritics' industry-leading gas adsorption instruments enables you to switch gases and save helium when testing non-microporous and non-adsorbing materials.

NOT JUST EASY, THE **EASIEST**

A hinged, self-aligning lid* makes operation easy and error-free for every user.
Swing. Turn. Done.
Combined with an intuitive control and display, the AccuPyc is the easiest instrument you will ever add to your lab.

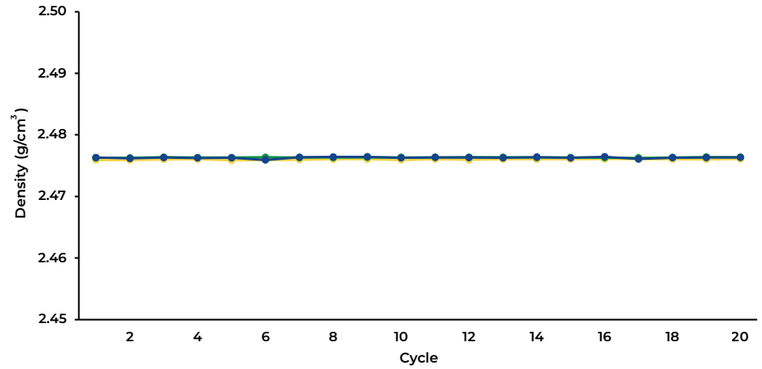
* Patent Pending

POWDERSAFE IS WORRY-FREE

PowderSafe mode keeps your sample and instrument safe when testing light, fluffy powders. Pressurizing the reference chamber before the sample chamber eliminates the potential for elutriation when measuring fine powders. Select it in your stored method and never worry again.

NOT JUST ACCURATE, THE **MOST** ACCURATE

Every element of the AccuPyc design enhances accuracy and reduces variability: the most stable temperature control, cutting-edge gas modeling, the most repeatable lid closure, and more. Superior measurements for accurate results you can trust.



Four repeat analyses of glass microspheres illustrate exceptional measurement precision and repeatability.

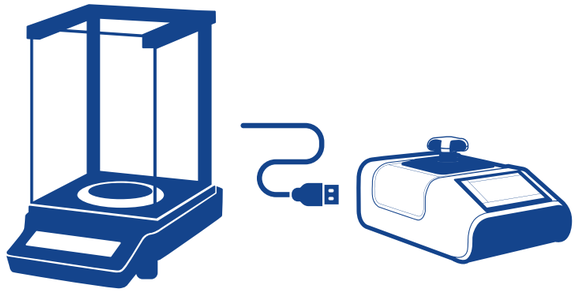
THE WIDEST RANGE OF MEASUREMENT TEMPERATURES

Precision control from **4°C to 60°C** empowers you to measure density at conditions that match your process. AccuTemp is a quiet, air-cooled thermoelectric temperature control system.

SEAMLESS DEVICE CONNECTIVITY

Simplify your workflow and avoid transcription errors when you connect your lab balance directly to the AccuPyc using a USB connection. Sample mass is transmitted directly, removing a manual step and a potential for user-error.

The AccuPyc can also integrate with other lab input devices like a keyboard or barcode reader to streamline user interaction.



ULTIMATE VOLUME FLEXIBILITY

SCARCE SAMPLES

Low measuring volume to conserve valuable resources.

HETEROGENEOUS MATERIALS OR LARGE PIECES

High volume to ensure a representative measurement.

The AccuPyc supports a wide range of measurement volume — without sacrificing accuracy or adding complexity — with simple volume insert kits.

MEASURE RIGHT, WITHOUT QUESTIONS

Different materials call for different operating conditions — whether testing light powders, granules, foams, or slurries. Define the conditions that are right for your process and store those conditions in the **Method Library**. Recall the next time you need it, so you always measure the same way — the right way.

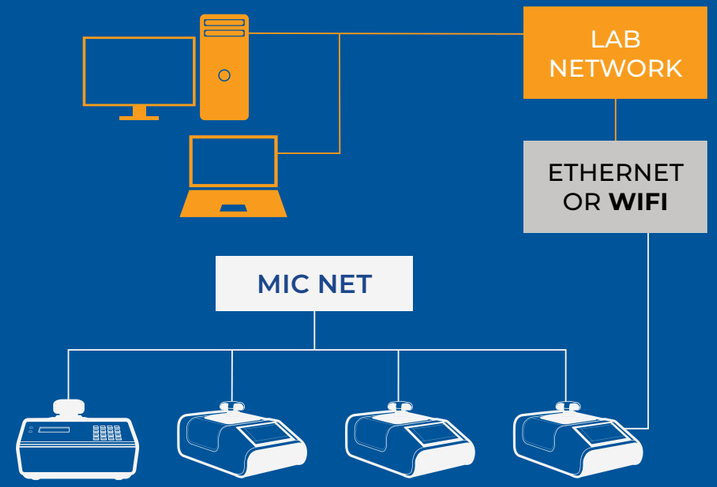
RUN, REVIEW, REPORT – AT YOUR FINGERTIPS

The intuitive **Breeze** touch interface gives you everything you need at your fingertips. Perform a measurement, review past results, send a report to print or to LIMS with the touch of a finger. Save space in your lab by eliminating a PC from the bench.

Prefer to work from a PC nearby or in your office? You can do that too! Execute measurements, view status of multiple instruments, or review results...anywhere.

ACT AS ONE WITH MIC NET

Never hunt for a past result or worry that your method settings are out of date. MIC Net is an instrument-to-instrument network that shares and stores results and methods across devices, including forward compatibility with the AccuPyc that is in your lab today.



FOAMPYC

The FoamPyc methods follow ASTM and ISO methodologies to determine open and closed cell content, compressibility and cell fracture with chemically and mechanically formed cellular polymers such as PVC, polystyrene and polyurethane.

SELECTED INTERNATIONAL TEST STANDARDS

ASTM B923	Metal Powders	**ASTM D6226**	Foam
ASTM C110	Cement	**ASTM D6761**	Catalysts
ASTM C604	Refractory Materials	**ASTM D70**	Asphalt
ASTM C799	Nuclear Materials	**ASTM D8171**	Fibers
ASTM D2638	Carbon	**DIN 66137**	Pycnometry
ASTM D2856	Foam	**ISO 12154**	Pycnometry
ASTM D4892	Petroleum	**ISO 18753**	Ceramics
ASTM D5550	Soil	**ISO 4590**	Foam
ASTM D5965	Coatings	**ISO 8130**	Coatings
ASTM D6093	Coatings	**USP <699>**	Pharmaceuticals

SPECIFICATIONS CAPABILITIES

Cell Volume

Nominal	**10 cm^3**	**100cm^3**
Available Inserts	0.1 cm^3, 1cm^3, 3.5cm^3	10cm^3, 35cm^3

Specifications

Temperature	**TS:** 20 °C ± 0.025 °C **ATC:** 4 °C to 60 °C ± 0.025 °C
Volume Accuracy	0.02%
Volume Repeatability	0.01%
W x D	26.5 cm x 43.0 cm

Volume Accuracy and Repeatability specifications based on operation from 10°C to 60°C

Features

Hinged Self-Aligning Lid
PowderSafe Mode
MIC NET data and method synchronization
Managed Method Library
WiFi Connectivity and 3 USB ports
USB Balance Integration
Vacuum and Pulse Sample Preparation
FoamPyc Methods
NIST-Traceable Volume Reference

SERVICE SUPPORT

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Customer service is at the heart of what we do with over 10,000 installations during the past 60 years.

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- Maximized uptime
- Reduced cost of ownership
- Well-trained users
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Micromeritics offers a full range of instrument installation, preventive maintenance and repair services to support instruments through their full life cycle. On-site and factory services are provided through our global network of factory trained and certified service engineers.

APPLICATION SUPPORT

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Micromeritics' team provides industry-leading, high-quality application support and training to assist scientists, engineers, and analysts in the field of material characterization. Our application support team is composed of scientists and engineers to help users obtain the highest quality data and information about their material from Micromeritics Instruments. The Micromeritics team is dedicated to helping users successfully use their Micromeritics Instruments for the life of their instrument.

- Expert, lifetime, applications support for Micromeritics customers.
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- Applications specific, hands-on training available in Micromeritics USA, Germany, Korea, and China facilities
- Collaborations with industrial and academic partners to continually improve the quality of measurements and interpretation of material characterization data

WORLDWIDE PRESENCE

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MORE than 12,000 Micromeritics systems are used every day in the labs of the most innovative companies and the most prestigious government and academic institutions.

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