



About Malvern Panalytical

Malvern Panalytical provides market-leading, material characterization technologies for the world's most innovative companies, academic institutions, and government laboratories to optimize and accelerate the development of advanced materials.

We support our customers through their biggest challenges by uncovering critical insights in material properties. From developing lifesaving vaccines and next-generation therapeutics to advancing clean energy solutions and sustainable industrial processes, we give scientists the confidence to make important decisions that shape the world we live in.

We wake up every day to delight our customers and help them solve the problems that matter. Through innovation, high-quality solutions and workflows, and excellence in customer satisfaction, we help reduce lead times, increase repeatability, and deliver data that is actionable and easily understood.

Our vision is to continue to be a trusted and recognized leader for quality and insights in material characterization, helping our customers navigate complex scientific topics with accuracy and ease.

We win customers with performance and keep them with service and insights. We are the 'Best together.' Our people are experts in their fields, delivering value and innovation for each other and for our customers. With diversity in experience and customer-centric thinking, we are the best choice for researchers and scientists seeking competitive advantage in the market.

We have a high-performance culture - empowering teams, quick decision-making and serving customers more effectively - grounded in agility, clarity and transparency, with speed and focus critical to our success, all shaped by our values: Own it. Aim High. Be True.

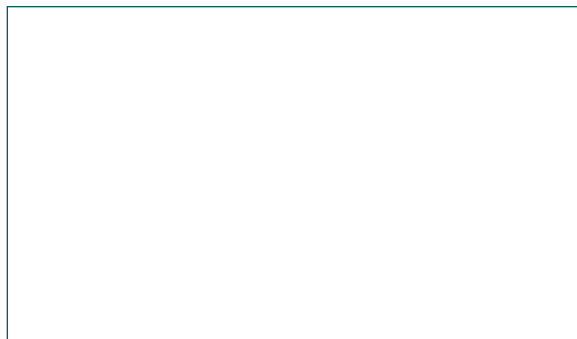
We are committed to helping to solve our customers' greatest challenges to make the world cleaner, healthier and more productive for the future.

Service & Support

Malvern Panalytical provides the global training, service and support you need to continuously drive your analytical processes at the highest level. We help you increase the return on your investment, and ensure that as your analytical requirements grow, we're there to support you.

Our worldwide team of specialists adds value to your business processes by ensuring applications expertise, rapid response, and maximum instrument uptime.

- Proactive local and remote support
- Full and flexible range of service agreements
- Compliance and validation support
- Onsite or classroom-based training courses
- e-Learning training courses and web seminars
- Digital services, including MyStore and My Customer Support Portal
- Sample analysis, method development, and applications consultancy



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**Malvern
Panalytical**

AccuPyc

**Fastest, easiest, most accurate measurement
of true density**



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.

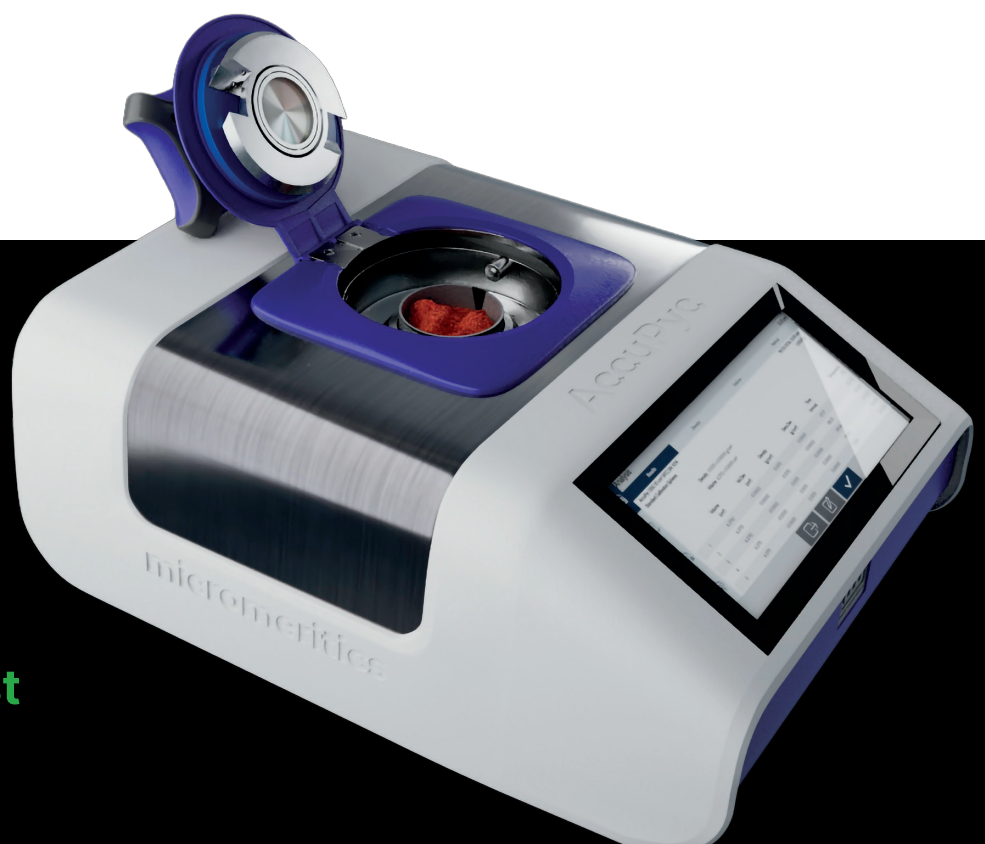
The sample chamber is then expanded to an adjoining reference chamber of known volume. The change in pressure is used to calculate the volume of the sample. True density is calculated from the sample mass and the volume it occupies. This method is useful for determining the true density of materials, 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 total porosity and pore volume.

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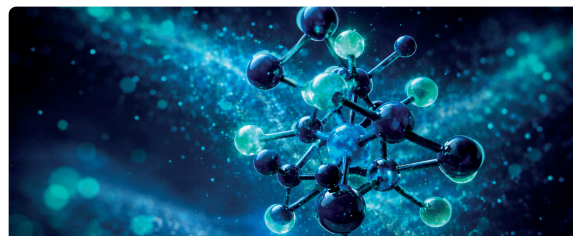


Applications



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.



Catalysts

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



Metal Powders

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



Pharmaceuticals

Monitor and control composition of API's and excipients by measuring product density. Density measurements can detect differences in polymorphic, hydrated, amorphous forms, and product purity.



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.



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



Polymers and Composites

Measure open and closed cell content in foams to assess thermal, acoustic, transport, and mechanical properties. Differentiate polymer phases and optimize fiber loading, void content, and material uniformity.

Rapid analysis meets unrivaled precision

Unlocking precise and repeatable density measurement methods on AccuPyc

- 1 Hinged Self-Aligning Lid / provides frustration-free operation and ensures repeatable chamber volume.
- 2 Intuitive Breeze Interface / makes it easy to measure samples and review results with or without a PC.
- 3 Convenient USB / access for data transfer or peripheral device integration. Even more ports at the back of the instrument.
- 4 AccuTemp Temperature Control / drives density repeatability by controlling temperature to $\pm 0.025^{\circ}\text{C}$ from 4°C to 60°C^* .
- 5 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.
- 6 On-Board Reference Material Storage / keeps what you need, where you need it.





SELECTED INTERNATIONAL TEST STANDARDS

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

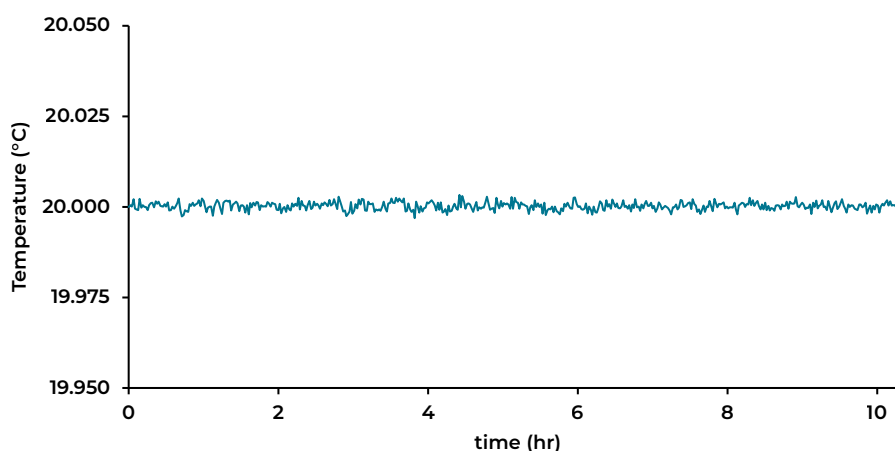
Advanced gas pycnometer

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 Technology



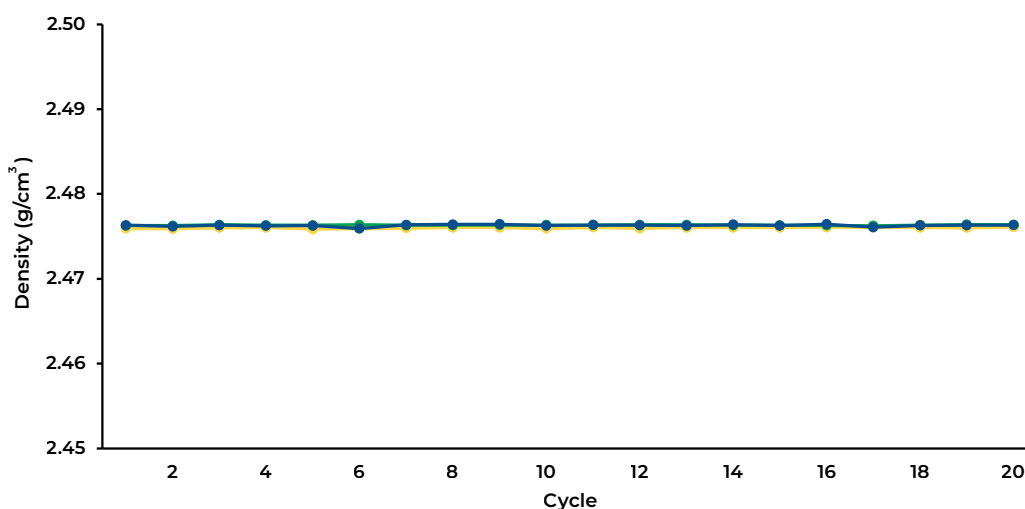


PowerSafe is worry-free

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 measurements temperatures

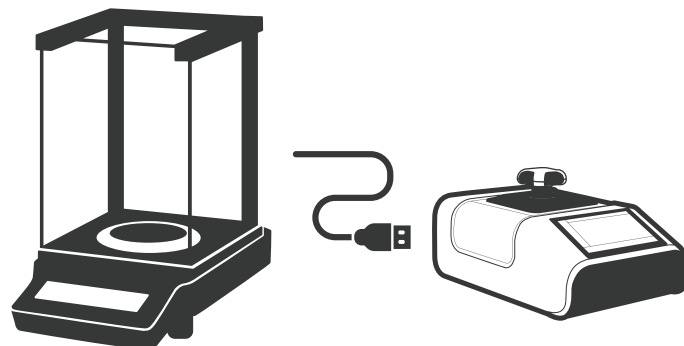
Precision control from 4 °C to 60 °C empowers you to measure density at conditions that match your process. AccuTemp is a quiet, air-cooled thermo-electric temperature control system



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.

Specifications

Cell Volume		
Nominal	10 cm ³	100 cm ³
Available Inserts	0.1 cm ³ , 1cm ³ , 3.5cm 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

