Anton Paar

Ultrapyc Series

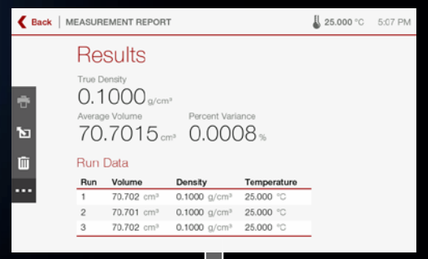
True density analyzers for solid materials

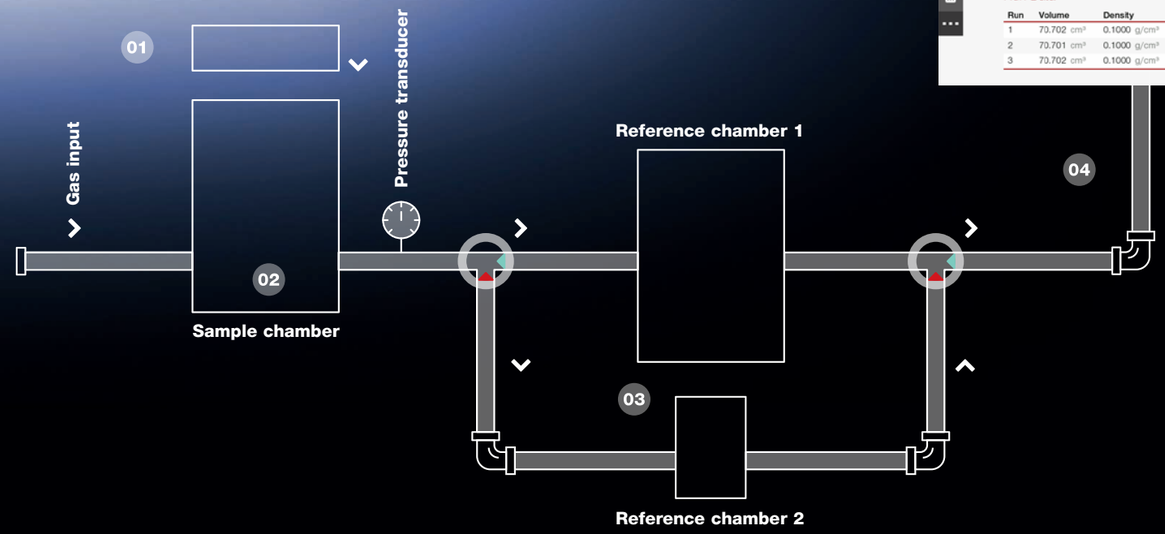
Ultrapyc series
Ultra-simple
Ultra-precise

We understand that you handle many measurement technologies, sample types, and responsibilities during your laboratory workday. Instruments that have complicated analysis routines and clutter valuable workspace are not welcome.

The Ultrapyc series of gas pycnometers is the solution for you. We have combined decades of knowledge in producing fast, accurate, and reliable solid density measurement with groundbreaking innovations and a state-of-the-art graphical user interface to create the most user-friendly gas pycnometer on the market today.

Whether you analyze cements, pharmaceuticals, catalysts, ceramics, fine powders, polymers, or foams – solid density measurement has never been more simple or more precise.





01
Sample is loaded into a chamber of known volume using the TruLock lid.

02
The system is then pressurized to a specified value with the analysis gas.

03
When stable, a valve opens to allow the gas to expand into another chamber whose volume is also known.

04
From the resulting pressure drop the volume, and therefore true density, of the sample is calculated.

The features that make Ultrapyc ultra-simple and ultra-precise

TruPyc technology provides unmatched accuracy across the widest range of sample amounts

Matching the free space in the sample chamber to the volume of the reference chamber is the key to accurate gas pycnometry results. As compared to gas pycnometers which use a single reference chamber the Ultrapyc series features multiple built-in reference chambers. Select your sample cell size and Ultrapyc automatically uses the most appropriate chamber.

TruLock lid for absolute repeatability

The innovative TruLock system is an ergonomic, self-aligning closing mechanism that results in extremely consistent sample chamber volumes with two simple turns.

Intuitive user interface for fast instrument handling

Ultrapyc instruments feature a user interface similar to a smartphone on their 7-inch touchscreen. The graphical overview of the measurement process keeps you informed of temperature, pressure, valve status, and preliminary results at all times. It makes the use of an extra computer unneccessary, saving precious lab bench space.

PowderProtect mode for safely measuring fine powders*

If you deal with fine powders you no longer need to worry about contaminating the instrument. The Ultrapyc 5000 models are the only instruments on the market that feature user-selectable bi-directional gas expansion control. By pressurizing the reference chamber first, PowderProtect mode eliminates the risk of instrument contamination.

Precise, fast, and hassle-free temperature control*

External water baths for temperature control are a thing of the past! Cut the clutter with the state-of-the-art Peltier temperature control offering temperature stability better than ±0.05 °C on Ultrapyc 5000 pycnometers. You are assured quick temperature stabilization and can rely on your samples always being measured at precisely the right temperature irrespective of your environmental conditions.

Direct connection to weighing balances

You can eliminate the risk of transcription errors while manually entering data from an external balance by connecting your Ultrapyc directly to any balance with an RS232 interface for direct data transfer.

* only available on Ultrapyc 5000 models

Industry solutions

Gas pycnometry is used extensively for determining the true density of porous solids. The Ultrapyc series complies with many ASTM, ISO, MIPF, and JIS standard test methods used across a wide variety of industries.

Powder coatings and dried film coatings The crystallinity of plastics and the true density of dry pigments are monitored by gas pycnometry to better understand the mechanical behavior of these materials. In addition, gas pycnometry can help determine the volatile organic content within dried films in order to assess the level of curing.

Cements The true density of cement is used for the accurate calculation of powder characteristics. Measured after setup time, the insights gained are important for formation and stability determination.

Ceramics and catalysts Density values are used in the development, manufacturing, and troubleshooting of refractory materials to confirm that the desired crystal phase is present and closed porosity is absent.

Polymers and foams Gas pycnometry is widely used to characterize the relative amounts of crystalline and amorphous phases within polymer materials. This technique is also used to assess the open cell content of foam materials to predict their performance as insulators or as sound- or collision dampening materials.

Mining and oil exploration Gas pycnometry is the primary technique used to quickly assess the composition of the solids used in drilling fluids.

Pharmaceuticals The true density of active and excipient materials is used to determine the composition for both development and process control purposes.

Metallurgy The true density of complex metal shapes formed by powder metallurgy is used to track the purity of raw materials or the presence of open or closed pores throughout processing.

Specifications

	Ultrapyc 3000	Ultrapyc 5000	Ultrapyc 5000 Foam	Ultrapyc 5000 Micro
	The base model	**Includes built-in temperature control and PowderProtect mode**	**Includes built-in temperature control, PowderProtect mode, and foam mode**	**Includes built-in temperature control and PowderProtect mode**
Large cell: 135 cm^3	Accuracy: 0.02 % Repeatability: 0.01 %			
Medium cell: 50 cm^3	Accuracy: 0.02 % Repeatability: 0.01 %			
Small cell: 10 cm^3	Accuracy: 0.03 % Repeatability: 0.015 %			
Micro cell: 4.5 cm^3				Accuracy: 0.10 % Repeatability: 0.05 %
Meso cell: 1.8 cm^3				Accuracy: 0.30 % Repeatability: 0.15 %
Nano cell: 0.25 cm^3				Accuracy: 1.00 % Repeatability: 0.50 %
Preparation modes	Flow, pulse	Flow, pulse, vacuum		
Transducer accuracy	Better than 0.1 %			
Pressure reading resolution	Digital pressure display resolution of 0.0001 psi			
Connections	4 USB ports			
Instrument dimensions				
Weight	10 kg			
W x D x H	27 cm x 48 cm x 25 cm			
Built-in temperature range		15 °C to 50 °C with stability better than ±0.05 °C		

Available connectivity to any balance using RS232 communication | Results available on screen, via a printer, or electronically in text and pdf formats | All units calibrated at the factory using NIST-traceable spheres | A pressurized gas source up to 20 psi and a standard power outlet are required for operation.

Accessories

Micro cell option

Non-elutriating cells

Selected international standards	ASTM B923-10	Metal Powders	ASTM D5550-14	Soils
	ASTM C110-15	Cements	ASTM D5965-02 (2013)	Coatings
	ASTM C2604-02 (2012)	Refractories	ASTM D6093-97 (2011)	Pigments
	ASTM D2638-10	Carbon	ASTM D6226-15	Rigid Foams
	ASTM D4892-14	Carbon	USP 699	Pharmaceuticals

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