Anton Paar

Semi-Solid and Solid Density Analyzers

Ultrapyc Series

Superior Density Measurements

Achieve accurate and repeatable results – no matter the sample.

Find out more

Accommodates samples from less than 0.1 cm^3 up to 135 cm^3

Results in less than a minute

Accurate densities to within 0.015 %

Built-in and customizable methods

Peltier temperature control (3 °C to 60 °C)

Bi-directional gas flow

Gas pycnometry offers unmatched precision and repeatability for determining true and skeletal density – outperforming traditional techniques like liquid displacement or geometric methods. By using an inert gas to penetrate fine pores and irregular surfaces, gas pycnometers deliver highly reliable results, even in porous, irregular, or delicate solids.

From powders to slurries, this non-destructive method delivers consistent results across industries including pharmaceuticals, ceramics, polymers, and energy materials.

Taking density measurements to the next level
With superior features such as TruPyc dual reference chambers, the TruLock lid with repeatable closure, and an intuitive touchscreen interface, the Ultrapyc series makes density determination fast, accurate, and easy – bringing confidence to every measurement.

Pellets and monoliths
Reliably analyze a wide range of solid samples, from less than 0.1 cm^3 to 135 cm^3, to assess their internal porosity and structural integrity for quality assurance.

Powders
PowderProtect mode offers bi-directional gas expansion that eliminates the possibility of contaminating your instrument with fine powders.

Pastes and slurries
Peltier temperature control and disposable cups provide the flexibility to measure complex and hard-to-clean semi-solid samples with no mess.

Foams
Built-in methods compliant with ASTM D6226 determine a foam's open-cell content so you can predict and optimize their performance.

Four Solutions Tailored to Your Measurement Needs

	Ultrapyc 3000	Ultrapyc 5000	Ultrapyc 7000	Ultrapyc 7000 Micro
TruPyc volume parity	✓	✓	✓	✓
TruLock repeatable sample chamber volume	✓	✓	✓	✓
PowderProtect bi-directional flow		✓	✓	✓
Peltier temperature control		✓	✓	✓
Method library			✓	✓
Foam mode			✓	
Small volume				✓

Ultrapyc 3000

Optimized volumes for accurate results
The Ultrapyc 3000 features TruPyc volume parity – two built-in reference chambers that automatically match your sample size for optimal accuracy. Its TruLock lid ensures repeatable chamber volume and best-in-class reproducibility across a wide range of sample volumes, from 0.1 cm^3 to 135 cm^3.

Ultrapyc 5000

Flexible control for complex samples
In addition to all Ultrapyc 3000 features, the Ultrapyc 5000 offers patented bi-directional control – choose reference-first (PowderProtect) or sample-first expansion to suit your material. With Peltier temperature control from 3 °C to 50 °C, the Ultrapyc 5000 ensures high-accuracy results even for volatile or temperature-sensitive samples.

Ultrapyc 7000

High throughput with advanced automation
The Ultrapyc 7000 builds on the Ultrapyc 5000 with an expanded temperature range up to 60 °C and a built-in method library for fast parameter switching – ideal for labs analyzing a variety of samples. It also includes dedicated foam methods (e.g., ASTM D6226) for streamlined testing of cellular materials.

Ultrapyc 7000 Micro

Precision for small samples
Designed for high-value or limited-quantity materials, the Ultrapyc 7000 Micro delivers all the benefits of the Ultrapyc 7000 while supporting ultra-small sample volumes – from less than 0.1 cm^3, up to to 10 cm^3 – without compromising accuracy or repeatability.

Streamline Your Experience

Seamless data flow with AP Connect
Transfer your measurement data directly to Anton Paar's AP Connect lab execution system — no USBs, no paperwork, no delays. Results are securely stored, organized, and instantly available across your lab network, helping you streamline documentation, support compliance, and accelerate decision-making.

Optimize your workflow, eliminate errors
Connect your Ultrapyc to a balance and barcode reader for seamless data integration. Sample weights are transferred directly from the balance, while barcode scanning ensures fast, error-free sample identification. No manual entry means no transcription mistakes – just faster setup, cleaner records, and smoother lab operations.

Touchscreen simplicity, built-in intelligence
The Ultrapyc's 7-inch touchscreen and intuitive onboard software make operation effortless – from setting up methods to viewing results in real time. With guided workflows and multi-language support, users of all experience levels can run accurate measurements with confidence.

Find out more

Versatility Across Industries

The Ultrapyc series complies with many ASTM, ISO, and USP standard test methods used for determining the density of solids and semi-solids across a wide variety of industries.

Technical ceramics and refractories
Skeletal density reveals closed porosity and sintering efficiency, making it vital for structural ceramics and high-performance refractories. The Ultrapyc ensures reliable results for rigid and porous samples, helping you validate performance specifications and reduce material variability.

Food science and nutraceuticals
Understanding true density helps optimize texture, stability, and shelf life in powders, granulates, and compressed products. The Ultrapyc enables fast, non-destructive testing of moisture-sensitive or porous food materials, supporting product consistency and formulation improvements in R&D and QA settings.

Asphalt, bitumen, and road materials
Accurate skeletal density is essential for assessing compaction, void content, and durability in asphalt mixtures and fillers. The Ultrapyc delivers precise measurements even for viscous or semi-solid samples, while PowderProtect mode and Peltier temperature control ensure stability during testing.

Additive manufacturing and powder metallurgy
In additive manufacturing and powder metallurgy, knowing the true density of your powders ensures proper compaction, sintering behavior, and final part integrity. With Ultrapyc's PowderProtect mode and TruPyc volume parity, even fine, reactive powders are handled safely and accurately, without compromising data quality.

Pharmaceuticals
From active ingredients to tablet blends, accurate skeletal density is essential for controlling dosage uniformity, porosity, and dissolution rates. The Ultrapyc's small volume cells, intuitive touchscreen, and AP Connect integration streamline workflows and support data integrity.

Construction materials and binders
True density of cement, fly ash, and aggregates is critical for mix design, porosity evaluation, and long-term durability. The Ultrapyc accommodates large sample volumes up to 135 cm^3 and offers robust, repeatable measurements, even in high-throughput environments.

Batteries and energy storage
For anodes, cathodes, and solid electrolytes, true density helps optimize energy density and performance. The Ultrapyc offers precise, temperature-controlled measurements and easy method switching for different chemistries – perfect for R&D teams characterizing multiple materials daily.

Polymers, plastics, and foams
Lightweight yet durable polymers and foams rely on accurate density profiling for quality assurance and material design. The Ultrapyc 7000 includes dedicated foam methods (e.g., ASTM D6226), while the touchscreen and guided workflows make testing quick and accessible – even for new operators.

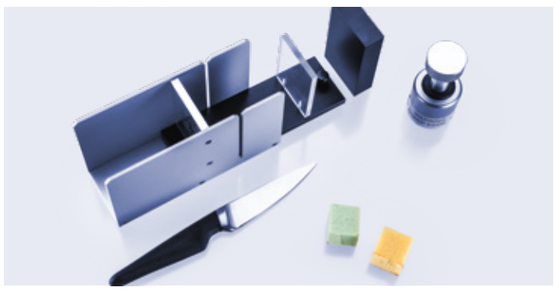
Mining and oil exploration
True density is used to assess the purity and composition of the barite solids that control the density of drilling fluids, and to measure the volume of the solid phase of the concrete and cement materials used in well construction. Ultrapyc instruments can deliver true density results for powders, cores, and semi-solids in less than a minute.

	Ultrapyc 3000	Ultrapyc 5000	Ultrapyc 7000	Ultrapyc 7000 Micro
Performance specifications				
Accuracy	0.02 %[1]		0.015 %[1]	0.075 %[2]
Reference volumes	2 (TruPyc) Nominally: 50 cm^3, 8 cm^3			2 (TruPyc) Nominally: 2 cm^3, 5 cm^3
Inserts available	135 cm^3, 50 cm^3, 10 cm^3, 4.5 cm^3, 1.8 cm^3, 0.25 cm^3			10 cm^3, 4.5 cm^3, 1.8 cm^3, 0.25 cm^3, 0.1 cm^3
Preparation modes	Flow, pulse, none	Flow, pulse, vacuum, none		
Gas expansion direction	Sample chamber first	Bi-directional flow (PowderProtect)		
Built-in temperature control	No	3 °C to 50 °C ± 0.02 °C[3]	3 °C to 60 °C ± 0.02 °C[3]	
Method library	No		Yes	
Built-in foam methods and calculations	No	No	Yes	No
Sample chamber closure	Repeatable dual-turn self-aligning lid (TruLock)			
Display and control	7-inch TFT WVGA (800 x 480 pixels); PCAP touchscreen			
Graphical user interface	Yes			
Transducer accuracy	Better than 0.1 %			
Connectivity				
printer, bar/QR reader	Compatible via USB ports (4 total)			
PC / network connectivity	Yes (AP Connect)		Yes (AP Connect or network shares)	
Language support				
Languages	Chinese, English, French, German, Japanese, Korean Portuguese, Spanish, Turkish		Chinese, English, French, German, Japanese, Korean, Polish, Portuguese, Spanish, Turkish	
Physical specifications				
Width x depth x height	27 cm (11 in) x 48 cm (19 in) x 25 cm (10 in)			
Weight	10 kg (22 lbs)			
Gas used (not supplied)	Ultra-high purity helium, nitrogen, or any other non-reactive, non-corrosive gas (e.g., argon) regulated to no more than 30 psi/2.07 bar			
Power supply	External AC/DC adapter Input: AC 100 V to 240 V, 47 Hz to 63 Hz Output: 24 VDC, 3A		External AC/DC adapter Input: 100 V to 240 V, 47 Hz to 63 Hz Output: 24 VDC, 5A	
Environmental specifications				
Ambient temperature	10 °C to 35 °C (50 °F to 95 °F)			
Air humidity	10 % to 90 % RH non-condensing			
Altitude	Maximum 3,000 m (9,800 ft)			
Indoor / outdoor usage	Indoor only			

1) With reference volume of 70.699 cm^3
2) With reference volume of 2.145 cm^3
3) For sample temperatures ≥ 15 °C, under standard laboratory conditions

Accessories

Foam sample preparation kit



Small-volume sample cells

Disposable cups

Non-elutriating cells

Selected international standards			
ASTM B923	Metal powders	ISO 787	Pigments
ASTM C110	Cements	ISO 4590	Foam-rigid cellular plastics
ASTM C604	Refractories	ISO 8130	Coating powders - Part 2
ASTM D2638	Carbon (petroleum coke)	ISO 12154	Solids
ASTM D4892	Carbon (solid pitch)	USP 699	Solids - pharmaceuticals
ASTM D5550	Soil solids		
ASTM D5965	Coatings		
ASTM D6093	Pigments (clear or pigmented coatings)		
ASTM D6226	Rigids foams		

Our well-trained and certified technicians are ready to keep your instrument running smoothly.

Maximum uptime | Warranty program | Short response times | Global service network

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