

VOLUME

DENSITY

SOLID CONTENT

OPEN CELL CONTENT

CLOSED CELL CONTENT



BetterPyc 380

Accuracy Meets Versatility



BetterPyc 380

Versatile Gas Pycnometer

The BetterPyc 380 is an automatic gas pycnometer that uses the gas displacement method to deliver highly accurate measurements with ease, offering precision at its best. With temperature control, pressure sensing, and intuitive software, it measures the volume, true density, solid content, open and closed cell content of your samples with up to 4-digit accuracy. Designed for research and production in a wide range of industries, the BetterPyc 380 will unlock the full potential of your products.

Features and Benefits

Multiple Functions

Provides five key measurements—volume, density, solid content, open and closed cell content—while preserving sample integrity.

High Accuracy

Ensures extreme accuracy and reliability with temperature control, high-resolution transducers, and calibrated chamber volumes.

Effortless Operation

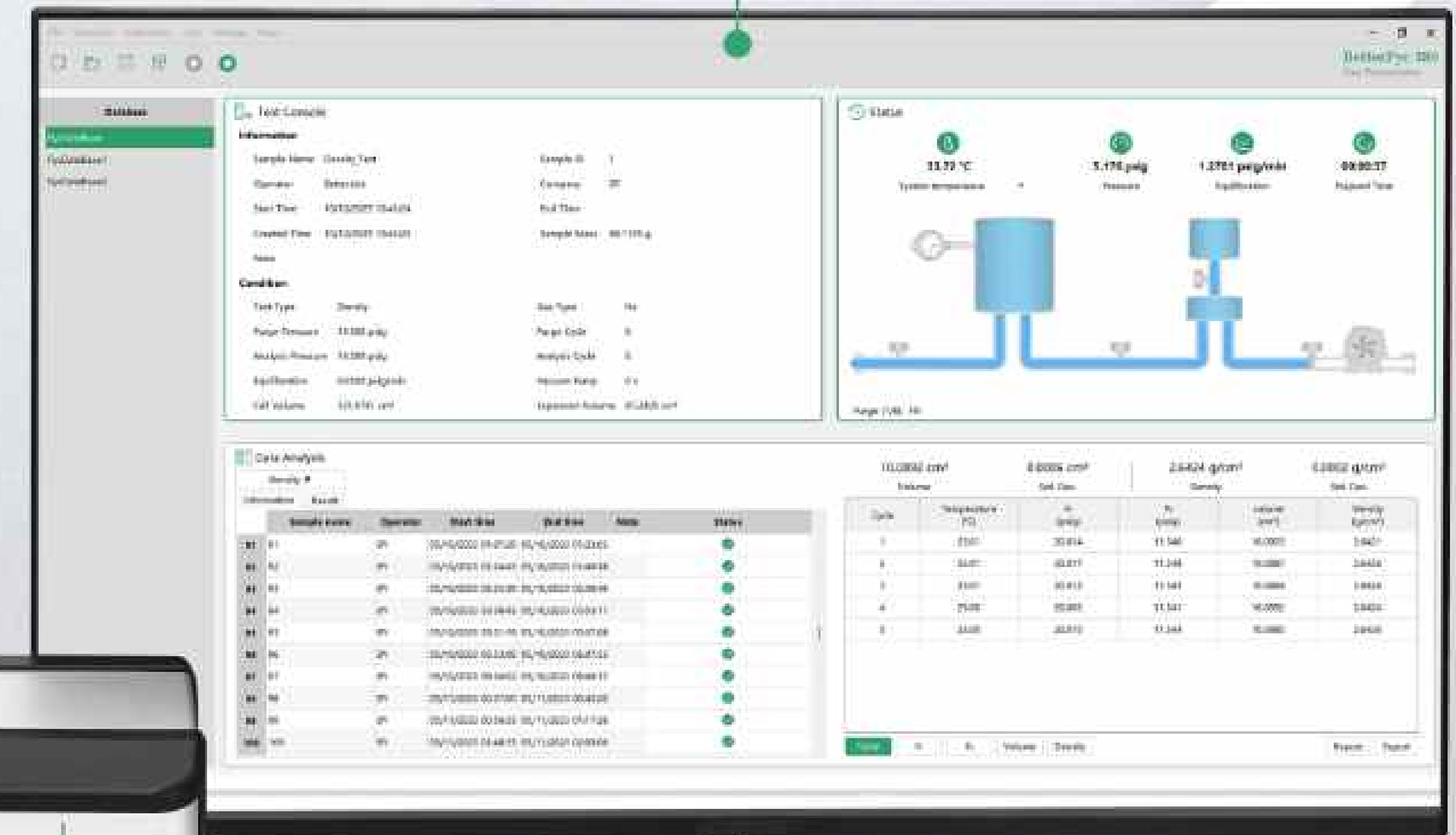
The EasyPyc software provides SOP templates, automatic leak detection, real-time test monitoring, and comparative analysis, ensuring ease of use for operators of all experience levels.

Versatile Accessories

Available with anti-corrosion sample cups, foam cutting tool, and temperature-probe lid.



Main Device



EasyPyc Software

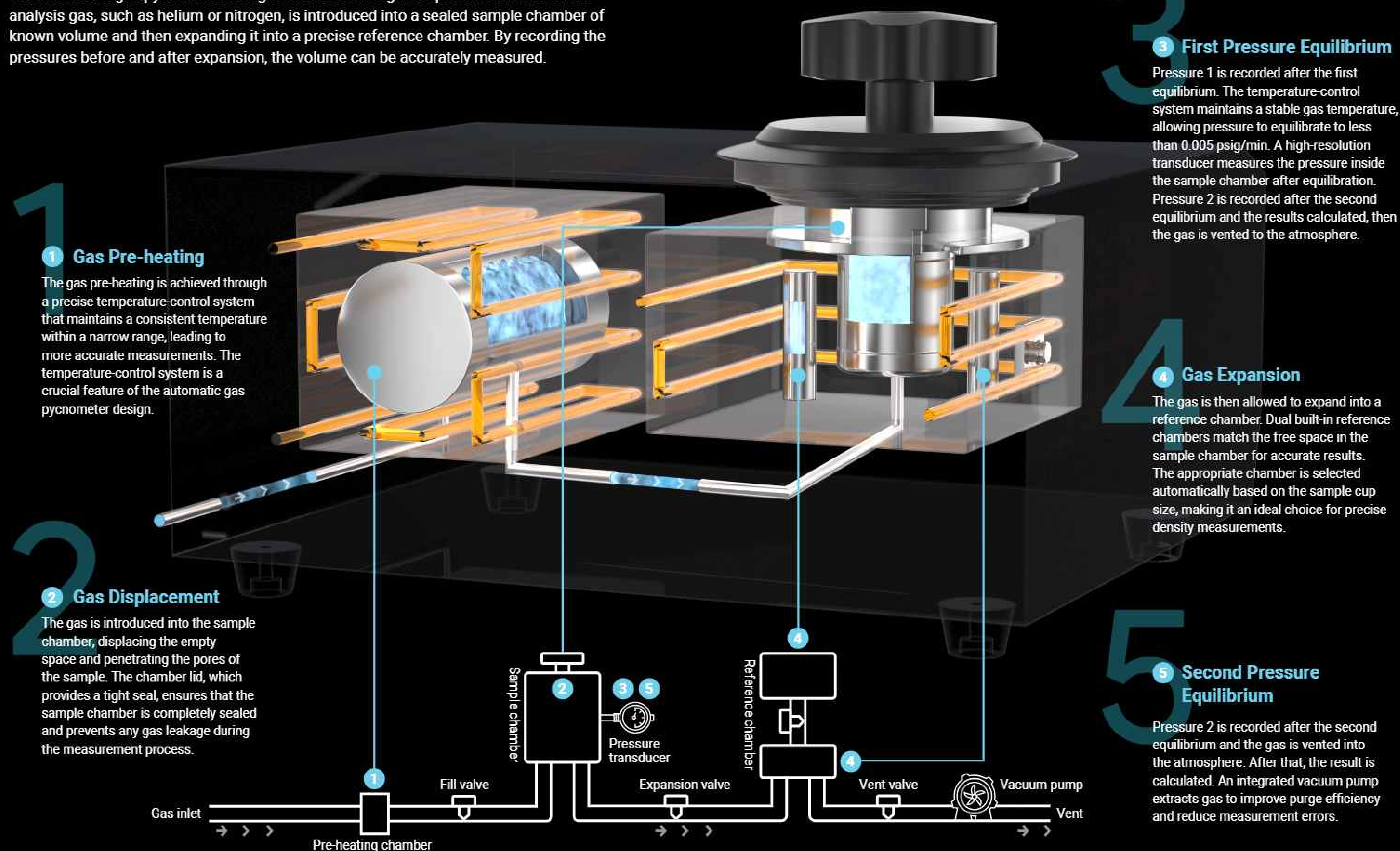


Sample Cups & Calibration Standard

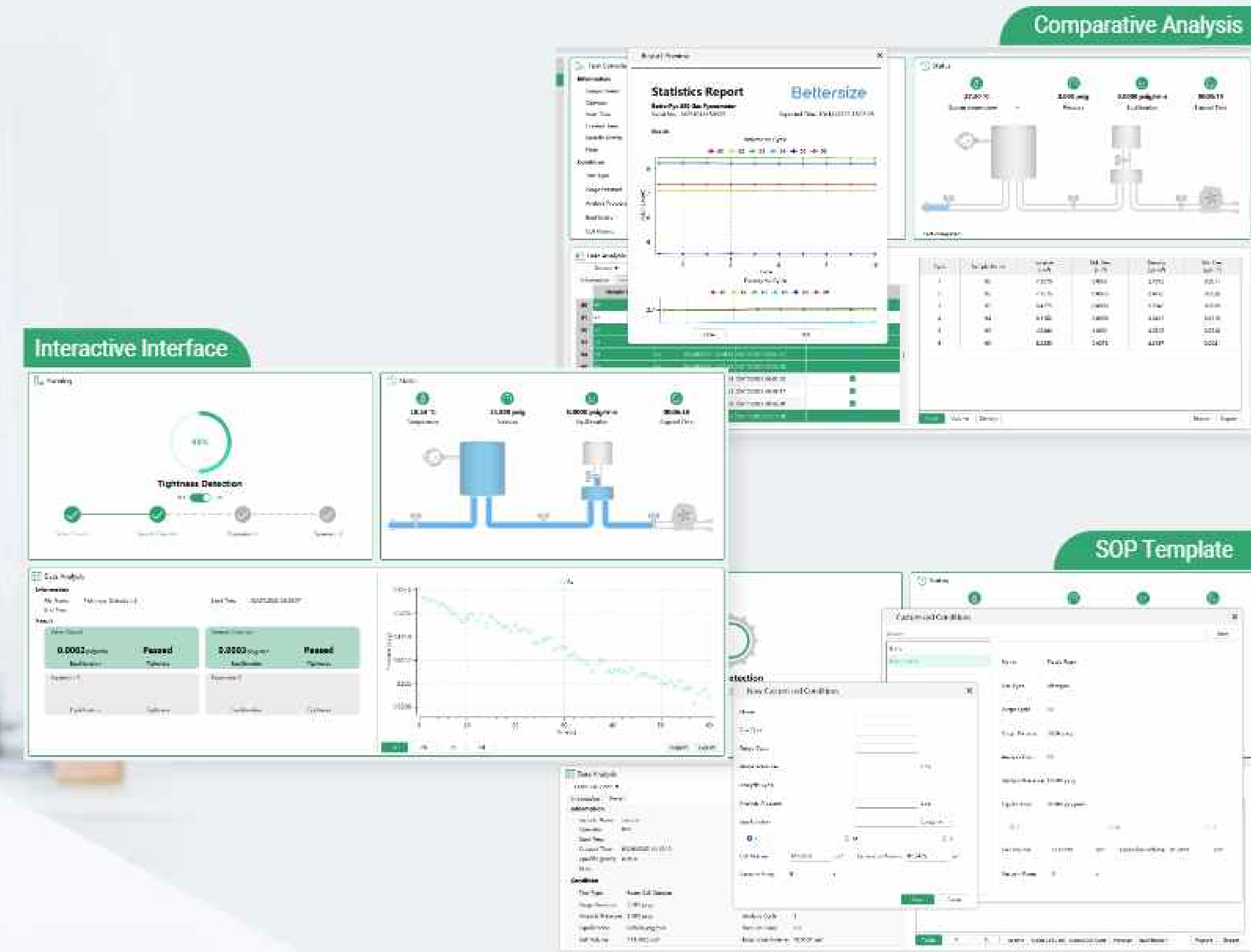


Working Principle

This automatic gas pycnometer design is based on the gas displacement method. An analysis gas, such as helium or nitrogen, is introduced into a sealed sample chamber of known volume and then expanding it into a precise reference chamber. By recording the pressures before and after expansion, the volume can be accurately measured.



Powerful Software - EasyPyc



Integrated Software Solution

The EasyPyc software comprehensively supports five key test parameters and offers advanced data comparison functionality, allowing users to generate detailed charts and trend plots for straightforward interpretation of analytical results.

It also supports remote balance data acquisition and external thermoelectric temperature control, offering easy operation and minimizing manual errors.

Interactive Interface

Real-time updates of critical system parameters such as temperature, gas pressure, equilibration and elapsed time help oversee the measurement process and ensure reliable results.

Additionally, the software features an animated visualization of the measurement process, enabling users to intuitively track instrument progress.

Efficient Workflow

The SOP (Standard Operating Procedure) testing function in the EasyPyc software allows users to conveniently configure test conditions and customize report templates.

An intelligent troubleshooting function is also provided to help users promptly identify and resolve common testing issues, ensuring experimental continuity, reducing interruptions, and enhancing overall workflow efficiency.



Industries We Serve

The **BetterPyc 380**, which complies with **USP, Ph.Eur., ASTM** and **ISO** standards, is a versatile instrument that can be used in a wide range of industries. It is able to accurately measure the density of a wide range of materials, the solid content in slurries, and the open cell content in plastic foams, enabling process optimization and quality assurance in relevant industries.

Powder Metallurgy



ASTM B923

The skeletal density of metal determines its properties and processing results, and the performance of metal structures can be predicted from powder skeletal density.

Calcined Coke



ASTM D2638

The density of calcined petroleum coke is a crucial quality specification for coke calcination, as it affects the properties of the resulting artifacts.

Cement



True density is essential for ensuring the quality and performance of cement powder, influencing its flowability, strength, and environmental impact.

Pigments



ASTM 6093

Dried film density helps determine the VOC content of clear and pigmented coatings, which is regulated by the government.

Pharmaceuticals



USP 699

Ph. Eur. 2.9.34

Product density determines and controls active or excipient composition. Product forms, purity, etc. can be determined by comparing measured density with theoretical and historical values.

Food



True density is crucial for ensuring the consistency and quality of dry food, affecting its processing, shelf life, and nutritional value.

Refractory



ASTM C604

True density is useful for: classification, identifying chemical differences, revealing mineral phases or alterations, determining total porosity and calculating results for other tests.

Coating Powders



ASTM D5965 ISO 8130-2

Total solids content helps determine coating coverage potential. Dry pigment blends are monitored by comparing measured and theoretical densities based on composition.

Soil



ASTM D5550

Soil specific gravity (SG), which is related to soil density, must be corrected due to precipitate formation after drying. A precipitate with lower SG leads to lower results, while one with higher SG leads to higher results.

Cellular Plastics



ASTM D6226 ISO 4590

Plastic foam properties vary based on the open/closed cell ratio. Insulation foams reduce thermal conductivity with trapped gas in closed pores. Flotation devices float due to closed air-filled pores.

Challenges We Solve

Versatile Samples | True Density

Due to the diverse nature of samples encountered in different industries, using a gas pycnometer can present challenges, which are generated by thermal sensitivity, corrosive substances, fine powders, or highly viscous samples.

Bettersize considers the needs of various industries and provides accessories that ensure accurate and reliable density measurements every time.



The temperature control system maintains the thermal stability of the entire gas system, which allows the pycnometer to accurately analyze the density of thermal-sensitive materials.

Non-elutriating cups are ideal for measuring samples with fine particles. 316L stainless steel anti-corrosion cups prevent damage to the pycnometer and ensure accurate results. Disposable cups are used for samples that are difficult to clean, such as asphalt.



Application Case

Precise true density measurement is vital for cement quality control and predicting hydration behavior. The BetterPyc 380 gas pycnometer outperforms traditional liquid displacement methods, delivering superior accuracy, efficiency and reliability for modern industry needs.

Sample	Temperature (°C)	Measured density (g/cm³)				Std. Dev. (g/cm³)
		1	2	3	Average	
Cement-1	23	2.8394	2.8401	2.8383	2.8393	0.0007
Cement-2	23	2.7717	2.7723	2.7724	2.7721	0.0003
Cement-3	23	2.8132	2.8138	2.8123	2.8131	0.0006

Powders | Void Fraction

Void fraction, also known as porosity, is a crucial factor that affects the properties of powder materials such as flow behavior, compaction behavior, and thermal conductivity.

Accurate measurement and control of void fraction are therefore essential for informed decision-making and optimal powder engineering.



The **BetterPyc 380** enables powder engineers to quickly measure true or skeletal density. By the combination with the BeDensi T Pro to measure the bulk density and tapped density, the void fraction of powder materials can be easily calculated.

Suitable configurations are as follows:

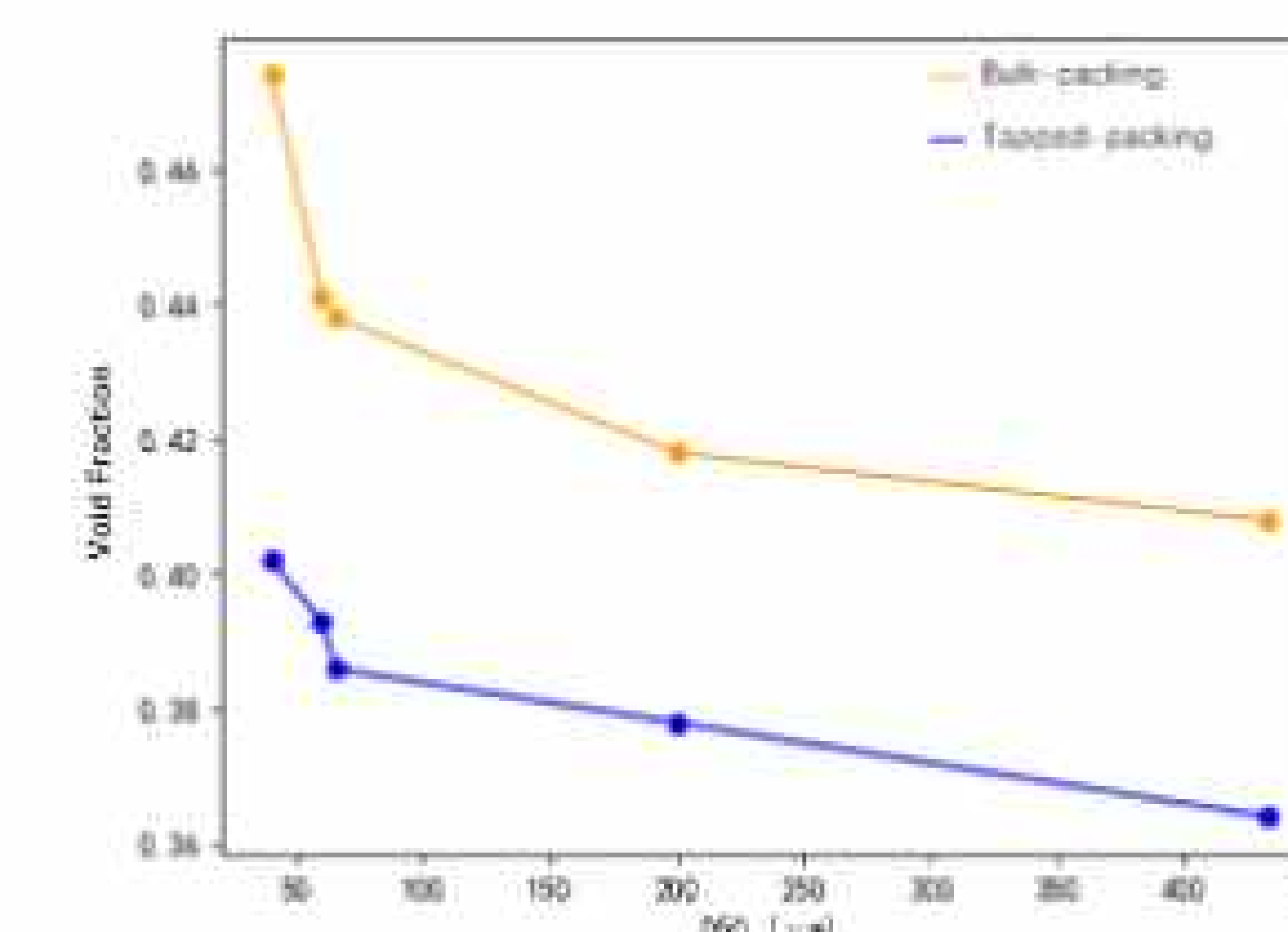
- 10 cm³, 35 cm³ and 100 cm³ nominal cups
- Temperature-controlled system



Application Case

This figure shows the void fraction of five types of glass beads with different particle sizes under bulk-packing and tapped-packing. The results indicate that larger particles pack more efficiently with fewer voids, while vibration further reduces the void fraction.

This highlights how controlling particle size and distribution improves powder packing density and product performance in applications such as coatings, composites, and additive manufacturing.



Challenges We Solve



Slurry | Solid Content

Processing a slurry can be challenging due to issues such as flowability and corrosion, which can disrupt the smooth operation of your processing system.

Accurately measuring and understanding the solid content of your slurry product is crucial to mitigating these challenges and optimizing your manufacturing process.



Foam | Open & Closed Cell Content

In the plastic foam industry, meeting performance requirements is crucial, with properties such as compression strength, thermal insulation, and moisture resistance being critical considerations.

The open cell content and closed cell content of plastic foams are key factors that affect their properties and performance, making it essential to accurately measure these parameters for optimal foam manufacturing and selection.

The **BetterPyc 380-S** is ideal for rapid density and solid content measurement of slurries with sample integrity. It features a chamber lid with a thermocouple for slurry temperature detection and an anti-corrosion cup for corrosive samples.

Suitable configurations are as follows:

- A chamber lid with a thermocouple
- Upgraded software with slurry measurement
- 10, 35, and 100 cm³ 316L stainless steel anti-corrosion cups (optional)



Application Case

By measuring solid content of a group of slurries, the measured results are in good agreement with the known values, which indicates that the desired slurry with the appropriate solid content can be accurately determined by using the BetterPyc 380.

Sample	Theoretical solid content (w/w)	Measured solid content (w/w)				Relative error. (%)
		1	2	3	Average	
Clay slurry	2.86	2.85	2.87	2.89	2.87	0.35
	19.58	18.94	18.99	19.03	18.99	3.03
	40.78	40.18	40.18	40.19	40.18	1.46

The **BetterPyc 380-F** is equipped with a foam cutting tool specifically designed to determine the corrected open cell content of rigid foams. It is fully compliant with the ASTM and ISO method and is able to provide accurate results by correcting surface cells opened by cutting.

Suitable configurations are as follows:

- A foam cutting tool
- Upgraded software with foam cell content measurement



Application Case

Comparing the cell contents of EVA and EPE foams reveals distinct structural and functional differences. Foams with higher open cell content, such as EPE, offer greater air permeability and flexibility, whereas those with more closed cells, like EVA, ensure better airtightness, mechanical strength, and insulation performance.

Sample	Open cell content (%)	Std. Dev. (%)	Closed cell content (%)	Std. Dev. (%)
EVA foam	88.42	0.06	10.42	0.06
EPE foam	96.31	0.08	2.67	0.08

Selection Guide

Choose the right accessories for accurate and reliable results with our easy-to-follow selection guide.



BetterPyc 380

- Density
- Volume



BetterPyc 380-S

- Density
- Solid content
- Volume



BetterPyc 380-F

- Density
- Foam cell content
- Volume



BetterPyc 380-FS

- Density
- Foam cell content
- Volume
- Solid content

Specifications

General	
Measuring Principle	Gas Displacement Method
Measuring Parameters	Volume, Density, Solid Content, Open Cell Content, Closed Cell Content
Cup Capacity	10 cm³, 35 cm³, 100 cm³ (nominal)
Measurement Performance	
Temperature Range	10-65 °C
Temperature Stability	0.03 °C
Transducer Accuracy	Better than 0.1%
Accuracy	0.02%
Repeatability	0.01%
Resolution	0.0001 g/cm³
Analysis Gas	
Pressure Range	0 - 22 psig (0 - 152 kPag)
Type	Helium or Nitrogen (suggested)
Instrument Dimensions	
Weight	10.6 kg
W×D×H	345 mm × 297 mm × 221 mm
Supply Voltage	100/240 V, 50/60 Hz
Software	
System	Windows 11 or higher
Connections	USB ports



Bettersize
BETTER PARTICLE SIZE SOLUTIONS



BREAKING
BOUNDARIES
SHAPING
THE FUTURE

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