Densi 100: Gas Pycnometer

Fast. Accurate. ISO-Compliant True Density Measurement

INTRODUCTION

"Accurate, Cost-Effective, Automated True Density Analysis"

True density is a critical physical property for solid materials—especially powders—affecting everything from product performance to quality control. True density reflects a material's purity and structural compactness, both of which play a direct role in its end-use properties.

Traditionally, density has been measured using Archimedes' water displacement method. However, this approach suffers from manual error, liquid drainage issues, and poor repeatability. In response, the International Organization for Standardization (ISO) adopted the gas displacement method (ISO 12154) as the official standard for true density measurement in 2014.

The **Densi 100** True Density Analyzer quickly and accurately determines the true volume and true density of a wide range of solid materials, including powders, granules, and solid blocks. With a sample chamber volume range of 1 cm^3 to 100 cm^3, the system accommodates both small and large samples. Each analysis is completed in approximately 3 minutes, delivering reliable results without compromising accuracy.

- ✓ TEST GAS: Helium or Nitrogen
- ✓ Characteristic: Non-Destructive
- ✓ Resolution: 0.0001 g/ml
- ✓ Repeatability: +/- 1%

Figure 1. ***Densi-100*** *Touch Screen*

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FEATURES

Integrated Testing Module

The **Densi 100** combines the sample chamber, expansion chamber, pressure sensor, and control valve into a single, compact unit, ensuring uniform system temperature and enhanced measurement stability. This integrated design delivers exceptional performance, achieving true density accuracy of up to ±0.03% and repeatability better than ±0.02%, making it ideal for both high-precision research and routine quality control applications.

Reference Material

The standard reference material used for calibration is made from non-expanded alloy and is certified by the National Institute of Metrology, China. This ensures traceability and high confidence in measurement accuracy, with volume precision up to 10^{-4} cc.

Multiple Sample Chambers and Inserts

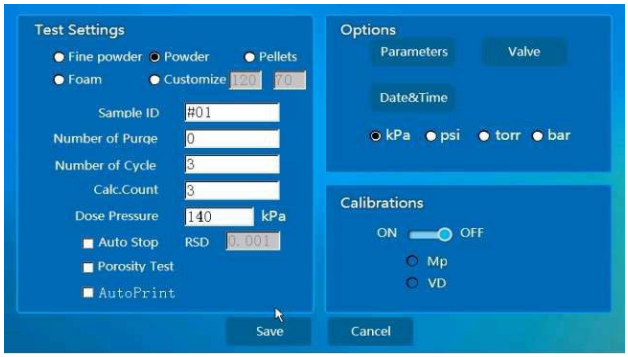
Various chamber and sample cell inserts are available, allowing users to optimize measurement accuracy and accommodate different sample volumes with precision and flexibility.

Density Measurement

The **Densi 100** Automatic True Density Analyzer accurately measures the true density of powders within a pressure range of 1 to 1.3 bar.

Unique Design

The Densi 100 is equipped with a built-in processor and Windows-based operating system, enabling fully independent operation without requiring an external computer. Its intelligent self-diagnostic program automatically performs seal integrity verification, reducing operator errors and ensuring consistent, high-quality test results.



Pressure Sensor

The **Densi 100**, equipped with a 2 bar (F.S.) pressure sensor, delivers highly stable and accurate true density measurements. The sensor's non-linearity is better than ±0.2%, ensuring precise pressure readings and reliable data capture throughout the testing process.

SOFTWARE

The Densi 100 offers an intuitive, fully automated testing process, completing measurements in approximately three minutes. Users can customize the number of repeat tests, while all test data is automatically recorded, saved in TXT format, and easily exported via USB. The system includes PC-compatible software for generating and printing comprehensive standard test reports, ensuring seamless data management and documentation. To enhance versatility, the software features five built-in test modes—Pellets, Powder, Fine Powder, Foam, and Custom—allowing for quick selection based on sample type.

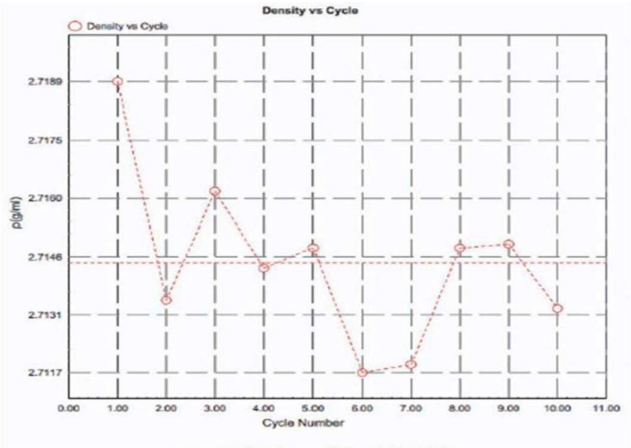
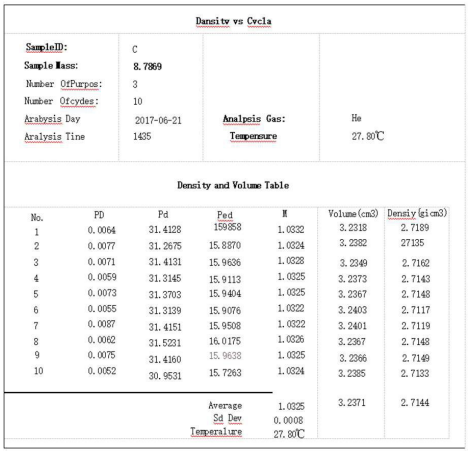


Figure 3. Graphical Testing Data



Density vs Cycle

SampleID:	C		
Sample Mass:	8.7869		
Number OfPurpos:	3		
Number Ofcydes:	10		
Arabysis Day	2017-06-21	Analpsis Gas:	He
Aralysis Tine	1435	Tempensure	27.80℃

Density and Volume Table

No.	PD	Pd	Fed	H	Volume(cm3)	Densiy(g\cm3)
1	0.0064	31.4128	159858	1.0332	3.2318	2.7189
2	0.0077	31.2675	15.8870	1.0324	3.2382	27135
3	0.0071	31.4131	15.9636	1.0328	3.2349	2.7162
4	0.0059	31.3145	15.9113	1.0325	3.2373	2.7143
5	0.0073	31.3703	15.9404	1.0325	3.2367	2.7148
6	0.0055	31.3139	15.9076	1.0322	3.2403	2.7117
7	0.0087	31.4151	15.9508	1.0322	3.2401	2.7119
8	0.0062	31.5231	16.0175	1.0326	3.2367	2.7148
9	0.0075	31.4160	15.9638	1.0325	3.2366	2.7149
10	0.0052	30.9531	15.7263	1.0324	3.2385	2.7133
			Average	1.0325	3.2371	2.7144
			Sd Dev	0.0008		
			Temperature	27.80℃		

Figure 4. Tabular Cycle Data

SPECIFICATIONS

Model	Densi 100
Principle	Gas displacement method
Pre-Treatment	Gas purge, Flow
Pressure	0-150 kPa (Gauge)
Accuracy	0.03%
Repeatability	0.02%
Cell Volume	Nominal: 100 ml or 10 ml Available Inserts : 35 ml, 10 ml, 3.5 ml, 1 ml
Calibration Method	Automatic Calibration
Gases	Helium or Nitrogen
Testing Range	0.0001 g/cm3 to infinity
Dimensions and Weight	L 15.0 in (380mm) x W 11.0 in (280mm) x H 11.0 in (280mm) 22 lbs. (10kg)
Power Requirement	110 or 240 VAC, 50/60 Hz

ABOUT US

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