

High Vacuum Gas Sorption Analyzer

Autosorb 6100





1



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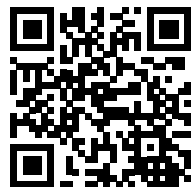


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The Choice Is Clear **Absolutely Autosorb**

With the new Autosorb 6100, a customizable high vacuum gas sorption analyzer designed for the most challenging measurements of surface area and pore size distributions in the nanometer range, we deliver on the most important requirements of material characterization laboratories: Accuracy, Agility, Accessibility, Adaptability, and Assurance.

FIND OUT MORE



[www.anton-paar.com/
apb-autosorb](http://www.anton-paar.com/apb-autosorb)

ABSOLUTELY ACCURATE

1

- Precise manifold temperature control $<0.05\text{ }^{\circ}\text{C}$
- Exceptionally leak tight system
- TruZone active coolant level control

ABSOLUTELY AGILE

2

- Six best-in-class degassing stations
- Three samples, three gases, three temperatures simultaneously
- 90+ hour cryogen Dewar

ABSOLUTELY ACCESSIBLE

3

- DoseWizard
- PowderProtect
- Intuitive Kaomi for Autosorb software

ABSOLUTELY ADAPTABLE

4

- 12 instrument configurations
- Five modular instrument upgrades

ABSOLUTELY ASSURED

5

- Compliant with 15+ ASTM, DIN, and ISO standards
- 3-year warranty
- Anton Paar global support network

Absolutely Accurate

Free from Error, Exact

Leveraging over 50 years of experience in gas sorption technology, the Autosorb 6100 has been engineered from the ground up to optimize every step in the measurement process for accuracy and performance.

1

Precise manifold temperature control

Control the manifold temperature between 35 °C and 50 °C with stability better than 0.05 °C. Obtain accurate results day in and day out, no matter the environmental conditions.

2

Exceptionally leak tight system

Vacuum-brazed, stainless steel manifold block construction and pneumatically actuated bellows valves ensure 38 % better vacuum performance than previous generation instruments and high-accuracy data in the 10^{-8} p/p_0 domain with nitrogen.

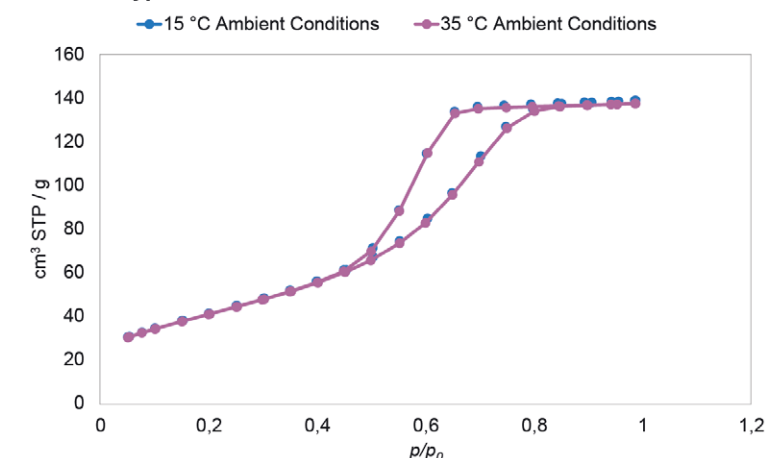
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TruZone active coolant level control

TruZone active coolant level control generates a near-constant temperature profile along the analysis cell ensuring accurate measurement of a wide range of material properties and sample types. The small and constant cold zone also ensures better than 2 % reproducibility of nitrogen BET surface areas even with less than 2 m² in the cell.

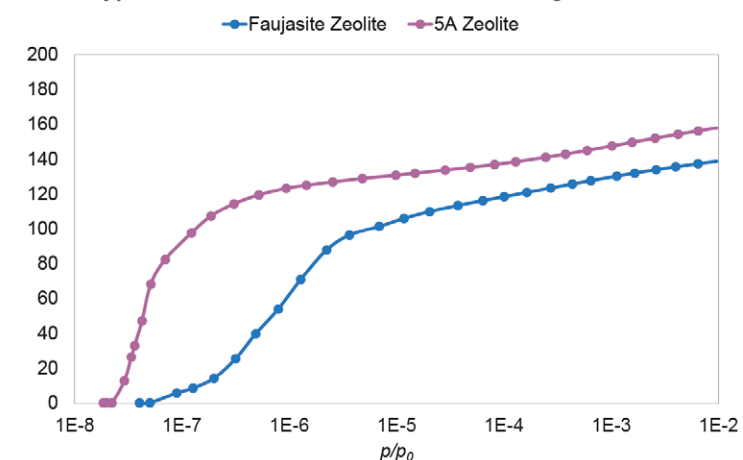
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Typical Performance under Environmental Stress



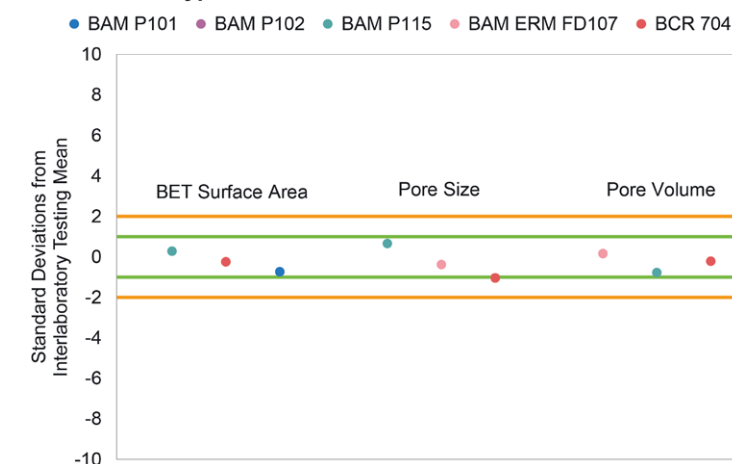
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Typical Low Pressure Performance, Nitrogen 77 K



3

Typical Reference Material Performance



Absolutely Agile

Able to Move Quickly and Easily

Best-in-class analysis and sample preparation features on the Autosorb 6100 keep your research agile, maximizing your laboratory's output of advanced measurements and novel materials.



Up to three independent analysis stations keep you flexible

Because the analysis stations are separate and have dedicated transducer sets, you can analyze up to three different samples with three different analysis gases simultaneously. You can also pair these with our patented CryoSync accessories so that each station measures at independent analysis temperatures.



90+ hour analysis Dewar for long-lasting measurements

The 3-liter Dewar included with Autosorb instruments holds enough cryogen to last for more than 90 hours. You'll never have to come in on the weekend to refill the Dewar again. Connect your Autosorb with alternative Dewars and external temperature control accessories for maximum analysis flexibility.



Six degassing stations maximize your throughput

Each of the six Autosorb 6100 degassing stations has access to a built-in cold trap and turbomolecular pump for best-in-class preparation of microporous samples. An automated "Test for Completion" routine after each degassing step ensures your samples are properly prepared for analysis.



Two independent heating zones, maximum flexibility

Each Autosorb 6100 comes with two heating mantles for simultaneous preparation of two sets of samples at two independent temperatures up to 450 °C. Adaptive heating profiles, including a pressure-controlled heating function, minimize elutriation and steaming damage of susceptible microporous samples.

Absolutely Accessible

Easy to Understand, Easy to Use

Take advantage of the new Kaomi for Autosorb software, which gives you streamlined control of the Autosorb 6100 – no matter your experience level – while also offering advanced analytical performance and flexibility.



DoseWizard system for simplified workflows

Kaomi for Autosorb makes gas sorption easy for users of all levels. Simply select one of our 30+ preloaded analysis profiles or tell the instrument your desired analysis methods, and the Autosorb 6100 will do the rest. For expert users, an advanced mode gives full control of analysis procedures.

PowderProtect keeps instrument downtime to a minimum

Our new PowderProtect feature virtually eliminates the risk of sample elutriation (loss of powder into the instrument) without requiring special evacuation parameters for different sample types, preventing contamination of the instrument by inexperienced operators.

Sample ID tracking ensures traceability

The Kaomi for Autosorb sample library stores and tracks all sample IDs, sample weights, cell selections, and degassing conditions so you don't have to.

Streamlined user interface keeps you in control

Monitor the instrument status from the sidebar, log view, or an enlarged instrument schematic view. Ensure the top performance of your instrument by tracking the next service date and performing fully guided maintenance routines. With Kaomi for Autosorb, you're always in control.

Data Explorer makes complex analyses easy

Easily find and analyze measurement files using the refined Data Explorer functionality. Create summary reports or graphical overlays of multiple measurements in just a few clicks.

Multilanguage support for operators around the globe

With support for eight different languages, Kaomi for Autosorb lets you control the instrument and analyze the data in the language in which you are most comfortable.

Absolutely Adaptable

Adjusts to New Conditions, Flexible

Face the future with confidence knowing you can customize the Autosorb 6100 to meet your current needs with 12 base instrument configurations. Five modular field upgrades ensure that your instrument will stay relevant and keep pace with your research.



Micropore (MP) analysis stations

Configured with 1550, 10, and 1 Torr transducers, MP stations are perfect for standard BET surface area, mesopore, and micropore analyses using nitrogen or argon.

Extended Range (XR) analysis stations

Configured with 1550, 10, and 0.1 Torr transducers, XR stations offer higher resolution of the low-pressure limits of the instrument. They're especially useful for micropore analyses using nitrogen in materials with oxidic or functionalized surfaces.

Any Gas (AG) analysis stations

Configured with a 1550 Torr transducer, AG stations offer additional throughput for BET or mesopore analyses using nitrogen.

Vapor sorption expands your measurement capabilities

Include a built-in vapor generator and recirculating Dewar to precisely measure water and organic vapor sorption. Obtain additional information about a material's surface chemistry and stability.

Integrated CryoSync for advanced temperature control

Control up to three of our exclusive CryoSync accessories directly from Kaomi for Autosorb. Seamlessly manage experimental temperatures from 82 K to 115 K independently on each analysis station.

Evolve with your research

If your research needs change, the Autosorb 6100 can be upgraded to alter the number and type of analysis stations, or add vapor and CryoSync control capabilities in the field.

Absolutely Assured

Protected, Secure, Confident

With compliance to 15+ ASTM, DIN, and ISO standards, you can be certain that the Autosorb 6100 is the right choice for your characterization needs. What's more, Anton Paar's global network of subsidiaries and distribution partners ensures a qualified expert is always nearby and ready to help.

1 Advanced Ceramics

- ASTM C1274 Advanced ceramic specific surface area
- ISO 18757 Specific surface area of ceramic powders

2 Carbons

- ASTM D6556 Total and external surface area

3 Catalyst and Catalyst Carriers

- ASTM D3663 Surface area
- ASTM D4222 Nitrogen adsorption and desorption isotherms
- ASTM D4365 Micropore volume and zeolite area
- ASTM D4641 Pore size distributions
- ASTM D4780 Low surface area

4 Other Non-Porous and Nanoporous Solids

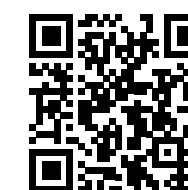
- ASTM B922 Metal powder specific surface area
- ASTM C1069 Specific surface area of alumina or quartz
- ASTM D1993 Precipitated silica – surface area
- DIN 66134 Pore size distribution and specific surface area
- DIN 66135 Particle characterization – micropore analysis
- ISO 9277 Specific surface area of solids
- ISO 15901 Pore size distribution and porosity of solid materials



Reliable. Compliant. Qualified.

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

FIND OUT MORE



www.anton-paar.com/service



Maximum uptime



Warranty program



Short response times



A global service network

Autosorb 6100	
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MEASUREMENT SPECIFICATIONS	
Measurement principle	Vacuum volumetric
Analysis gases	N ₂ , Ar, Kr, CO ₂ , CH ₄ , H ₂ , and other non-corrosive gases
Analysis stations	Number: 1, 2, or 3 Independence: Up to 3 gases at 3 analysis temperatures can be used concurrently, 1 analysis gas and temperature per station
Independent p ₀ station	Yes (dedicated cell and transducer)
Pressure	- Range: 2x10⁻⁵ to 1100 Torr (2.6x10⁻⁸ to 0.997 p/p₀ for N₂ 77K) - Resolution (MP): 2x10⁻⁵ Torr (2.6x10⁻⁸ p/p₀ for N₂ 77K) - Resolution (XR): 1x10⁻⁶ Torr (1.3x10⁻⁹ p/p₀ for N₂ 77K)
Surface area	- Absolute detection limit: 0.1 m² (N₂ 77K) - Specific detection limit: 0.01 m²/g (N₂ 77K) - Typical reproducibility: 1 %* - Reproducibility limit: 2 % with 2 m² in the cell
Pore size	- Range: 0.35 nm to 500 nm (diameter) - Typical reproducibility: 0.5 %*
TruZone	Yes (active coolant level control)
PowderProtect	Yes (prevents sample elutriation)
Analysis Dewar	- Duration: 90+ hours with liquid nitrogen - Refill during analysis: Yes - Volume: 3 L
Sample preparation	- Integrated degassing stations: 6 - Temperature control: 2 independent heating zones, ambient to 450 °C - Dedicated cold trap: Yes - Available methods: flow and vacuum, programmable multistep degassing profiles
Vapor option	Yes (water, isopropanol, benzene, hexane, cyclohexane, xylene, and other non-corrosive vapors)
CryoSync control option	Yes (automated control of temperature between 82 K and 115 K)
* Measured on BAM P115.	

Kaomi for Autosorb Software Features	
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FEATURES	
Instrument connection	Control up to 4 instruments from 1 PC
DoseWizard	- 30+ built-in analysis profiles aligned with ASTM, DIN, and ISO - Standard profiles with easy measurement selection - Advanced profiles with full control of experimental procedures
Available methods	- Surface area and pore volume: Alpha-s, BET, DR, Gurvich pore volume, Langmuir, t-plot, - Pore size and pore volume distributions: NLDFT, QSDFT, GCMC, Kr(87) thin-film, BJH, DH, DA, HK, SF, MP - Other: summary reports, overlays, average particle size, average pore size, fractal dimensions
Available languages	Chinese, English, French, German, Japanese, Korean, Portuguese, Spanish

Autosorb 6100	
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TECHNICAL SPECIFICATIONS	
Dimensions (W x H x D)	70.5 cm x 69.9 cm x 107.9 cm (27.8 in x 26.5 in x 42.5 in)
Weight	128.4 kg (283.1 lbs)
Operating environment	- Temperature: 15 °C to 35 °C (59 °F to 95 °F) - Humidity: 20% RH to 80% RH, non-condensing
Wetted parts	303 SS, 304 SS, 316 SS, Ni/Cr/Si/Fe/C/P, PCTFE, NW2201, inconel and incoloy nickel alloys, FKM, silicon, SiO ₂ , Si ₃ N ₄ , gold, copper, aluminum, EPDM, nylon, borosilicate glass, fused silica glass
Analysis manifold construction	Vacuum-brazed manifold block in stainless steel
Analysis manifold temperature	- Range: user adjustable 35 °C to 50 °C - Stability: ±0.05 °C
Analysis manifold valves	- Type: stainless steel, air-operated bellows valve - Cycle life: 5,000,000 cycles - External leak rate: 5x10⁻¹² Pa m³/sec - Seat leak rate: 5x10⁻¹² Pa m³/sec
Pressure transducer (1550 Torr)	- Number: 3 to 5 (dependent on instrument configuration) - Accuracy: ±0.1 % of span typical, ±0.15 % of span maximum - A/D data acquisition: 32 bit
Pressure transducer (10 Torr) – MP or XR	- Number: 1 to 3 (dependent on instrument configuration) - Accuracy: ± 0.12 % reading up to 1 Torr ± 0.1 % reading from 1 to 10 Torr - Resolution: 0.002 % full scale
Pressure transducer (1 Torr) – MP only	- Number: 1 to 3 (dependent on instrument configuration) - Accuracy: ±0.12 % reading up to 1 Torr - Resolution: 0.02 % full scale
Pressure transducer (0.1 Torr) – XR only	- Number: 1 to 3 (dependent on instrument configuration) - Accuracy: ±0.15 % reading up to 0.1 Torr - Resolution: 0.001 % full scale
Pirani vacuum gauge – Degas only	- Number: 1 - Accuracy: 5×10⁻⁴ to 1x10⁻³ Torr: ±10 % of reading 1×10⁻³ to 100 Torr: ±5 % of reading - 100 Torr to atmosphere: ±25 % of reading
Vacuum system	- Turbo molecular drag pump and dry diaphragm pump - Manufacturer's specification: 5x10⁻¹⁰ mbar - Typical pressure at analysis port: 2.67x10⁻⁵ mbar
Gas	- Ports: 7 (5 analysis, 1 helium, 1 degas/backfill) - Purity: 99.999 % - Input pressure: 8 psig to 10 psig (0.55 bar to 0.69 bar)
Air	Input pressure: 50 psig to 100 psig (3.45 bar to 6.9 bar)
Electrical	- Supply: AC 100 to 240 V AC, 50 / 60 Hz - Maximum consumption: 1810 VA (dependent on instrument configuration)
PC connection	Ethernet
RoHS3 compliant	Yes
CE / UKCA certified	Yes
Altitude	Up to 3,000 m
Indoor/outdoor use	For indoor use only

