Anton Paar

High Vacuum
Gas Sorption Analyzers

Autosorb Series

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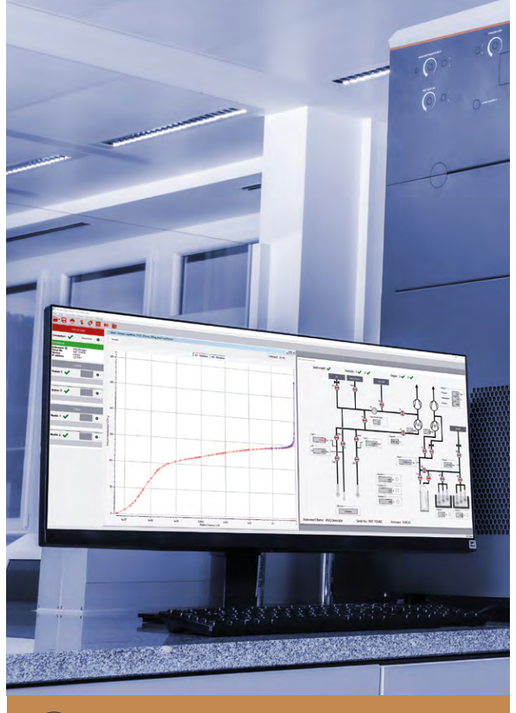

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The Choice Is Clear
Absolutely Autosorb

With the new Autosorb series, customizable high vacuum gas sorption analyzers designed for the most challenging measurements of BET surface area, active 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

1 ABSOLUTELY ACCURATE
- → Precise manifold temperature control <0.05 °C
- → Exceptionally leak-tight system
- → TruZone active coolant level control

2 ABSOLUTELY AGILE
- → Six best-in-class degassing stations
- → Three samples, three gases, three temperatures simultaneously
- → 90+ hour cryogen Dewar or 1,100 °C furnace

3 ABSOLUTELY ACCESSIBLE
- → DoseWizard
- → PowderProtect
- → Intuitive Kaomi software

4 ABSOLUTELY ADAPTABLE
- → Three instrument models
- → 8+ factory-installed options
- → 7+ modular field upgrades

5 ABSOLUTELY ASSURED
- → Compliant with 20+ 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 series 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.

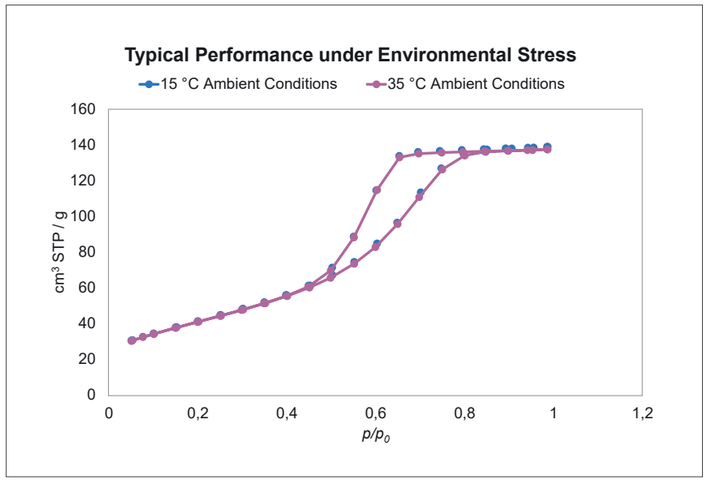
2

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.

3

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 m^2 in the cell.

1



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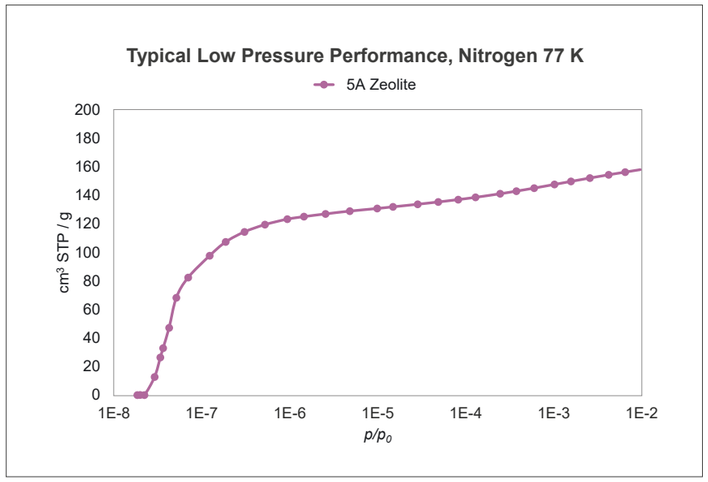

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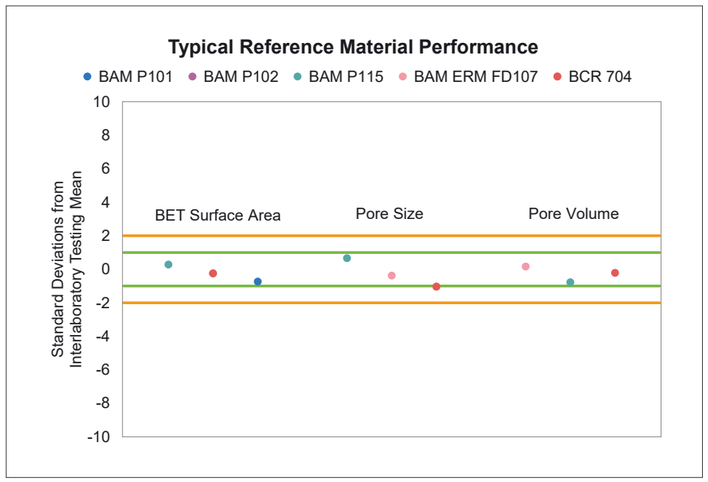

Absolutely Agile
Able to Move Quickly and Easily

Best-in-class analysis and sample preparation features on the Autosorb series 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.

Measurement agility realized with quick swap to 1,100 °C furnace
Switch between the cryogenic Dewar and the 1,100 °C furnace included with Autosorb 6200 and 6300 instruments in minutes. Rapidly perform a complete characterization of your catalysts, including BET surface area, pore size distribution, active area, and metal dispersion, quickly and easily.

Six degassing stations, two independent heating zones, maximum flexibility
Simultaneously prepare two sets of samples at two independent temperatures up to 450 °C. A built-in 2-liter cold trap, turbomolecular pump, and adaptive heating profiles, including automated pressure-controlled heating and test for completion, ensure your samples are properly prepared for analysis.

Absolutely Accessible

Easy to Understand, Easy to Use

Take advantage of the new Kaomi software, which gives you streamlined control of your Autosorb – 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 45+ preloaded analysis profiles or tell the instrument your desired analysis methods, and Autosorb 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, you're always in control.

Dynamic Kaomi React interface makes complex analyses easy
Analyzing dynamic flow chemisorption measurements has never been easier. The new Kaomi React interface helps you easily find measurement files and intuitively guides you through advanced peak deconvolution and pulse titration analyses.

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

Customize the Autosorb to meet your current application needs with a choice of three instrument models. As your research changes, modular field upgrades allow your Autosorb to adapt to new applications.

Autosorb 6100
Our basic high-vacuum analyzer features independent analysis stations and a long-lasting cryogen Dewar perfect for analyses of surface area and pore size. Field upgrades let it adapt to new applications as your needs change.

Autosorb 6200
Our mid-range analyzer can be customized to perform a wide range of chemisorption and physisorption analyses. Along with the basic features of the Autosorb 6100, this model includes a 1,100 °C furnace, a choice of chemical compatibility, and additional measurement options for advanced catalyst characterization.

Autosorb 6300
Our most powerful instrument features: full chemisorption and physisorption capabilities ideal for advanced catalyst characterization applications. In addition, PFE elastomers offer the highest chemical resistance of the three instruments and give you access to the widest range of potential measurements in the series.

		Autosorb 6100 ↓	Autosorb 6200 ↓	Autosorb 6300 ↓
INSTRUMENT FEATURE	**APPLICATION**			
Sealing materials / chemical compatibility	Standard resistance (N_2, Ar, Kr, CO_2, H_2,)	✓	✓	✓
	CH_4, C_2H_6, C_3H_8, and other alkanes, C_6H_6, C_8H_{10}	✓	O	✓
	NH_3, C_5H_5N, C_3H_6O, and other reactive gases		O	✓
Turbo pump system and low pressure transducers	BET surface area Pore size distribution	✓	✓	✓
Vapor option	Water activity Moisture uptake	O / U	O / U	✓
High-temperature (1,100 °C) furnace	Active area Dispersion Crystallite size	U	✓	✓
Integrated TCD	Reduction/oxidation Acid site strength Activation energy		O / U	✓
Integrated mass spectrometer	Reactive species identification		O / U	O / U

✓ Included in base instrument
O Factory-installed option
U Modular field upgrade

Absolutely Assured
Protected, Secure, Confident

With compliance to 20+ ASTM, DIN, and ISO standards, you can be certain that the Autosorb series 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
→	ASTM D3908	Hydrogen chemisorption
→	ASTM D4824	Catalyst acidity by ammonia chemisorption

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, 1-4	Particle characterization – micropore analysis
→	ISO 9277	Specific surface area of solids
→	ISO 15901, 2-3	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 ↓	Autosorb 6200 ↓	Autosorb 6300 ↓
MEASUREMENT SPECIFICATIONS			
Measurement principle	- Vacuum Volumetric	- Vacuum Volumetric - Dynamic Flow (Optional)	- Vacuum Volumetric - Dynamic Flow
N_2, Ar, Kr, CO_2, H_2, and other non-corrosive gases	Included		
CH_4, C_2H_6, C_3H_8, other alkanes, C_6H_6, C_8H_{10}	Included	Dependent on configuration	Included
NH_3, C_5H_5N, C_3H_6O, and other reactive gases	N/A	Dependent on configuration	Included
Physisorption 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		
Chemisorption analysis stations	N/A	1	
Independent p_0 station	Yes (dedicated cell and transducer)		
Pressure	- Range: $2x10^{-5}$ to 1100 Torr ($2.6x10^{-8}$ to 0.997 p/p_0 for N_2 77K) - Resolution (MP): $2x10^{-5}$ Torr ($2.6x10^{-8}$ p/p_0 for N_2 77K) - Resolution (XR): $1x10^{-6}$ Torr ($1.3x10^{-9}$ p/p_0 for N_2 77K)		
BET surface area	- Absolute detection limit: 0.1 m^2 (N_2 77K) - Specific detection limit: 0.01 m^2/g (N_2 77K) - Typical reproducibility: 1 % (measured on BAM P115) - Reproducibility limit: 2 % with 2 m^2 in the cell		
Pore size	- Range: 0.35 nm to 500 nm (diameter) - Typical reproducibility: 0.5 % (measured on BAM P115)		
Active area	N/A	- Absolute detection limit: 0.03 m^2 (H_2 on Platinum 313 K) - Specific detection limit: 0.003 m^2/g (H_2 on Platinum 313 K) - Typical reproducibility: 2 % (measured on 2 % Platinum on Alumina reference sample)	
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		
Analysis furnace	N/A	- Maximum temperature: 1,100 °C - Maximum Ramp Rate: 50 °C per minute - Furnace cooling by built-in fan	
Sample preparation	- Integrated degassing stations with dedicated cold trap: 6 - Temperature control: 2 independent heating zones, ambient to 450 °C - Available methods: flow and vacuum, programmable multi-step degassing profiles, test for completion routines, pressure-controlled heating		
ADDITIONAL SPECIFICATIONS			
Kaomi for Autosorb software	- Control up to 4 instruments from 1 PC - 8 languages: Chinese, English, French, German, Japanese, Korean, Portuguese, Spanish - DoseWizard: 45+ built-in analysis profiles (ASTM, USP, DIN, ISO)		
Vapor source	Optional	Optional	Included
CryoSync control	Optional	Optional	Optional
TCD and loop injector	N/A	Optional	Included
Mass spectrometer	N/A	Optional	Optional

	Autosorb 6100 ↓	Autosorb 6200 ↓	Autosorb 6300 ↓
TECHNICAL SPECIFICATIONS			
Dimensions (W x D x H)	79.5 cm x 70.1 cm x 107.9 cm (31.3 in x 27.6 in x 42.5 in) dependent on configuration		
Weight	136.4 kg (300 lbs) dependent on configuration		
Operating environment	- Temperature: 15 °C to 35 °C (59 °F to 95 °F) - Humidity: 20 % RH to 80 % RH, non-condensing - Indoor use only		
Gas distribution manifold elastomers	FKM	FKM or EPDM (dependent on configuration)	PFE
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 m^3/sec - Seat leak rate: $5x10^{-12}$ Pa m^3/sec		
Pressure transducer (1550 Torr) - Analysis and degas	- Number: 3 to 5 (dependent on 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 configuration) - Accuracy: ±0.15 % reading up to 10 Torr - Resolution: 0.002 % full scale		
Pressure transducer (1 Torr) - MP only	- Number: 1 to 3 (dependent on configuration) - Accuracy: ±0.15 % reading up to 1 Torr - Resolution: 0.002 % 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: $5x10^{-4}$ to $1x10^{-3}$ Torr: ±10 % of reading $1x10^{-3}$ to 100 Torr: ±5 % of reading 100 Torr to atmosphere: ±25 % of reading		
Vacuum system	- Turbomolecular drag pump and dry diaphragm pump - Manufacturer's specification: $5x10^{-10}$ mbar - Typical pressure at analysis port: $2.67x10^{-5}$ mbar		
Thermal conductivity detector (TCD)	N/A	Two-filament TCD with rhenium/tungsten filaments Detection limit: 0.5 uL (air injected into helium)	
Included gas ports	7 (5 analysis, 1 helium, 1 degas/backfill)		15 (12 analysis, 1 helium, 1 degas/ backfill, 1 titration)
Optional gas ports	7 additional analysis	7 additional analysis 1 titration gas	N/A
Gas supply	- 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: 100 to 240 VAC ±10 %, 50 or 60 Hz - Maximum consumption: 1600 W (dependent on configuration)		
PC connection	Ethernet		
RoHS3 compliant	Yes		
CE / UKCA certified	Yes		

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