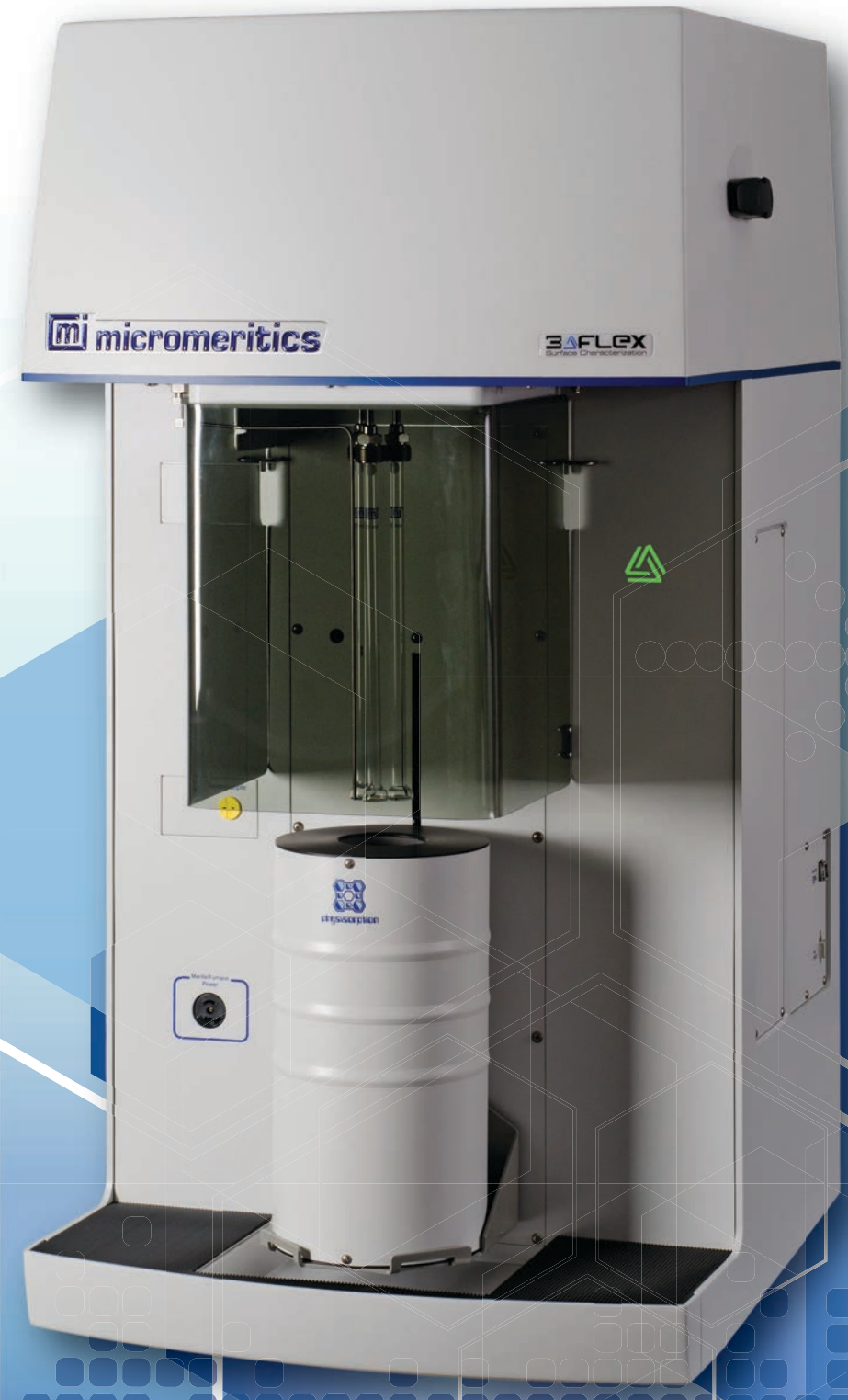
micromeritics®

3FLEX

Surface Characterization



3FLEX
Surface Characterization

Versatile High-Throughput Surface Characterization

Micromeritics 3Flex Surface Characterization Analyzer is a fully automated, three-station instrument capable of high-throughput surface area, mesopore, and micropore analyses with superior accuracy, resolution, and data reduction. Each analysis station is upgradable from mesopore to micropore with its own transducer for simultaneous sample analyses. With its many advanced features, the 3Flex was designed with a single focus: to improve analytical results.

Advancements in Perfomance and Technology

- Three configurable analysis ports for high-throughput – one, two or three micropore ports to meet current or future needs
- Standard mesopore, micropore, or physisorption ready instrument – includes krypton capability for low surface area materials
- Pneumatically actuated, hard seal valves provide ultra-clean, leak-free operation
- Stainless steel gas inlets, VCR fittings, and analysis manifold
- Interactive MicroActive software for data analysis with user-defined reporting options
- Advanced instrument diagnostics
- Small footprint conserves valuable lab space

Major Design Features

3Flex Major Design Features	Design Benefits	Results Advantages
316 SS VCR fittings and pneumatically actuated hard seal valves	Provides virtually leak-free gas management and lowest outgassing rate in the industry	Improving gas management control provides increased accuracy and sensitivity especially when collecting data in the most critical ranges of the isotherm
One instrument with three configurable analysis ports for high-throughput mesopore and micropore analyses	Eliminates costly investment in multiple instruments to accomodate varying high-throughput needs	Maximize your investment with a single instrument that fully addresses your current sample analysis needs and is expandable for future requirements
Stainless steel gas inlets, manifold, valving, and gaskets	Highly pure and chemically resistive surfaces provide a non-contaminating analytical environment	Eliminates interference from contaminates and outgassing associated with elastomer seals and o-rings. Highly resistive surfaces permit greater selection of adsorptive gasses and vapors to be explored
Dashboard continuously monitors critical system component performance and key maintenance scheduling	Maximizes instrument uptime by allowing the user to have instant access to performance indicators and alerts the user when routine maintenance is needed	Increases confidence in analytical results by providing one-click confimation of system performance. Maximizes uptime by ensuring that the user will never miss the recommended maintenance schedule
Minimal instrument footprint	Three configurable ports; improved sensitivity, accuracy, and repeatability; six gas inlets on one of the smallest footprints in the industry	Maximum performance and reliability from a high-performance instrument that conserves critical bench space. No extra height for safety shields

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Specification	3Flex Instrument Specifications	3Flex Analysis Performance Specifications	Discussion
Sample Analysis Ports	3 ports	1, 2 or 3 micropore-capable ports	High-throughput mesopore to micropore capability - ability to upgrade mesopore ports to micropore in the future
Vacuum System	Turbo molecular drag pump in series with four-stage diaphragm pump		Two pumps ensure a superior high vacuum system - one to pull pressure down to a level where the turbo molecular drag pump provides additional performance
Pumping Speed	53 L/sec (hydrogen) 61 L/sec (nitrogen)	53 L/sec (hydrogen) 61 L/sec (nitrogen)	High pumping speed is essential to permit fast and clean evacuation
Ultimate Vacuum	3.75 x 10^{-10} mmHg		Determines the quality and speed of analysis
Vacuum Gauge	Dual Cold Cathode/ microPirani gauge	Gauge placed in close proximity to sample port	For proper monitoring, the gauge must be placed close to sample port. Measuring vacuum at the pump is not indicative of pressure at the sample. The 3Flex design permits automatic zeroing, ensuring greater accuracy and repeatability
Minimum Measureable Surface Area	0.01m^2/g	0.0005 m^2/g (krypton)	Standard krypton capability permits very low surface area material to be accurately analyzed
Manifold Outgas Rate	<0.1 µmHg/min	0.05 µmHg/min	Essential to limit outgas rate for accurate adsorption measurements of the isotherm
Transducers	10 mmHg, ± 0.12% of reading 0.1mmHg, ±0.15% of reading	10 mmHg, ±0.12% of reading accuracy screen resolution 0.0001 mmHg 0.1mmHg, ±0.15% of reading accuracy screen resolution 0.000001 mmHg	Percent of actual reading is more accurate than percent of full scale deflection Due to our proprietary temperature control, the actual analysis performance of the transducer has demonstrated better accuracy than the instrument specification
Adsorptive Gas Inputs	6	Expandable to 12	Expandable versatility extends adsorptive gas range investigation to optimize analysis
Degas	3 *in situ*, 6 with optional SmartPrep	Ambient to 450 °C, programmable - 5 heating and 5 soak periods	Helium free-space can be performed after analysis to prevent helium entrapment
Dewar	3.2 L capacity, >80 hrs (single tube, no isothermal jacket)	>70 hrs (3 sample tubes, isothermal jackets, P_o tube)	Re-designed and improved Dewar can provide analysis time greater than listed specification with a unique design that permits refilling without interrupting analysis
Control of Cryogen Level on Sample Tube	Isothermal jacket		Assures a constant thermal profile along the length of both the sample and P_o tubes throughout an extended analysis - permits refilling Dewar without interrupting analysis. No exposed areas of sample tube above liquid cryogen level
Sample Tubes	Metric, flat bottom, 9 and 12mm		Tubes are clearly marked for diameter and feature convenient ID Spot

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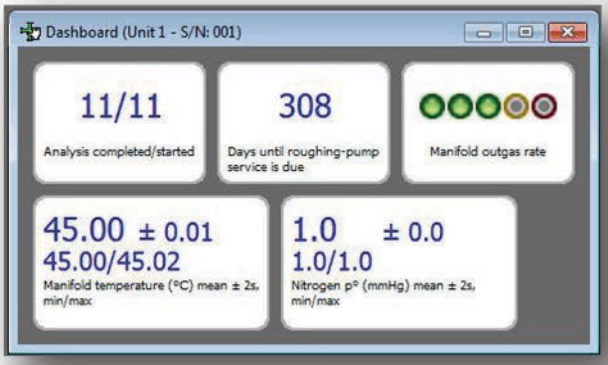
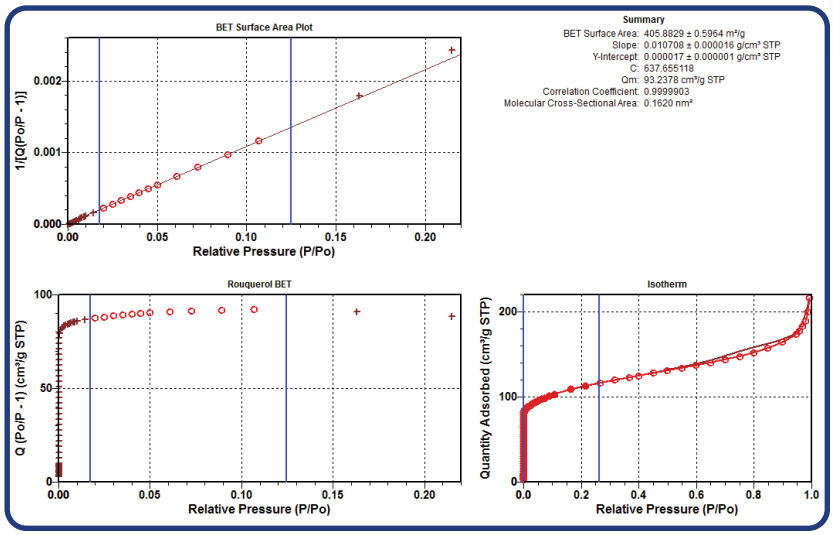
Innovative Instrument Diagnostics

With a single click, the 3Flex provides a powerful suite of information that allows the user to maintain the instrument in peak operating condition with real-time analysis views.





MICRO ACTIVE

MicroActive for 3Flex

Interactive data manipulation permits user to accurately and precisely determine surface area and porosity. User selectable data ranges through the graphic interface allows direct data modeling for BET, t-plot, Langmuir, and DFT interpretation, minimizing time to results.

Specifications

Physical	*Height:*	44 in. (111.76 cm)
	Width:	22.5 in. (57.15 cm)
	Depth:	24 in. (60.96 cm)
	Weight:	185 lbs. (83.91 kg)
Power Consumption	*Voltage:*	100/115/230 VAC
	Frequency:	50 or 60 Hz
	Power:	1500 VA, maximum
Operating Conditions	*Temperature :*	10 to 35 °C (50 to 95 °F) operating
		0 to 50 °C (32 to 122 °F) non-operating
	Humidity:	20% to 80% relative, non-condensing

HEADQUARTERS
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