

QUANTACHROME

MONOSORB™

RAPID SURFACE AREA ANALYZER



Quantachrome
INSTRUMENTS

MONOSORBTM AUTOMATION • SPEED • RELIABILITY



Features of the MonosorbTM

The Monosorb utilizes a modified BET equation for extremely rapid, single-point determinations of surface area. Over the years, the Monosorb has evolved into a highly sophisticated instrument with increased ease of operation, accuracy, reliability, and full automation.

Ease-of-Use

- Direct display of surface area upon completion of analysis.
- Personnel can learn to operate the Monosorb in a matter of minutes.
- Sample cells are held in self-sealing Quick Connect fittings, which automatically snap closed when the sample cell is removed.

Speed

- Requires approximately six minutes to complete an analysis.
- Uses small quantities of sample, resulting in short degassing and analysis times.
- Utilizes a modern and reliable method for rapid and accurate BET surface area measurements.
- Does not require void volume measurements and ideal gas corrections.

Autocalibration

- A calibrated gas loop makes calibration fast and easy.
- The microprocessor-controlled autocalibration permits users to confirm calibration quickly and easily.
- For adsorbates other than nitrogen, a manual override permits the instrument to be recalibrated in a matter of minutes.

Reliability

- The unique autocalibration feature ensures that the Monosorb will produce reliable data for years.
- Electronic circuitry operates the filaments of the specially designed, ultra-stable thermal conductivity detector at extremely low current to prevent burn out.

Sensitivity and Range

- Uses samples weighing less than one gram and performs measurements of surface areas as low as 0.1 square meters in the sample cell regardless of adsorbate gas used.

Accuracy and Reproducibility

- The Monosorb typically achieves a reproducibility better than 0.5%.
- Linearization of the measured surface area with the voltage signal is accomplished using a highly accurate A/D converter.

Versatility

- Utilizes a modified BET equation for single-point surface area determinations.
- A selectable flow path accommodates larger samples of high surface area.
- Can be used with many different adsorbates, including argon, krypton, carbon monoxide, carbon dioxide and other non-corrosive gases.

Optional Accessories

- The THERMOFLOW for simultaneous preparation of three additional
- The FLOW CONTROLLER for gas blending.

MONOSORB™ SPECIFICATIONS

Operation of the Monosorb™

Samples are prepared for analysis in the built-in degas station. Flowing gas sweeps away impurities, resulting in a clean surface upon which adsorption may occur. The sample can be heated to a user-selectable temperature with the supplied heating mantle. Digital temperature control and display are mounted on the instrument front panel. After degassing is complete, the sample cell is transferred to the analysis station. Quick connect fittings automatically seal the sample cell during transfer.

With the push of a single button, analysis commences. A dewar flask filled with coolant is automatically raised, immersing the sample cell and causing adsorption. The instrument detects when adsorption is complete (2-3 minutes), automatically lowers the dewar flask, and gently heats the sample cell back to room temperature using a built-in hot-air blower. As a result, the desorbed gas signal is displayed on a digital meter and the surface area is directly presented on a front panel display. The entire measurement (adsorption and desorption) cycle typically requires less than six minutes.

The technique uses a high sensitivity, thermal conductivity detector to measure the change in concentration of an adsorbate/inert carrier gas mixture as adsorption and desorption proceed. When integrated by the on-board electronics and compared to calibration, the detector provides the volume of gas adsorbed or desorbed. A built-in microprocessor ensures linearity and automatically computes the sample's BET surface area.

Performance

Surface Area Range: 0.1 m² to >250 m²
(0.01 m²/g to 3,000 m²/g)

Adsorbate*: Nitrogen (standard operation)
Argon
Krypton (very low surface areas)
Carbon Dioxide

Ads/Des cycle: Automatic

Dewar elevator: Automatic

Desorption: Hot air blower

Calibration loop: Icc

Analysis Stations: One (quick disconnect fitting)

Preparation Station: One (quick disconnect fitting)

Degas Temperature: Room Temp to 350°C (450°C optional)

* In a mixture with Helium

Gases

Compatibility: Ar, Kr, He, CO₂

Input Pressure(gauge): 140 kPa

Gas lines(supplied): quick disconnect to 1/8" swage

Physical

Depth: 32 cm (12.5 in.)

Width: 62.5 cm (24.5 in.)

Height: 65 cm (25.5 in.)

Weight: 24 kg (53 lbs.)

Electrical

Voltage: 110-120 V or 220 V

Frequency: 50/60 Hz

Connection: Grounded single plug outlet

Environmental

Ambient Temperature: 15-40°C

Related Humidity: 20-90% (non-condensing)

Accessories Included

- One Dewar Flask
- Three Sample Cells
- Two Cell Holder Assemblies
- Heating Mantle (350°C max)
- Spare O-rings and septums
- Instructional Manual

Accessories

Gas Regulator Assembly

Proper Monosorb functioning is assured when high-quality gas regulators are used. Quantachrome supplies complete assemblies which include two stage regulators with dual gauges, cylinder connector, isolation valve and 1/8" gas line connector. The regulators feature stainless steel, non-venting diaphragms and the appropriate CGA fitting for specific gases. Different assemblies are available for nitrogen and other inert gases including helium, hydrogen, carbon monoxide, oxidizing gases etc.



Gas Blender (Mass Flow Controller)

Physisorption measurements require mixed gases, e.g. 30% N₂ in He for BET surface area. Quantachrome offers this two-channel gas mixer. Simply dial in the required gas flow, up to 20 ml/min, into each of the two precision mass flow controllers. One channel comes ready calibrated for helium the other for seven other gases.

Thermoflow™ Degasser

Recommended for Monosorb surface area analyser. Affordable, high throughput sample preparation. Each of three stations has independent temperature controls.



Rotary Micro Riffler

Like most powder and porous materials characterization, surface area studies generally require sub-samples much smaller than the original samples. The Rotary Micro Riffler uses the most accurate way of splitting a powder sample into smaller fractions- spin riffing. The vibrating hopper features adjustable feed rate and the variable-speed collector uses standard or micro test tubes.





Quantachrome Instruments' corporate headquarters in Boynton Beach, Florida.

Quantachrome®

Renowned innovator of ideas for today's porous materials community.

For almost 40 years, Quantachrome's scientists and engineers have revolutionized measurement techniques and designed instrumentation to enable the accurate, precise, and reliable characterization of powdered and porous materials:

- Adsorption/Desorption Isotherms
- Surface Area Measurement
- Pore Size Distribution
- Chemisorption Studies
- Water Sorption Behavior
- Mercury Porosimetry
- True Solid Density
- Tapped Density

Not only are Quantachrome products the instruments of choice in academia, but the technology conceived and developed by our expert staff is applied in industrial laboratories worldwide, where research and engineering of new and improved porous materials is ongoing. Manufacturers also rely on porous materials characterization technology to more precisely specify bulk materials, to control quality, and to isolate the source of production problems with greater efficiency.

Quantachrome is also recognized as an excellent resource for authoritative analysis of your samples in our fully equipped, state-of-the-art powder characterization laboratory.



Quantachrome Instruments Application Laboratory.

CORPORATE HEADQUARTERS

Quantachrome Instruments

1900 Corporate Drive
Boynton Beach, FL 33426 USA
Phone: +1 (561) 731-4999
Fax: +1 (561) 732-9888
E-mail: qc.sales@quantachrome.com

CHINA

Quantachrome Representative Office

M806. Jingbao Garden
183 Andingmenwai Street
Beijing 100011, China
Tel/Fax: +86 10 64400892

EUROPE

Quantachrome UK Limited

Pale Lane Farm, Pale Lane
Hartley Wintney
Hook RG27 8BA, UK
Phone: +44 (0) 1252819719
Fax: +44 (0) 1252819901

EUROPE

Quantachrome GmbH & Co. KG

Rudolf-Diesel Str. 12
85235 Odelzhausen, Germany
Phone: +49 (0) 8134/93240
Fax: +49 (0) 8134/932425



Quantachrome Instruments' quality management system is certified to be in accordance with ISO9001:2000.

WORLDWIDE SALES AND SERVICE

Argentina	Mexico
Australia	Middle East
Austria	Morocco
Bahrain	Netherlands
Belarus	New Zealand
Belgium	Norway
Brazil	Oman
Bulgaria	Pakistan
Canada	Peru
Central America	Philippines
Chile	Poland
China	Portugal
Colombia	Puerto Rico
Croatia	Romania
Cyprus	Russia
Czech Republic	Saudi Arabia
Denmark	Singapore
Egypt	Slovak Republic
Estonia	Slovenia
Finland	South Africa
France	South Korea
Germany	Spain
Greece	Sri Lanka
Hungary	Sweden
India	Switzerland
Indonesia	Taiwan
Ireland	Tanzania
Israel	Thailand
Italy	Turkey
Jamaica	Ukraine
Japan	United Arab Emirates
Jordan	United Kingdom
Kuwait	Uruguay
Latin America	Uzbekistan
Latvia	Venezuela
Lithuania	Vietnam
Malaysia	

Quantachrome
INSTRUMENTS

Serving Porous
Materials and Powder
Characterization
Needs Since 1968



www.quantachrome.com

Trademarks and registered trademarks are the property of their respective owners.