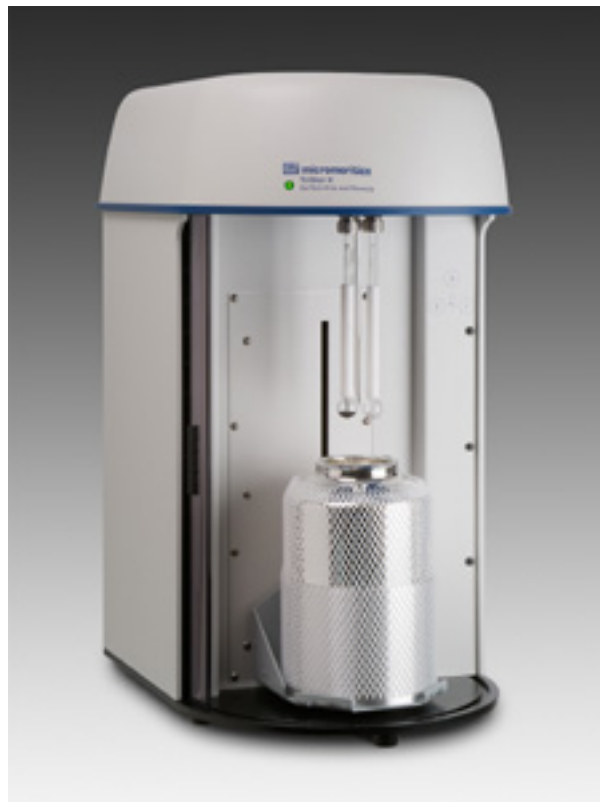


Tristar 3020



- [Description](#)
- [Features](#)
- [Analysis Technique](#)
- [Technical Specifications](#)

Description

The **Tristar® II 3020** provides high-quality surface area and porosity measurements on solid materials by using the technique of gas adsorption. The TriStar II is a fully automated, three-station analyzer capable of increasing the speed and efficiency of quality control analyses, with the accuracy, resolution, and data reduction to meet most research requirements. This easy-to-operate, tabletop instrument is designed to analyze up to three samples simultaneously for optimum throughput. Its speed and accuracy make it an ideal instrument for a wide variety of applications that include pharmaceuticals, catalysts, carbon, cosmetics, paints, pigments, geoscience, fuel cells, high-tech ceramics and much more. The instrument features a krypton option, allowing measurements in the very low surface area range. The instrument also combines versatility in analysis methods and data reduction to allow the user to optimize analyses to specific applications. For applications that fall under FDA's 21CFR11 rule, the TriStar's [confirm™](#) software option provides the security features and audit trails required by this regulation.

Features

- Three analysis ports can operate simultaneously and independently of one another. Three BET surface area measurements can be performed in less than 20 minutes. For additional throughput, four TriStars can be operated with one computer.
- Surface areas as low as 0.01 m²/g can be measured with the standard nitrogen system. A krypton option can extend surface area measurements to as low as 0.001 m²/g.
- A dedicated P₀ port is standard, allowing the measurement of saturation pressure on a continuous basis.
- Incremental or fixed dosing routines prevent overshooting pressure points while minimizing analysis time.
- Free space can be measured, calculated, or manually entered.
- Enhanced product support features include: video clips, Ethernet communication between the computer and TriStar II, bar code reader capability, built-in electronic test points and diagnostic software; ability to perform remote diagnostics via the internet; and the ability to read and compare historical TriStar and Gemini data to TriStar II data.
- A 2.75-liter Dewar and extended length sample tubes allow complete adsorption and desorption isotherms to be collected without operator intervention.
- The TriStar II can collect up to 1000 data points.
- Intuitive and powerful Windows® based software: The most powerful features of this software are found in its expanded range of data reduction and reporting. SPC reports, new

isotherm and thickness models, isosteric heat of adsorption, and integrated DFT models are all included.

- A variety of optional sample preparation devices are available.
 - An attractively designed cabinet combines a small footprint with easy accessibility
-

Analysis Technique

The TriStar II 3020 uses physical adsorption and capillary condensation principles to obtain information about the surface area and porosity of a solid material. The analytical technique is simple: a sample contained in an evacuated sample tube is cooled (typically) to cryogenic temperature, then is exposed to analysis gas at a series of precisely controlled pressures. With each incremental pressure increase, the number of gas molecules adsorbed on the surface increases. The equilibrated pressure (P) is compared to the saturation pressure (P_o) and their relative pressure ratio (P/P_o) is recorded along with the quantity of gas adsorbed by the sample at each equilibrated pressure.

As adsorption proceeds, the thickness of the adsorbed film increases. Any micropores in the surface are filled first, then the free surface becomes completely covered, and finally the larger pores are filled by capillary condensation. The process may continue to the point of bulk condensation of the analysis gas. Then, the desorption process may begin in which pressure systematically is reduced resulting in liberation of the adsorbed molecules. As with the adsorption process, the changing

quantity of gas on the solid surface at each decreasing equilibrium pressure is quantified. These two sets of data describe the adsorption and desorption isotherms. Analysis of the shape of the isotherms yields information about the surface and internal pore characteristics of the material.

Specification

Measurement:

Absolute

Resolution: Within 0.05 mmHg

Accuracy : Within 0.5%

Linearity Within specified full scale (transducer manufacturer's

Relative

Resolu < 10⁻⁴

□

P/Po ratio 0 to 1.0 Range: 0 to 950 mmHg

Analysis:

Specific Surface Area:

From 0.01 m²/g, nitrogen unit

From 0.001 m²/g, krypton unit

Total Surface Area:

From 0.1 m², nitrogen unit

From 0.01 m², krypton unit

Pore Volume:

From 4 x 10⁻⁶ cm³/g

Dewar : > 24 hours

Corruptive Gases:

Nitrogen Nitrogen; argon, carbon dioxide, or other non-corrosive gases; butane, methane, or other light h

Krypton Same as Nitrogen unit, plus the capability to perform krypton surface area analyses at lower pre

The TriStar should be operated in a properly vented environment when using flammable or toxic gases.

Temperature:

Accuracy: ± 0.25 °C

Resolution: Within 0.1 °C

Electrical: Voltage: 100/200,220/240 VAC

Frequency: 50/60Hz

Power: 150 VA (maximum)

Physical: Height: 76 cm (30 in.)

Width: 64 cm (25)

Depth: 53 cm (21 in.)

Weight: 45 kg (100 lb.)

Other Hardware:

Miscellaneous: ISO 9001 manufacturer
CE certified

