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DATASHEET

Vitrobot Mark IV

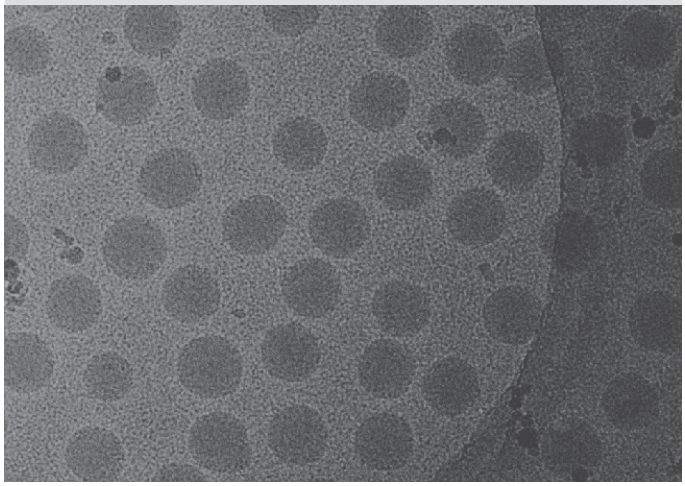
Explore the real structure of biological samples

The Vitrobot Mark IV System is a state-of-the-art specimen preparation unit that offers great value to the demanding scientific areas of cell biology and molecular imaging as well as being very suitable for food, industrial, pharmaceutical and nanotechnological applications—where the true colloidal structure needs to be viewed.

Fundamental research in cellular and structural biology is increasingly focused on unraveling interactive processes and pathways at the macromolecular level. High resolution transmission electron microscopy (TEM) of biological samples instantly frozen in ultra thin layers of vitreous ice allows scientists to visualize three-dimensional macromolecular structures and molecular machines in pristine, fully hydrated condition, and in their naturally occurring context. The Thermo Scientific™ Vitrobot™ Mark IV completely automates the vitrification process to provide fast, easy, reproducible sample preparation—the first step in obtaining high quality images and repeatable experimental results.

Vitrification cools the sample so rapidly that water molecules do not have time to crystallize, forming instead an amorphous solid that does little or no damage to the sample structure. The Vitrobot Mark IV System, the fourth generation of the Vitrobot line, provides precise but flexible control of all critical parameters in the plunge-freezing process. Its newly designed touch screen interface is robust and easy to use. Sophisticated automation guarantees high quality, reproducible processing and high sample throughput. The enclosed process chamber allows careful control of environmental variables, such as temperature and prevents the cooling and concentration artifacts often associated with ‘open space’ freezing methods. The new coolant container includes an anti-contamination device and provides a more efficient post freeze handling path. The Vitrobot Mark IV System can improve the speed and quality of sample preparation in any application where colloidal structure is important.

Key Benefits
Fully automated, reproducible vitrification of aqueous suspensions
Precise control of critical process parameters
Enclosed process chamber
High sample throughput
Easy and flexible user interface
Semi-automated grid transfer



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Technical specifications

- Weight 31 kg

Dimensions

- l/w/h 413/260/890 mm

Power supply

- Voltage 110 – 230 V
- 50 – 60 Hz
- Fuse 4 AT (110 V USA)
- Fuse 2 AT (230 V Europe)
- Power cable 90 – 250 V

Operating parameters

- Working temperature 4–60° C
  (at an ambient temperature range between 18–25° C)
- Peltier controlled heating/cooling
- Maintain relative humidity at 100%
- Ultrasonic controlled humidification

Instrument control

- Linux operating system
- Touch screen control and set-up
- Mouse and foot pedal controls also available

Sample application

- Small sample volumes can be applied manually with a pipette through a small side port on the left and the right side of the climate chamber
- Both application time and wait time (between application and blotting) are software controlled and can be set in the user interface
- Precisely timed control of multiple sample applications, blotting actions, and vitrification enables time resolved analysis of interactions among separately applied components

Blotting device

- Excess fluid is removed from the grid by (repeated) blotting with filter paper on rotating foam pads
- Number of blotting actions (max. 16 times for one grid) and duration of blotting are software controlled and can be set in the user interface
- Longitudinal grid positioning (‘blot offset’) and wait time between blotting and vitrification (‘drain time’) are user definable

Vitrification process

- Automated shutter control allows smooth, instant injection of the sample grid into the coolant (liquid ethane or propane). A lift for the container brings the coolant close to the shutter to ensure optimal vitrification
- Synchronous lowering of the coolant container and the grid holder keeps the grid submerged in the coolant and minimizes the risk of contamination prior to transfer ring the sample into a storage box or cryo holder
- Coolant container with integrated anti-contamination ring
- Grid transfer from the coolant towards a grid box in the liquid nitrogen environment is semi automated

Find out more at **thermofisher.com/EM-Sales**

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