



MODEL 1062 TrionMill

A fully automated tabletop argon ion mill that features highly flexible milling parameter adjustment. The instrument offers large-scale milling of planar and cross-section samples. Samples of up to 50 mm diameter are effectively processed with three ion sources, which creates the largest and most uniform flat area achievable by ion milling. Allows the direct transfer of environmentally sensitive materials to a scanning electron microscope (SEM) or focused ion beam system (FIB).

Model 1062 TrionMill specifications

Ion sources

- Three TrueFocus ion sources
- Variable energy (100 eV to 10.0 keV) operation
- Beam current density up to 10 mA/cm²
- Milling angle range of 0 to +10°
- Choice of single, double, or triple ion source operation
- Motorized ion source angle adjustment
- Independent ion source energy control
- Adjustable spot size (300 µm to 5 mm)
- Faraday cups for the direct measurement of beam current from each ion source; allows optimization and adjustment of the ion source parameters for specific applications
- Beam alignment camera
- Milling rates in excess of 500 µm/hour
- Low ion source maintenance

Load lock

- Front-loading load lock for high sample throughput
- Pneumatic vacuum gate valve
- Bayonet sample holder capture with quick release functionality

User interface

- Instrument operation controlled via 10-inch, ergonomically adjustable touch screen

Automatic termination

- Automatic termination by time or temperature

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Sample stage	<p>Offers both planar and cross-section milling capabilities:</p> <ul style="list-style-type: none">• Planar Up to 50 mm diameter x 25 mm height [1.968 x 0.787 in.]• Cross section Maximum: 10 x 10 x 4 mm [0.39 x 0.39 x 0.157 in.] <p>Automatic height detection establishes the milling plane, which yields repeatable results</p> <p>360° sample rotation or rocking motion with variable speed</p>
Sample cooling (optional)	<p>Liquid nitrogen conductive cooling with integral dewar</p> <p>Dewar access positioned close to instrument operator</p> <p>Provides up to 18 hours of cryo conditions</p> <p>Offers cryo protection capability, which automatically stops milling operations if the stage temperature rises above a user-selected temperature threshold</p>
Cross-section station (optional)	<p>Produces pristine cross-section samples</p> <p>Allows precise positioning of the area of interest: x, y, and θ</p> <p>Effective for use with a wide variety of materials, including semiconductor devices, multilayers, ceramics, polymers, and hard/brittle materials</p> <p>Prepared region of interest is flat and free from damage for subsequent SEM imaging and analysis</p> <p>Accommodates a wide range of sample and mask sizes:</p> <ul style="list-style-type: none">• Sample and mask align both laterally and angularly• Multiple uses from a single mask
Vacuum/inert gas/cryogenic transfer system (optional)	<p>Allows direct transfer of a sample at vacuum, in inert gas, or at a cryogenic temperature to a SEM or FIB</p> <p>Uses active pumping to maintain high vacuum</p> <p>A collaboration with Quorum Technologies Ltd.</p>

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Sample viewing (optional)

Sample can be monitored in situ in the milling position when using the high-magnification microscope

Microscope options:

- 525X high-magnification microscope
- 1,960X high-magnification microscope

Viewing window is protected by a programmable shutter that prevents buildup of sputtered material and preserves the ability to observe the sample in situ

Sample image acquisition (optional)

CMOS (complementary metal oxide semiconductor) camera for image acquisition and display

Useful for monitoring the delayering process

Image acquisition system includes:

- CMOS camera
- Secondary monitor
- Imaging computer
- Keyboard
- Mouse

Images can be saved to the imaging computer or transferred to another computer

Remote operation (optional)

Enables operation of multiple milling tasks from a remote computer, including:

- Recipe programming
- Start, pause, stop, and restart
- Sample viewing
- Sample image acquisition
- Operating parameters monitoring
- Service diagnostics

Stack light indicator (optional)

Allows the determination of milling operation status from a distance

Sample illumination

Both high-magnification microscopes have light sources that provide top-down, user adjustable, reflected sample illumination

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Process gas	Argon \geq 99.999% purity (ultra high, Grade 5.0) Automatic gas control using three mass flow controllers
Control gas	Nitrogen \geq 99.99% purity (high, Grade 4.0) or clean, dry air (CDA)
Vacuum system	Turbomolecular drag pump and an oil-free, multi-stage diaphragm pump Vacuum sensing with a cold cathode, full-range gauge
Enclosure	Width: 75.46 cm [29.71 in.] Height: <ul style="list-style-type: none">• Touch screen: 66.13 cm [26.04 in.]• High-magnification microscope: 85.27 cm [33.57 in.] Depth: 85.91 cm [33.82 in.] Enclosure design offers easy access to internal components
Weight	99.8 kg [220 lb.]
Power	100/120 or 220/240 VAC; 50/60 Hz; 1000 W
Warranty	One year



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