

MicroMill

A Microsampling Device For Isotopic Analysis



The MicroMill Advantages

- Sub-micron sample motion control.
- High-precision milling.
- Sample height detection and tilt correction by a drill-tip sensor.
- Sample map navigation increases sample-area field-of-view.
- 50mm of computer-driven sample movement on X, Y and Z axes.
- Sub-sampling path interpolation.
- Data/image file re-coordination, including save, recall, and export.
- New contour-following function.

Applications

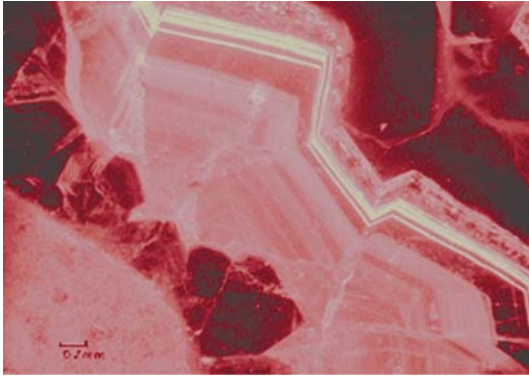
Because of its high-resolution milling capability, MicroMill is extremely useful in a range of applications. Two examples of these are the following:

- Complex crystal growth zonation: Subsampling provides high-resolution elemental isotopic chemistries, and intra-zonal variations of the crystal structure.
- Accretionary growth structure examination: Subsampling within annual growth banding of molluscan shells allows reconstructing seasonal variations present during the life of an organism, such as a clam.

A Unique Microsampling Device

MicroMill is a microsampling system designed for high-resolution milling to recover sample powder for chemical and isotopic analysis.

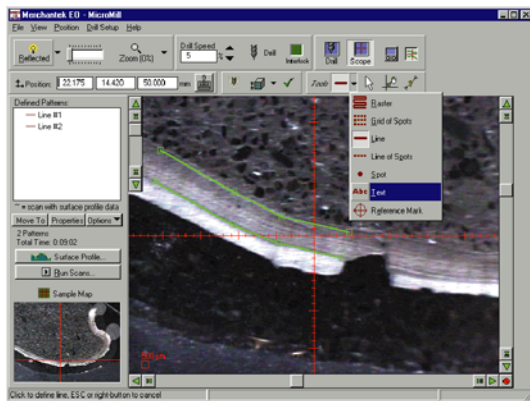
The combination of sub-micron stage resolution and position accuracy, real-time video observation and proprietary software permits sampling of complex accretionary structures in skeletal and crystalline materials.



Study growth zones in diagenetic carbonates: MicroMill's subsampling capability provides high-resolution elemental isotropic chemistries and intrazonal variation of crystal structure.



Accretionary growth banding in molluscan shell: Subsampling within the annual growth banding of a clam shell allows reconstruction of seasonal variations present during the lifespan of this organism.



MicroMill software main screen: Sample navigation window shown in lower left corner increases the field-of-view up to 52mm wide.

Hardware Specifications

- High-resolution stereo microscope with 6.7X to 40X optical zoom and petrographic features
- S-video color CCD video camera with 24.5mm to 3.3mm field-of-view for imaging and digitizing of sample
- Independent (second) color CCD camera with 3X digital magnification for in-process viewing of mill bit
- Automated 50mm travel in X, Y and Z stages with sub-micron step resolution
- Open-stage architecture accommodates large samples
- Software-selectable flood and transmitted lighting
- Continuously adjustable (360°) cross polarizers
- Low-eccentricity, high-torque DC milling chuck with variable speed (1,200 – 35,000rpm)
- Precision tungsten-carbide milling tools for high spatial resolution
- Joystick stage control for manual sample positioning.

Hardware Specifications

- MicroMill software (Windows®-based) with point-and-click functions
- Live video image displayed on computer monitor
- On-screen display of digitized and interpolated sub-sampling paths
- Precise depth control over entire area of sampling
- Z-tilt correction and contour-following functions
- Off-line digitized files can be read directly with software transformation of image coordinates
- Data record file with sample-path information and estimated sample volumes
- Save, recall and export images (BMP, TIF, JPG and TGA files)

Site Requirements

Length	16" / 406 mm
Width	12" / 305 mm
Height	26" / 660 mm
Weight	42 lb. / 19 kg
Voltage	100 - 240 VAC, 300W, 50/60 Hz



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