Sample Preparation and Cross-Section Preparation

ArBlade 5000 /
IM5000-CTC

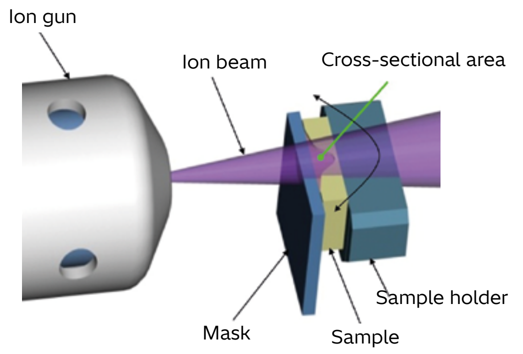
Argon ion Polishing Systems of the IM Series

The clever alternative to FIB technology

The IM series systems are indispensable for SEM sample preparation. They are ideal for when high-quality, millimetre-scale cross-sections or surfaces are needed and conventional mechanical preparation methods don't give satisfactory results. The two systems IM4000 II and ArBlade 5000 are presented on the following pages.

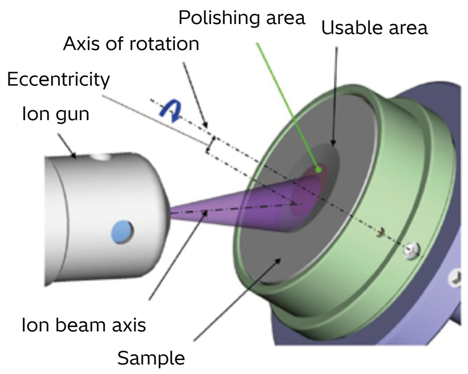
Cross-section preparation

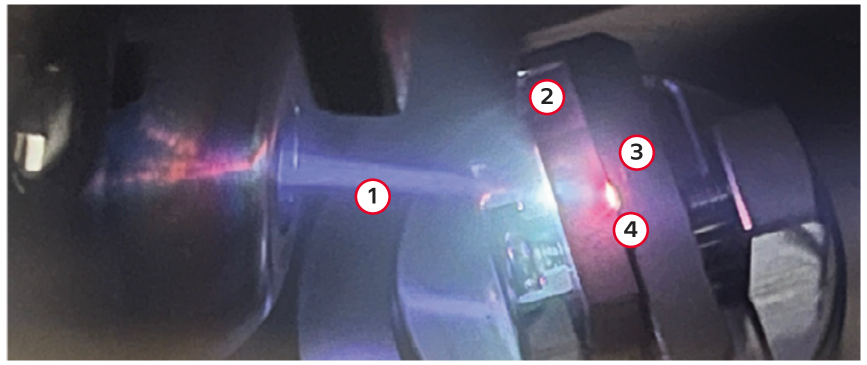
Sharp, precisely positionable and mechanically undisturbed cross-sections in millimetre widths through almost all materials and composites. Even heat-sensitive materials such as polymers can be processed successfully, and an optional temperature-controlled cryogenic version is available if required. A sample height of up to 8mm also allows for larger workpieces.



Surface polishing (flatmilling)

Post-processing of mechanically pre-polished surfaces on samples up to 50mm in diameter and 25mm in height. By freely selecting the angle of incidence of the ion beam, various effects can be achieved, from surface smoothing and cleaning for EBSD analyses to relief generation through selective sputtering.

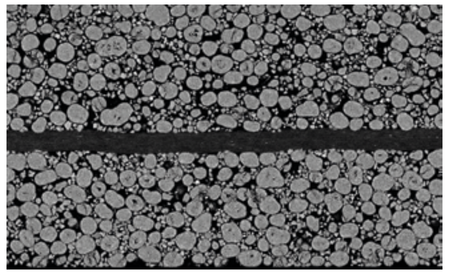




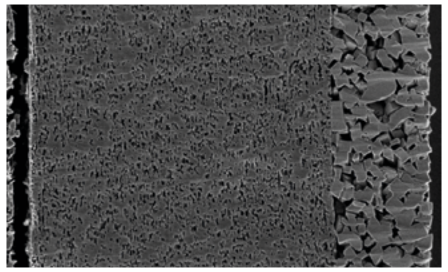
1 Argon ion beam
2 Mask
3 Sample stub
4 Sample

Insight into the ArBlade 5000 sample chamber during cross-sectioning at an NCM LiB cathode

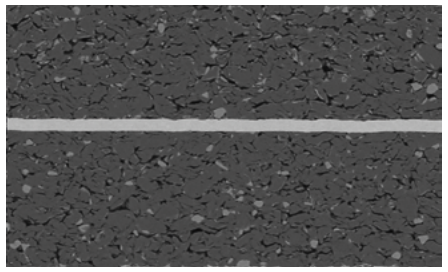
Energy systems



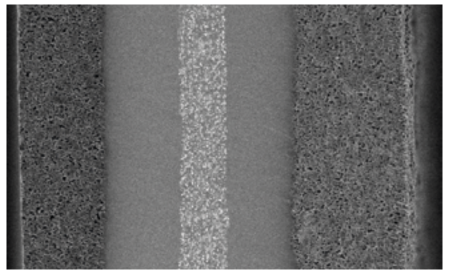
LiB NCM Cathode



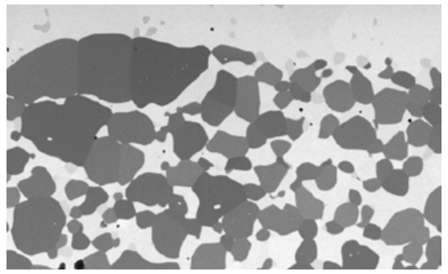
LiB separator film



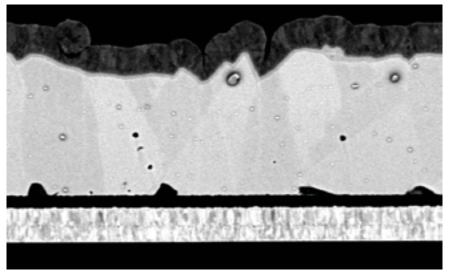
LiB Anode



Polymer fuel cell

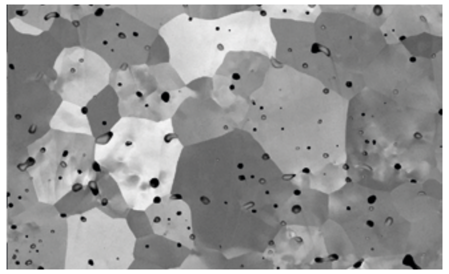


Ceramic fuel cell (La-Ce/NiO)

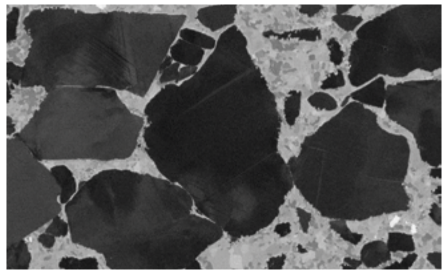


CIGS solar cell

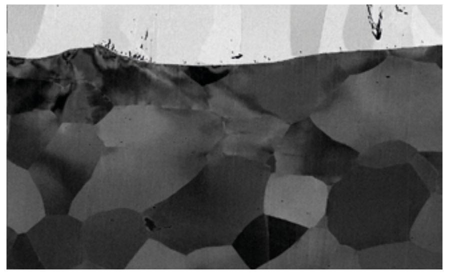
Metals



Tungsten alloy

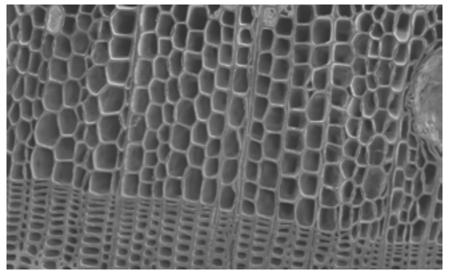


Boron nitride

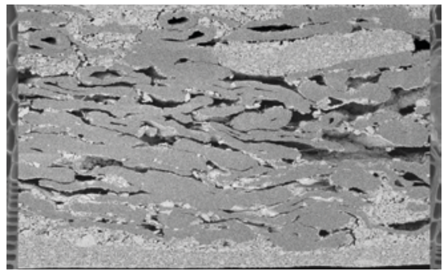


Zinc coating on steel

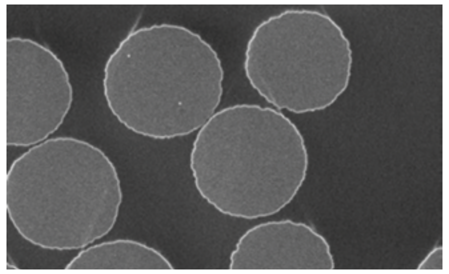
Organics



Wood



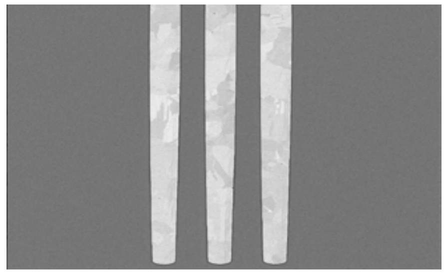
Paper



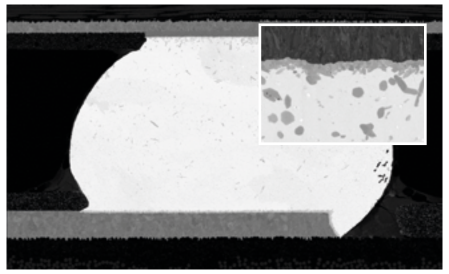
Carbon fibre reinforced plastic

Semiconductors

Chip bonding wires



Cu TSV



Bonding ball on PCB

ArBlade 5000 / IM5000-CTC

High-performance Ar+ ion polisher

Variable width cross-section due to lateral movement of the sample

ArBlade 5000 / IM5000 extends the cross-sectioning capabilities of the IM4000 II series with the option of expanding cross-sections to a width of up to 10mm, depending on actual requirements. For this purpose, the sample is periodically moved laterally during cross-cutting in the previously registered processing area while remaining in the optimum focus. Sequential processing of several individual positions is also possible as an option; the optional multiple sample holder allows automatic processing of up to 3 samples.

The ArBlade 5000 / IM5000 is equipped with a more powerful ion gun with a removal rate of over 1mm per hour. With the ArBlade 5000-CTC, cryo cross-sections of variable widths are also possible at definable process temperatures down to -100 °C.

✓ Air Protection

Product Features

- Single, robust and maintenance-friendly Penning type ion gun with independent control of beam current and acceleration voltage. Allows intensive ion beams at all acceleration voltages (0-8kV)
- Cross-section widths can be flexibly selected by periodically moving the sample relative to the ion beam from 1mm to 10mm wide
- Cross-sectional process depth in Si with 100µm protrusion above mask, stage oscillation +/-30°, is 1000µm per hour or more
- Surface polishing can be carried out at tilt angles from 0° to 90°, angle can be changed during the process

Optional Accessories

- Flat milling equipment for specimen up to 50mm Ø and 25mm height
- Multiple cross-section holders for up to 3 samples up to 15mm wide, or one sample up to 50mm wide
- Advanced Control Software for extended range of functions
- Inert gas transfer function “Air protection” for cross sections and surface polishing
- Special cryo cross-section holder for extra fast and accurate cryo processes

All extensions and additions from IM4000 are available. Plus exclusive IM5000 / IM5000 CTC additions:

Advanced Control Software
External operating software with an extended range of functions, allowing the creation of free work sequences with several cross-section positions, for example

Multiple / Large Sample Holder
Extended traverse path of 40mm allows sequential automatic processing of several individual samples or even a single sample up to 50mm wide

Positioning Microscope for Clamp Holder
Alternative to the mechanical sample positioners for spring clamp holders (cryo and multiple cross-section holders)

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