



Applications of Ion Beam Slope Cutting with Gatan's PECS

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Ion Beam Slope Cutting is a technique for cutting heterogeneous materials without producing mechanical deformation or damage. It can reveal internal microstructure by a representative cut through the sample along selected surface lines with any wanted inclination. It has essential advantages in comparison with typical mechanical grinding/polishing methods and can be applied universally to most materials. Compared with the FIB method 10000 times larger cut areas can be produced with noble gas ions.

Ion Beam Slope Cut through LTCC Thick Film Structures

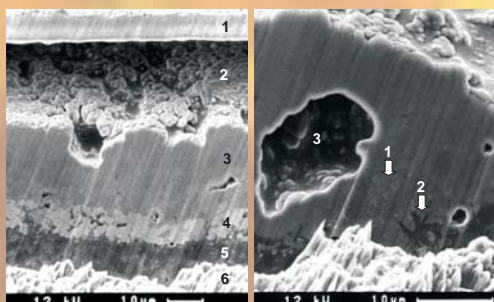


Fig. 1. General view of the cross-section: 1 - bottom edge of diaphragm, 2 - thermistor surface, 3 - thermistor film, 4 - conductive film, 5 - substrate, 6 - ion etched surface of LTCC.

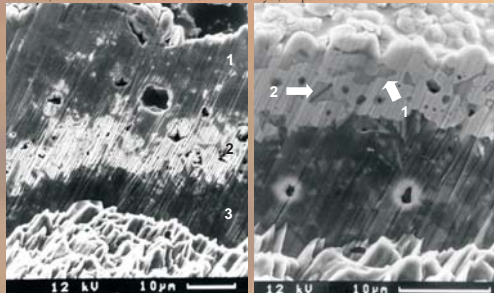
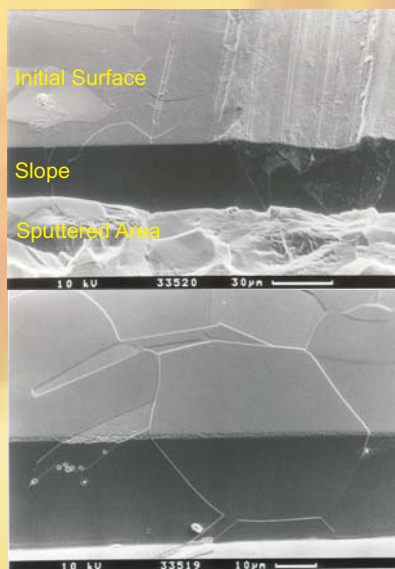


Fig. 2. Cross-section of thermistor layer: 1 - poorly visible grains, 2 - cluster of bar-like grains transferred from the substrate to the thermistor layer, 3 - pore.

Samples: Dr. A. Dziedzic, TU Wrocław

Ion Beam Slope Cutting in Tribology: Ni-Cr-Fe Alloy



Sample: Dr. W. Hübner, BAM Berlin

(Ti,Al)N-Layer on WC-Co: Network of Cracks after Laser Treatment

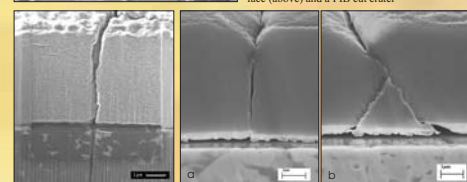
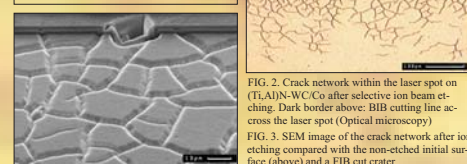
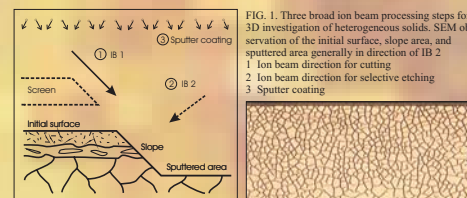


FIG. 1. Three broad ion beam processing steps for 3D investigation of heterogeneous solids. SEM observation of the initial surface, slope area, and sputtered area generally in direction of IB 2

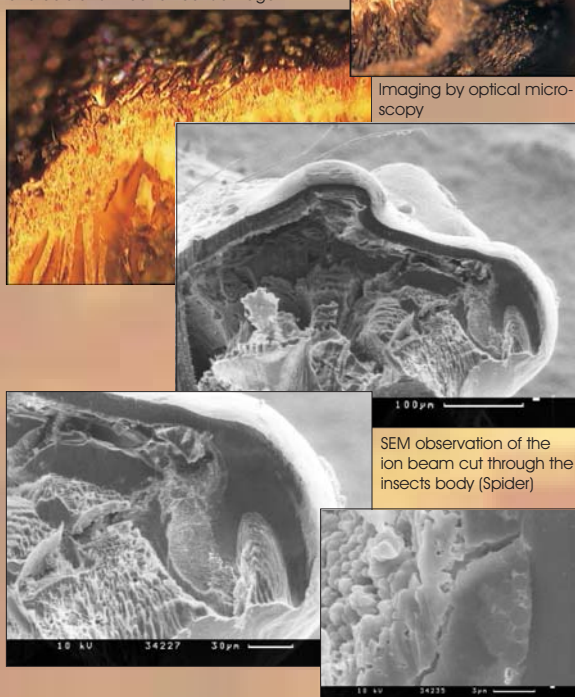
Sample, FIB Cut, and FESEM Images: Dr. S. Menzel, IFW Dresden

Ion Beam Slope Cutting of Biological Samples

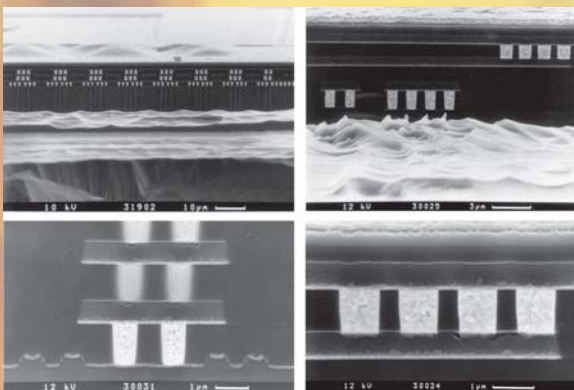
Biological samples (e.g. insects) which are fixed for SEM observation (water-free) can be cut by ion beam and coated with Au/Pd. The organic material is cut by IBSC without artefacts and mechanical damage



Imaging by optical microscopy

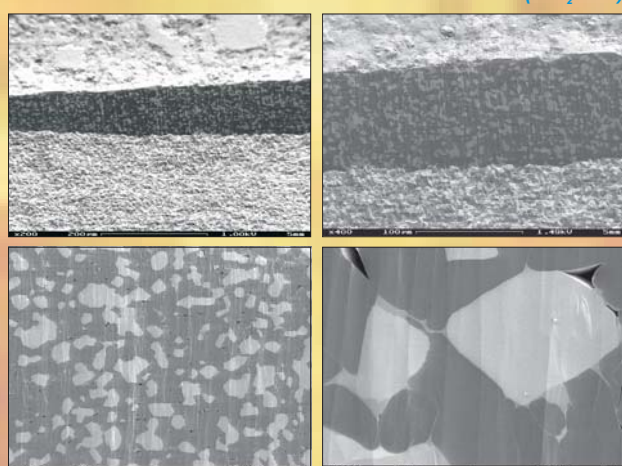


SEM observation of the ion beam cut through the insects body (Spider)



Ion Beam Slope Cut of an IC Structure with subsequent Ion Beam Etching and Coating

IBSC of Ceramic: Titanium Boride / Boron Nitride (TiB₂-BN)



Sample and FESEM (ZEISS GEMINI) Images: Dr. P. Obenaus, FH-IKTS Dresden