SEMPrep2 (model SC-2000)

for high-quality site-specific sample preparation in SEM application

- Cross-sectional sample preparation by slope cutting in 90 , 45 and 30 by different sample holders
- Final polishing and cleaning of traditional SEM and EBSD samples
- Load-lock system for faster and easier sample exchange
- High-energy ion gun for rapid milling
- Optional ultra high-energy ion gun specially recommended for ion milling extra hard materials or for extreme fast milling
- Low-energy ion gun for gentle surface polishing and cleaning
- Automated parameter settings and operation
- Sample rotation and oscillation
- Real-time monitoring of the milling process by high-resolution CMOS camera and TFT monitor

DESCRIPTION

The SC-2000 model is equipped both with high- and low-energy ion sources. Rapid slope cutting with the high-energy ion gun followed by gentle surface cleaning with the low-energy ion gun provides cross-sectional SEM samples suitable for semiconductor failure analysis and other analytical purposes. The system also provides an ion milling based solution for improving and cleaning of mechanically polished SEM samples and preparation of damage-free surfaces for EBSD technique.

SPECIFICATIONS

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Ion sources:	two ion guns:	focused high-energy ion gun operating from up to 10keV or optionally ultra high-energy ion gun operating up to 20 keV focused low-energy ion gun in the range of 100eV to 2keV continuously and independently adjustable milling energy
	beam current density:	max. 100mA/cm² for focused high-energy ion gun max. 150mA/cm² for ultra high-energy ion gun max. 10mA/cm² for focused low-energy ion gun
	sputtering rate:	150 µm/hour on Si at 30º for focused high-energy ion gun 530 µm/hour on Si at 30º for ultra high-energy ion gun 28 µm/hour on Si at 30º for focused low-energy ion gun
Sample stage:	sample size:	slope cutting sample holder (available with 30º, 45º, 90º tilted platforms) for 30º, 45º holders: max. 20 mm (l) x 16 mm (w) x 7 mm (th) for 90º holder: max. 20 mm (l) x 16 mm (w) x 5.5 mm (th) sample holder for surface cleaning (EBSD) using 3 different head type: flat head type: max. Ø36 mm x 0-5.5 mm standard type: max. Ø26 mm x 3-14 mm hollow type: max. Ø24 mm x 13-19 mm
	sample tilting:	0º to 30º in 0.1º increments
	sample rotation:	in-plane rotation, 360º (available only for surface cleaning sample holder)
	sample oscillation:	in-plane oscillation from ±10º to ±40º in 10º steps
Sample cooling:	LN_2 cooling for preparing heat sensitive samples - optional	
Vacuum system:	oil-free diaphragm and turbomolecular pumps with combined (Pirani/Penning) vacuum gauge	
Gas supply system:	99.999% purity argon high-precision working gas flow control with motorized needle valve	
Imaging system:	high resolution CMOS camera with manual zoom video lens of 50-400x magnification	
Computer control:	easy-to-use graphical interface, automated ion source setup, milling parameter setting and operation control	

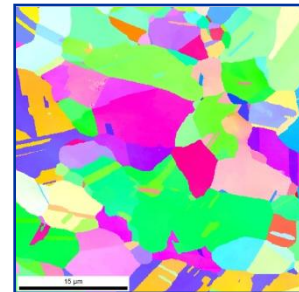# APPLICATIONS

ION BEAM SLOPE CUTTING

To produce planar cross-sections of different quality of solid state materials for SEM/EBSD imaging and microanalysis.
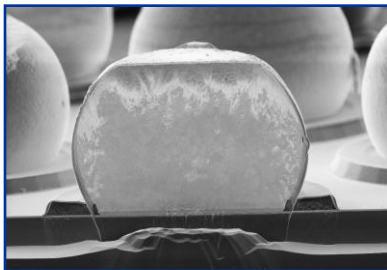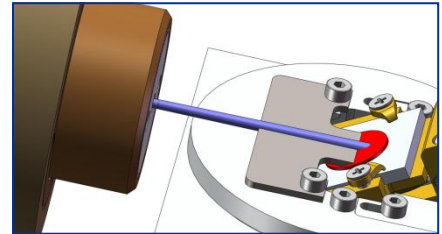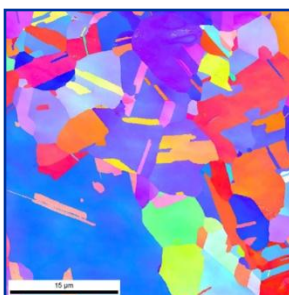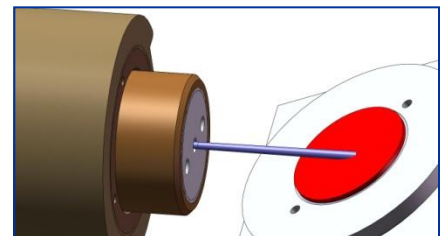

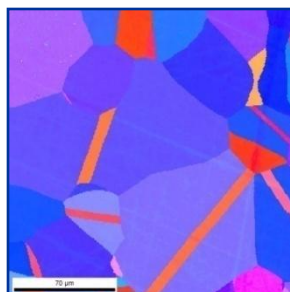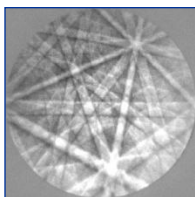Sn-Ag solder ball grid array (BGA)
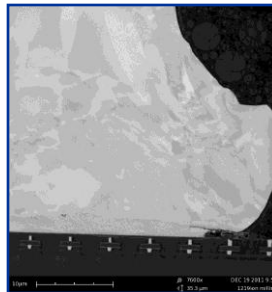
Metal wire bonding

EBSD image (OIM) made on the as-cut surface of copper
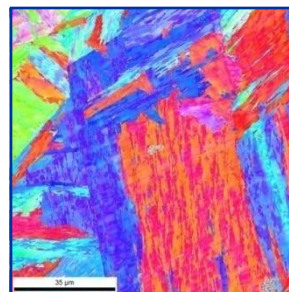
FINAL POLISHING

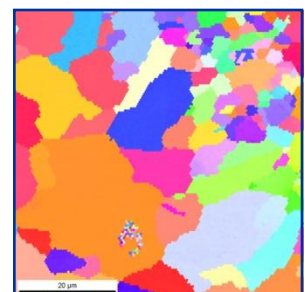To produce samples for Electron Back Scatter Diffraction (EBSD) study and Orientation Imaging Microscopy (OIM)

Copper

Nickel

Martensitic steel

Limestone

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