

PECS II

Model 685

The PECS™ (precision etching coating system) II is a table top broad beam argon milling tool for polishing as well as coating samples. These two processes can be performed on the same sample without interruption of the vacuum.

The PECS II is a completely self-contained, bench-top instrument designed to polish surfaces and remove damage using two broad argon beams. This method is ideal for producing high-quality samples for scanning electron microscope (SEM), optical or scanning probe microscopy (SPM). These specimens are suitable for imaging, energy dispersive x-ray spectroscopy (EDS), electron backscatter diffraction (EBSD), cathodoluminescence (CL), electron-beam induced current (EBIC), or other analytical techniques.

The PECS II platform utilizes WhisperLok® technology with an optional temperature-controlled liquid nitrogen cooling stage. This feature helps prevent sample melting or structural changes caused by heat associated with conventional milling processes.

The PECS II platform incorporates a 10-inch touch screen to increase control and reproducibility of the polishing process for both novice and expert users. The digital zoom microscope monitors the polishing process in real-time and stores color images in the DigitalMicrograph® software for review and analysis while your sample is in the SEM.



Benefits

- **WhisperLok system:** Load and unload samples without venting the main chamber
- **Low energy focusing penning ion guns:** Mill damage-sensitive surfaces, including EBSD or CL, using low energy focusing penning ion guns
- **Variable energy from 0.1 – 8.0 keV:** Tunable low energy milling to reduce amorphous layer and higher energy to increase milling speed
- **Liquid nitrogen specimen cooling:** Eliminates artifacts, including oxidation and migration of gallium
- **10-inch color touchscreen control:** Fast, simple access to all control parameters; no computer required
- **Digital zoom microscope:** Real-time operation during milling
- **Color image storage in DigitalMicrograph software:** Store and use optical images for correlation with other analysis systems
- **Sputter deposition:** Sputter a target material onto the sample surface to protect or minimize charging in an SEM/FIB

Applications

- Semiconductor
- Metals (oxide, alloy)
- Ceramics
- Natural resources

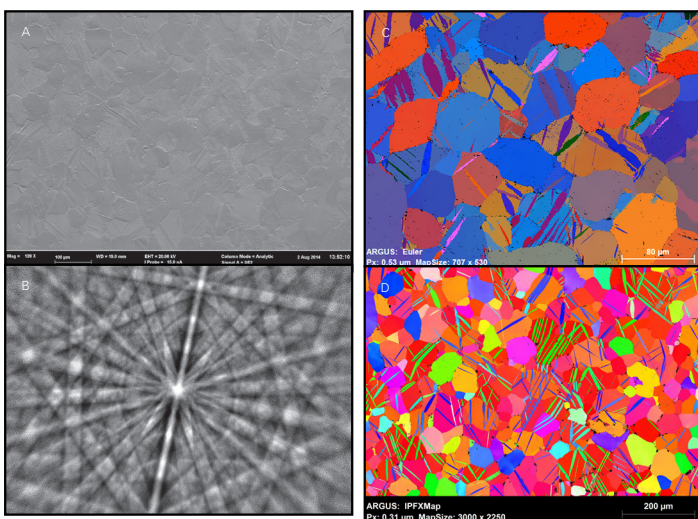


Figure 1. (A) PECS II polished SE image of the surface showing highly twinned grains. (B) Kikuchi pattern from Zircaloy after PECS II polish. (C) EBSD Euler angle map. (D) IPFZ map. *Results courtesy of Professor Angus Wilkinson and Dr. Hamidreza Abdolvand, Department of Materials, University of Oxford. Data acquired on a Zeiss Compact Merlin equipped with a Bruker Quantax EBSD system.*

Specifications

Ion source	
Ion guns	Two penning ion guns with rare earth magnets
Milling angle	0 – 18° Each gun independently adjustable
Ion beam energy (keV)	0.1 – 8.0
Ion current density peak (mA/cm ²)	10
Milling rate on silicon (µm/h)	90
Beam diameter	Adjustable using gas flow controller or discharge voltage
Specimen stage	
Sample size (D x H, mm)	32 x 15
Rotation (rpm)	1 – 6
Beam modulation	Single, double with adjustable range
Viewing	Digital zoom microscope with PC and DigitalMicrograph storage (optional)
Vacuum	
Dry pumping system	Two stage diaphragm pump backing a 80 L/s turbo drag pump
Pressure (torr)	
Base	5 x 10 ⁻⁶
Operating	8 x 10 ⁻⁵
Vacuum gauge	Cold cathode type for main chamber Solid state for backing pump
Specimen airlock	WhisperLok technology
Specimen exchange time (min)	<1
User interface	
10-inch color touchscreen	Simple operation with complete control of all parameters and recipe operation
Dimensions and utilities	
Overall size (L x W x H, mm)	583 x 531 x 615
Shipping weight (kg)	45
Power consumption (W)	
During operation	200
Guns off	100
Power requirements with universal 100 – 240 VAC (Hz)	50 – 60
Argon gas (psi)	25

Specifications are subject to change.

Ordering

Model	Description
685 Cold (685.C)	PECS II with cold stage
685 Pro (685.O)	PECS II Cold with digital imaging microscope
685 Advantage (685.A)	PECS II Pro with motorized argon ion guns
685 Met Etch (685.M)	PECS II without deposition
685 ProTransfer (685.OV)	PECS II Pro with vacuum transfer pod
685 AdvantageTransfer (685.AV)	PECS II Advantage with vacuum transfer pod

