Ilion II System

Model 697

The Ilion® II broad beam argon milling system is a tabletop tool for producing cross-sections and planar polishing of samples for examination in the scanning electron microscope (SEM) and other instruments. Each Ilion II system is suitable for polishing a wide range of materials, including samples made from multiple elements and alloys with a wide range of mechanical hardness, size and other physical characteristics.

The instrument incorporates the WhisperLok® system for sample exchange and an optional temperature-controlled liquid nitrogen cooling stage.

The Ilion II system incorporates a 10" touch screen computer for ease of use and to increase control and reproducibility of the polishing process. A digital zoom microscope monitors the polishing process in real-time, and the color images can be stored in the DigitalMicrograph® (DM) software for review and analysis while the sample is in the SEM.

Benefits

- **WhisperLok system:** Ability to load and unload samples without venting the main chamber
- **Low energy focusing penning ion guns**: Improved low energy milling for surface damage sensitive techniques such as electron backscatter diffraction (EBSD) or cathodoluminescence (CL)
- **Variable energy from 0.1 – 8.0 kV:** Improved low energy milling for reduction in amorphous layer and higher energy for faster milling
- **LN_2 specimen cooling:** Eliminates artifacts
- **10" color touch screen control**: Simple but full control from the graphical user interface
- **Digital zoom microscope:** Operates in real-time while milling
- **Color image storage in DM software**: Ability to store and use optical images with the SEM data in the same format

Applications

- EBSD sample preparation
- Semiconductor
- Metals (oxide, alloy)
- Ceramics
- Geological samples
- Oil shales
- Polymers

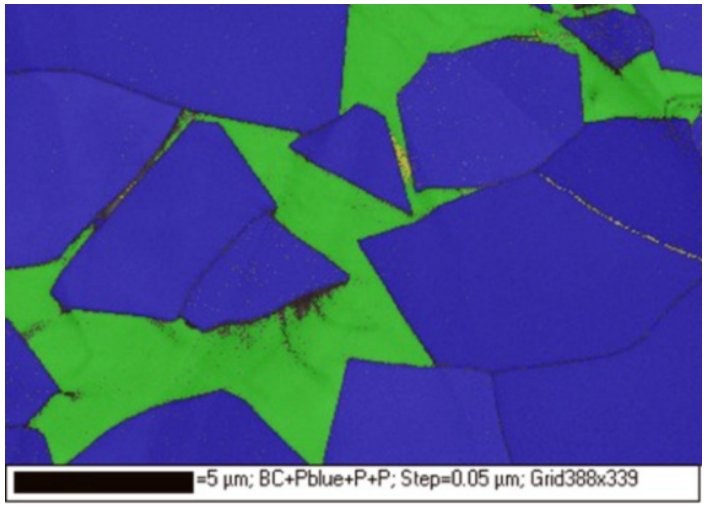

Figure 1. EBSD at 20 kV of tungsten carbide / cobalt sample with no phase transformation of the cobalt phase from FCC to HCP. Sample polished at 1 kV in the Ilion II system. *Courtesy of Dr. A Gholinia, University of Manchester, UK.*

Specifications

Ilion II system	
Ion source	
Ion guns	Two penning ion guns with rare earth magnets
Milling angle (°)	+10 to -10° Each gun independently adjustable
Ion beam energy (kV)	0.1 – 8.0
Ion current density peak (A/cm^2)	10
Milling rate on silicon at 8.0 kV (µm/h)	300
Beam diameter	Adjustable using gas flow controller or discharge voltage
Specimen stage	
Sample size (L x W x H, mm)	10 x 10 x 4
Mounting	Ilion patented blade
Rotation (rpm)	0.5 – 6.0
Beam modulation	Single or double with adjustable range or no modulation
Viewing options	Digital zoom microscope with PC and DM storage
Vacuum	
Dry pumping system	Two stage diaphragm pump backing a 80 L/s turbo drag pump
Pressure (torr)	
Base	5×10^{-6}
Operating	8×10^{-5}
Vacuum gauge	Cold cathode type for main chamber, solid-state for backing pump
Specimen airlock	WhisperLok, specimen exchange time <1 min
User interface	
10" color touch screen	Simple operation with complete control of all parameters and recipe operation
Dimensions and utilities	
Overall size (L x W x H, mm)	575 x 583 x 531
Shipping weight (kg)	45
Power consumption (W)	
During operation	200
Guns off	100
Power requirements	Universal 100/240 VAC, 50/60 Hz Users to specify voltage and frequency
Argon gas (psi)	25

Specifications are subject to change.

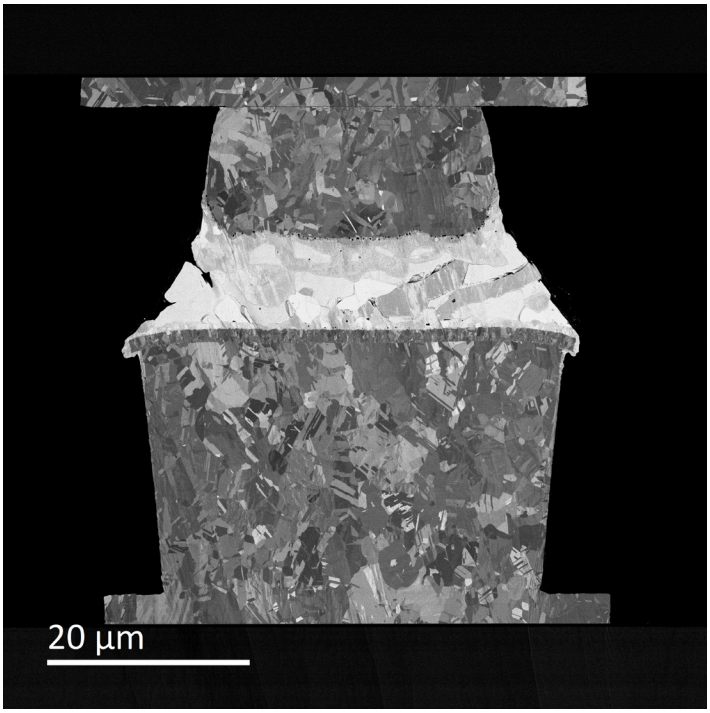

Figure 2. Backscattered electron image of 2.5 interposer structure, prepared by the Ilion II system. *Courtesy of the Fraunhofer Institute, Dresden, Germany. © 2013 Fraunhofer IZM, Dept. HDI&WLP/ASSID.*

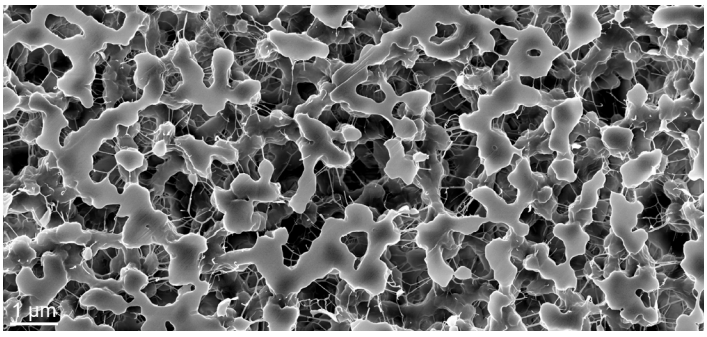

Figure 3. Polymer aerogel imaged in cross section after preparation with Ilion II. *Courtesy of the Leventis Lab, Missouri University of Science and Technology, USA.*

Ordering

Model	Description
697 Basic	Ilion II System
697 Cool	Ilion II Basic with cold stage
697 Pro	Ilion II Cool with digital zoom microscope with DM
697 Advantage	Ilion II Pro with motorized guns

Please consult with your local sales representative for details regarding spares and consumables.

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