

Scanning electron micrograph (SEM) showing a dense collection of nanomaterials, including large, flat, hexagonal or polygonal flakes and numerous smaller, needle-like or rod-like structures. The background is dark, and the nanomaterials are light gray.

COXEM

Product Catalog

www.coxem.com



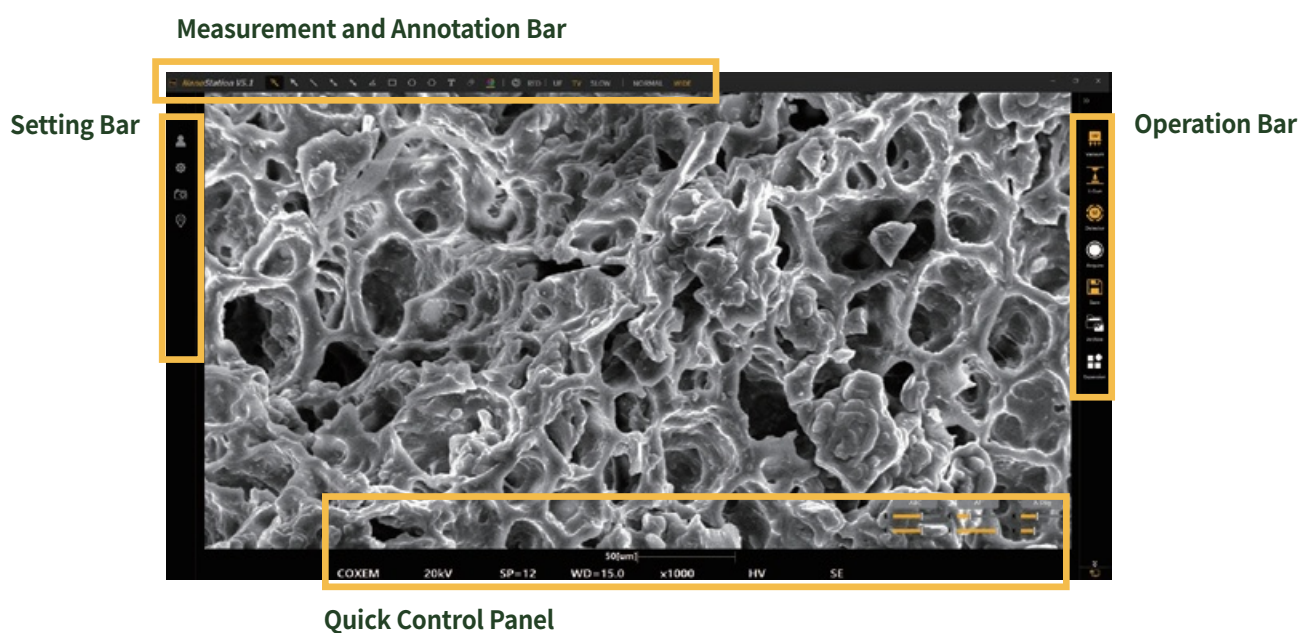
Coxem's NEW SEMs

EM-40 / CX-200K / CX-300



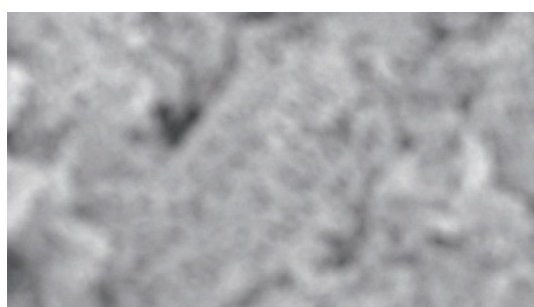
New GUI NanoStation 5.1

The NanoStation 5.1 has been improved and optimized for faster and more accurate analysis. It allows users to observe the shape of a sample and form an image in real-time on a quad display, and to combine SE and BSE signals into a single image for observation.

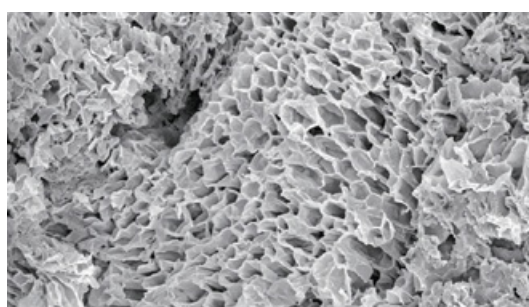


Auto Focus in 3 seconds

Auto Focus(AF) can dramatically reduce the time taken to analyze sample images.

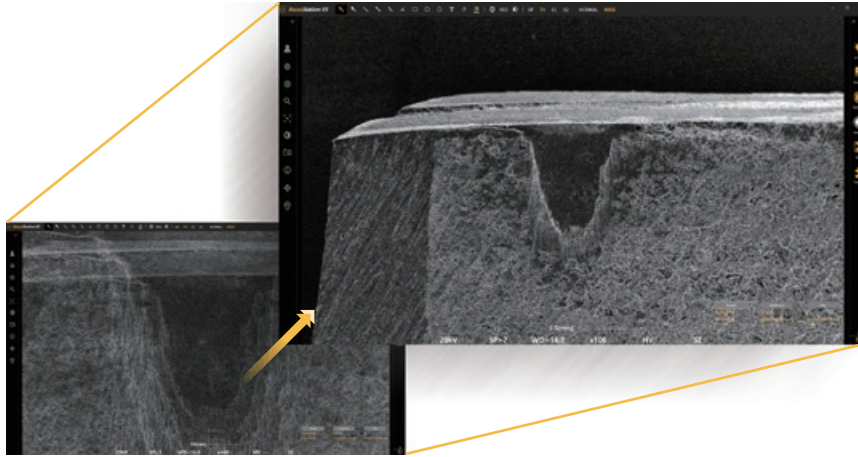


**Auto Focus
in 3 seconds**



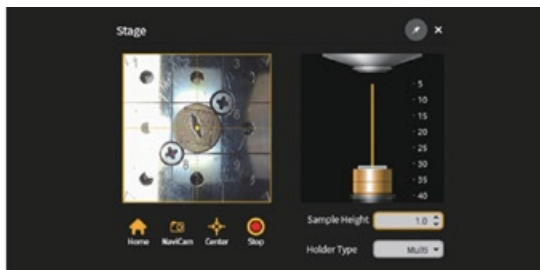
Fast scanning speed (ULTRA / TV / SLOW mode)

NanoStation 5.1 has greatly improved scanning speed compared to the existing EM series allowing users to select their preferred imaging speed to observe samples more quickly and clearly in various scan modes.



Motorized stage & Multi-sample holder

NanoStation 5.1 offers a motorized stage that allows the working distance between the lens and the sample on the Z-axis to be adjusted, thereby shortening the time required to analyze samples.



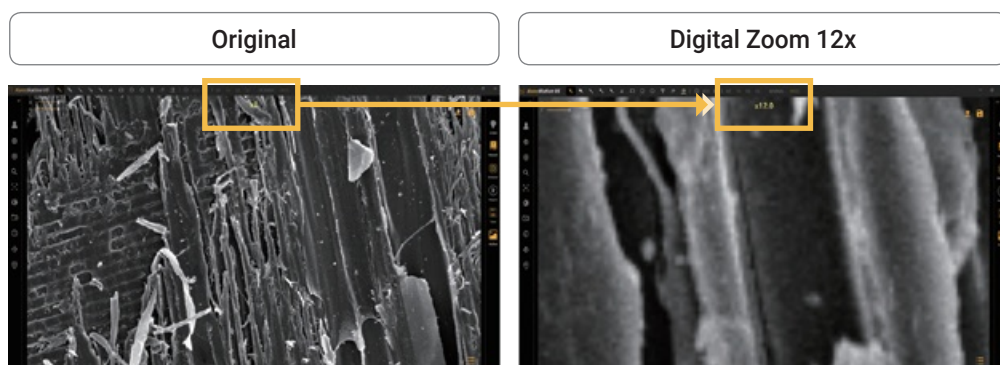
Multi-sample holder



Pin stub

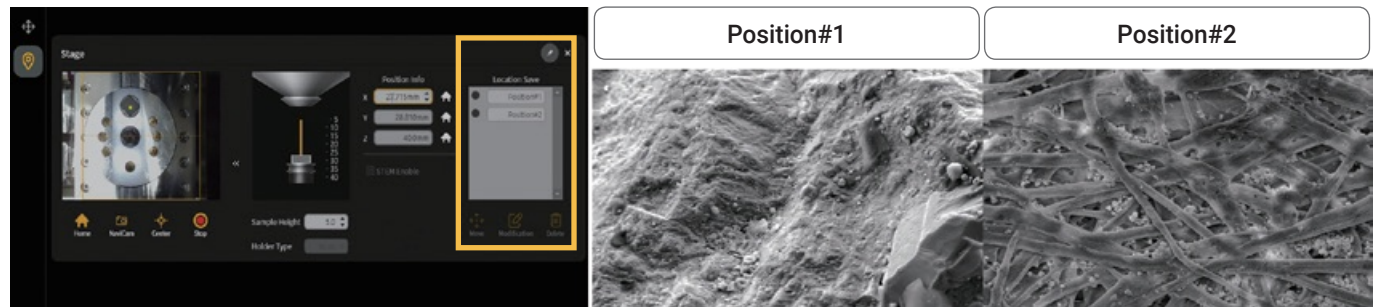
Archive editing function

Users can re-edit the sample measurement, annotation, and other details of sample images saved in the archive. They can also enlarge saved images by up to 12 times using the digital zoom function.



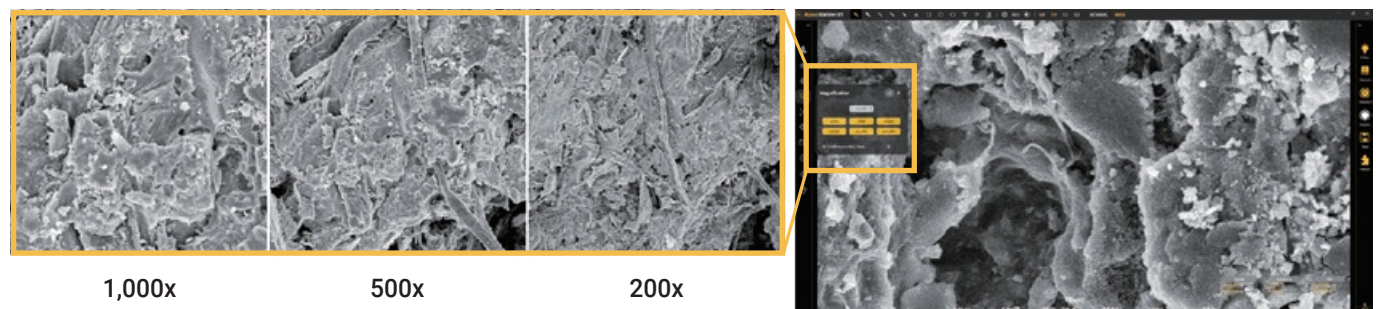
Location save function

When analyzing multiple samples, users can save up to 8 preferred analysis positions and quickly observe the samples by accurately moving to the saved positions.



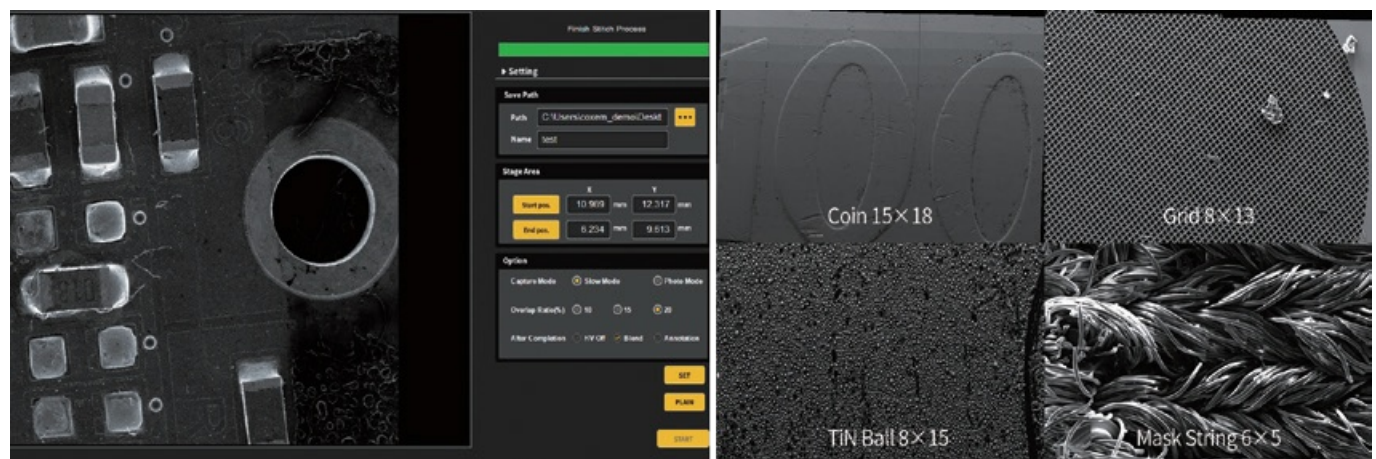
ContinuousMagSave function

The ContinuousMagSave function allows users to directly set various magnifications at the desired position for analyzing samples, and images at the specified magnifications are automatically captured and saved.



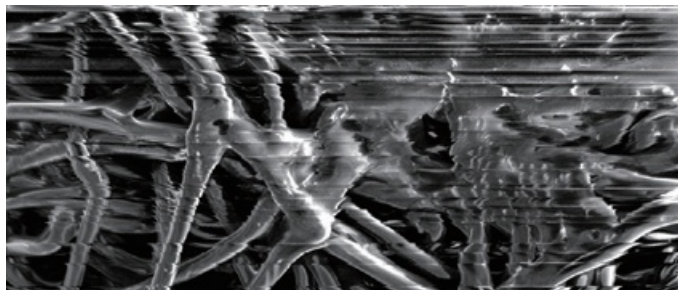
Panorama 3.0

NanoStation 5.1 offers it as a standard feature, and its upgraded stitching function enables users to acquire more precise and accurate images when analyzing large-area samples.

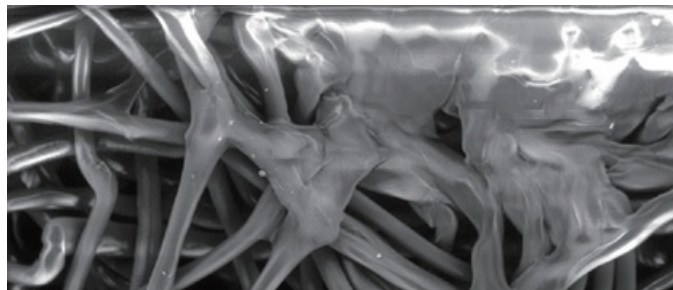


Variable pressure (10 / 20 / 30Pa) ——

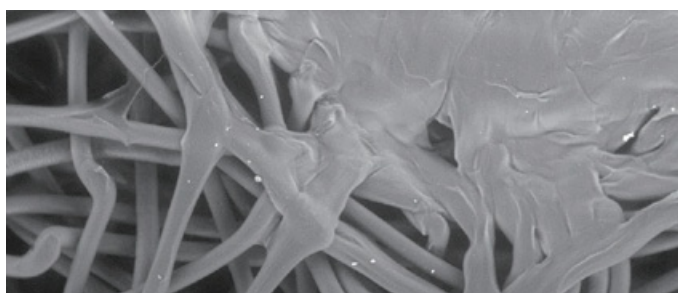
Variable Pressure (VP) mode enables the observation of biological and non-conductive samples without conductive coating or extensive sample preparation.



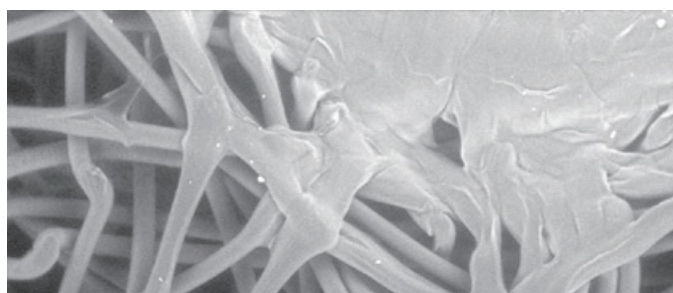
High vacuum



10Pa



20Pa



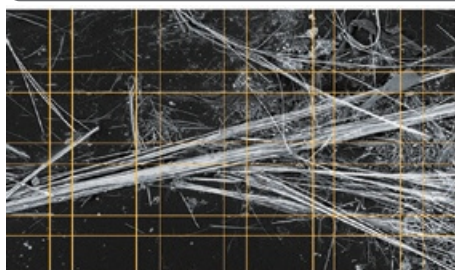
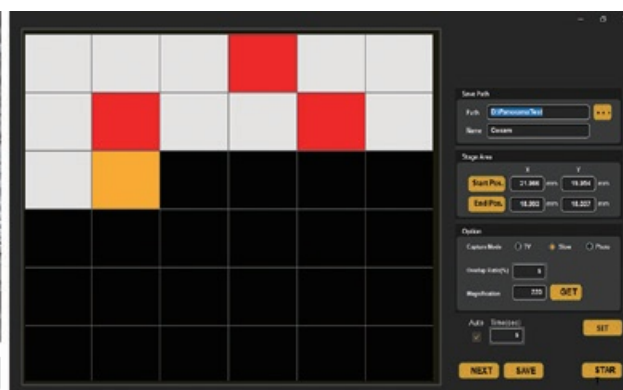
30Pa

NanofiberScanner ——

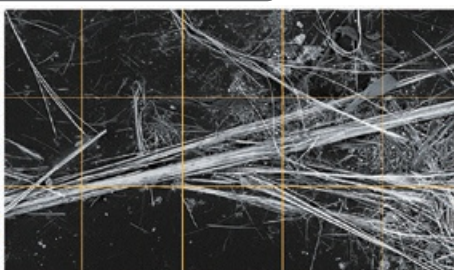
The NanofiberScanner, Coxem's analysis program, is ideal for analyzing asbestos. It allows users to save sample images and its positions immediately at the desired location during large-area analysis.



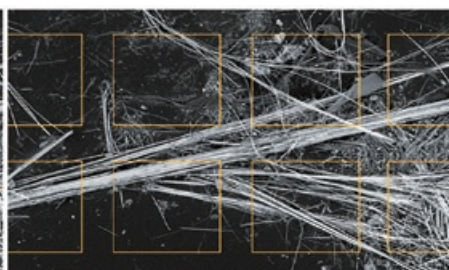
Asbestos



+30%



0%



-30%

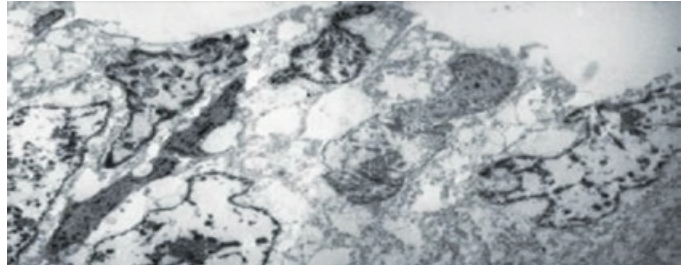
STEM analysis

COXEM's SEM can perform STEM analysis by inserting a STEM detector and is capable of analyzing materials such as asbestos, cellular tissue, and nanostructures.

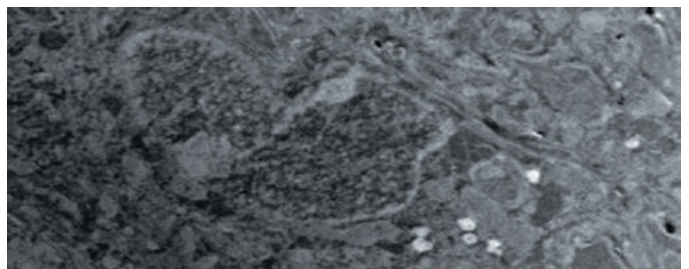


Stage stroke at STEM mode

- X axis 0~35mm
- Y axis 0~35mm
- Z axis 33mm (fixed)



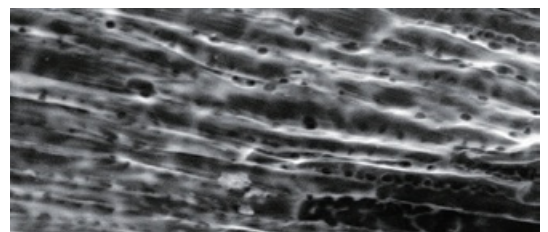
Bright field mode



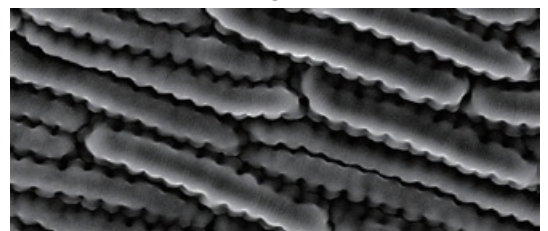
Dark field mode

Coolstage

When observing a sample containing water, Coolstage lowers the sample temperature, thus obtaining analysis images without compromising the sample's unique microstructure and avoiding the complex sample preparation process of removing and fixing moisture.



Leaf without Coolstage



Leaf with Coolstage

The Next Level of EM Series

EM-40

- All-new GUI, NanoStation5.1
- Fast frame rate up to 13fps
- X, Y, Z axes motorized stage
- Variable pressure (10, 20, 30Pa)
- Compatible with compact EBSD
- Fast particle analysis with EDS



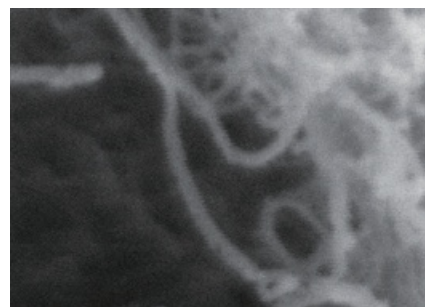
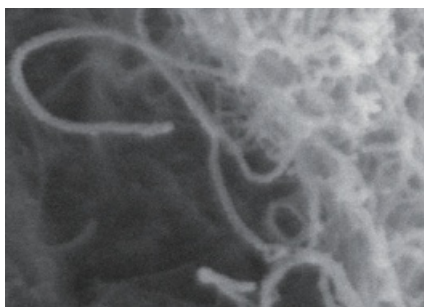
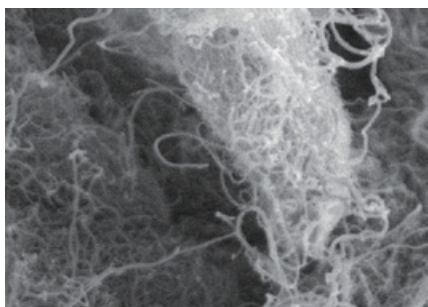
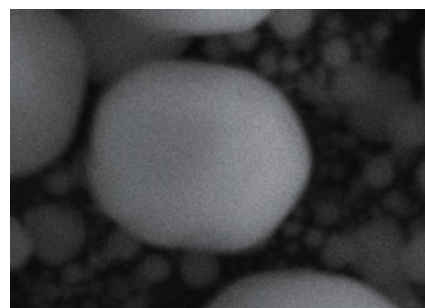
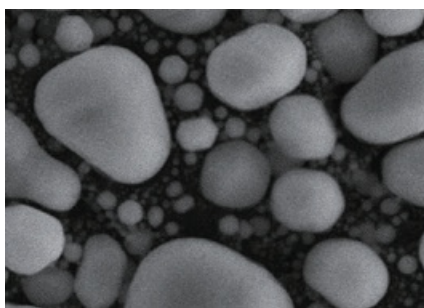
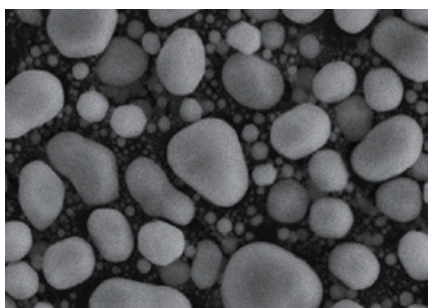
Perfect image quality across all magnification ranges

The EM-40 can observe samples at a high magnification up to 250,000x, allowing users to obtain high-resolution images effectively by adjusting the voltage, working distance, and size of the electron beam.

50,000x

150,000x

250,000x



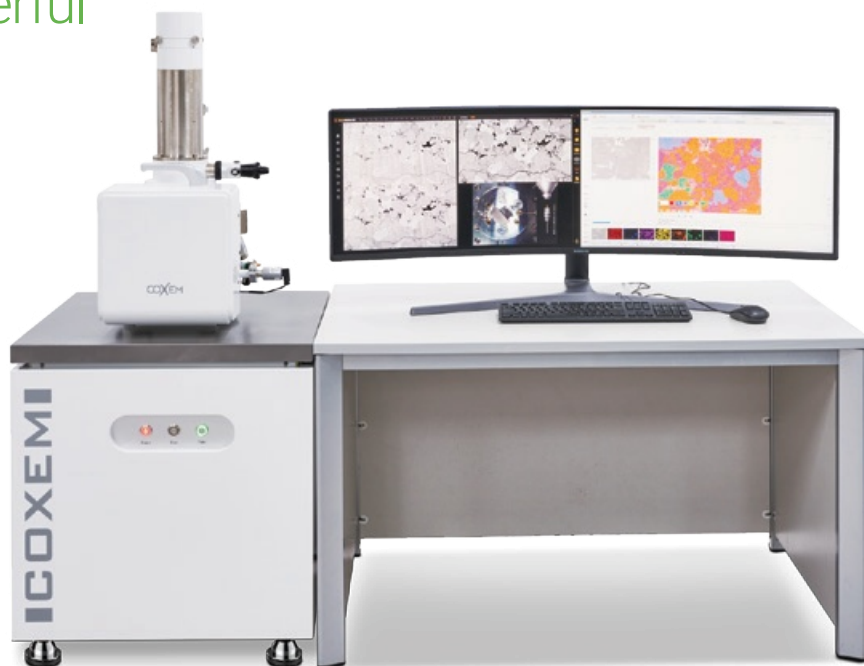
EM series

Model	EM-30N	EM-40
Electron gun	Tungsten filament (W)	Tungsten filament (W)
Spatial resolution	< 5nm	< 5nm
Magnification	15x to 150,000x	13x to 250,000x
Accelerating voltage	1 ~ 30kV	1 ~ 30kV
Sample stage	X : 35mm, Y : 35mm, Tilt : 0 ~ 45° 3-axis motorized	X : 40mm, Y : 40mm, Z : 40mm, 3-axis motorized
Detector	SE, BSE*, EDS*	SE, BSE*, EDS*
Vacuum mode	HV, LV*	HV, LV*, VP*
Vacuum system	Turbo pump (80L) + Rotary pump (100L)	Turbo pump (80L) + Rotary pump (100L)
Dimension	400(W) × 630(L) × 600(H)mm, 95kg	315(W) × 560(L) × 580(H)mm, 81.5kg
Features	Panorama 1.0 Auto start Auto focus Auto brightness & contrast Signal mixing Dual display & Save Line profile Image filtering Annotation tool	Panorama 3.0 Auto start Auto focus 1 Second auto brightness & contrast Signal mixing Triple display & Save Line profile Image filtering Annotation tool Deep 3D(Live 3D) basic Auto Stigmatism
Data output format	JPEG, TIFF, BMP	JPEG, TIFF, BMP
Options*	STEM NaviCAM, Coolstage LV (20Pa) Panorama 2.0 Diaphragm pump	EBSD, STEM NaviCAM, Coolstage LV (20Pa), VP (10 / 20 / 30Pa) NanofiberScanner Nano Particle Analyzer Deep 3D pro Dynamic Focus &Tilt correction Diaphragm pump

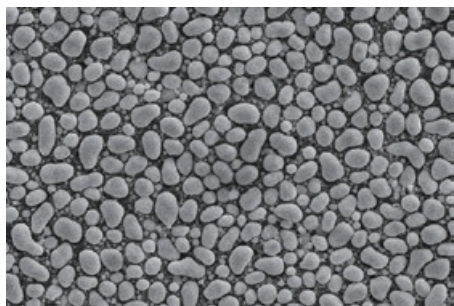
* EM-40PE supports expanded x, y stage stroke (50 x 50mm)

The Standard, Yet Powerful CX-200K

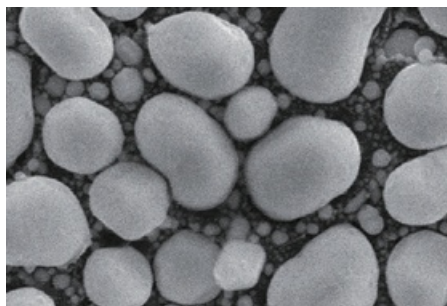
- All-new GUI, NanoStation5.1
- Maximum Mag. 500,000x
- Self-diagnostic system
- Optimized imaging
- 5-axis motorized stage
- Air-protection module
- A variety of options (EDS, EBSD, Coolstage, STEM etc)



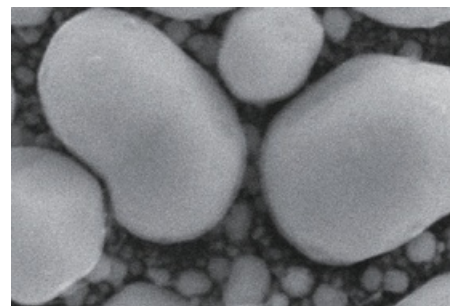
Optimized imaging



10,000x



50,000x

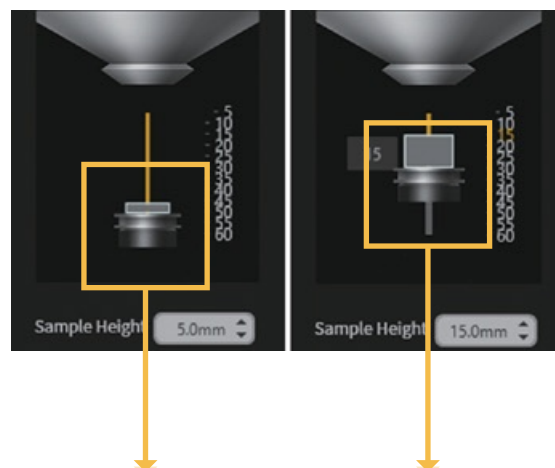


100,000x

Stage control



- Home** : The coordinate 0.0 position of the stage
NaviCAM : Saves the actual sample image through the camera when loading the sample
Center : Aligns the sample to the center position of the stage coordinates
Stop : Manually stops the movement of the stage
H.D (Home Disable) : Disables the axis of the stage from moving to the home position
Move : Moves to the saved position of the sample
Modify : Edits the name of the sample
Delete : Deletes the saved position of the sample

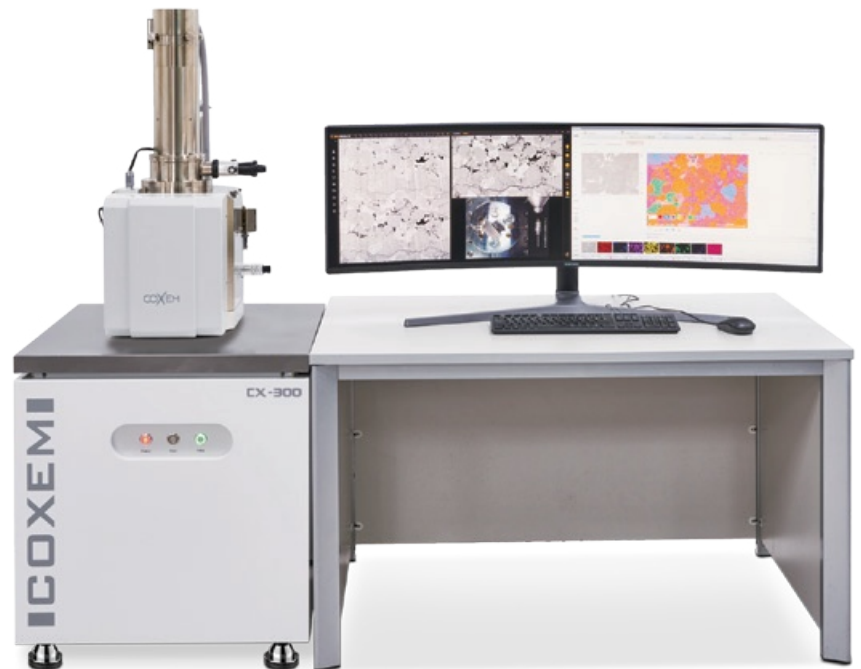


Graphic display according to the sample height and working distance

The Advanced Innovation CX-300

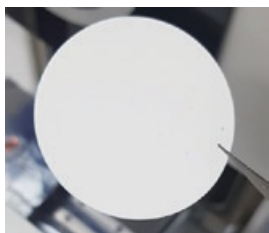
Advanced features

- Designed for large-area nanoparticle analysis
- Sample stage that supports up to four membrane filters (47mm)



Large area analysis

CX-300 provides a nano particle analysis solution that systematically classifies results including size, distribution, and composition of nano particles in large-area



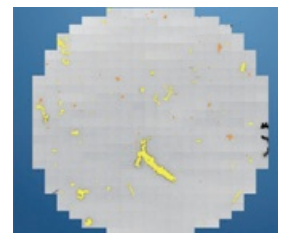
Sample collection
(Membrane filter)



Sample loading



Analysis area setting

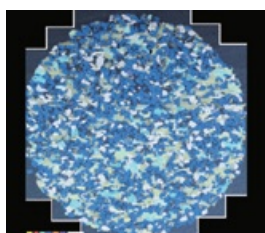


Analysis result

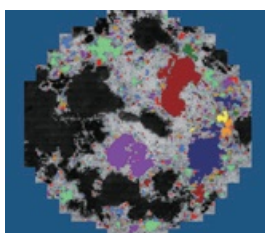
Applications of large-area analysis



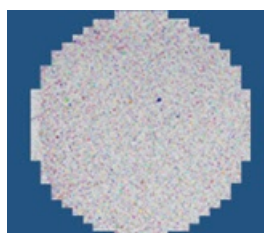
Engine oil



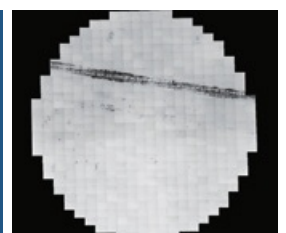
Geological material



Micro plastic



Environment
(Micro dust)



Coating paper

Air-protection module

For samples that react rapidly to air exposure, such as air-sensitive samples, preparation occurs within a specialized air-protection holder capable of maintaining a fully enclosed environment within a glove box filled with inert gases like nitrogen or argon. This prevents damage caused by exposure to air.

The sample can either be mounted directly onto Coxem's SEM for surface observation using the air protection holder, or it can be placed in an Ion Beam Polisher for cross-sectioning before observation in the SEM.



Glove box



Ion Beam Polisher (IP-10K)



Normal SEM (CX-200K and CX-300)



For SEM



For IP

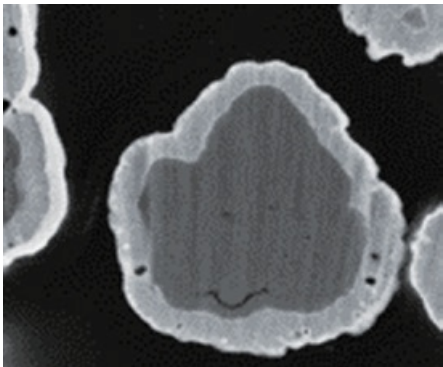


Lid knob

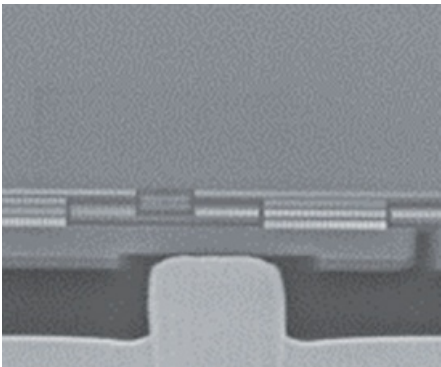
CX series

Model	CX-200K	CX-300
Electron gun	Tungsten filament (W)	Tungsten filament (W)
Spatial resolution	< 3nm	< 3nm
Magnification	9x to 500,000x	9x to 500,000x
Accelerating voltage	1 ~ 30kV	1 ~ 30kV
Sample stage	X : 60mm, Y : 60mm, Z : 60mm, R : 360, T : -20 ~ 90°	X : 100 mm, Y : 100mm, Z : 60mm, R : 360, T : -20 ~ 90°
Detector	SE, BSE*, EDS*	SE, BSE*, EDS*
Vacuum mode	HV, LV(20Pa)*, VP(10, 20, 30Pa)*	HV, LV(20Pa)*, VP(10, 20, 30Pa)*
Vacuum system	Turbo pump (300L) + Rotary pump (100L)	Turbo pump (300L) + Rotary pump (100L)
Dimension	640(W) × 682(L) × 1,432(H)mm, 210kg	640(W) × 690(L) × 1,460(H)mm, 210kg
Features	Panorama 3.0 Auto start Auto focus Auto brightness & contrast Auto Stigmation Deep 3D(Live 3D) basic Signal mixing Triple display & Save Line profile Image filtering Annotation tool ChamberCAM	Panorama 3.0 Auto start Auto focus 1 Second auto brightness & contrast Auto Stigmation Deep 3D(Live 3D) basic Signal mixing Quad display & Save Line profile Image filtering Annotation tool ChamberCAM
Data output format	JPEG, TIFF, BMP	JPG, TIFF, BMP
Options*	EBSD, STEM NaviCAM, Coolstage LV(20Pa), VP(10 / 20 / 30Pa) NanofiberScanner Nano Particle Analyzer Deep 3D pro Dynamic Focus &Tilt correction Air-protection module Scroll pump	EBSD, STEM NaviCAM, Coolstage LV(20Pa), VP(10 / 20 / 30Pa) NanofiberScanner Nano Particle Analyzer Deep 3D pro Dynamic Focus &Tilt correction Air-protection module Scroll pump

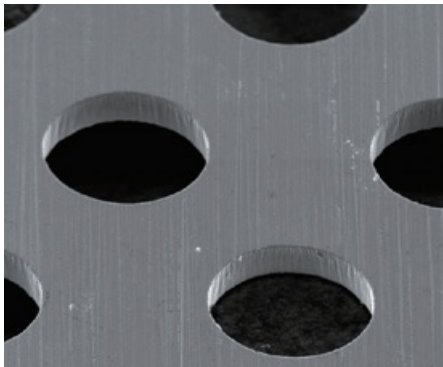
Applications



Metal powder



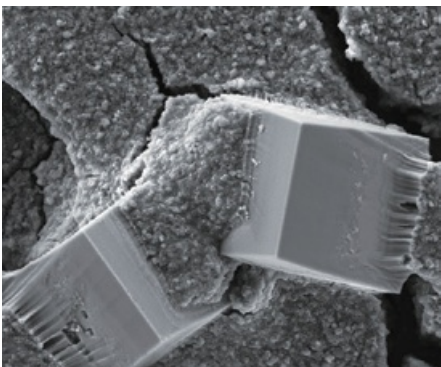
Semiconductor



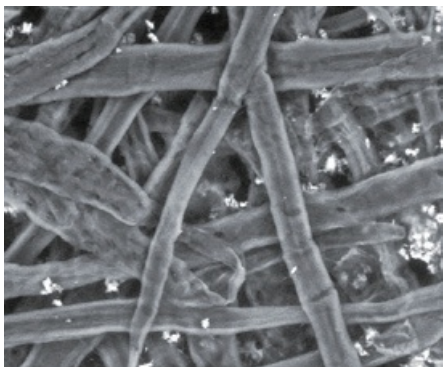
Metal plate



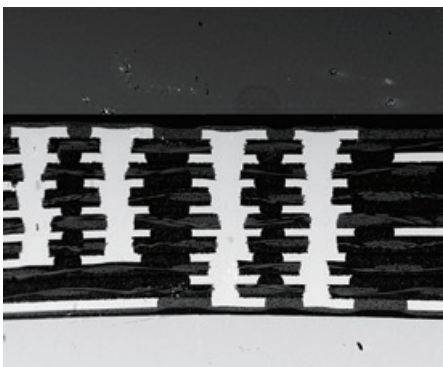
PCB



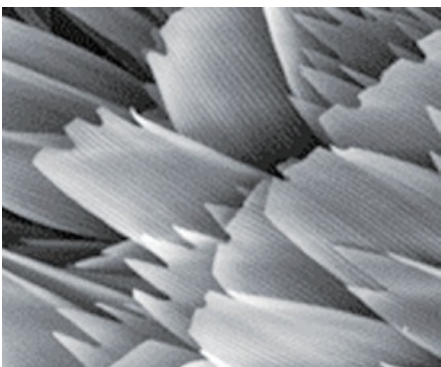
Emulsion



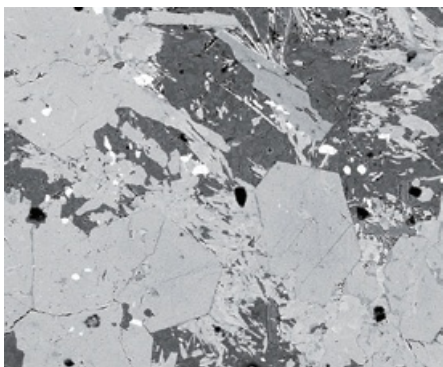
Paper



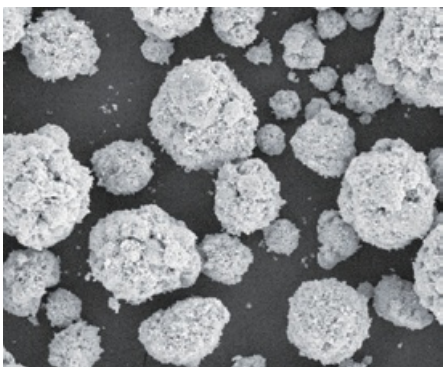
PCB



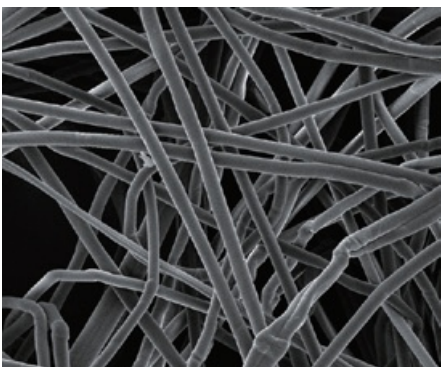
Bug



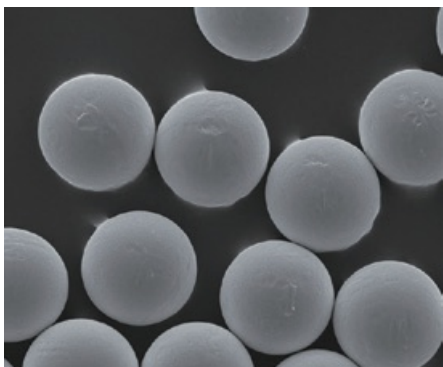
Mineral (Shale)



Nickel powder



Mask sheet



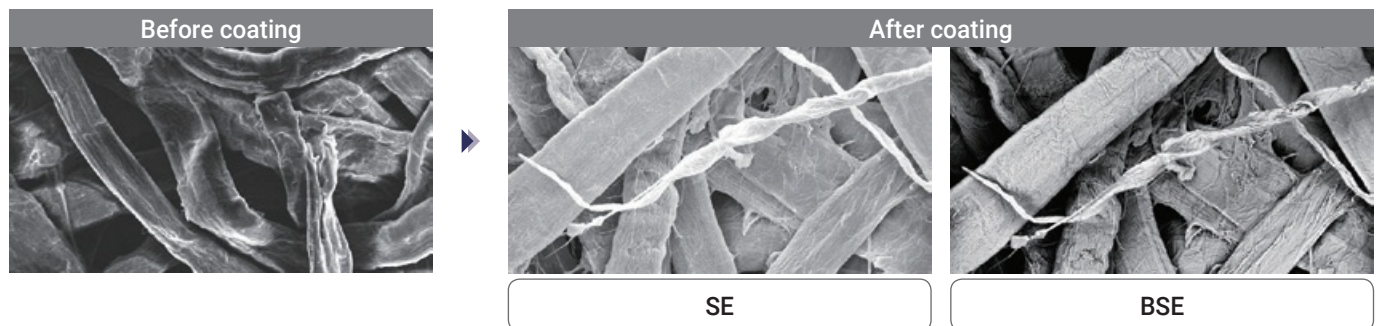
Tin ball

Powerful Sample Preparation Instrument : Ion Sputter Coater

SPT-20

SPT-20 protects the sample from surface damage by sputtering a thin layer of conductive material onto it, allowing for higher-quality SEM images.

SPT-20 is well-suited for preparing samples for both tungsten SEM and Tabletop SEM analysis.



Features

- Compact and cost-effective solution
- One-touch operation from the LCD touch panel
- Stable coating with current feedback function
- Various metal targets available : Pt, Au

Specification

50mm dia. 0.1mm thickness, 99.99%



Ion sputter coater system :

Dimension & Weight	420(W) × 220(L) × 230(H)mm, 10kg
Power consumption	AC 110 or 220V, 50/60 Hz, 300W
Chamber size	Ø100mm
Target size	50mm
Target	Pt, Au
Operating vacuum	0.1 Torr
Maximum Ion voltage	3kV
Ion current	0 ~ 9mA
Coating time	10 ~ 300sec

Pump system :

Vacuum pump set	Rotary vacuum pump (50L)
Pump dimension & Weight	120(W) × 373.5(D) × 200(H)mm, 14kg
Power consumption	AC 110V or 220V, 50/60Hz, 0.12kW

Ion Beam Polisher **IP-10K**



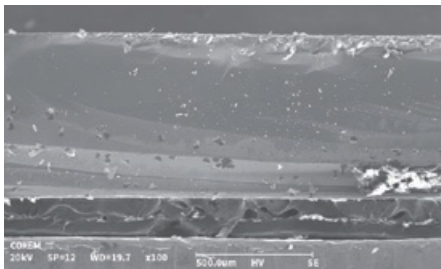
The IP-10K is COXEM's upgraded Ion Beam Polisher, equipped with various options including flat-milling, cooling module, and the air-protection module, ensuring enhanced performance and versatility for a wide range of applications. It offers unparalleled capabilities for the precision milling of materials at the microscale levels, providing exceptional cleanliness and accuracy.

Features

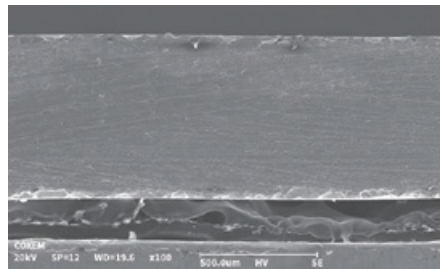
- A fast milling speed of 1,000um/h (Si, 8kV)
- Minimizes thermal damage with the cooling module
- Air-protection module compatible with SEM
- Flat-milling function provided for planar etching
- A fast pump/vent time with easy sample loading
- Higher front mask usability

Ion beam polishing

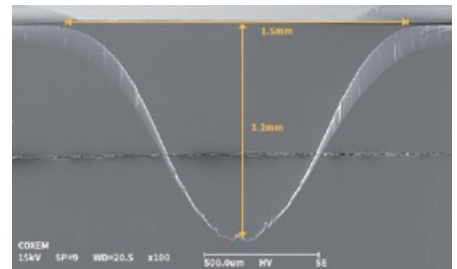
It is evident how much cleaner the cross-section surface appears after ion beam polishing compared to images of fractured or mechanically polished samples.



Fractured



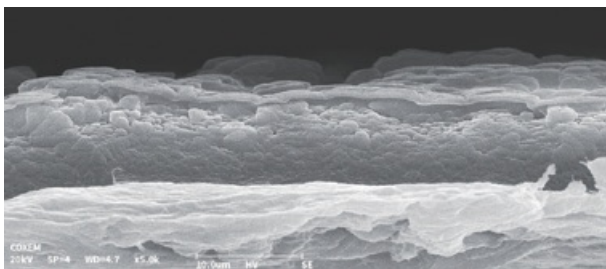
Mechanical polishing



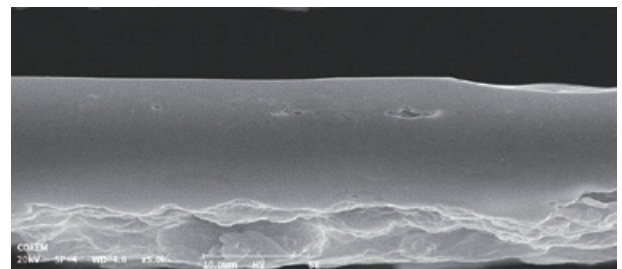
Ion Beam polishing

Cooling module

When working with heat-vulnerable samples, the risk of heat damage can be minimized by using a Peltier-type cooling stage, capable of cooling the stage down to -20°C.



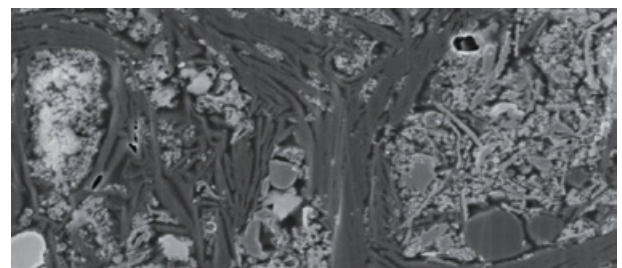
Milling condition : 4kV1h



Milling condition : 4kV1h -20°C

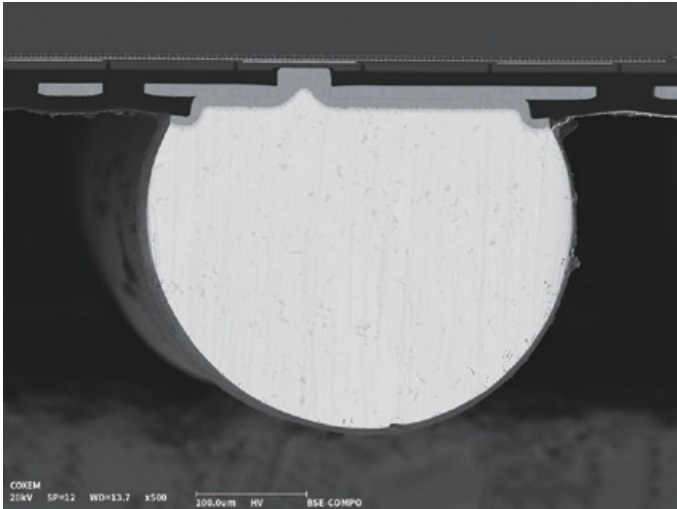
Air-protection module

When the sample is susceptible to deformation in the air, the air protection option proves highly beneficial. This option allows milling and observation of the sample to be completed without exposure to the air.

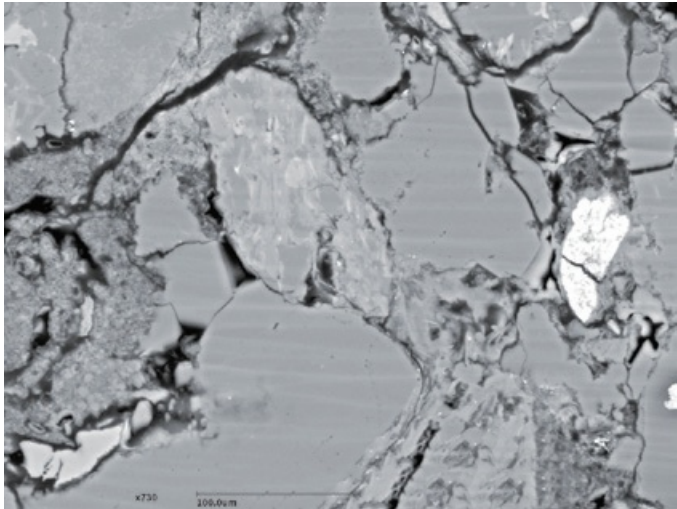


Battery

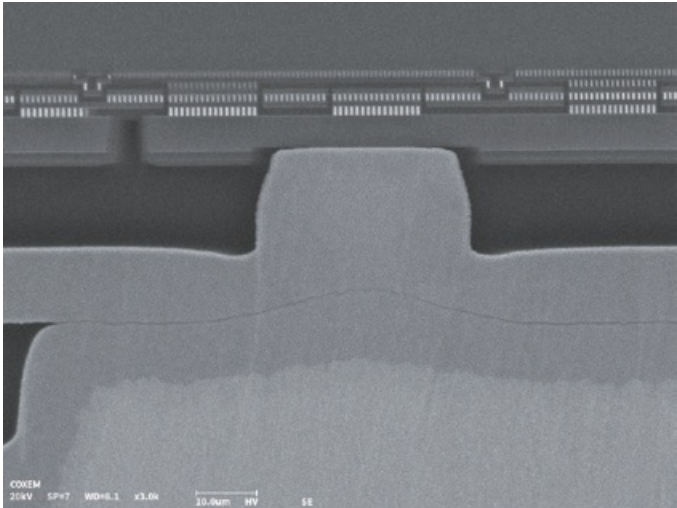
Applications



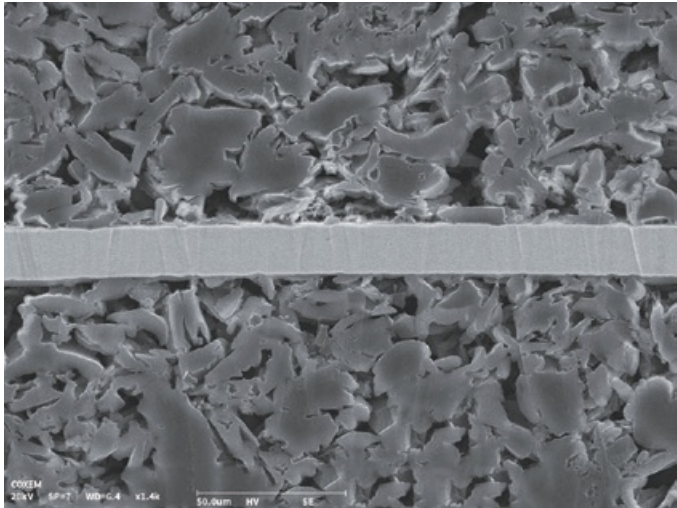
Solder ball



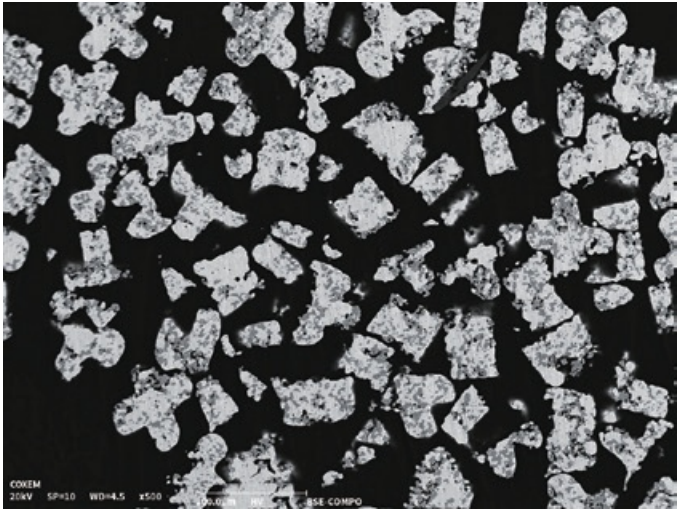
Mineral



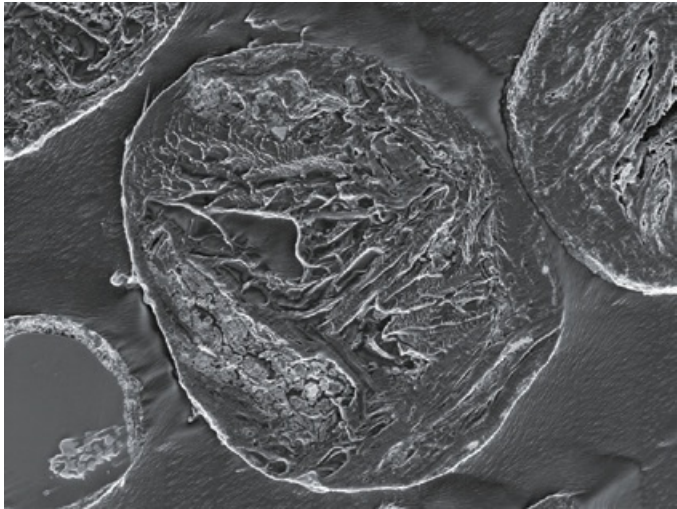
Solder ball



Anode powder



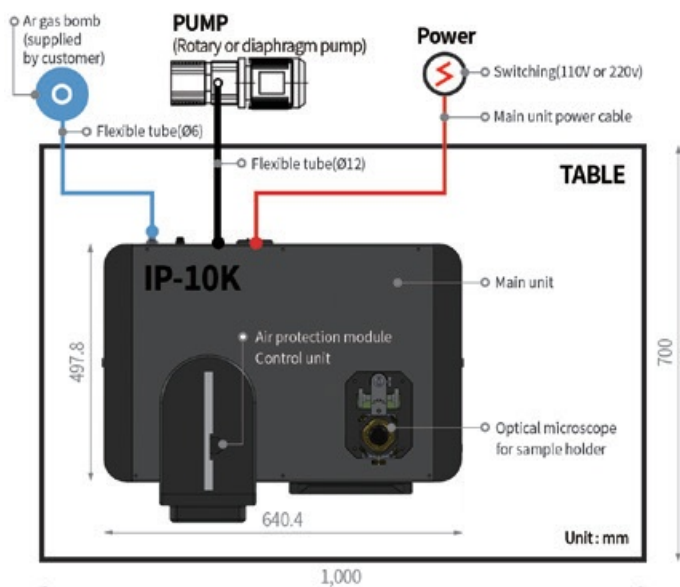
Metal Powder



Anode powder

Specifications

Model	IP-10K	IP-8K
Accelerating Voltage	2 to 8kV	2 to 8kV
Milling Speed	1,000 $\mu\text{m}/\text{h}$ (at 8kV on Si wafer)	700 $\mu\text{m}/\text{h}$ (at 8kV on Si wafer)
Sample Stage Swing Angle	$\pm 35^\circ$	$\pm 35^\circ$
Maximum Sample Size	20(W) $\times$ 10(L) $\times$ 5.5(T) mm 16(W) $\times$ 10(D) $\times$ 9.5(H) mm	20(W) $\times$ 10(L) $\times$ 5.5(T) mm 16(W) $\times$ 10(D) $\times$ 9.5(H) mm
Specimen Movement Range	X axis movement : ± 3.5 mm Y axis movement : ± 2 mm	X axis movement : ± 3.5 mm Y axis movement : ± 2 mm
Operation	7 inch touch panel	7 inch touch panel
Digital Microscope for Sample Positioning	Mag. 5x, 10x, 20x, 40x	Mag. 5x, 10x, 20x, 40x
Chamber Camera for Monitoring	Mag. 5x, 10x, 20x, 40x Brightness adjustable in 4 steps Ion beam observation mode (LED off)	Mag. 5x, 10x, 20x, 40x Brightness adjustable in 4 steps Ion beam observation mode (LED off)
Gas Used	Argon gas (99.999%)	Argon gas (99.999%)
Gas Pressure	0.03 MPa ~ 0.05 MPa	0.03 MPa ~ 0.05 MPa
Gas Flow Control	Mass Flow Control unit	Mass Flow Control unit
Vacuum Systems	Turbo pump, Diaphragm pump	Turbo pump, Diaphragm pump
Dimension	640(W) $\times$ 492(D) $\times$ 282(465)(H) mm	640(W) $\times$ 492(D) $\times$ 282(465)(H) mm
Weight	Main system 45 kg / Diaphragm pump 6.5 kg	Main system 45 kg / Diaphragm pump 6.5 kg
Flat Milling (Option)	O (10° to 90°)	O (10° to 90°)
Cooling Module (Option)	Peltier Type (-25°C ~ $+50^\circ\text{C}$)	X
Air-Protection Module (Option)	O	X





We used paper certified by FSC®



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