COXEM

Product Catalog

www.coxem.com

Window to the Nano World **COXEM**

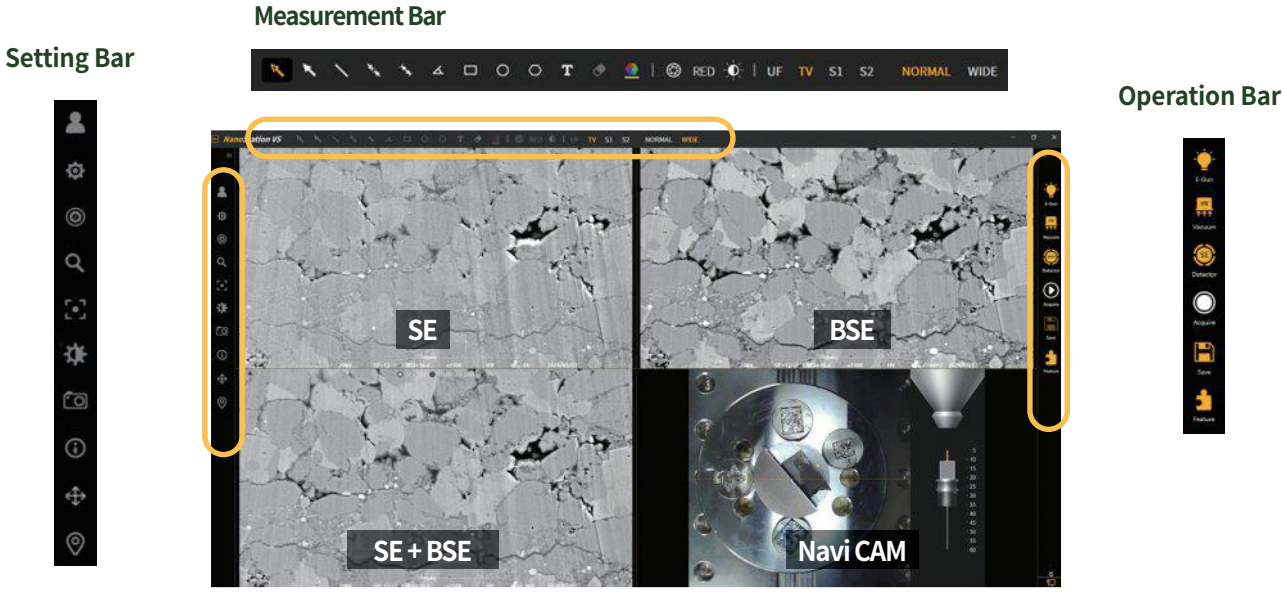
COXEM

Coxem's NEW SEMs

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

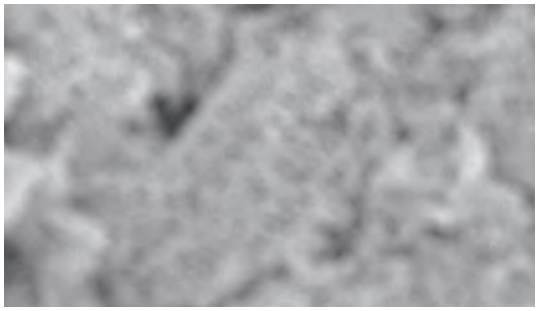
New GUI NanoStation 5.0

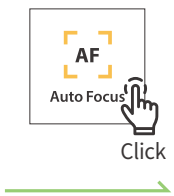
The NanoStation 5.0 has been improved and optimized for faster and more accurate analysis. It allows users to observe the shape of a sample and form an image in real-time on a quad display, and to combine SE and BSE signals into a single image for observation.



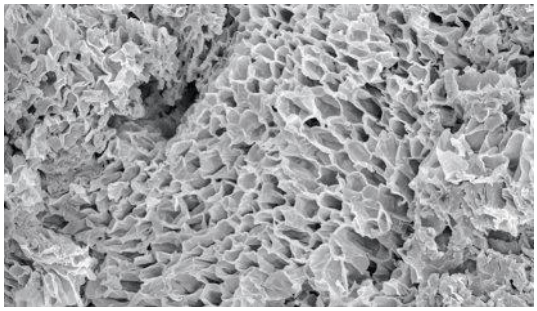
Auto Focus in 3 seconds

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



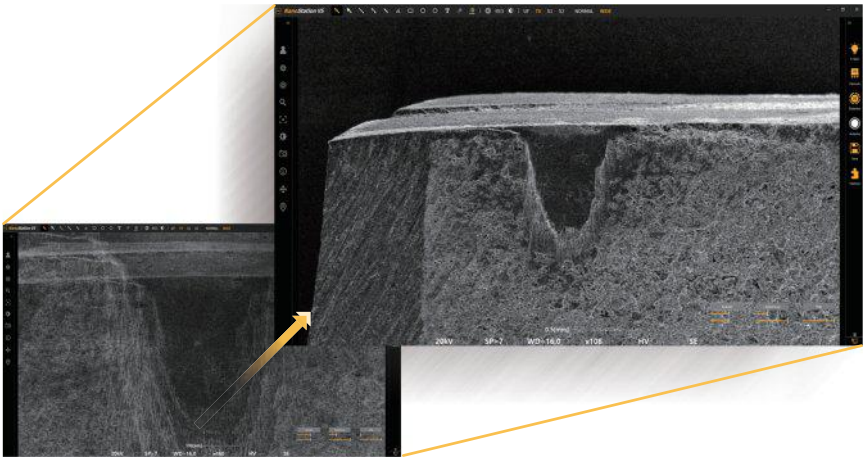


Auto Focus in 3 seconds



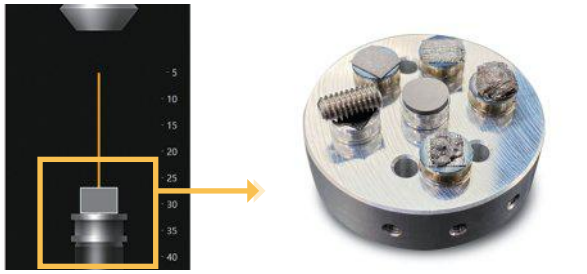
Fast scanning speed (ULTRA / TV / SLOW mode)

NanoStation 5.0 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 5.0 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.



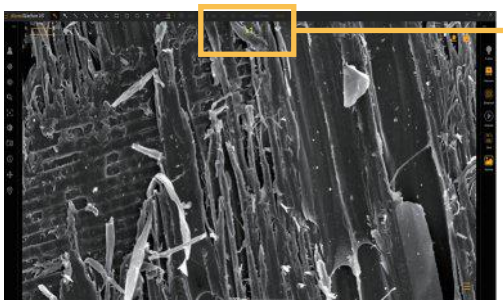
Multi-sample holder

Pin stub

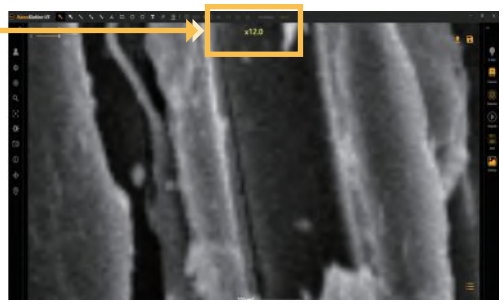
Archive editing function

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.

Original

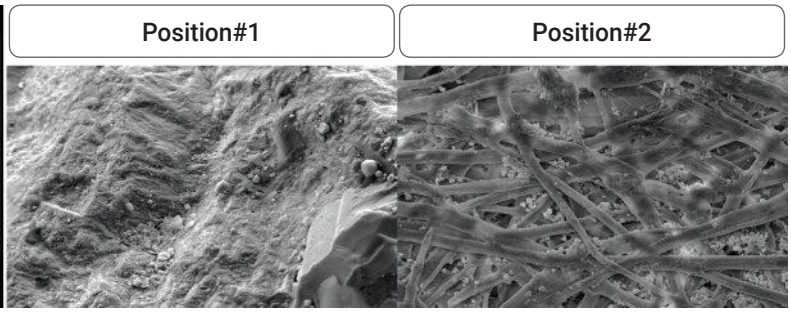


Digital Zoom 12x



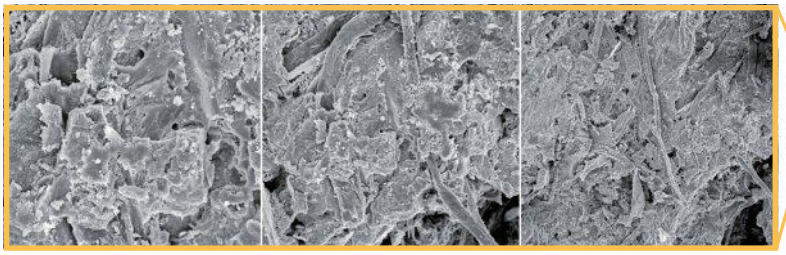
Location save function

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.

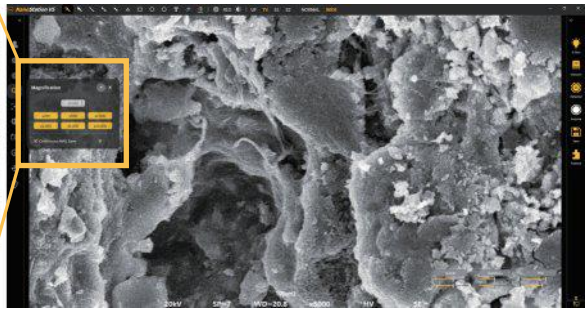


ContinuousMagSave function

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.

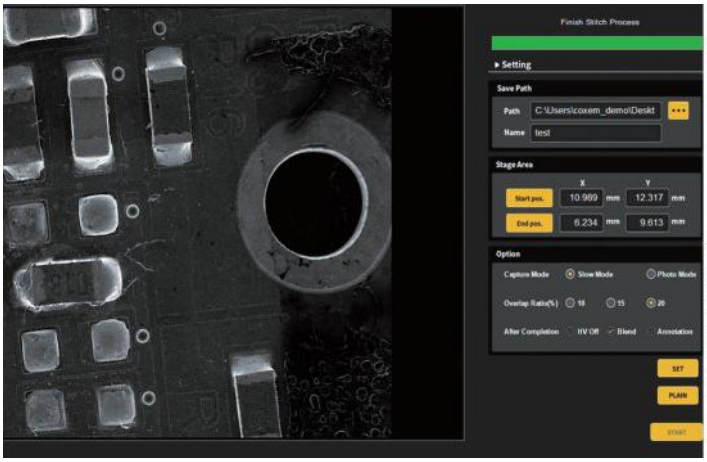


1,000x 500x 200x



Panorama v2

NanoStation 5.0 it 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.



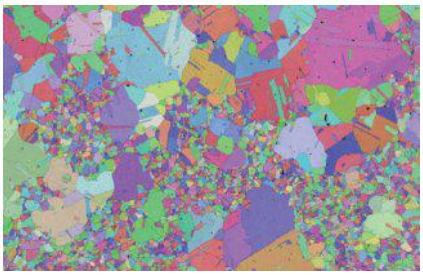
Options

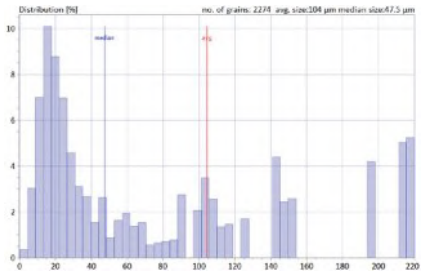
Compatible with compact EBSD

The EBSD obtains crystallographic data of a material by analyzing the diffraction pattern created by electrons backscattered from the sample surface by an incident electron beam. Coxem's EM-40, the world's first tabletop SEM to feature EBSD integration, along with the EBSD-integrated CX series, finds applications across diverse fields such as metallurgy, materials engineering, and geology.

BRUKER

QUANTAX ED-XS

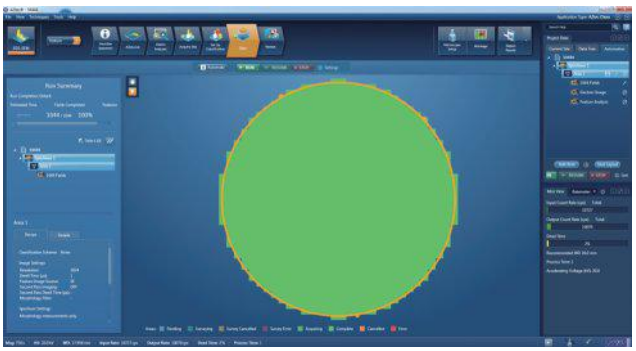


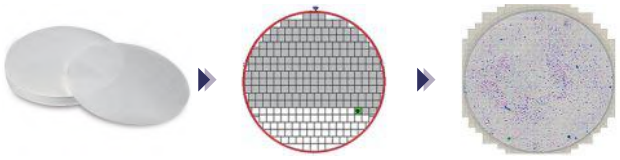


Ni alloy with bimodal grain size distribution

Fast particle analysis

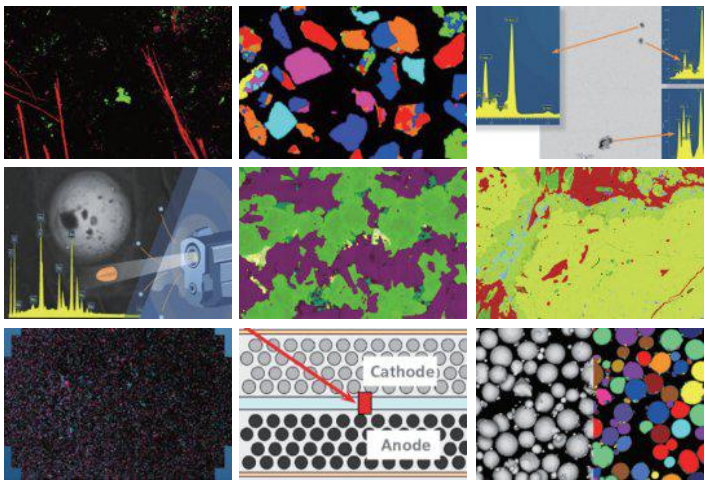
The improved scan speed enables rapid analysis of particles, and accurate analysis is possible not only when a sample consists of a single element but also when it comprises a mixture of elements.





47mm Membrane Filter

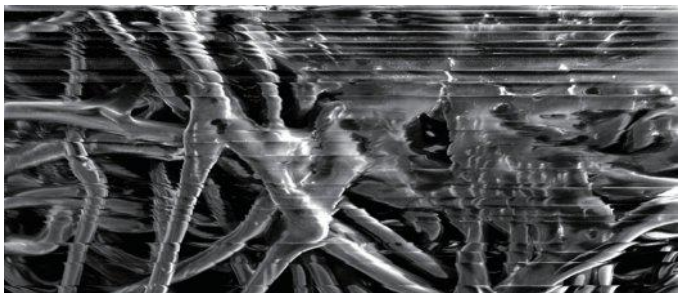
Mechanical Stage Field



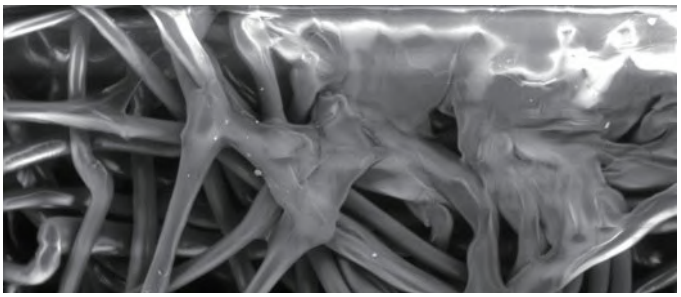
OXFORD INSTRUMENTS

Variable pressure (10 / 20 / 30Pa)

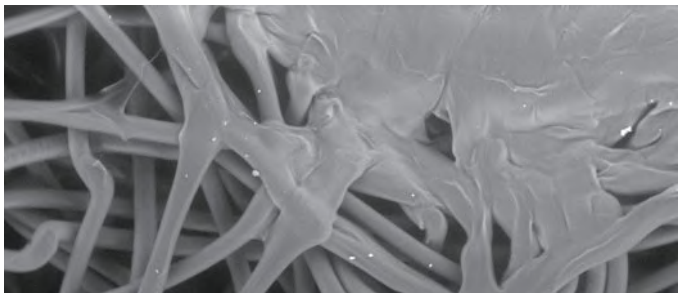
The variable mode enables users to analyze biological samples or insulating materials without having to preprocess the sample.



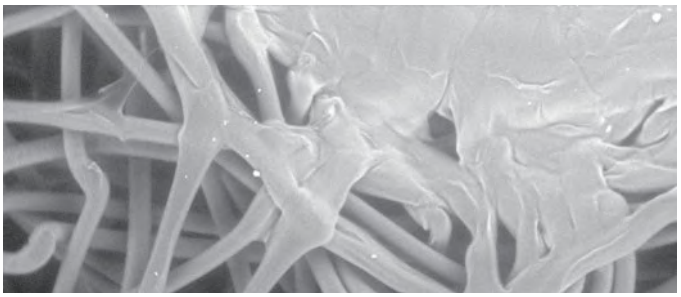
High vacuum



10Pa



20Pa

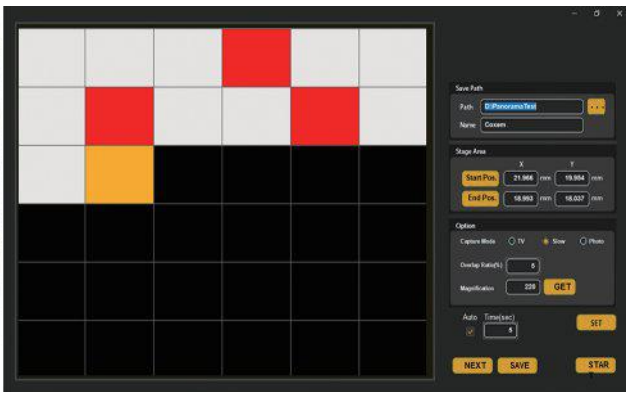


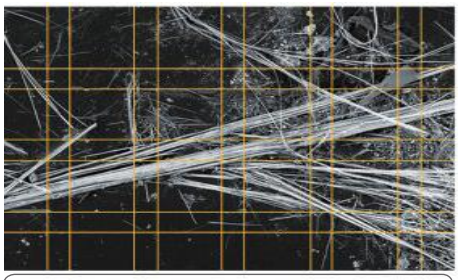
30Pa

NanofiberScanner

The NanofiberScanner, Coxem's new 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%

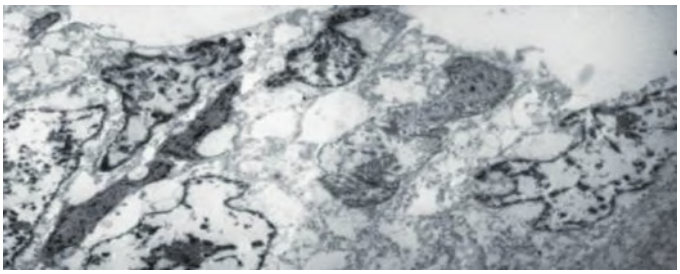
-30%

STEM analysis

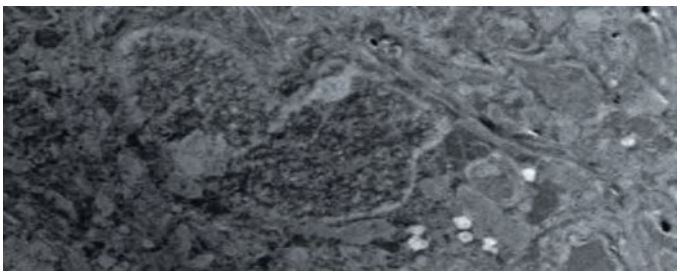
COXEM's SEM can perform STEM analysis by inserting a STEM detector and is capable of analyzing materials such as asbestos, cellular tissue, and nanostructures.

Stage stroke at STEM mode

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



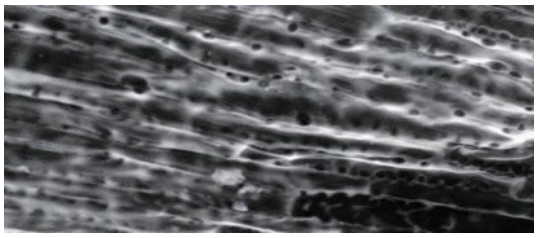
Bright field mode



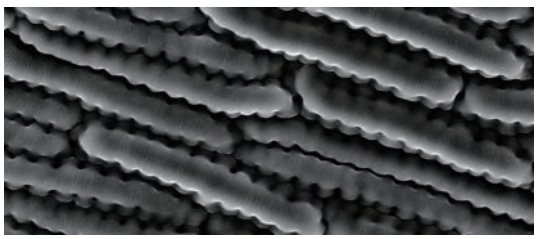
Dark field mode

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

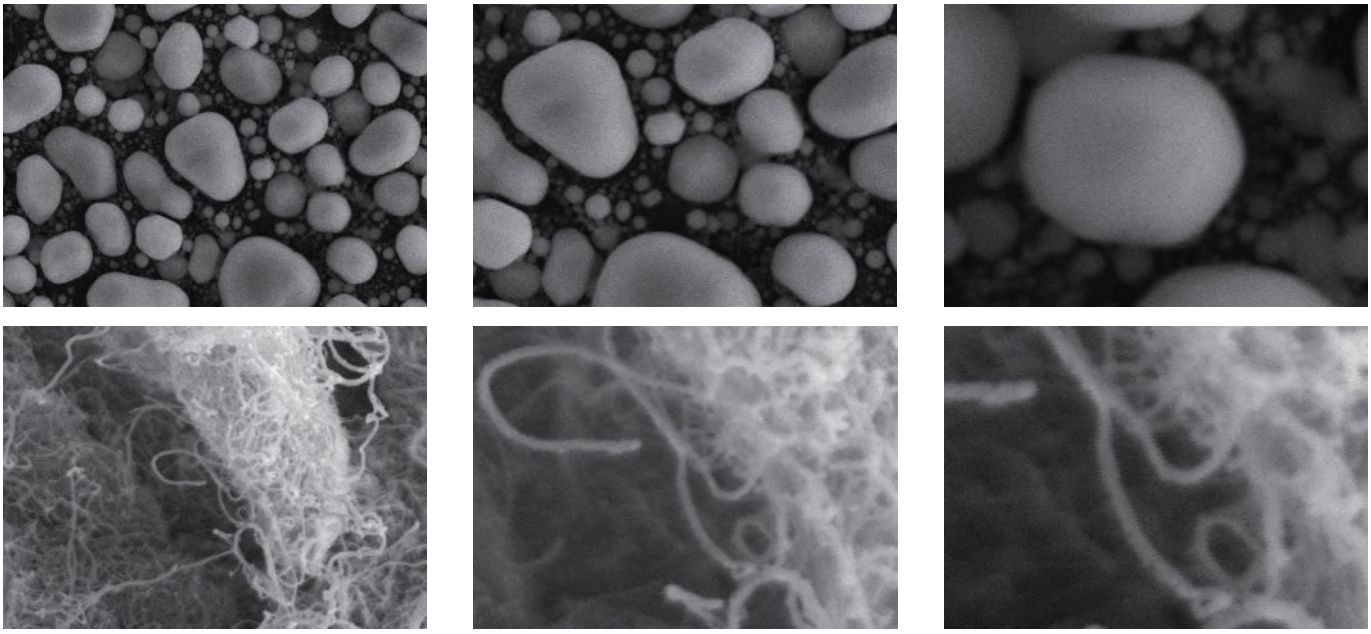
EM-40

- **All-new GUI, NanoStation5**
- **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

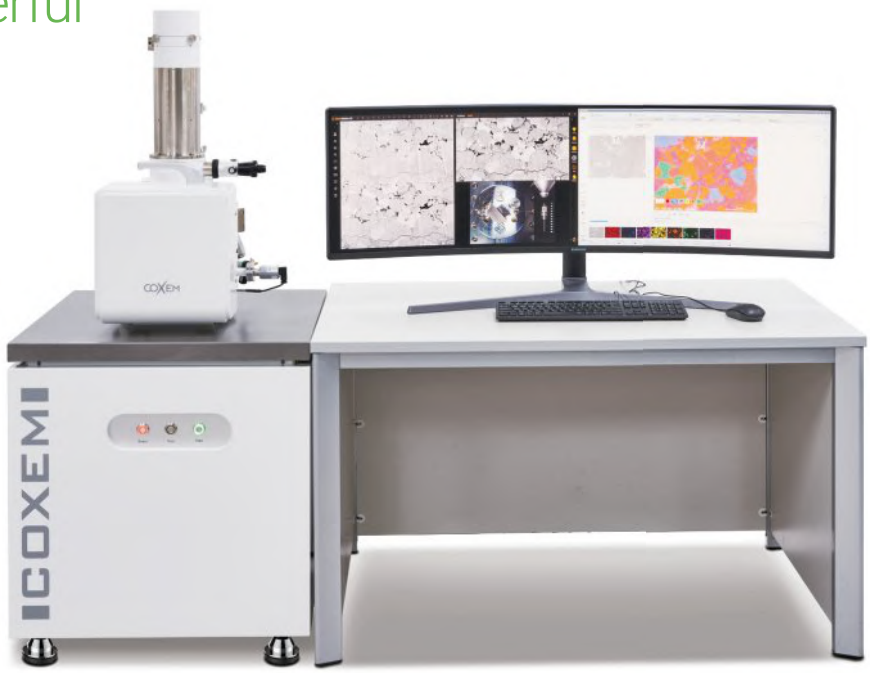


EM series

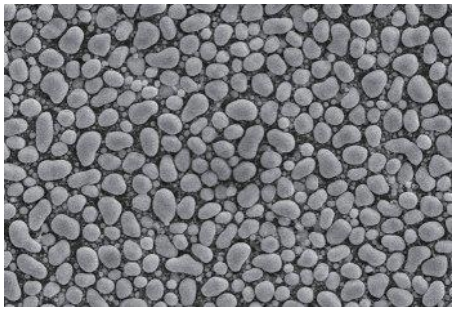
Model	EM-30N	EM-40
Electron gun	Tungsten filament (W)	Tungsten filament (W)
Spatial resolution	< 5nm	< 5nm
Magnification	15x to 150,000x	13x to 250,000x
Accelerating voltage	1 ~ 30kV	1 ~ 30kV
Sample stage	X : 35mm, Y : 35mm, Tilt : 0 ~ 45°	X : 40mm, Y : 40mm, Z : 40mm, 3-axis motorized
Detector	SE, BSE*	SE, BSE*
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, 85kg	315(W) × 560(L) × 580(H)mm, 81.5kg
Features	Panorama v1	Panorama v2
	Auto focus	Auto focus
	Auto brightness & contrast	1 Second auto brightness & contrast
	Auto start	Auto start
	Signal mixing	Signal mixing
	Dual display & Save	Triple display & Save
	Line profile	Line profile
	Image filtering	Image filtering
	Annotation tool	Annotation tool
	ChamberCam	ChamberCam
Data output format	JPEG, TIFF, BMP	JPEG, TIFF, BMP
Options*	BSE, EDS, EBSD, STEM	BSE, EDS, EBSD, STEM
	NaviCam, Coolstage	NaviCam, Coolstage
	LV (20Pa)	LV (20Pa), VP (10 / 20 / 30Pa)
	Panorama v2, NanofiberScanner	NanofiberScanner
	Diaphragm pump	Diaphragm pump

The Standard, Yet Powerful
CX-200K

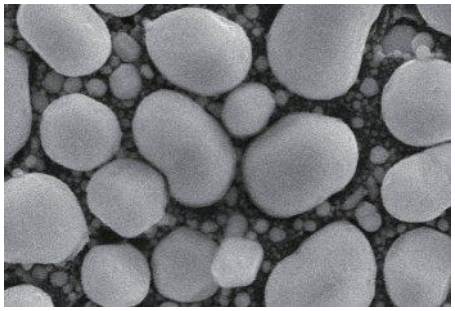
- All-new GUI, NanoStation5
- Maximum Mag. 500,000x
- Self-diagnostic system
- Optimized imaging
- 5-axis motorized stage
- Air-protection module
- A variety of options
  (EDS, EBSD, Coolstage, STEM etc)



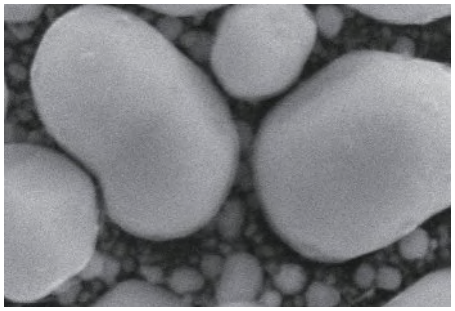
Optimized imaging



10,000x



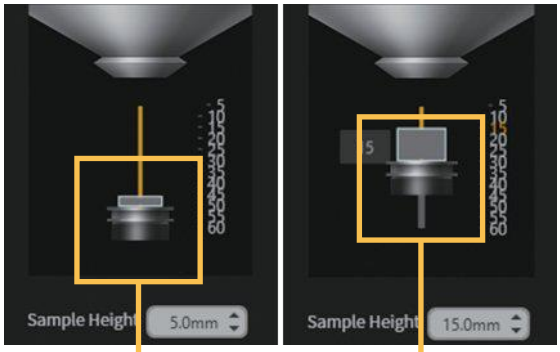
50,000x



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 NaviCam
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

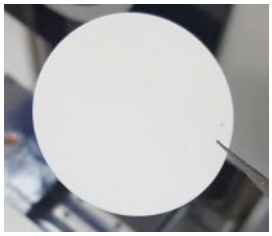
The Advanced Innovation
CX-300

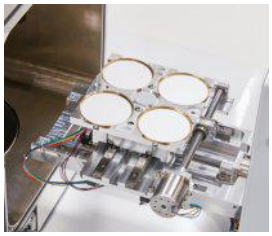
Advanced features

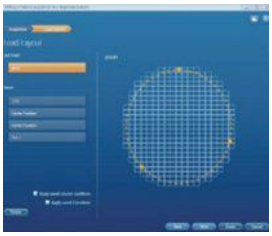
- **Designed for Large-area**
- **Convenient working process with NaviCam, ChamberCam**

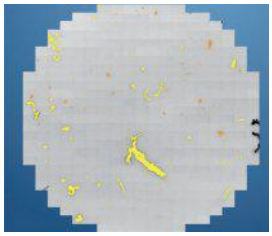
Large area analysis

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)

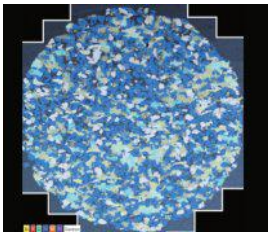

Sample loading

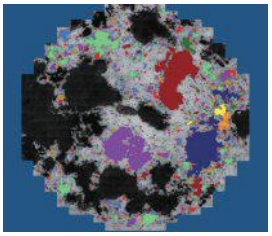

Analysis area setting

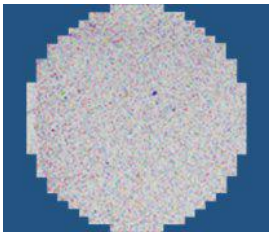

Analysis result

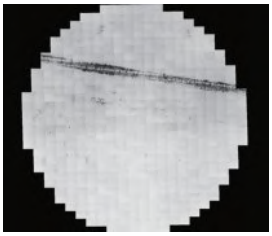
Applications of large-area analysis


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

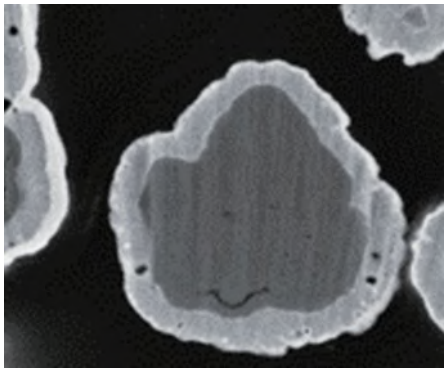
For IP

Lid knob

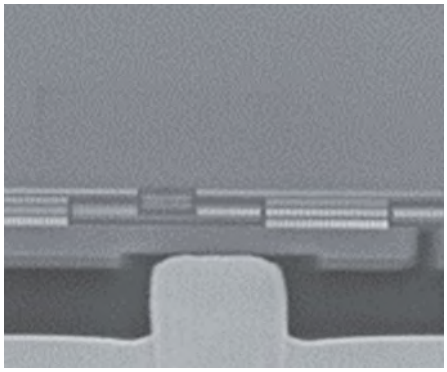
CX series

Model	CX-200K	CX-300
Electron gun	Tungsten filament (W)	Tungsten filament (W)
Spatial resolution	< 3nm	< 3nm
Photo magnification	6x to 300,000x	6x to 300,000x
Display 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	SE, BSE
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 v2	Panorama v2
	Auto focus	Auto focus
	Auto brightness & contrast	1 Second auto brightness & contrast
	Auto start	Auto start
	Signal mixing	Signal mixing
	Triple display & Save	Quad display & Save
	Line profile	Line profile
	Image filtering	Image filtering
	Annotation tool	Annotation tool
	ChamberCam	ChamberCam
Data output format	JPEG, TIFF, BMP	JPEG, TIFF, BMP
Options*	EDS, EBSD, STEM	EDS, EBSD, STEM
	Coolstage	NaviCam, Coolstage
	LV(20Pa), VP(10 / 20 / 30Pa)	LV(20Pa), VP(10 / 20 / 30Pa)
	NanofiberScanner	NanofiberScanner
	Scroll pump	Scroll pump
	Air-protection module	Air-protection module

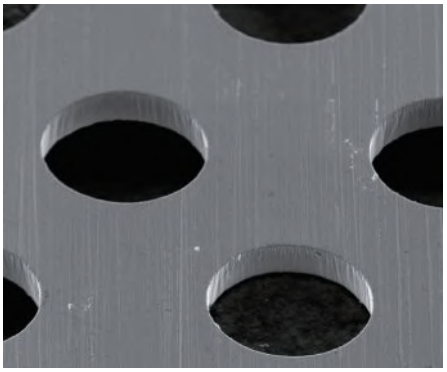
Applications



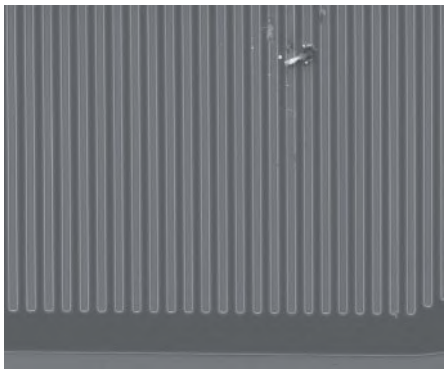
Metal powder



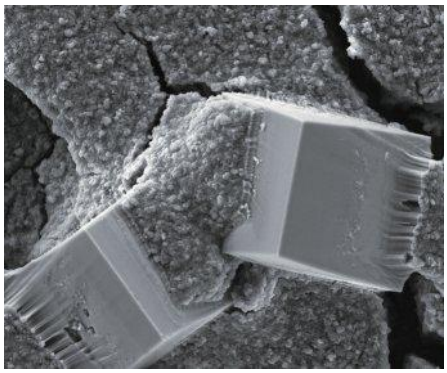
Semiconductor



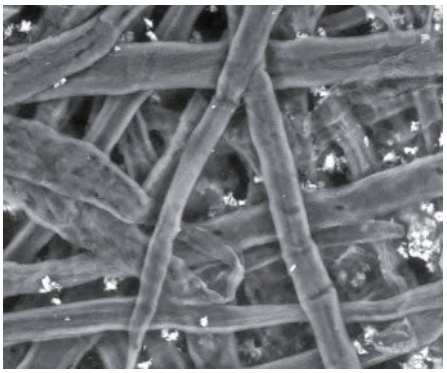
Metal plate



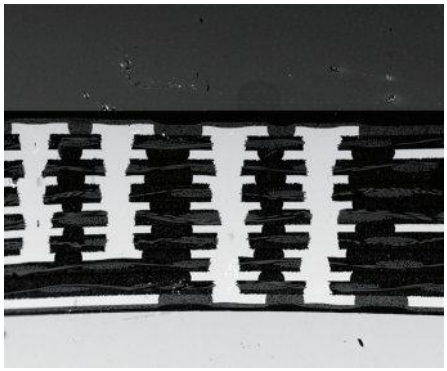
PCB



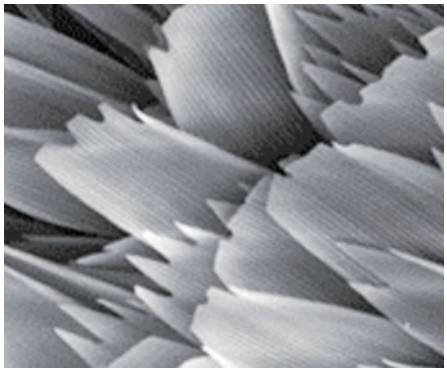
Emulsion



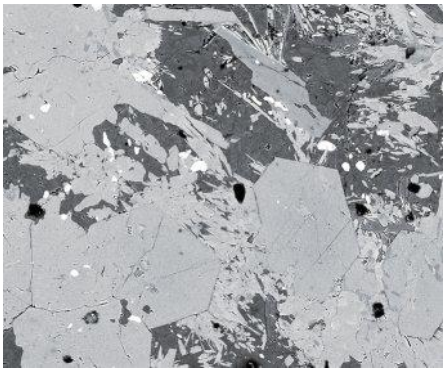
Paper



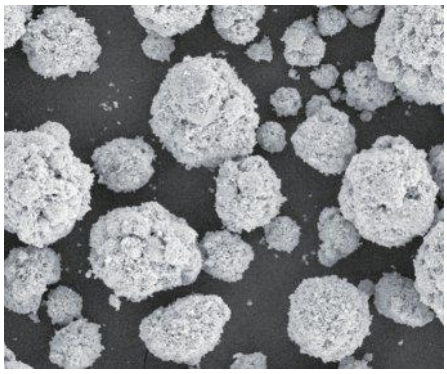
PCB



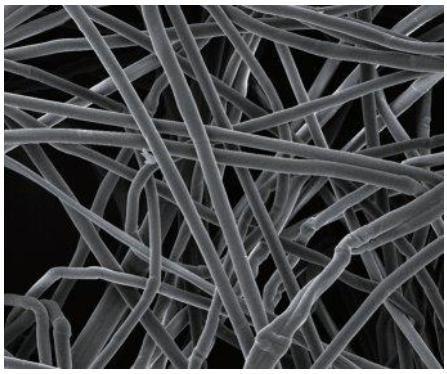
Bug



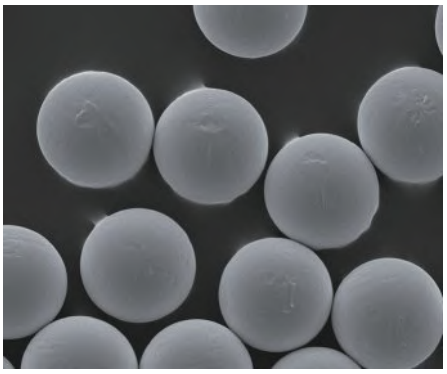
Mineral (Shale)



Nickel powder



Mask sheet



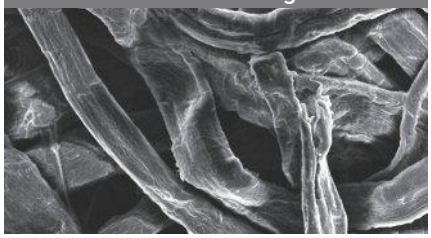
Tin ball

Powerful Sample Preparation Instrument : Ion Sputter Coater

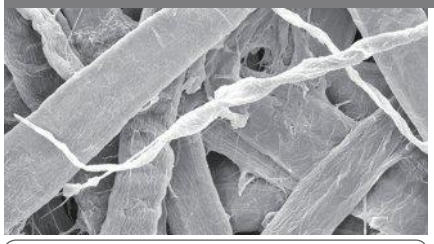
SPT-20

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.

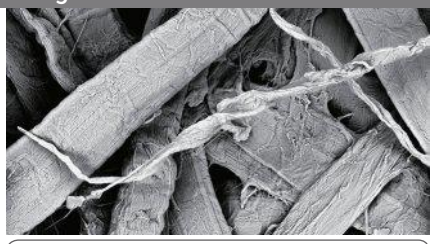
Before coating



After coating



SE



BSE

Features

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

50mm dia. 0.1mm
thickness, 99.99%

Specification

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	Au, Pt, Pt-Pd
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

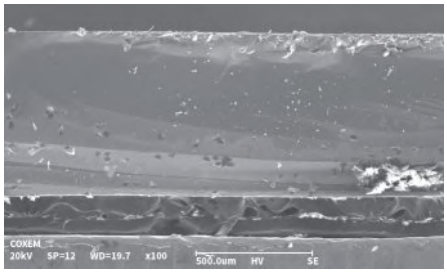
The IP-10K is COXEM's upgraded Ion Beam Polisher, equipped with various options including flat-milling, cooling stage, and the air-protection module, ensuring enhanced performance and versatility for a wide range of applications. It offers unparalleled capabilities for the precision milling of materials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

Features

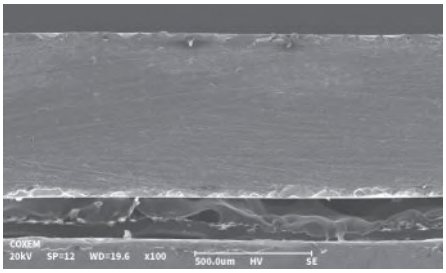
- **A fast milling speed of 1,000um/h (Si, 8kV)**
- **Minimizes thermal damage with the cooling stage**
- **Air-protection module compatible with SEM**
- **Flat-milling function provided for planar etching**
- **A fast pump/vent time with easy sample loading**
- **Higher front mask usability**

Ion beam polishing

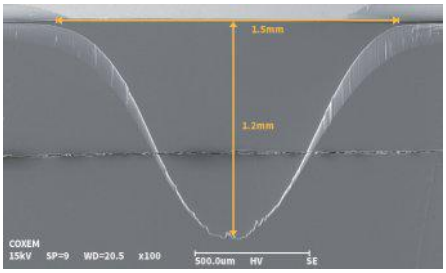
It is evident how much cleaner the cross-section surface appears after ion beam polishing compared to images of fractured or mechanically polished samples.



Fractured



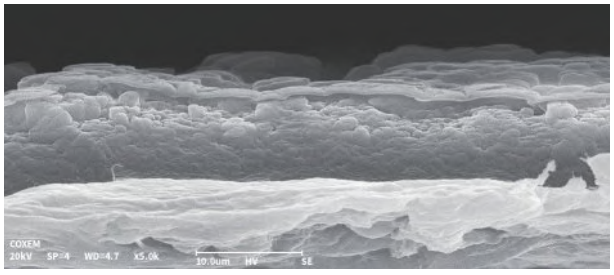
Mechanical polishing



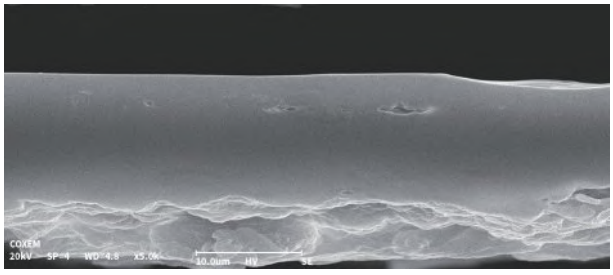
Ion Beam polishing

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.



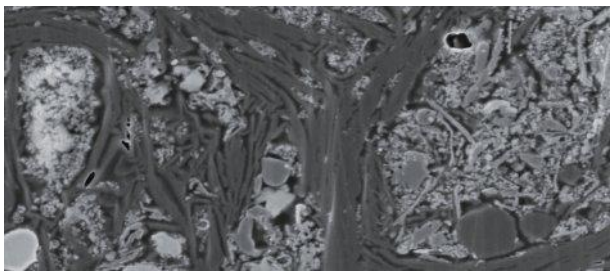
Milling condition : 4kV1h



Milling condition : 4kV1h -20°C

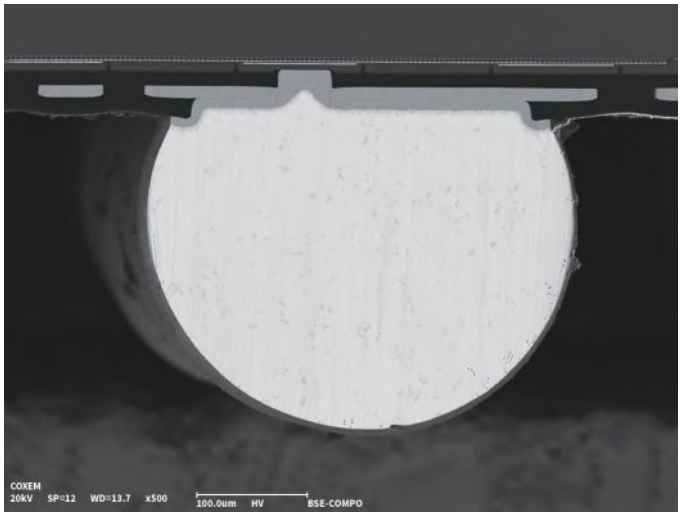
Air-protection module

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.

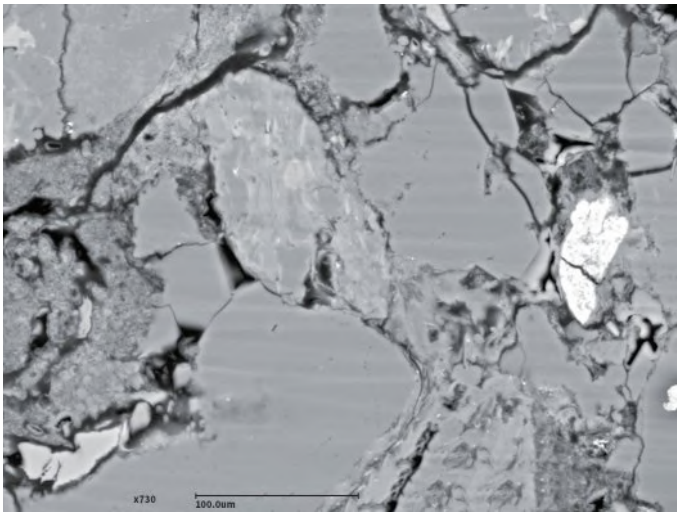


Battery

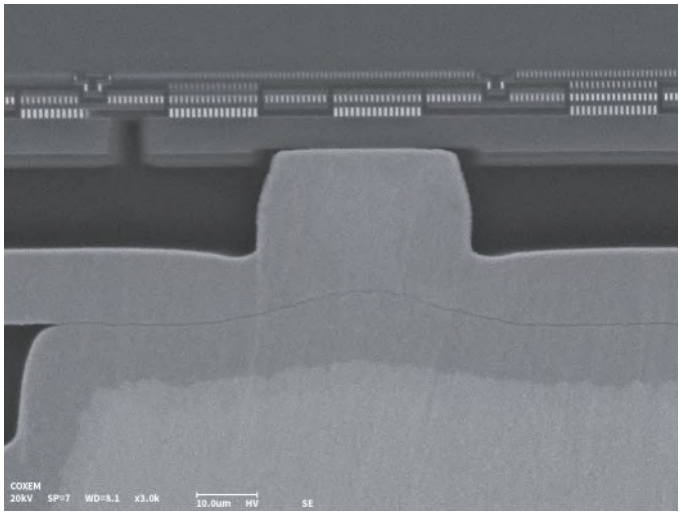
Applications



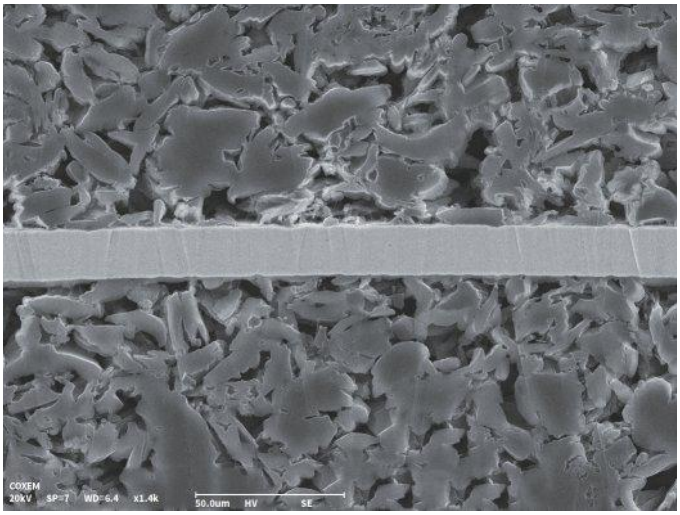
Solder ball



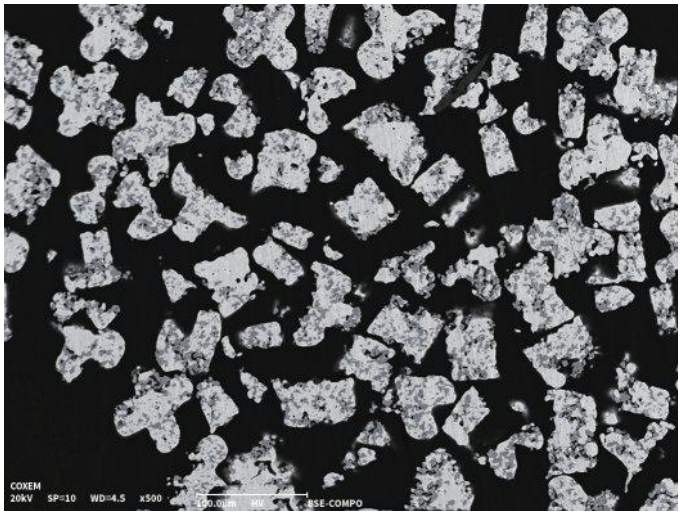
Mineral



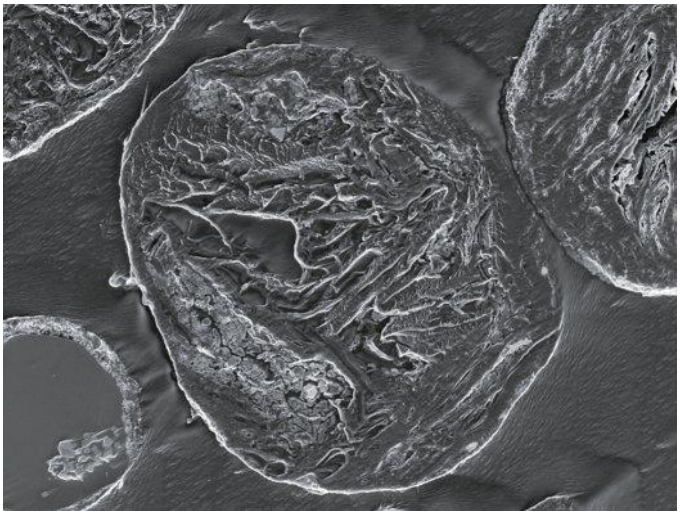
Solder ball



Anode powder



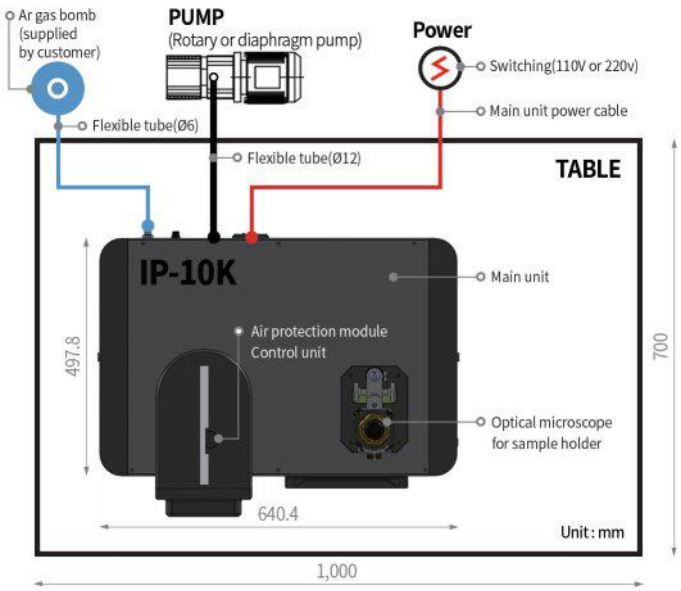
Metal Powder



Anode powder

Specifications

Ion accelerating voltage	2 to 8kV
Milling speed	1,000um/h (at 8kV on Si wafer)
Sample stage swing angle	±35°
Maximum sample size	20(W) × 10(L) × 5.5(T)mm 16(W) × 10(D) × 9.5(H)mm
Specimen movement range	X axis movement : ±3.5mm Y axis movement : ±2mm
Flat milling stage tilt angle range	10° to 90°
Sample size for flat milling	Ø32 × 18(H)mm
Operation	7 inch touch panel
Digital microscope for sample positioning	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)
Gas used	Argon gas (99.999%)
Gas pressure	0.03MPa ~ 0.05MPa
Gas flow control	Mass Flow Control unit
Vacuum systems	Turbo pump, Diaphragm pump
Dimension	640(W) × 492(D) × 282(465)(H)mm
Weight	Main system 45kg / Diaphragm pump 6.5kg
Options	Air-protection module, Cooling module, Flat milling



We used paper certified by FSC®

COXEM | KOSDAQ LISTED COMPANY

COXEM Co., Ltd.
#201, Migun Technoworld, 199 Techno2-ro, Yuseong-gu Daejeon, Korea, 34025

TEL. +82. 42. 861. 1686

FAX. +82. 42. 861. 1689

E-MAIL. domestic@coxem.com
overseas@coxem.com
customerservice@coxem.com

www.coxem.com