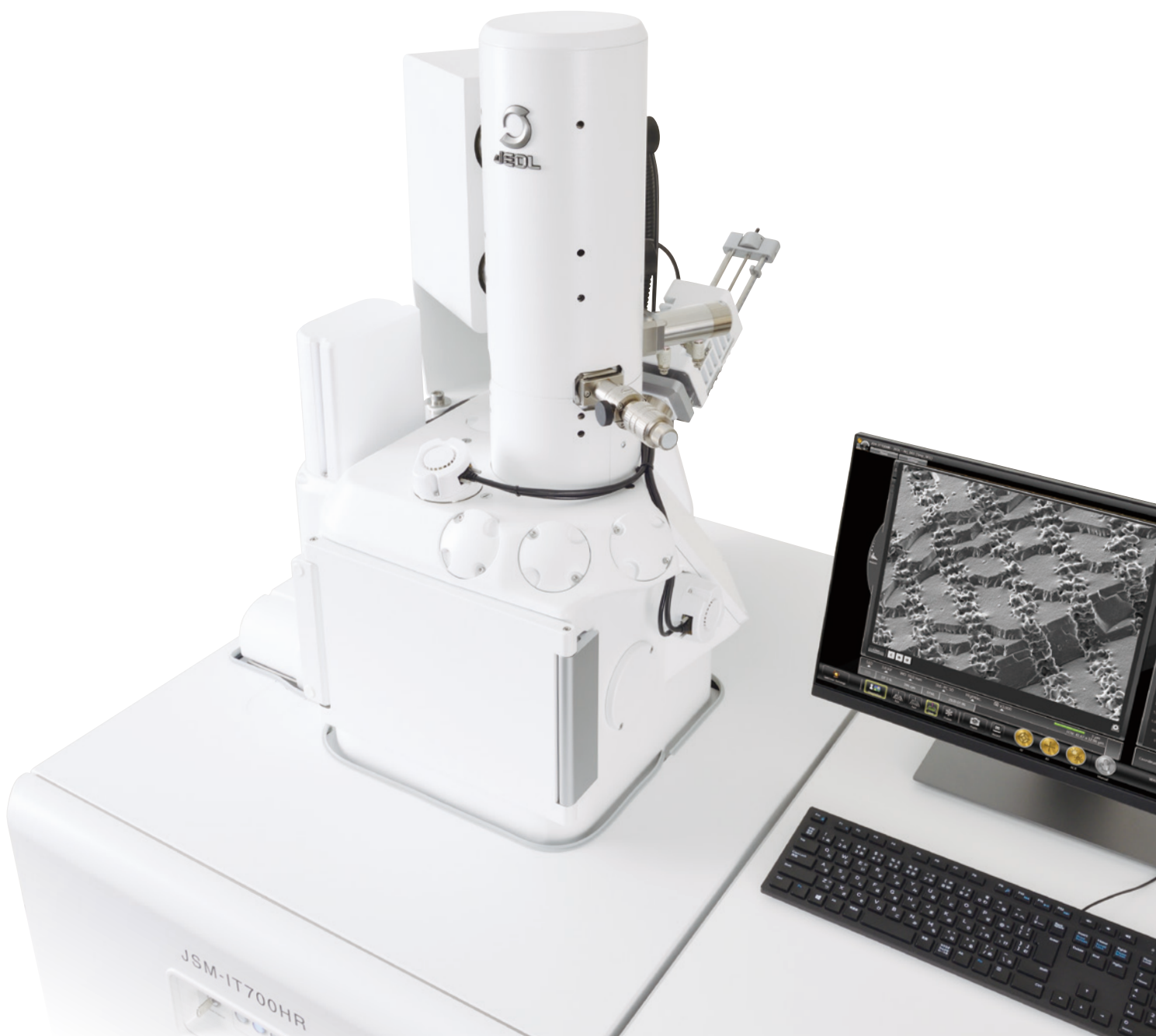




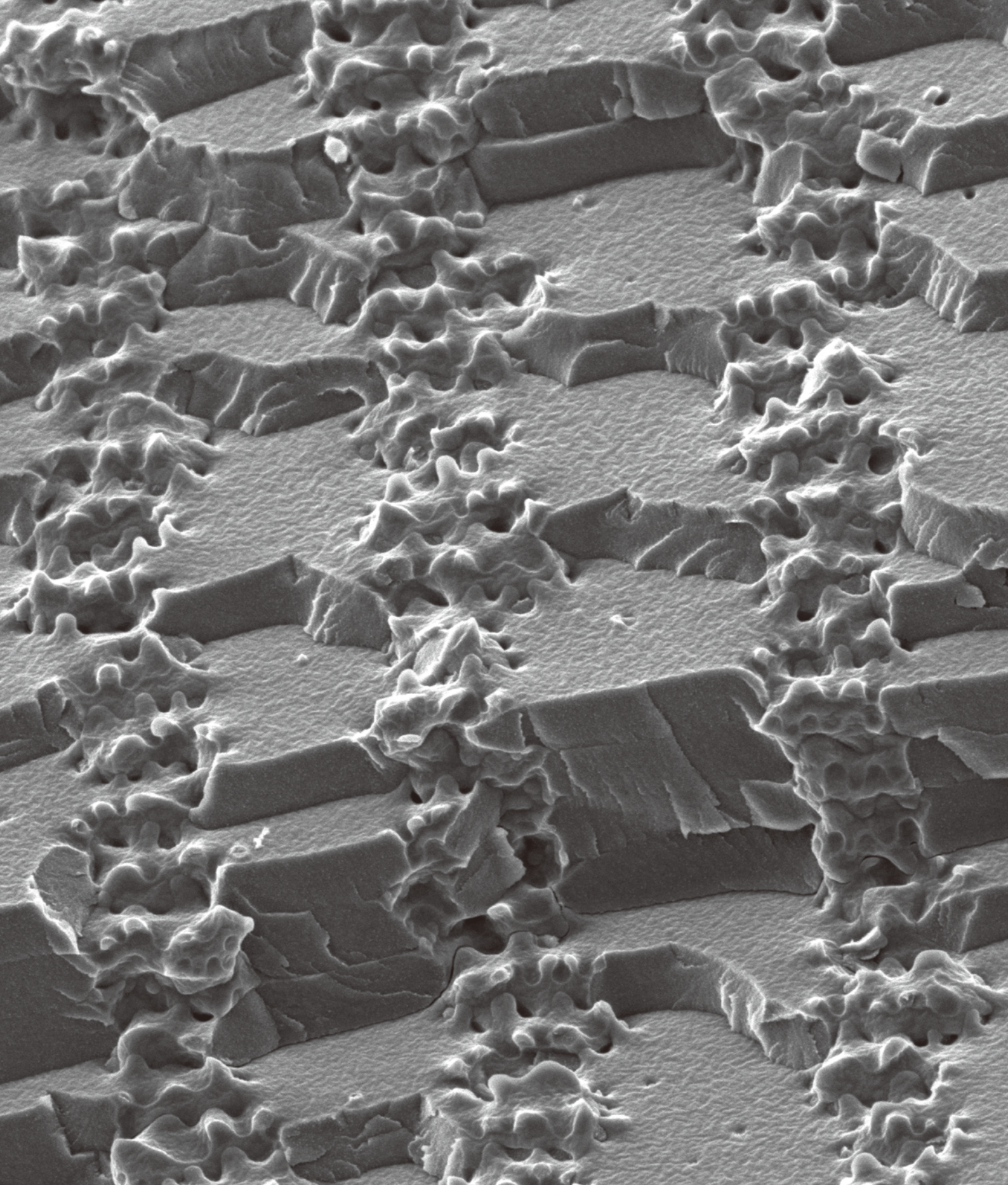
Scientific / Metrology Instruments
Scanning Electron Microscope

Solutions for Innovation

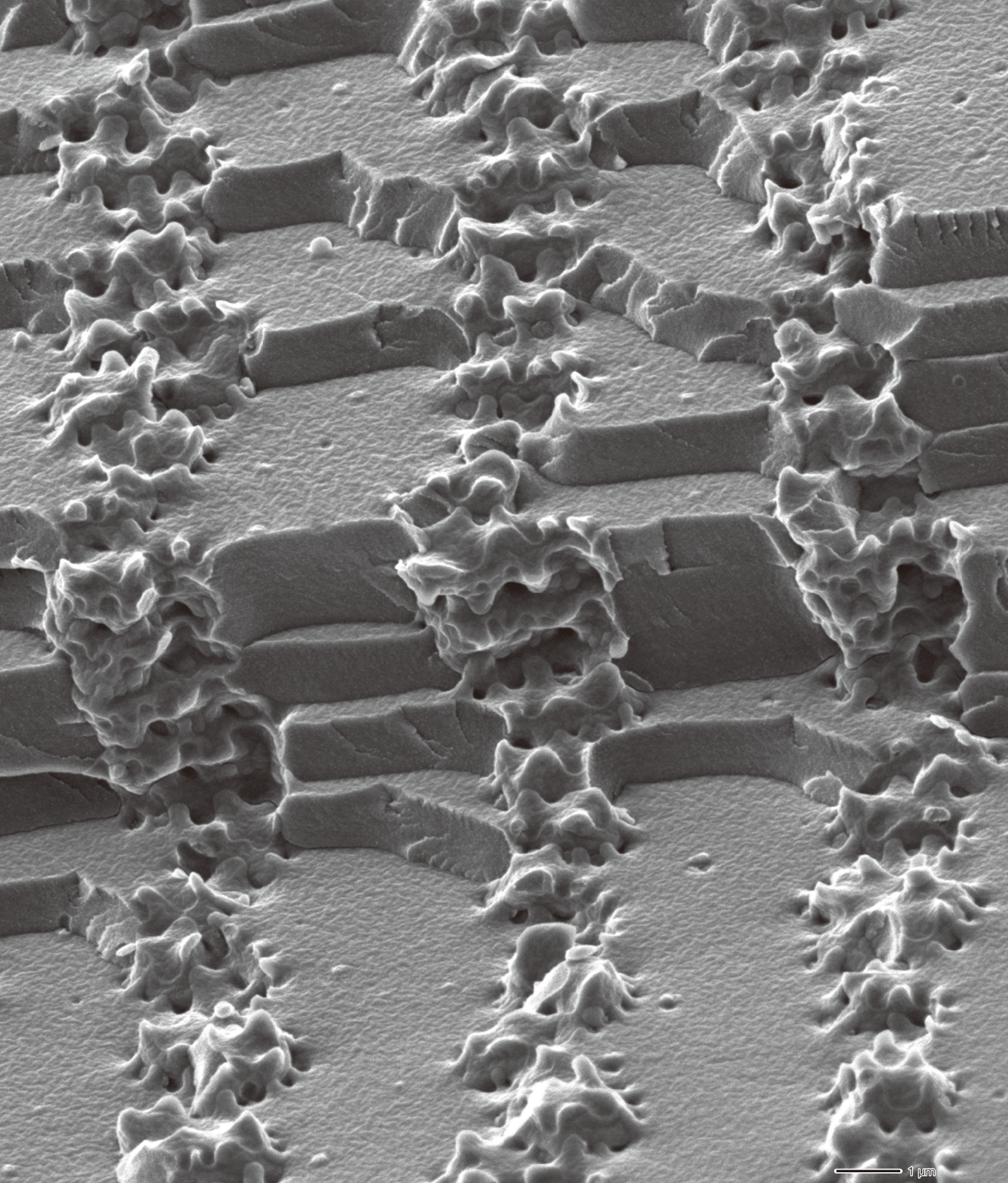
JSM-IT700HR



JEOL Ltd.



SEM-Essential in Daily Lab Operation
JSM-IT700HR Makes it Easy.



specimen: crystalline lens

Nano-scaled materials are driving the current technological breakthroughs, and their observation and analysis is facilitated by a new and innovative SEM, JSM-IT700HR. Its new electron gun with spatial resolution of 1 nm and the largest probe current of 300 nA, combined with an exceptionally user friendly software interface significantly simplifies observation and analysis in SEM. The compact instrument design also features a large specimen chamber with multiple accessory ports as well as EDS integration. JSM-IT700HR Advanced SEM, Powerful and Simple to Use.

Compact High Resolution SEM



Easy to use

— Built-in tools for a streamlined workflow!

- **Zeromag** simplifies specimen navigation. Provides a seamless transition from an optical image to SEM image.
- **Live Analysis** for real-time monitoring of the elements in the field during
- **SMILE VIEW™ Lab** to manage the data and generate reports.
- **Auto functions** deliver sharp, high resolution images by Auto Focus, Auto and Auto Beam Alignment.



High definition • High brightness • High stability

— Powerful analytical SEM performance

- 15 fold increase in probe current compared to traditional SEM.
- Delivers high resolution even at large probe currents.



Large chamber for large specimens

— Free from the limitation of specimen size

- Large volume, high speed specimen exchange system.
- Simple, safe! Specimen Exchange Navi for step-by-step guide.
- Integrated camera available for monitoring specimen position.

image observation.

Stigma

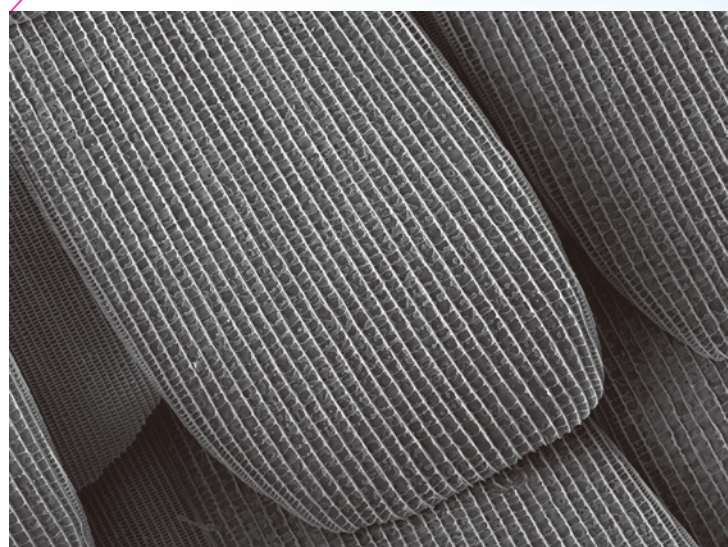
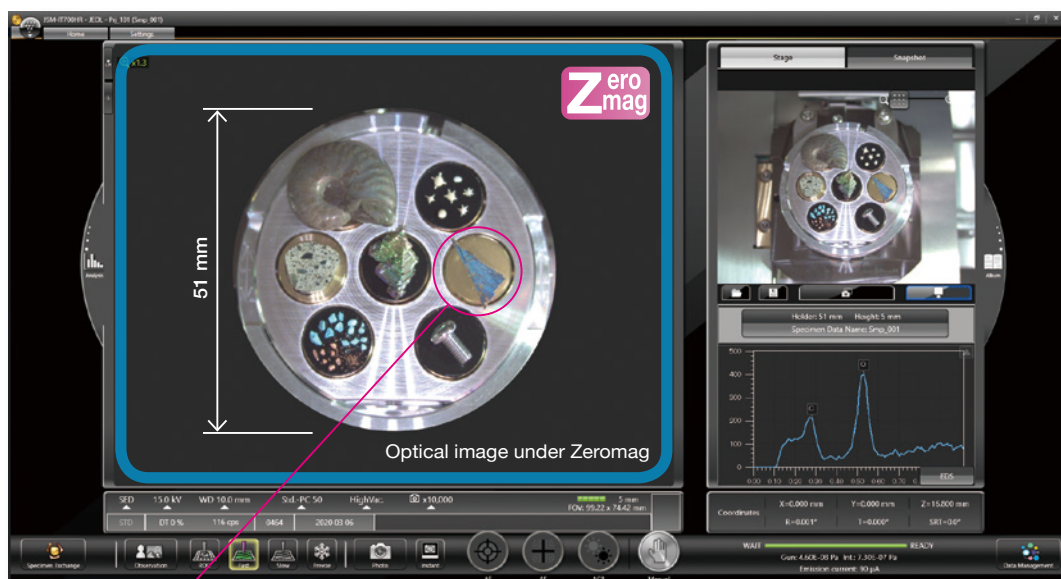




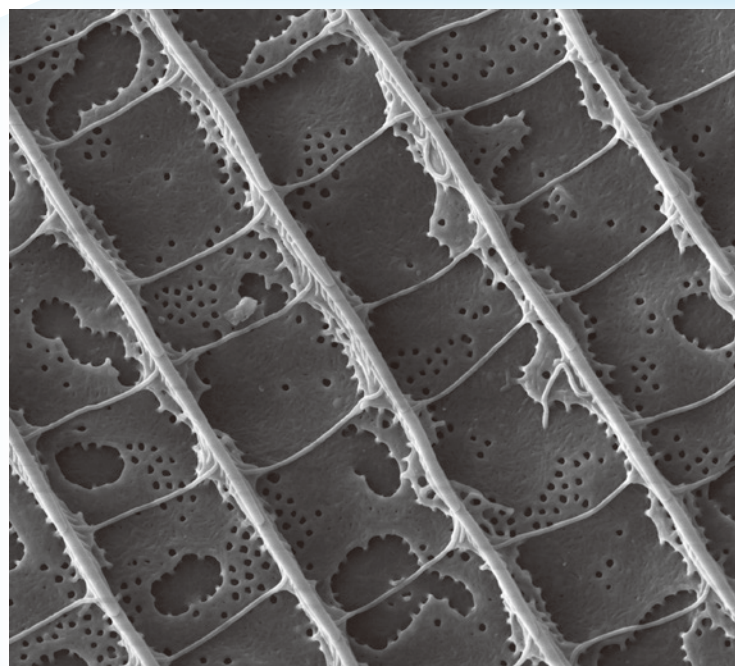
Zeromag

Magnify optical image, seamless transition to the

Zeromag is designed to link the holder graphic or optical image* with the SEM image. Using Zeromag, field searching is easy.



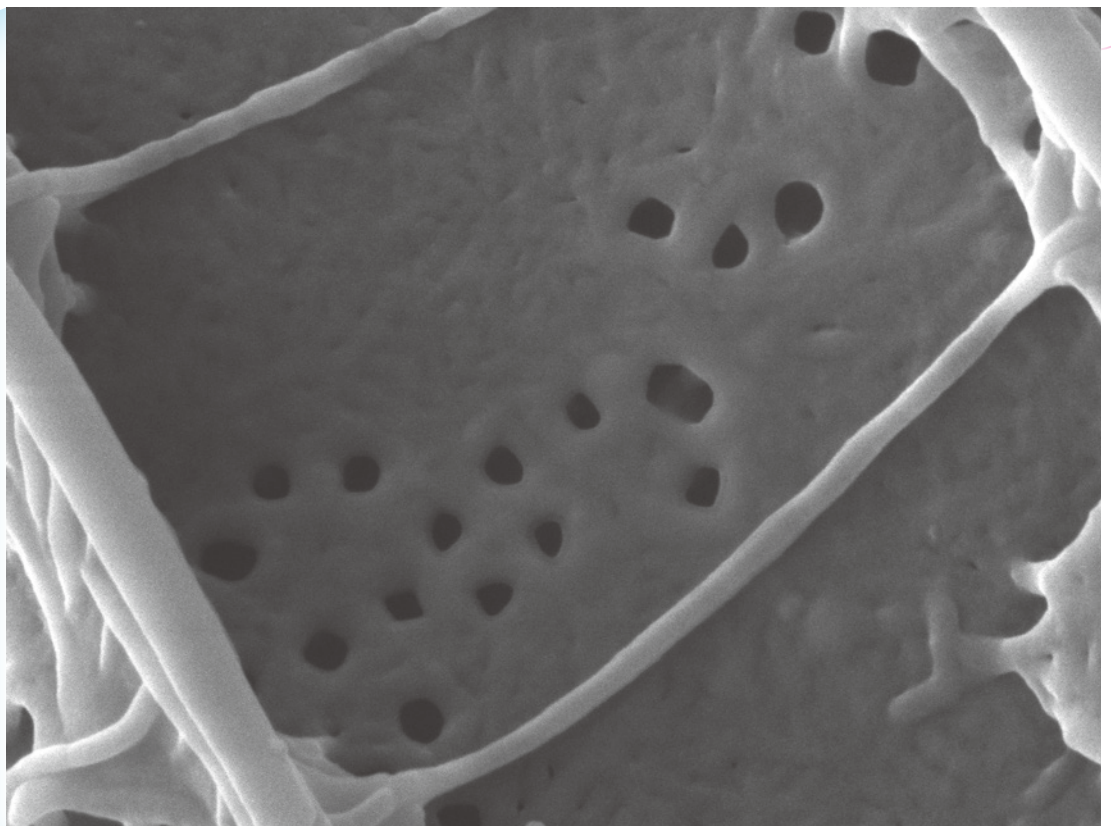
×1,000



SEM image

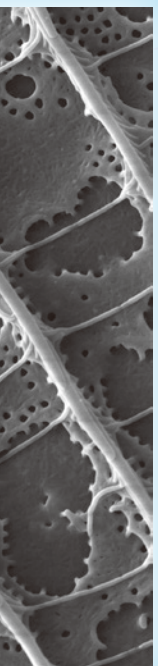
Specimen: Wing scale of butterfly, Accelerating voltage: 3 kV

×50,000



500 nm

×10,000



1 μm

* Stage Navigation System (SNS) is necessary to display an optical image.












Integrated EDS & Live Analy

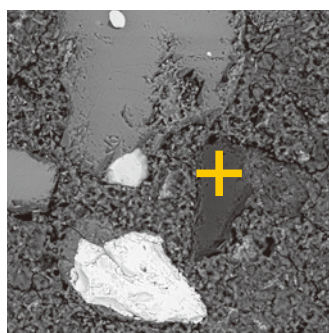
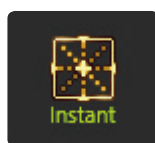
Integration of observation and analysis

EDS analysis directly on the SEM observation screen for seamless transition from observation to analysis. Moreover, Live Analysis provides real-time monitoring of the spectra for characteristic X-rays.

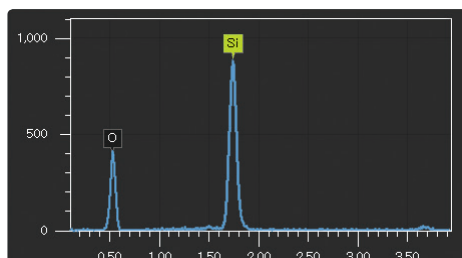
EDS Functions

-  Instant analysis
-  Point analysis
-  Whole field or Area analysis*
-  Whole field or Area map*
-  Line analysis or Diagonal line analysis*
-  Particle analysis
-  Polygon analysis
-  Ellipse analysis
-  Free line analysis

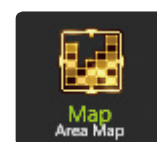
Instant analysis



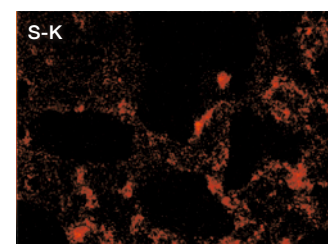
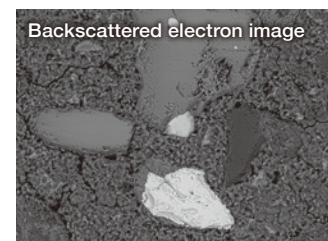
Click and hold for a quick survey of the elemental composition.



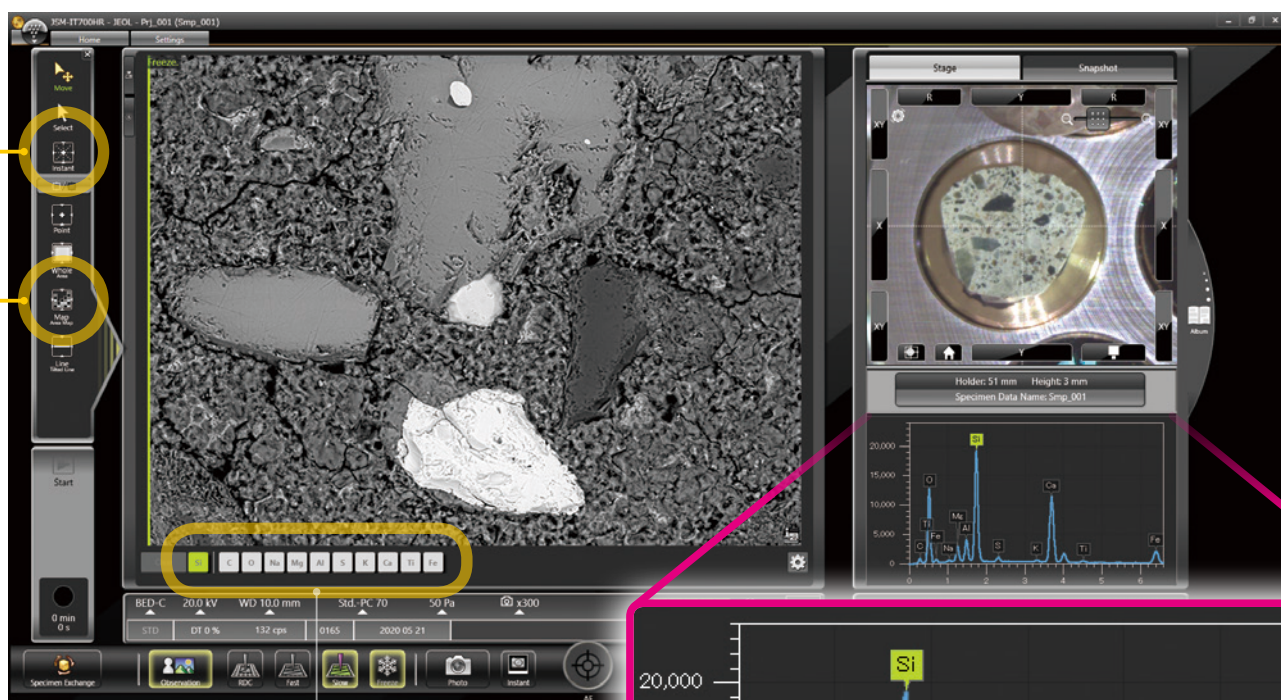
Easy EDS mapping



Start the analysis instantly with 3 clicks

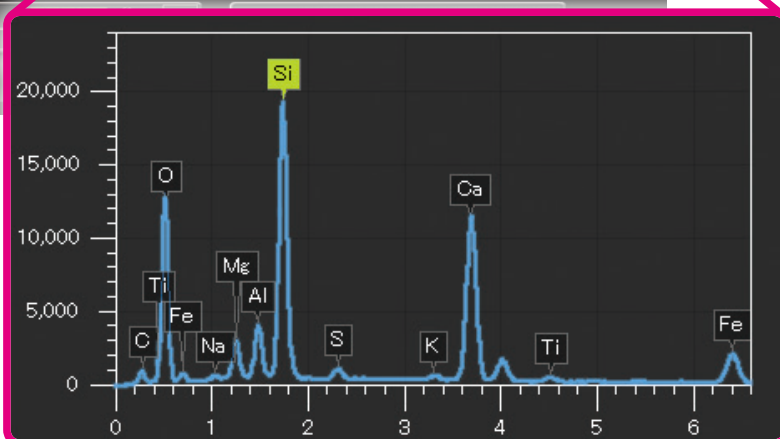


* An icon has two functions and it is possible to switch between them by clicking.

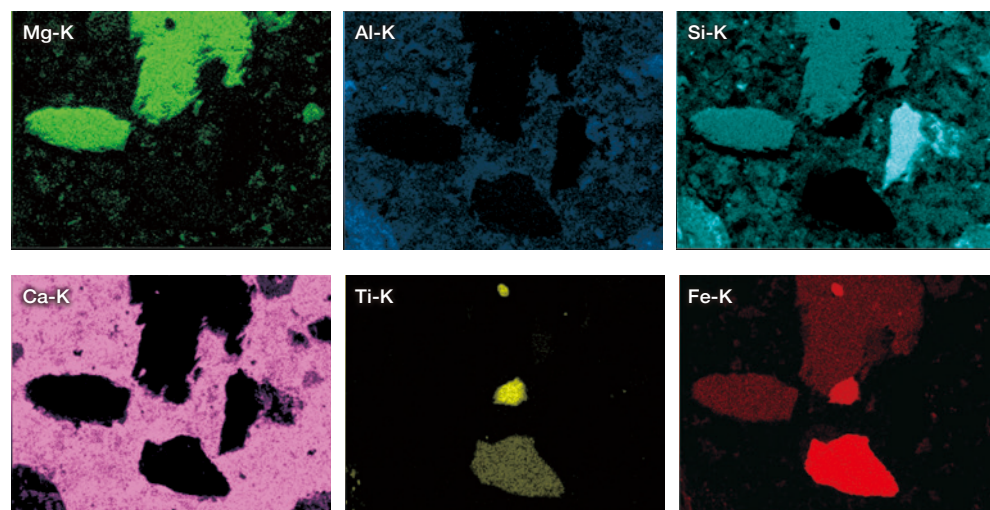


Display elements

Major elements in the specified area are displayed. In addition, the elemental icon is highlighted when the element which is selected in advance is detected.



Live Analysis



50 µm

Specimen: Mechanically polished section of concrete
Accelerating voltage: 20 kV
Magnification: x300 Low-vacuum mode



SMILE VIEW™ Lab

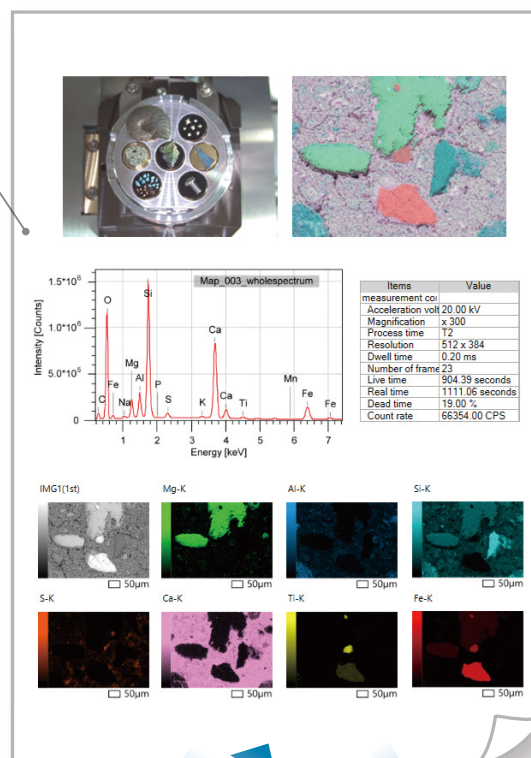
Fast and flexible report generation

SMILE VIEW™ Lab is a JEOL original data management tool, which links the optical image, SEM image and EDS analysis results. With one click, a report can be generated easily after the measurement. An off-line version of the software*¹ is available to free up the SEM and enhance productivity.

① Select data

Just select the data needed for a report from the data list

② Transfer the data to a report template



SVL

Save the edited data

Analyze again

Can edit the size and color of spectra instantly

Feed back

Output as PDF, Power Point and Word*²



③ Access to analysis data

The report can be edited and analyzed again because the generated report has been linked to the original data. Reanalysis is hassle free.

*¹ Off-line data analysis software (option) is required. *² Need to install Microsoft® Office.



Tools for speed

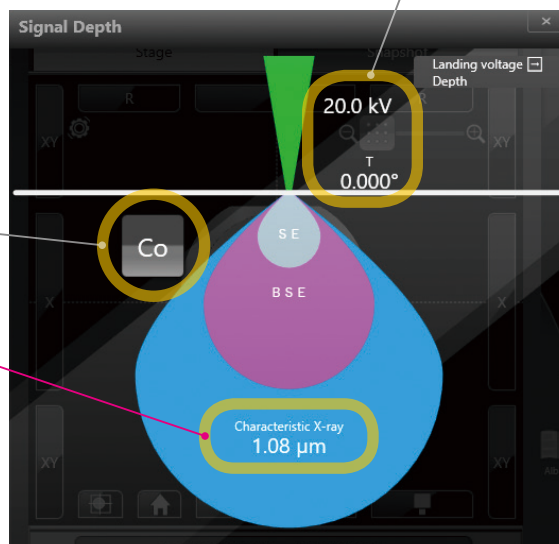
Display the depth of signal NEW

A new function for displaying the generation depth of signal is built-in. Observing the analysis depth on the specimen is very effective for understanding the elemental results generated.

Auto display the operation conditions including accelerating voltage and tilt angle

Element

Generation region of characteristic X-rays



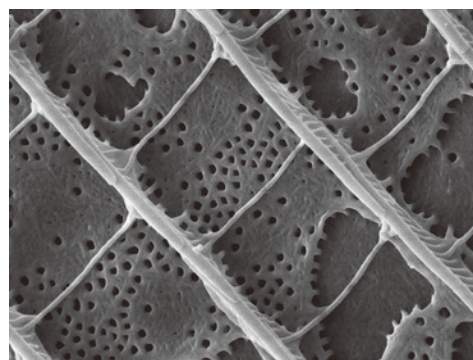
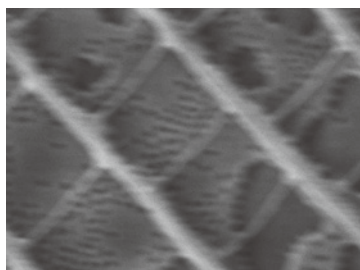
Auto functions



In order to obtain clear SEM images, it is necessary to have correct beam alignment, focus and astigmatism. JSM-IT700HR optimizes all these adjustments automatically.

Auto focus/stigma (AF/AS)

The focus and astigmatism are not corrected



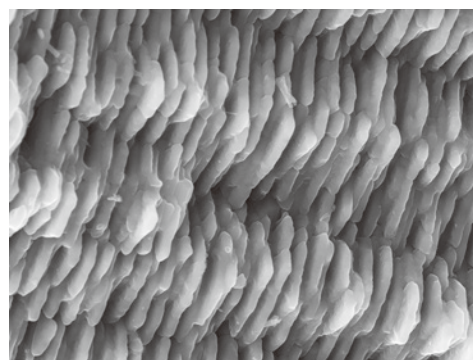
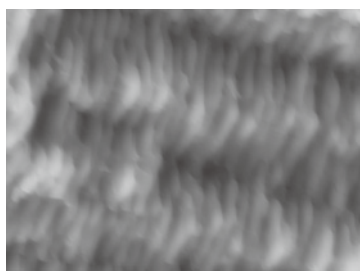
1 μm

1 μm

Specimen: Wing scale of butterfly, Accelerating voltage: 3 kV

Auto Beam Alignment (ABA)

Axis of beam is not corrected



1 μm

1 μm

Specimen: Cleaved surface of ammonite, Accelerating voltage: 15 kV

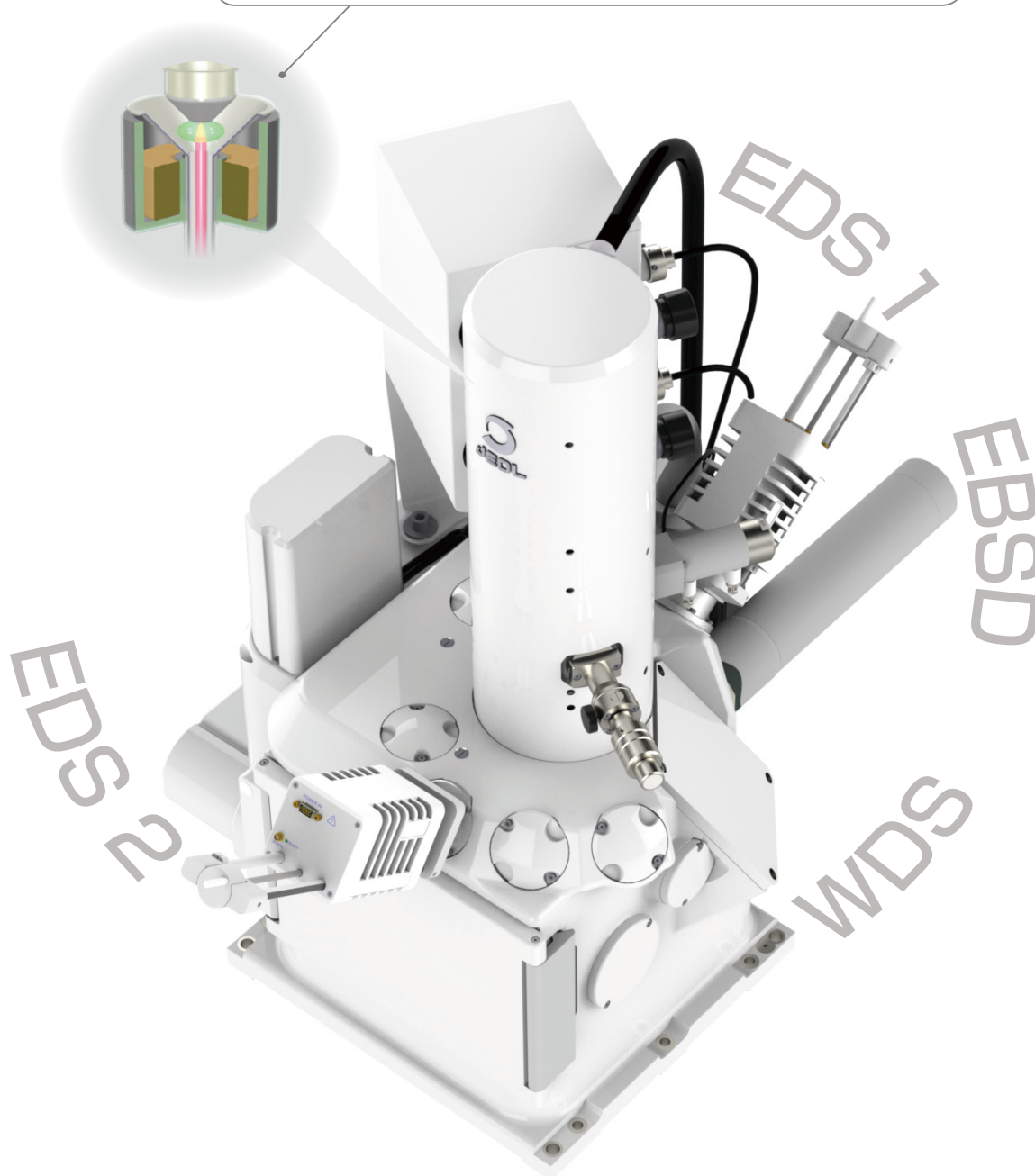




High definition • High brightness

In-lens Schottky field emission electron gun

By integrating the Schottky electron gun and low aberration condenser lens, the electrons generated from electron gun have been effectively collected to provide high brightness. The resolution has been improved by optimizing the electron optical system and enhancing performance while reducing noise, which all relates to the high brightness electron gun.

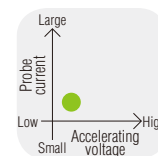


*There are 11 ports optimized for analysis on the multi-purpose chamber.
For example, one EDS port is positioned coaxially to the EBSD port allowing simultaneous measurement. A second EDS port is mounted opposite the first for dual EDS minimizing shadows with topographic specimens.*

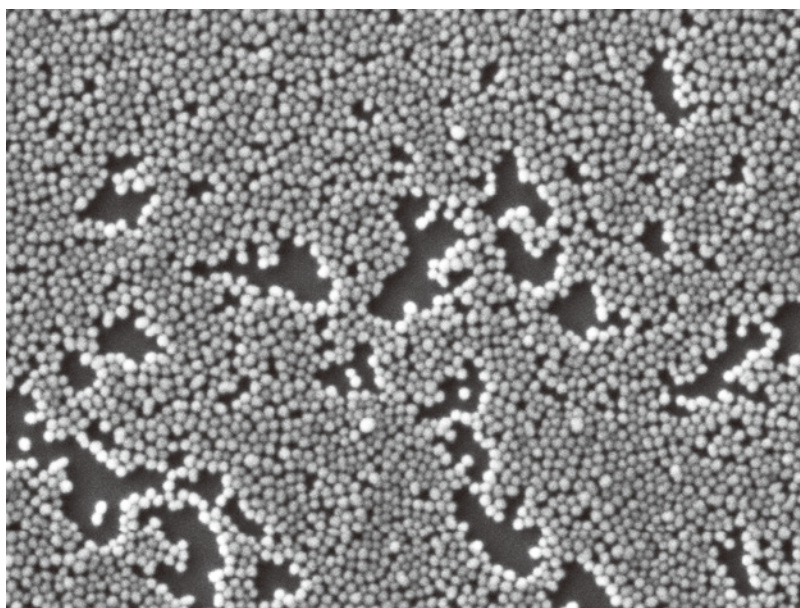
• High stability

Feature 1

High resolution at low accelerating voltage



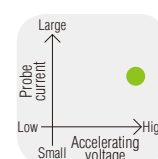
Observe non-conductive specimens directly, such as soft materials. In-lens Schottky electron gun provides high resolution at low accelerating voltage.



Specimen: Polystyrene particles, Accelerating voltage: 1.5 kV

Feature 2

High resolution at large probe current

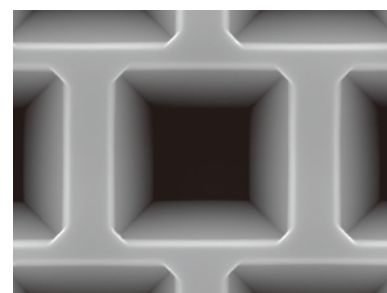
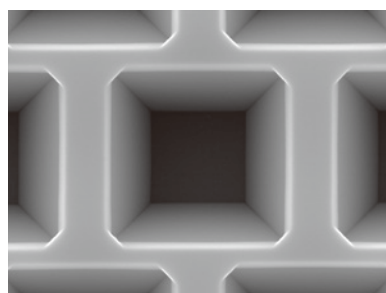
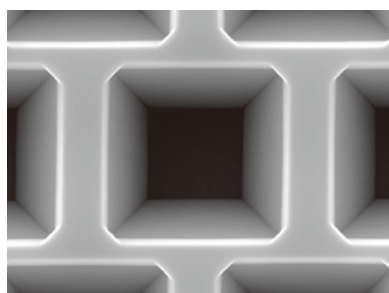


Small Large

0.5 nA

1 nA

3 nA



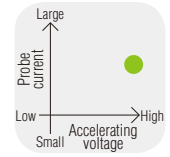
Specimen: Si pattern, Accelerating voltage: 15 kV, WD: 10 mm

Maintain high resolution with increasing probe current due to the in-lens Schottky effect.



Application 1

Large area observation and analysis with montage function

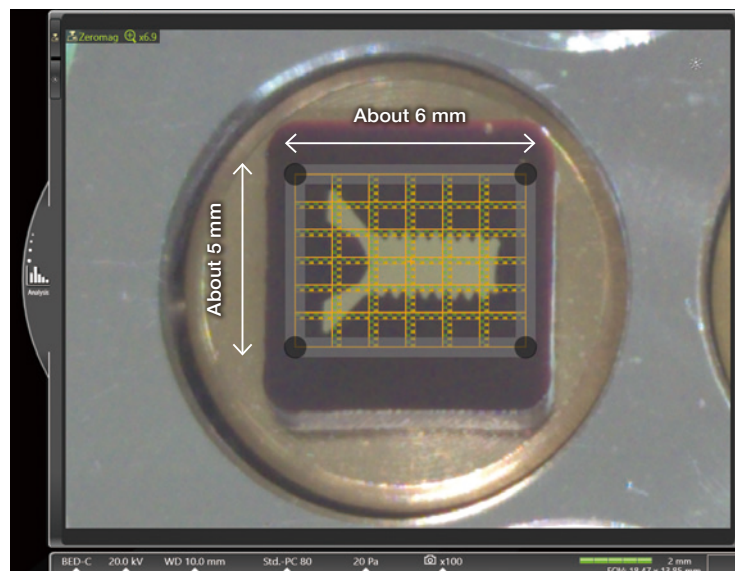


Montage is a function to connect all images in a large area as one high-definition image. This function is very useful for acquiring detailed information over a large area.

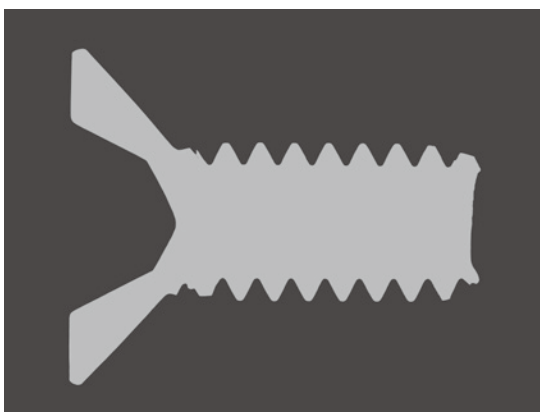
Fast montage with high probe current. Start montage automatically through Zeromag

The in-lens Schottky field emission electron gun not only delivers high current but also high current stability. Ideal for long acquisition times with large area montage data sets.

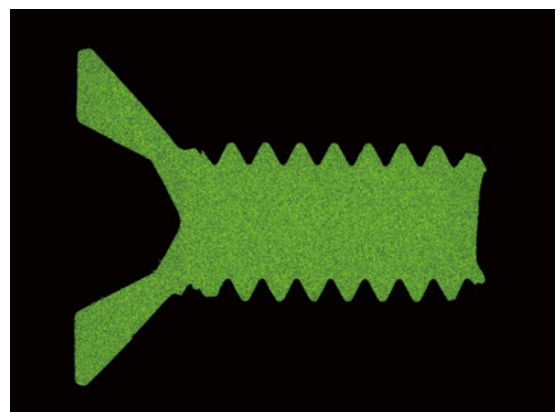
Set montage on Zeromag



SEM image



EDS map image (Cu-K)



500 μm

Montage result: 6×6 (Left: Backscattered electron image Right: Cu element map)

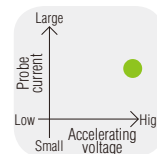
Specimen: Flat milled section of brass screw*, Accelerating voltage: 20 kV, Low vacuum mode (20 Pa), Imaging area: 6.4 mm × 4.8 mm

* Flat milling fabrication was performed by IB-19530CP after mechanical polishing.

Application 2 Particle analysis



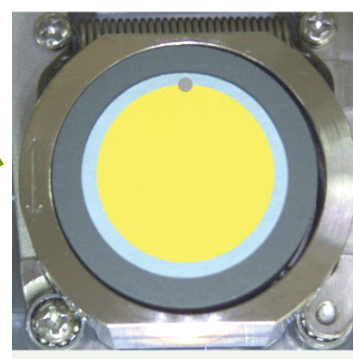
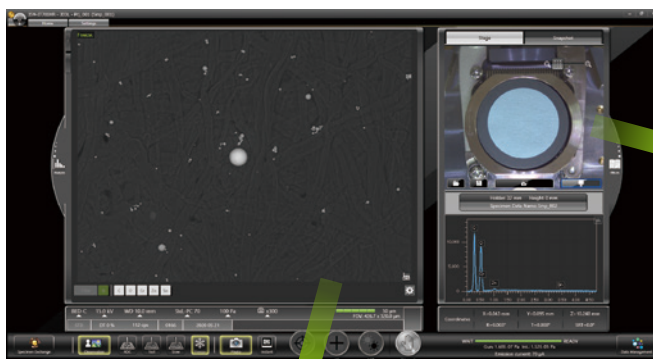
Particle analysis is a method to automatically analyze the number of particles, particle diameter, and the element information of particles by specifying the brightness of the backscattered electron image. The large probe current enables high speed analysis.



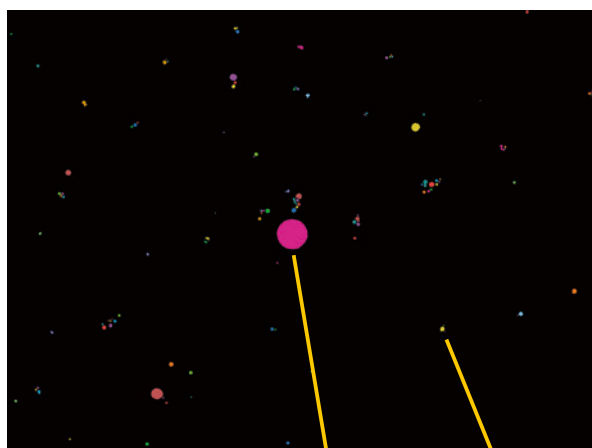
The automatic analysis of fine particles collected on the surface of a filter

EDS elemental analysis of every particle, which is extracted as a measurement object from the specimen, can be accomplished automatically. The recorded particle shape information, including the particle diameter and area, plus EDS analysis results of every particle are processed statistically.

Specify the analysis area



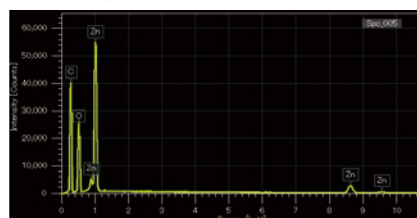
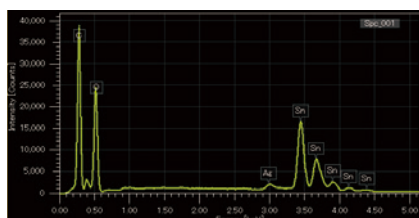
Identify the particles from the backscattered electron image



List of analysis result

Particle	Size (μm)	Area (μm²)	Elemental Composition (%)
Particle 1	0.8	0.5	Al 100.0
Particle 2	1.2	1.0	Al 100.0
Particle 3	0.5	0.2	Al 100.0
Particle 4	1.5	1.5	Al 100.0
Particle 5	0.3	0.1	Al 100.0
Particle 6	1.0	0.8	Al 100.0
Particle 7	0.7	0.4	Al 100.0
Particle 8	1.1	0.9	Al 100.0
Particle 9	0.6	0.3	Al 100.0
Particle 10	1.3	1.1	Al 100.0

Specimen: Metal particles on a filter
Accelerating voltage: 15 kV,
Vacuum degree: 100 Pa



Features

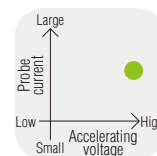
- Specify the analysis area on the optical image
- Auto-extract and auto-analyze the objects in the specified area
- Set as a Recipe



Application 3

Crystal orientation analysis by EBSD

EBSD (Electron Back Scatter Diffraction) detector can be attached to the SEM, and the diffraction patterns will be projected on the detector plane. Analyzing these diffraction patterns provides understanding of the crystal orientation. A crystal orientation map with high S/N can be obtained quickly with large probe current.



Cross section of Au wire milled by CP*1

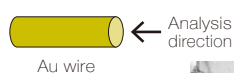
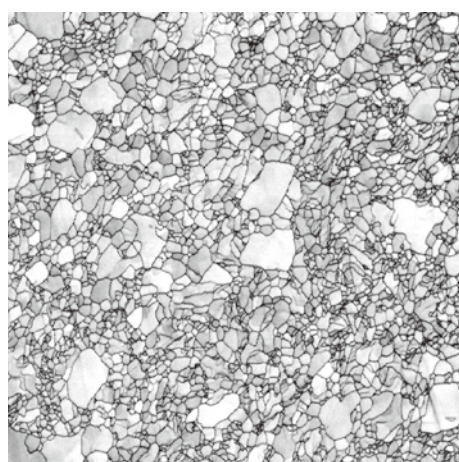


Image Quality*2 Map



EBSD map image (direction: Direction 3)



Accelerating voltage: 15 kV, Probe current: 5 nA, Magnification: $\times 3,000$

Cross section of Au wire milled by CP*1 along longitudinal direction

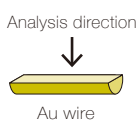
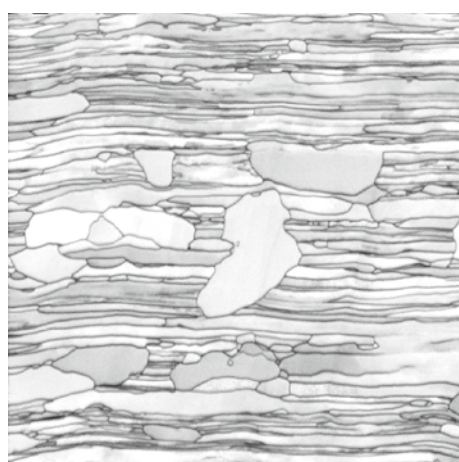


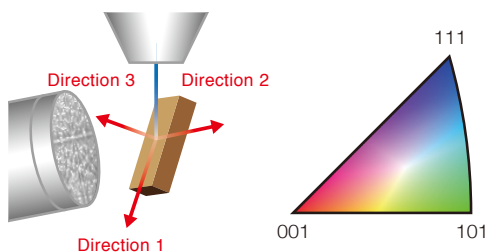
Image Quality*2 Map



EBSD map image (direction: Direction 3)



Accelerating voltage: 15 kV, Probe current: 5 nA, Magnification: $\times 3,000$

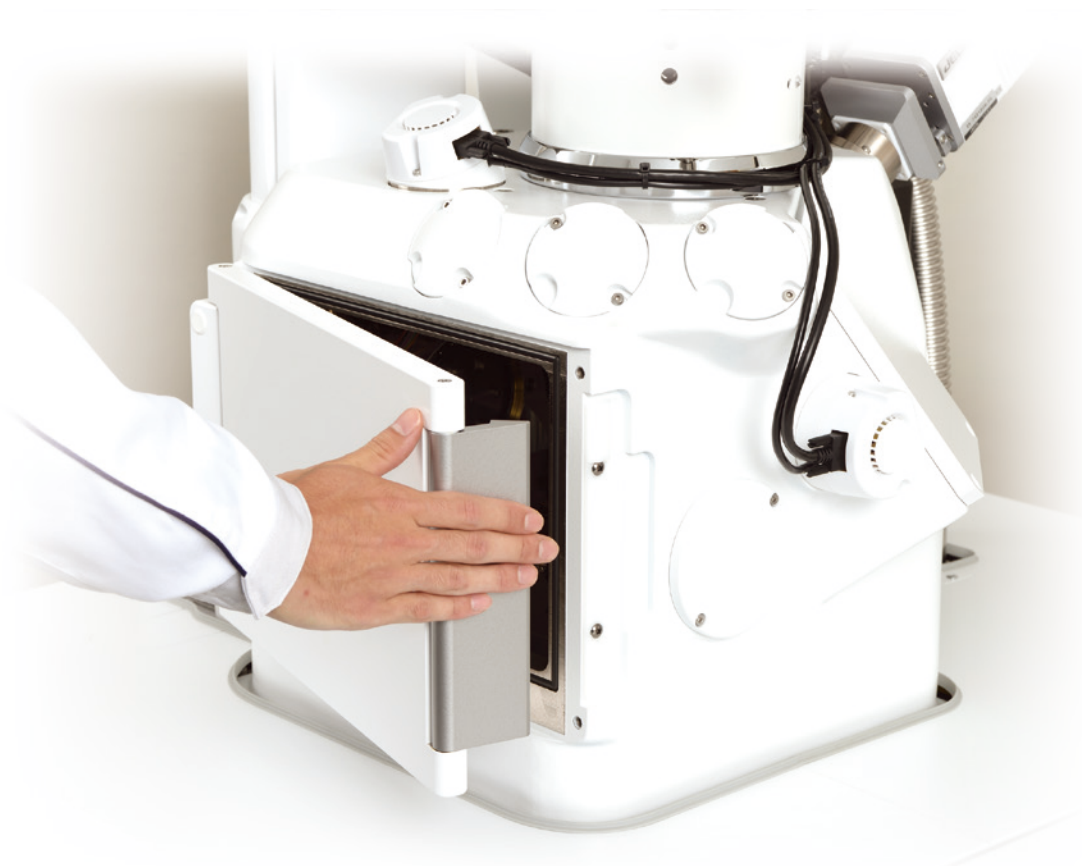


*1 CP: CROSS SECTION POLISHER™

*2 Image Quality: sharpness of pattern



Direct analysis of a large specimen



Directly introduce a large specimen into the chamber

The large chamber can easily fit a specimen as large as 200 mm in diameter, a height of 90 mm. Positioning and observation is easy with the high speed, high precision motor stage with a maximum load of 2 kg.

High speed vacuum system

Chamber evacuation in less than 3 minutes*. In addition, using LLC (option) to exchange specimen enables further improvement of the specimen exchange speed or cleaner vacuum evacuation.

* The real-time for vacuum depends on the specimen and environment.

Specimen exchange

Drawout type

With one-touch, the specimen which is difficult to introduce into the chamber based on the shape or size, can be easily introduced using drawout exchange system with high speed evacuation. Drawout responds to the specimen with various shapes.

Load lock chamber (LLC)

Option

Load lock chamber (LLC: pre-evacuation chamber) allows for even faster specimen exchange or keeping the chamber clean overall.

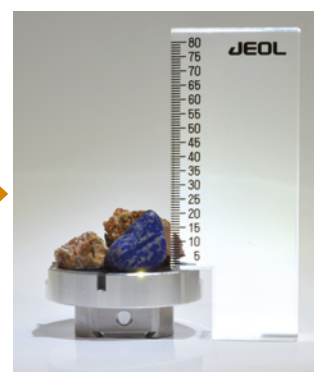
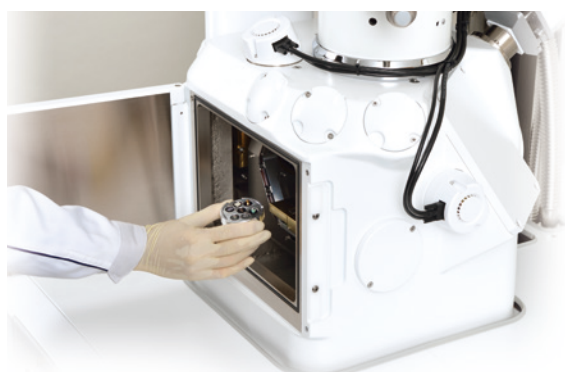




Simple! Specimen Exchange

The target can be confirmed after specimen exchange.

Following the navigation, the process from opening the chamber to starting the



Set specimen height

Easy specimen exchange

Following the navigation, after venting the chamber, the stage moves to the specimen exchange position automatically and then the specimen can be exchanged safely. The height of specimen should be measured before introducing into the chamber.

Input the specimen height

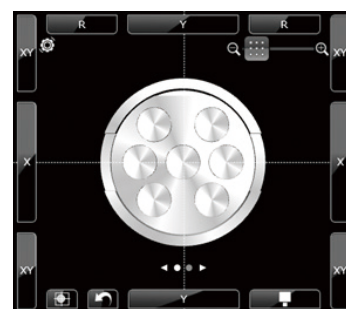
Inputting the specimen height activates the stage fail-safe. Specimens with various shapes can be observed and analyzed safely.



Safety! Features for Navigation

Holder graphic

The holder graphic confirms the position of the specimen. Based on the tilt and rotation, the holder graphic displays the current position of specimen.



Top view

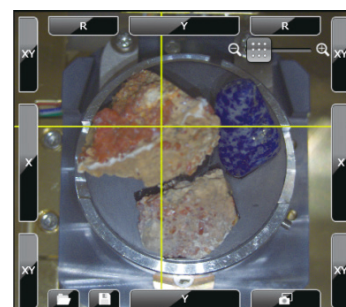
Option

Stage navigation system (SNS)

Navigate from the optical image of the specimen. Zeromag links the optical image with SEM image and EDS data for clear picture of analysis locations.

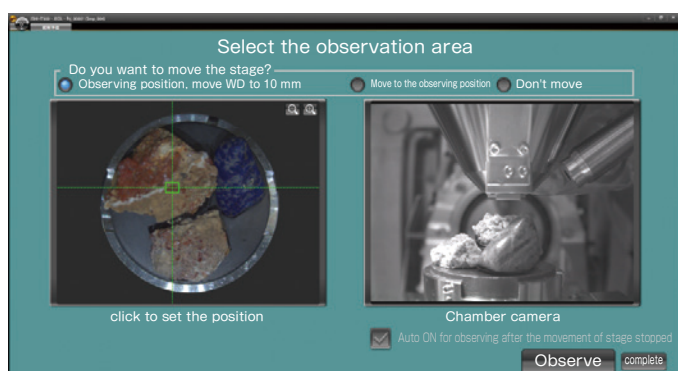
Range of optical image: 10 × 10 cm

Number of pixels: 5,000,000 pixels, Digital zoom: ×20



Navi

observation is safe, simple and reliable.



Navigation follow



Set the condition during vacuum evacuation.
Save time!

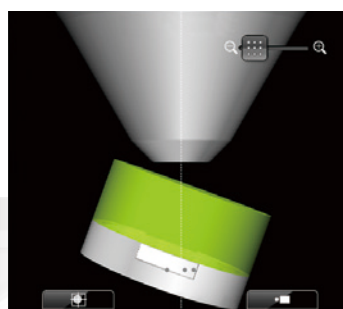
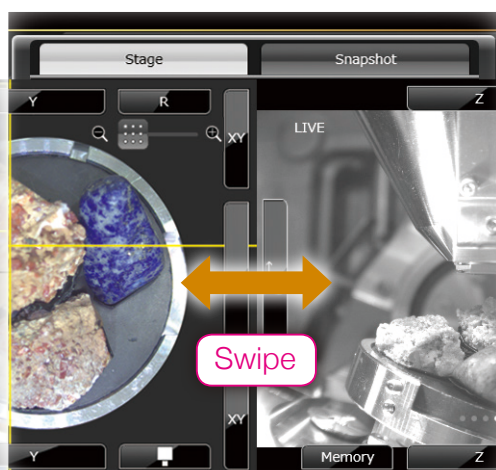
During the evacuation cycle, capture the optical image*, navigate to the field of interest and set the operating conditions from a Recipe.

* SNS (option) is required to take the optical image

Display the image of target field at the specified magnification automatically when the evacuation finished

By the time the chamber is evacuated, the specimen is positioned to the field of interest, the SEM conditions are set and the image is automatically adjusted and displayed.

Switch from holder graphic, SNS and CS with a swipe.



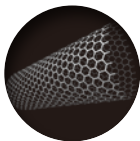
Height



Option

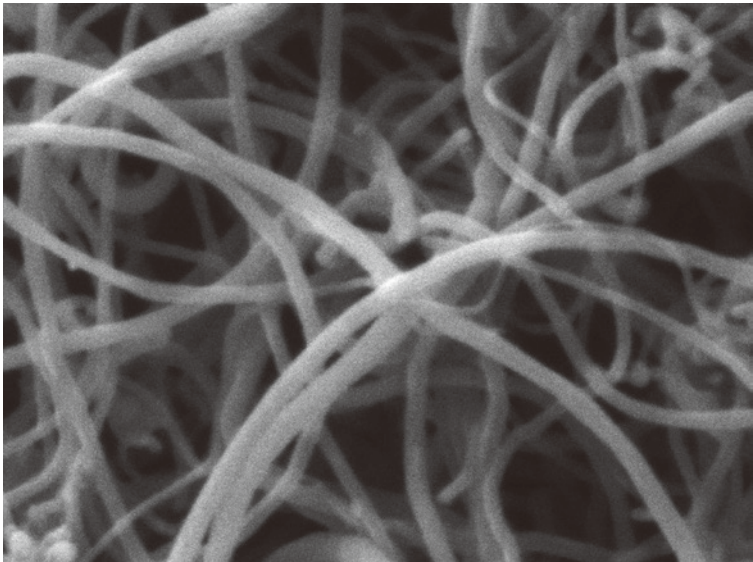
Chamber scope (CS)

Check the specimen position inside the chamber. Digital zoom for easy observation.



Nanomaterials

Carbon nanotube



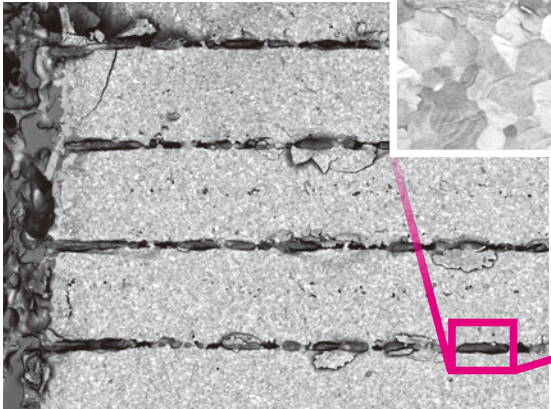
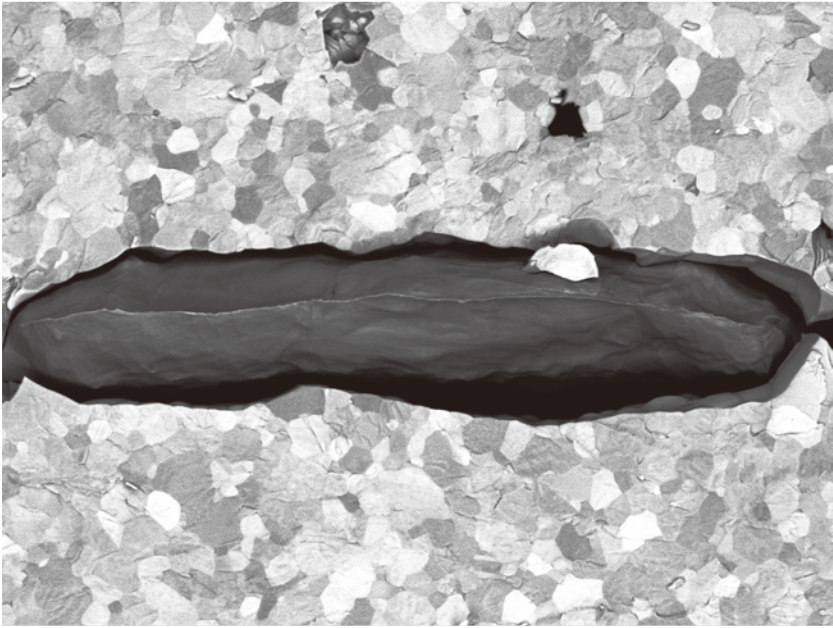
Observation at low accelerating voltage clearly reveals the surface structure.

Accelerating voltage: 2 kV, Signal: Secondary electrons, Magnification: $\times 100,000$



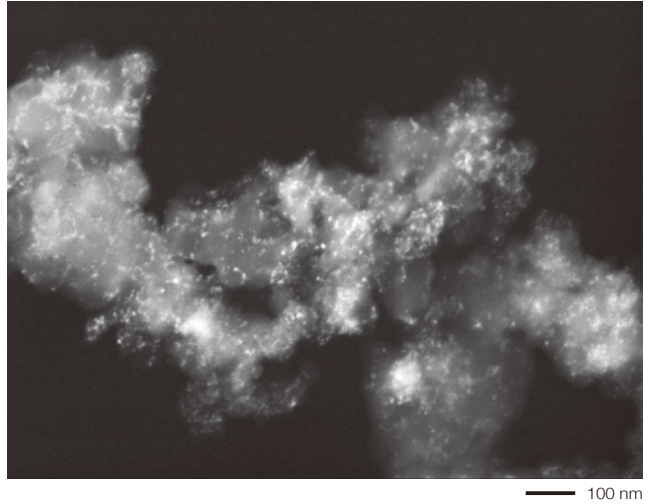
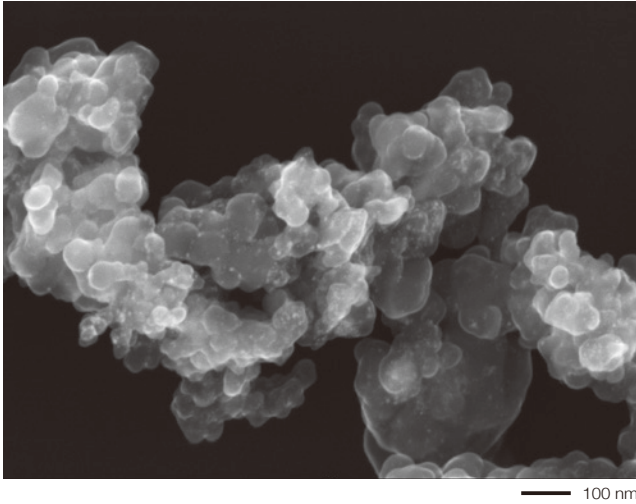
Electronic products

Fractured surface of ceramic capacitor



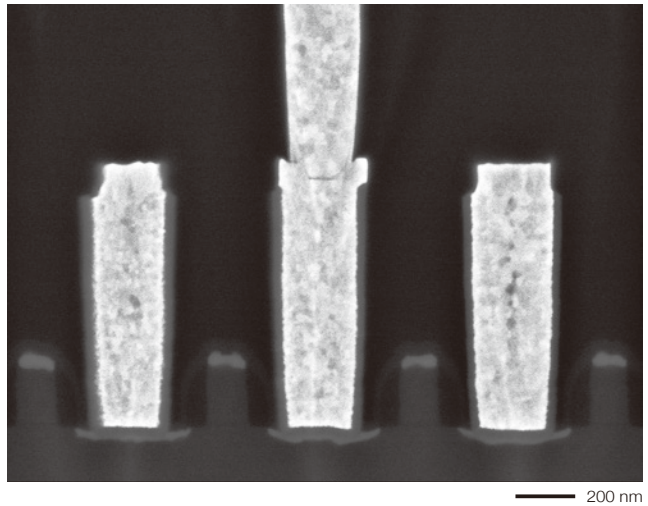
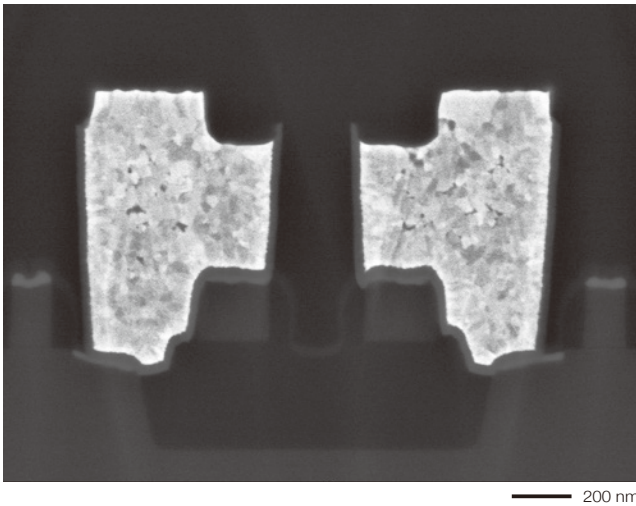
Accelerating voltage: 5 kV, Signal: Backscattered electrons, Magnification: $\times 1,000$ (left) $\times 10,000$ (right)

Catalyst Pt on carbon



Accelerating voltage: 10 kV, Signal: Secondary electrons (left), Backscattered electrons (right), Magnification: $\times 100,000$

CP-milled section of semiconductor SRAM

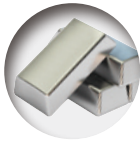


Accelerating voltage: 5 kV, Signal: Backscattered electrons, Magnification: $\times 60,000$ (left, right)



IB-19520CCP

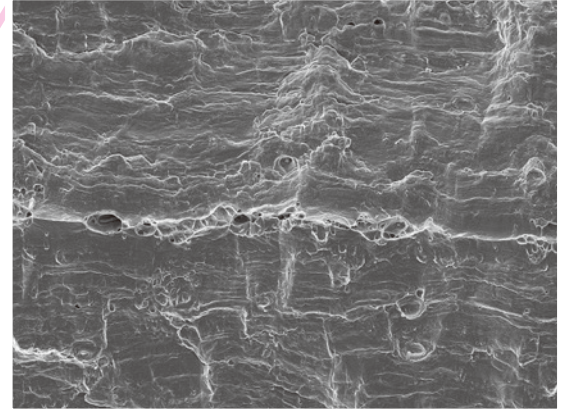
CP is an instrument for preparing a cross section of a specimen using a broad Ar ion-beam and shield plate. In recent years, CP has been widely used to prepare cross sections of metal, ceramics, plastic, and other materials.



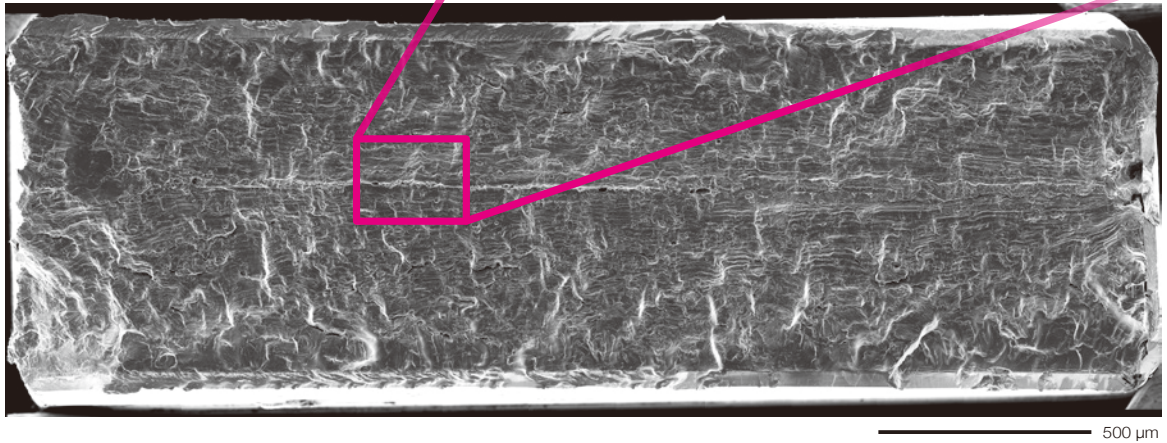
Metals

Large area montage analysis

By observing the entire area of a fracture surface, a detailed analysis of the fracture mechanism can be made. In this specimen, typical fatigue failure, such as the striation pattern and dimple microvoids, are observed.



Fracture surface of stainless



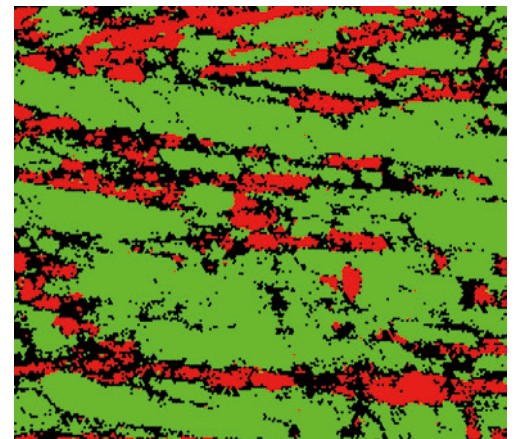
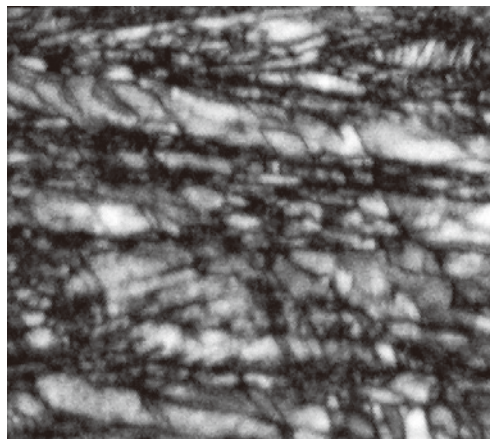
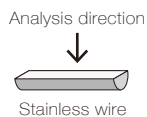
Accelerating voltage: 15 kV, Signal: Secondary electrons, Magnification: $\times 500$, Montage result: 13×6

High magnification EBSD analysis

CP-milled section of stainless wire along the longitudinal direction

Image Quality Map

Phase map image

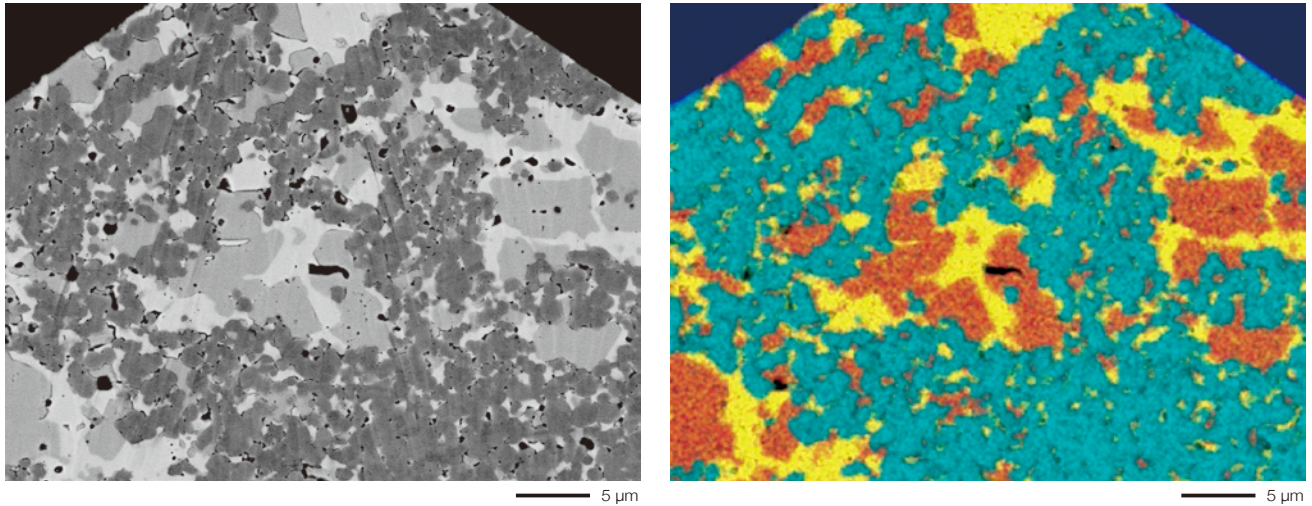


■ α -Fe ■ γ -Fe

2 μm

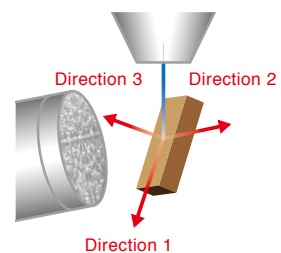
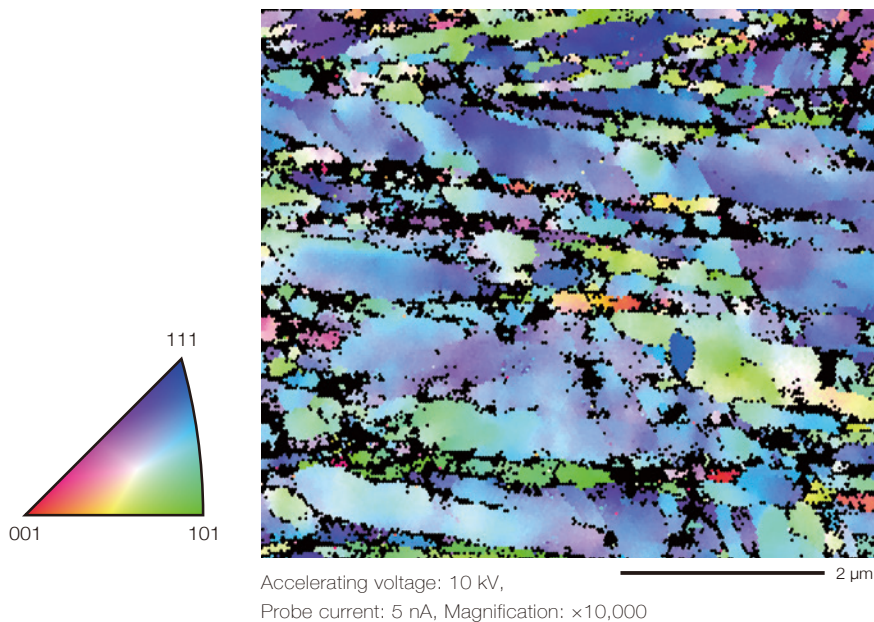
Elemental analysis: EDS map

CP-milled section of precision cutting blade



Using overlay map, the distribution of heavy metal elements in the precision cutting blade is made clear.

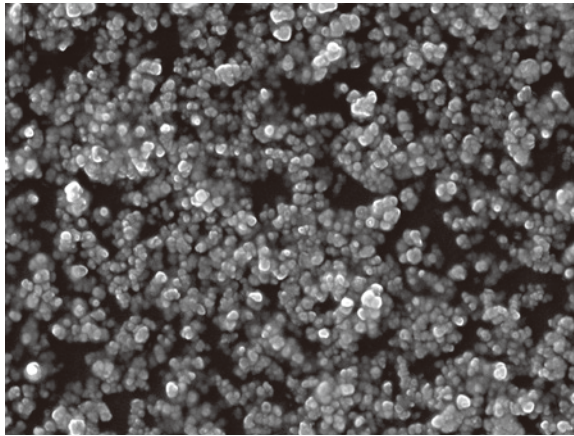
EBSD map image (direction: Direction 3)





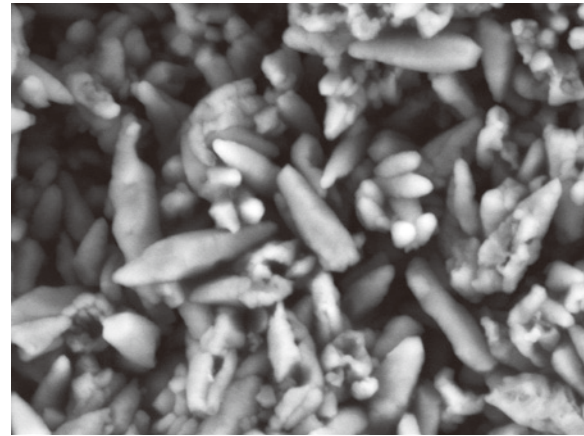
Soft materials

Carbon black in the rubber



Accelerating voltage: 15 kV,
Signal: Secondary electrons, Magnification: $\times 20,000$

Plastic glove

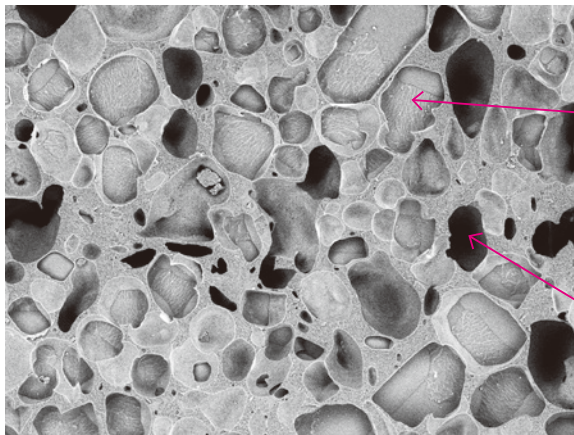


Accelerating voltage: 5 kV, Signal: Low vacuum
backscattered electrons, Magnification: $\times 30,000$

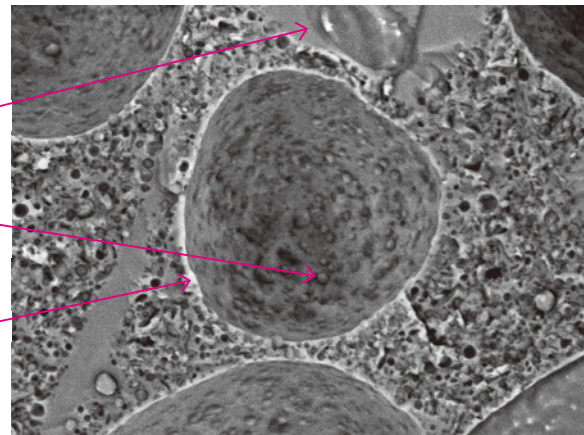


Food

Ice cream

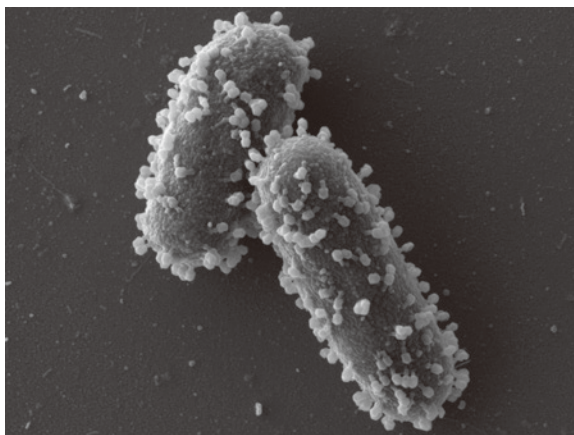


Accelerating voltage: 7 kV,
Signal: Low vacuum backscattered electrons, Magnification: $\times 300$ (left) $\times 30,000$ (right)

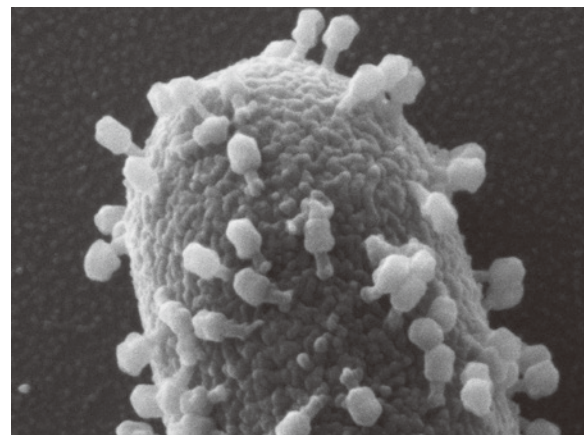


Biology

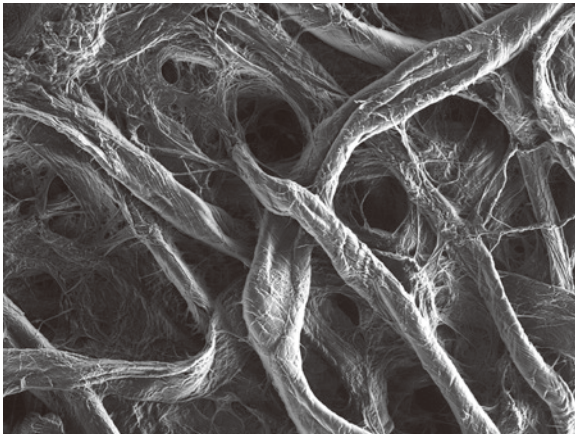
E. coli and T4 phage



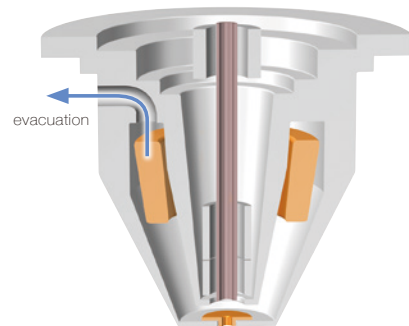
Accelerating voltage: 2.5 kV,
Signal: Secondary electrons, Magnification: $\times 25,000$ (left) $\times 80,000$ (right)



Membrane on a chicken eggshell



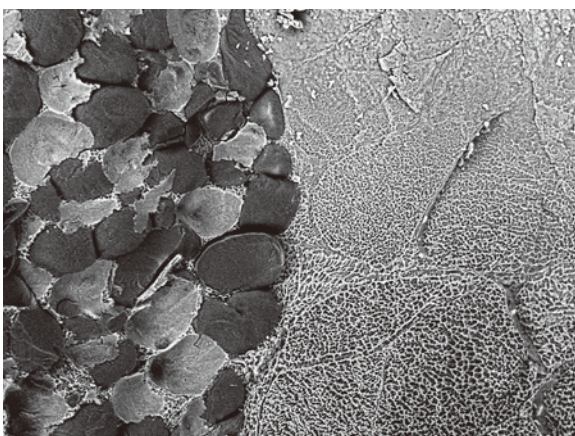
Accelerating voltage: 5 kV,
Signal: Low-vacuum secondary electrons, Magnification: $\times 500$



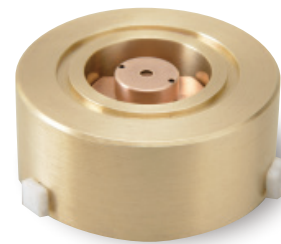
Low-vacuum mode

Low vacuum mode allows for observation of non-conductive materials without treatment. Evacuation at the objective lens improves image quality in low vacuum mode.

Fat globules and muscle fiber of chicken



Accelerating voltage: 10 kV,
Signal: Low-vacuum backscattered electrons, Magnification: $\times 300$



LV cryo-holder

LV cryo-holder keeps a specimen frozen without water loss. A hydrous specimen like food can be observed. It is possible to visualize the texture by understanding the size of ice and the diameter of muscle fibers.

Mitochondria of mouse kidney



Accelerating voltage: 2.5 kV,
Signal: Secondary electrons. Magnification: $\times 50,000$



JFD-320 Freeze Drying Device

This freeze drying device minimizes the effect of surface tension, suitable for drying hydrous specimens.

Specimen preparation of E. coli and T4 phage:
Critical point drying after Glutaraldehyde and OsO_4 treatment.

Specimen preparation of mouse mitochondria:
Freeze drying after OsO_4 maceration treatment.

Technical DATA

SEM specifications

Resolution High vacuum mode For Analysis Low vacuum mode	1.0 nm (20 kV) 3.0 nm (1.0 kV) 3.0 nm (15 kV probe current 3 nA) 1.8 nm (15 kV BED)
Photo magnification	×5 to ×600,000 (Print size of 128 mm × 96 mm)
Display magnification	×14 to ×1,679,449 (on the monitor) (Displayed as 358 mm × 269 mm)
Electron gun	In-lens Schottky field emission electron gun
Accelerating voltage	0.5 kV to 30 kV
Probe current	A few pA to 300 nA
LV pressure adjustment	10 Pa to 150 Pa
Aperture angle control lens (ACL)	Built-in
Objective lens aperture	Four stage, with XY fine adjustment function
Automatic function	Beam alignment, focus / astigmatism / brightness / contrast correction
Maximum specimen size	200 mm diameter × 75 mm height 200 mm diameter × 80 mm height *1 32 mm diameter × 90 mm height *2
Specimen stage	Large eucentric stage X: 125 mm Y: 100 mm Z: 80 mm Tilt: -10 to 90° Rotation: 360°
Montage function	Built-in as standard
Measurement-position coordinate display	200 mm diameter
Standard recipe	Built-in (including EDS conditions *3)
Image mode	Secondary image, REF image, compositional image, topography image, shadow image
Pixels for image acquisition	640 × 480 1,280 × 960 2,560 × 1920 5,120 × 3,840
OS	Microsoft®Windows®10 64bit
Observation monitor	23.8 inch touch panel
EDS *3	Refer to EDS specification
Measurement functions	Built-in (distance between 2 points, distance between parallel lines, angle, diameter, etc.)
Data management Report generation	SMILE VIEW™ Lab Output to Microsoft®Word Microsoft®PowerPoint® *4
Language switch	Operable on UI (Japanese / English / Chinese *5)
Vacuum system	Full automatic, TMP: 1, SIP: 2, RP: 1

- *1 The holder with 200 mm diameter × 80 mm high is optional.
 *2 The holder with 32 mm diameter × 90 mm high is optional.
 *3 Standard in JSM-IT700HR LA.
 *4 Microsoft®Office must be installed.
 *5 Chinese is optional.
 *6 For JSM-IT700HR LA, EDS software is installed on the same PC as SEM control software.
 *7 The optional probe current compensation unit is required.
 Automatic monitoring of the probe current is possible only when EDS is connected to the microscope PC.
 *8 Two EDS detectors with the same active sensor size are required.

Available in two types: LV (Low Vacuum) or LA (Low Vacuum & Analysis)

Main Options

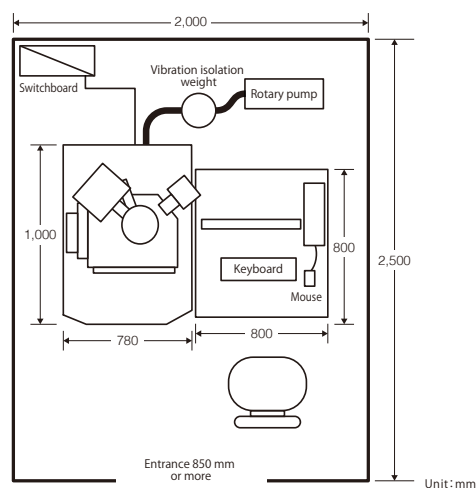
- Low Vacuum Secondary Electron Detector (LVSED)
- Energy Dispersive X-ray Spectrometer (EDS) *3
- Wavelength Dispersive X-ray Spectrometer (WDS)
- Electron Backscatter Diffraction Detector (EBSD)
- Load Lock Chamber (pre-evacuation chamber)
- Stage Navigation System (SNS)
- Chamber scope (CS)
- Operation panel
- 3D measurement software
- Operation table
- UPS
- Air compressor

Installation Requirements

Power	Single-phase AC100 V, 50/60 Hz, 3.0 kVA
Voltage fluctuation	within ± 10% (voltage drop from 3.0 kVA by 3% or less)
Grounding terminal	100 Ω or less
Compressed air	Type: dry compressed air (air mount/driving main valve) Connector: JIS B0203 Rc 1/4 Pressure: 0.45 or 0.55 MPa (gauge pressure)
Installation room	Temperature: 20 ± 5 °C Humidity: 60% or less Height: 2,000 m or less Stray AC field: 0.3 μT or less (50/60 Hz, Sine wave, WD 10 mm, 30 kV)
Room dimensions	2,000 mm × 2,500 mm × 2,300 mm or more Door width 850 mm or more

	W (mm)	D (mm)	H (mm)	Weight (Kg)
EOS column unit	780	1,000	Approx. 1,620	Approx. 650
Rotary pump (RP): 1	234	526	306	Approx. 29.5
Vibration isolation weight	160	160	90	Approx. 11.7
Table (small)	800	800	670 to 890 Up & down	Approx. 40
Table (large)	1,200	800	670 to 890 Up & down	Approx. 48

Installation Room Example



EDS specifications

Applicable to LA (Low Vacuum & Analysis)

●: Standard ○: Option

		Standard
Control PC	OS: Microsoft®Windows®10 64bit *6	●
Language	Japanese / English / Chinese *5	●
Detector	SDD type	Select from the detector list
Spectral analysis	Qualitative analysis (peak identification, automatic qualitative analysis)	●
	Visual peak ID	
	Standard-less quantitative analysis (ZAF method)	
	Standard quantitative analysis (ZAF method) *7	
	PHI-RHO-Z (PRZ) method: quantitative correction method	
	QBase (Qualitative analysis database)	
Line analysis	Line analysis (parallel & arbitrary direction)	●
Elemental map	Elemental map (map with multiple colors, monochrome, multiple-color superimposition)	●
	Maximum pixel resolution: 4,096 × 3,072	
	Real-time pop-up spectrum	
	Deconvolution map (net count map, quantitative map)	
	Real-time net count map	
	Real-time filter	
	Line profile display	
	Probe tracking	
	Play Back Analysis (time resolved spectral map)	
Serial analysis	Spectral analysis, line analysis, elemental map	●
	Comprehensive analysis of already-analyzed data (qualitative & quantitative analysis)	
Montage	Automatic montage (SEM image, elemental map)	●
	Serial elemental mapping for multiple areas	
Particle analysis software	Particle analysis (auto / manual) & EDS analysis, classification of particle analysis data, graph display of statistical processed particle analysis data, large-area serial particle analysis	○
	GSR (Gun Shot Residue) library	○
	Metal feature analysis library	○
	Automobile parts cleanliness analysis library	○
Report generation	SMILE VIEW™ Lab, output as Microsoft®Word, Microsoft®PowerPoint® file	●
SEM integration	Integrated management of observation & analysis data	●
	Specifying analysis position on the SEM operation screen (direct analysis on UI for SEM)	
	Graphical display of analysis positions	
Help function	Help guide	●
Dual detector	Analysis with two detectors *8	○
Off-line function	License software for off-line data analysis	○

Specifications for DrySD™ detectors

Sensor size	Energy resolution	Detectable elements
30 mm²	129.0 eV or less	Be to U
60 mm², 100 mm²	133.0 eV or less	B to U

Specifications subject to change without notice.
 Microsoft, Windows, PowerPoint and Microsoft Office are registered trademarks of Microsoft Corporation in USA and other countries.
 Microsoft Word is a product name of Microsoft Corporation.



Certain products in this brochure are controlled under the "Foreign Exchange and Foreign Trade Law" of Japan in compliance with international security export control. JEOL Ltd. must provide the Japanese Government with "End-user's Statement of Assurance" and "End-use Certificate" in order to obtain the export license needed for export from Japan. If the product to be exported is in this category, the end user will be asked to fill in these certificate forms.



JEOL Ltd.

3-1-2 Musashino Akishima Tokyo 196-8558 Japan Sales Division Tel. +81-3-6262-3560 Fax. +81-3-6262-3577
www.jeol.com ISO 9001 • ISO 14001 Certified

• **AUSTRALIA & NEW ZEALAND** /JEOL (AUSTRALASIA) Pty.Ltd. Suite 1, L2 18 Aquatic Drive - Frenche Forest NSW 2086 Australia • **BELGIUM** /JEOL (EUROPE) B.V. Planet II, Gebouw B Leuvensesteenweg 542, B-1930 Zaventem Belgium
• **BRAZIL** /JEOL Brasil Instrumentos Cientificos Ltda. Av. Jabaquara, 2958 5º andar conjunto 52 : 04046-500 Sao Paulo, SP Brazil • **CANADA** /JEOL CANADA, INC. 3275 1ere Rue. Local #8 St-Hubert, QC J3Y-8Y6, Canada • **CHINA** /JEOL (BEIJING) CO., LTD. Zhongkeziyuan Building South Tower 2F, Zhongguancun Nansanjie Street No. 6, Haidian District, Beijing, P.R.China • **EGYPT** /JEOL SERVICE BUREAU 3rd Fl. Nile Center Bldg., Nawal Street, Dokki, (Cairo), Egypt • **FRANCE** /JEOL (EUROPE) SAS Espace Claude Monet, 1 Allee de Giverny 78290, Croissy-sur-Seine, France • **GERMANY** /JEOL (GERMANY) GmbH Gute Aenger 30 85356 Freising, Germany • **GREAT BRITAIN & IRELAND** /JEOL (U.K.) LTD. JEOL House, Silver Court, Watchmead, Welwyn Garden City, Herts AL7 1LT, U.K. • **INDIA** /JEOL INDIA PVT. LTD. Unit No.305, 3rd Floor, ABW Elegance Tower, Jasola District Centre, New Delhi 110 025, India /JEOL INDIA PVT. LTD. Hyderabad Office 422, Regus Solitaire Business centre, 1-10-39 to 44, level 4, Gumidelli Towers, Old Airport Road, Begumpet, Hyderabad - 500016, India • **ITALY** /JEOL (ITALIA) S.p.A. Palazzo Pacinotti - Milano 3 City, Via Ludovico il Moro, 6/A 20080 Basiglio(MI) Italy • **KOREA** /JEOL KOREA LTD. Dongwoo Bldg. 7F, 1443, Yangjae Daero, Gangdong-Gu, Seoul, 05355, Korea • **MALAYSIA** /JEOL (MALAYSIA) SDN.BHD. 508, Block A, Level 5, Kelana Business Center, 97, Jalan SS 7/2, Kelana Jaya, 47301 Petaling Jaya, Selangor, Malaysia • **MEXICO** /JEOL DE MEXICO S.A. DE C.V. Arkansas 11 Piso 2 Colonia Napoles Delegacion Benito Juarez, C.P. 03810 Mexico D.F., Mexico • **QATAR** /Mannai Trading Company W.L.L., ALI Emadi Complex, Salwa Road P.O.Box 76, Doha, Qatar • **RUSSIA** /JEOL (RUS) LLC Krasnoprolatarskaya Street, 16, Bld. 2, 127473, Moscow, Russian Federation • **SCANDINAVIA** /SWEDEN JEOL (Nordic) AB Hammarbacken 6A, Box 716, 191 27 Sollentuna Sweden • **SINGAPORE** /JEOL ASIA PTE.LTD. 2 Corporation Road #01-12 Corporation Place Singapore 618494 • **TAIWAN** /JIE DONG CO., LTD. 7F, 112, Chung Hsiao East Road, Section 1, Taipei, Taiwan 10023 (R.O.C.) • **THE NETHERLANDS** /JEOL (EUROPE) B.V. Lireweg 4, NL-2153 PH Nieuw-Vennep, The Netherlands • **USA** /JEOL USA, INC. 11 Dearborn Road, Peabody, MA 01960, U.S.A.

No. 1201H045C Printed in Japan, Kp