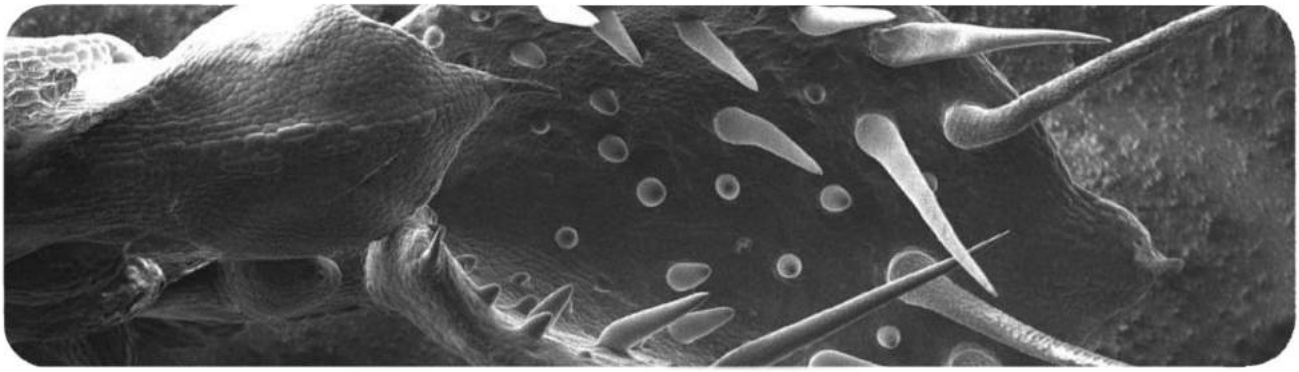
HIROX

www.hirox-europe.com

Tabletop Scanning Electron Microscope

The Ultimate Solution

SH-3500MB / SH-4000M / SH-5000M



Imagine a Higher state of Resolution

The Hirox SEM series is focused on two essentials: powerful performance and user-friendly operation. Using the table-top compact configuration, Mini-SEM provides high-resolution, high-magnification SEM images with the ease of use. Auto-focus, Auto-auto brightness and contrast produce an excellent image every time.

No doubt about strong performance and flexible integration. 5-axis full stroke control and 4-hole variable aperture of SH-5000M help fine-resolution SEM image. Built-in multi detector (SE+BSE) of SH-4000M provides the ideal observation for each different type of specimen. All Mini-SEM series including SH-3500MB provide image observation condition within 3 minutes after sample loading.

Optional EDX system and many other tools can be adapted for your application.

Major Applications

Material Science

· Metal / Ceramic Surface, Fiber Texture
· Particle Distribution and Size Measurement
· Failure Analysis – Corrosion, Stress

Semiconductor

· Wafer, Bonding Wire, LED, Micro-Pattern
· CNT (Carbon Nano Tube)

Biological / Pharmaceutical

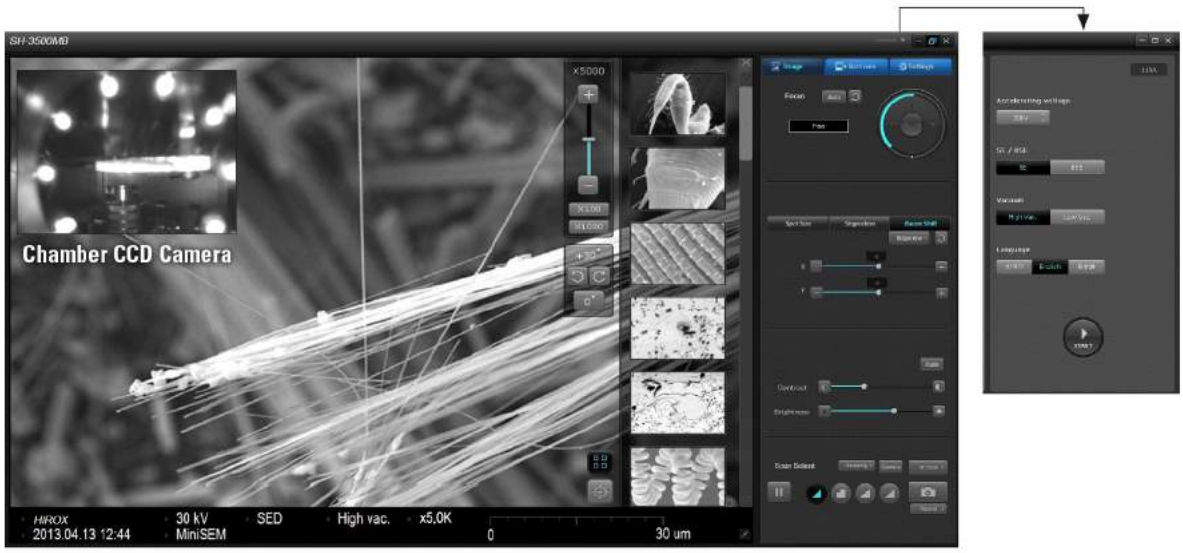
· Food, Bacteria, Medicinal Powder

Life Science / Energy

· Solar Cell, Battery Electrode, Catalyst

Education / Healthcare

Operating Software - User Interface



SH-5000M

- Max. 100,000x Magnification
- SE Detector (Option – BSE Detector)
- 5kV to 30kV Variable Accelerating Voltage
- Image Observation Ready within 3 min.
- 5-axis Strokes – X, Y, R, Z, T
- 4-Hole Variable Aperture (30 / 50 / 100 / 200 um)
- Options – EDX System, Cooling Stage, Low Vaccum Control
  Multi-Vacuum Mode - Standard / Charge Up Reduction

SH-4000M

- Max. 60,000x Magnification
- SE Detector & BSE Detector – Multi Mode
- 5kV to 30kV Variable Accelerating Voltage
- Multi-Vacuum Mode – Standard / Charge Up Reduction
- Image Observation Ready within 2 min.
- 3-axis Strokes – X, Y, R (Option - X, Y, T)
- Options – EDX System, Cooling Stage

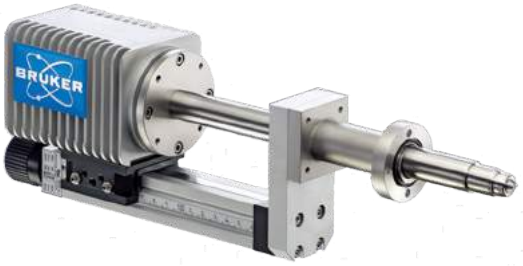
SH-3500MB

- Max. 30,000x Magnification
- BSE Detector (Solid State Type)
- 5kV to 30kV Variable Accelerating Voltage
- Multi-Vacuum Mode – Standard / Charge Up Reduction
- Image Observation Ready within 2 min.
- 3-axis Strokes – X, Y, R (Option - X, Y, T)
- Options – EDX System, Cooling Stage

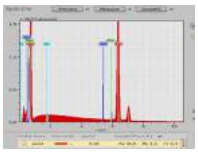
Accessories

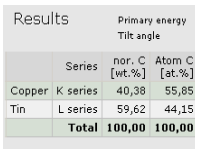
EDS System

- SDD Type – Nitrogen Free
- Elemental Detection from Boron (5) to Americium(90)
- Spectrum Resolution < 133 eV(MnKa)
- Multi-point Analysis / Line Scan / Elemetal Mapping




SEM Image Aquizition

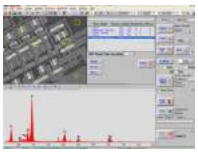

Elemental ID Analysis

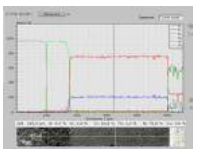

Results

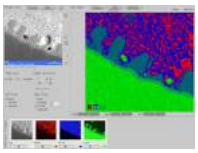
Primary energy
Tilt angle

	Series	nor. C [wt.%]	Atom C [at.%]
Copper	K series	40,38	55,85
Tin	L series	59,62	44,15
	Total	100,00	100,00

Quantification Analysis


Multi point Analysis


Line Scan

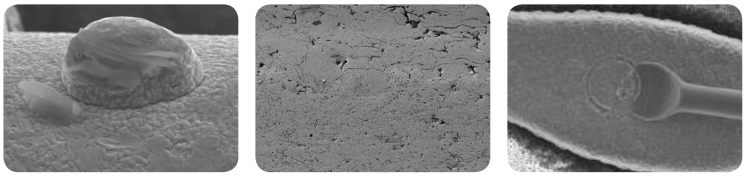

Mapping

Ion Sputter Coater MCM-100

- Quick and Easy Operation
- Sample Loading Size - Max. 50mm
- Target Material - Au(Gold) or Pt(Platinum)
- Dimension / Weight: 180(W) x 310(D) x 310(H)mm / 15kg

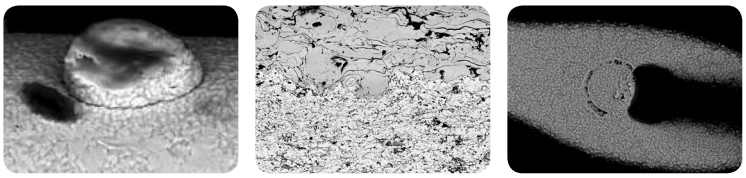
BSE Detector

- SE (Secondary Electron) Image



4-Channel Fixed Type (Solid-State)
Composition or Topographic Analysis

- BSE (Backscattered Electron) Image

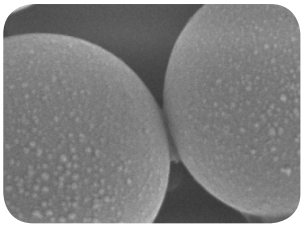


- Excellent atomic number resolution 0.1Z at Z=30
- Choice of Detectors for normal, low voltage, UVH

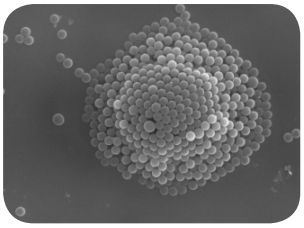
SEM Application

Particle Measurement and Characteristic Analysis

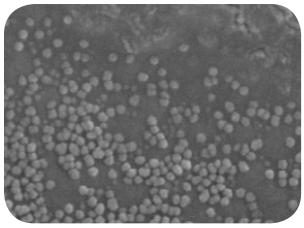
- Industrial Powder - High Molecule, Nano Powder
- Battery Electrode / Pharmaceutical and Biological



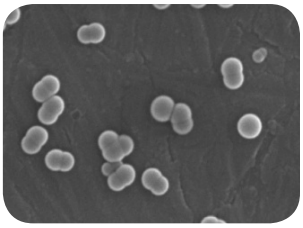
Latex



Silicon Powder



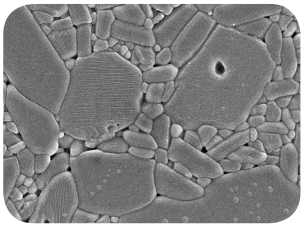
Nano Powder



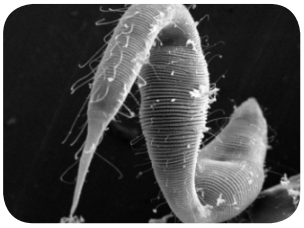
Lactic Acid Bacteria

Material Science and Failure Analysis

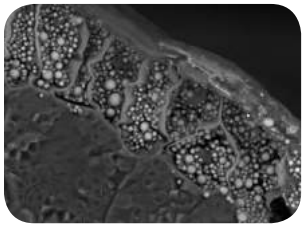
- Metal / Plastic and Ceramic / Film
- Bio-science



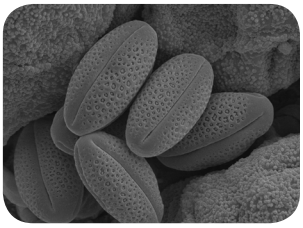
Ceramic



Sea Animal



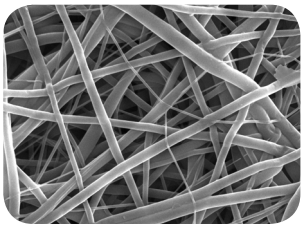
Rice



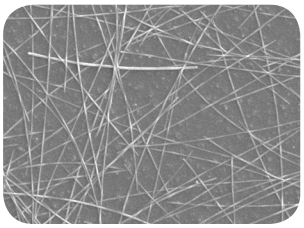
Flower's Stamen

Fiber Observation

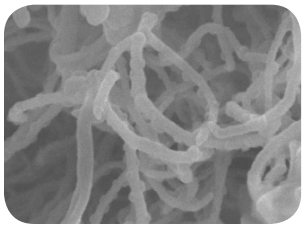
- Carbon Fiber / Glass Fiber
- CNT (Carbon Nano Tube)



Fiber



Nano wire

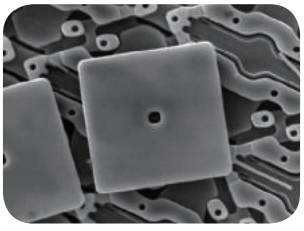


CNT (Carbon Nano Tube)

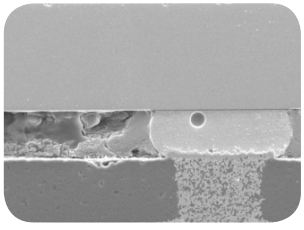
Fiber

Electronic Component Observation and Failure Analysis

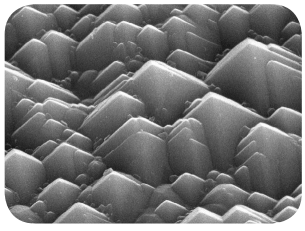
- BGA / PCB / LED / Wafer
- Bonding Wire / Micro-Electronics



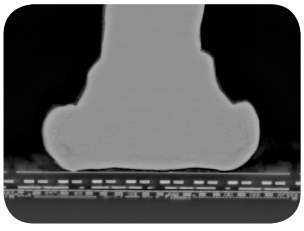
Pattern



BGA Chip



Solarcell

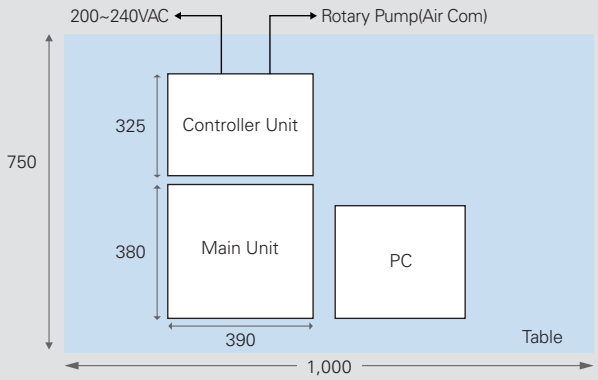


Wire Bonding

Mini - SEM Specifications

	SH-3500MB	SH-4000M	SH-5000M
Electron system			
Resolution	20nm (30kV, BSE Image)	15nm (30kV, SE Image) 20nm (30kV, BSE Image)	5nm (30kV, SE Image)
Magnification	30x ~ 30,000x	30x ~ 60,000x	30x ~ 100,000x
Accelerating Voltage	5~30kV (5 / 10 / 15 / 20 / 30 – 5 Steps)		
Detector	Backscattered Electron (BSE)	Secondary Electron Image (SEI)	Secondary Electron Image (SEI)
		Backscattered Electron (BSE) *Multi Mode	Backscattered Electron (BSE) *option
Observation mode	Standard mode Charge-up reduction mode	Standard mode Charge-up reduction mode	Standard mode
Electron Gun	Pre-centered Tungsten Filament Cartridge		
Lens System	Two-stage Electromagnetic Condenser Lens One-stage Electromagnetic Objective Lens		
Stage system			
Stage Traverse	3-axis System - X, Y-axis : 35mm / R-axis : 360° · Image Shift : ±150㎛ · Chamber CCD Camera · T-axis : 0 to 45°(Option)		5-axis System · X, Y-axis : 40mm / R-axis : 360° T-axis : 0 to 45°, Z-axis : 0 to 35mm · Image Shift : ±150㎛
Max. Sample Size	70mm in Diameter x 30mm in Height		80mm in Diameter x 35mm in Height
Iamge system			
Frame Memory	High Speed Mode (320×240) : Preview mode Low Speed Mode (640×480) Photo Mode1 (1280×960) Photo Mode2 (2560×1920) Sampling Photo mode3		
Automation Function	Auto Start, Auto Focus, Auto Stigmator Auto Contrast & Brightness		
Image Format	BMP, JPG, PNG, TIFF		
Data display	Magnification, Detector Type, Accelerating Voltage, Vacuum mode, Logo(text), Date and time, Micron marker		
Vacuum System			
Vacuum mode	High & Low Vacuum system		High Vacuum System
Vacuum Pump	Rotary Pump + Turbo Molecular Pump [Full Automation System]		
Control system			
OS	Microsoft Windows® 7		
CPU	Intel® Core™ i5		
Memory / HDD	2GB / 500GB		
Interface connector	USB 2.0		
Dimensions and weight			
Main Unit	390(W)x380(D)x560(H)mm, 90kg		
Controller Unit	390(W)x325(D)x560(H)mm, 37kg		
Rotary Pump	400(W)x160(D)x340(H)mm, 24kg		
Installation room	Room temperature : 15℃~30℃ / Humidity : 70% or less / Electric power : Single phase 200~240 AC, 1KW, 50/60Hz		

Example of Installation Layout



· Specifications of Operating Computer are subject to change
· A table with casters is not recommended

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