



SERON
TECHNOLOGIES

Invest Novel Thinking, Create Novel Value



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본 카달로그 내의 제품 이미지와 사양은 실제와 다소 차이가 있을 수 있습니다.



(주)새론테크놀로지

COMPANY

The History of Korean Scanning Electron Microscope by Seron Technologies Inc.

In 2001 Seron Technologies launched the first commercialized SEM with focus on being the 'first' and 'best' in Korea regarding SEM. Seron has further developed their SEM series by fulfilling customers' needs and applications; introduction of a range of products and solutions, ranging from desktop SEM, compact SEM and e-beam instrument

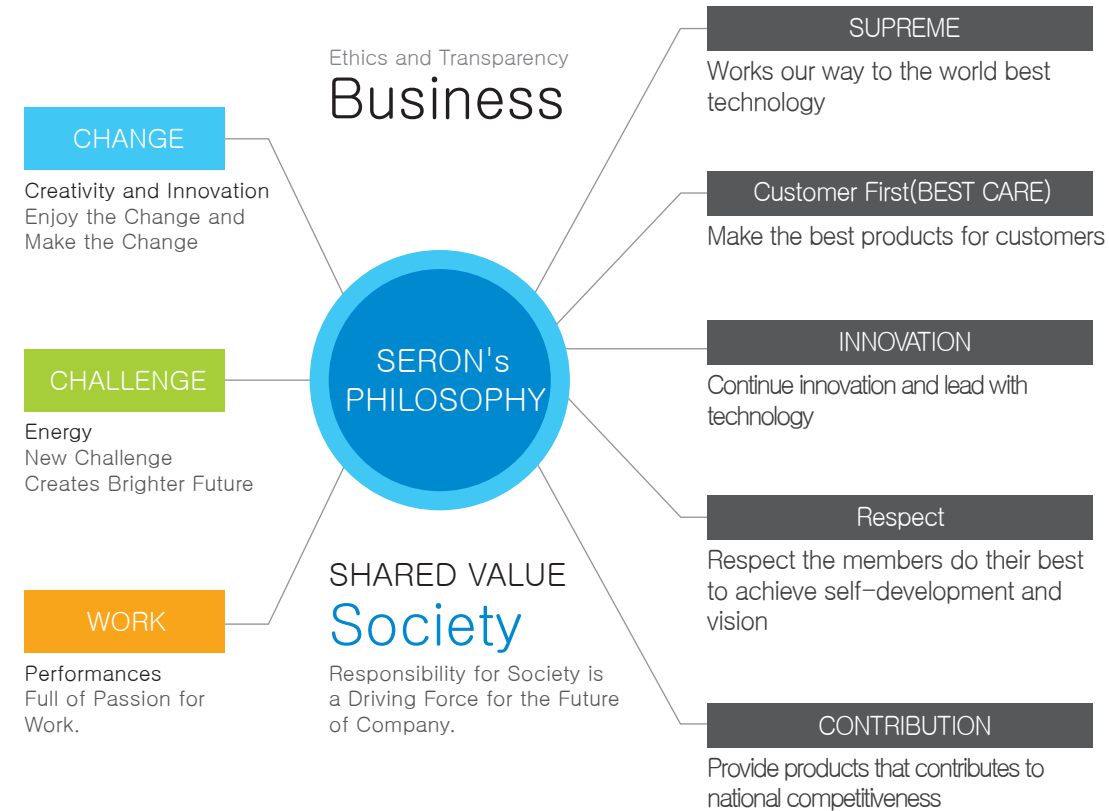
The word 'Seron' in Korean means new, which Seron Technologies have encompassed into their core existence

Seron has been the first to introduce and launch a variety of new techniques, as the name suggests. In 2005, Seron developed the first micro e-beam joining system in the world. Followed by introducing a new solution for nano mechatronics, the Hybrid X-ray imaging SEM by applying electron optics to X-ray tube. Seron also introduced a range of products for advanced research as well as industrial requirements. Seron Technologies Inc.'s desktop series and compact series are cost effective solutions fully developed by Seron's expertise.

Time for next stage

Building upon this success, Seron Technologies products demonstrate their historical accomplishments. Seron is launching onto the next stage of field emission SEM, equipped with premium normal SEM of LaB6

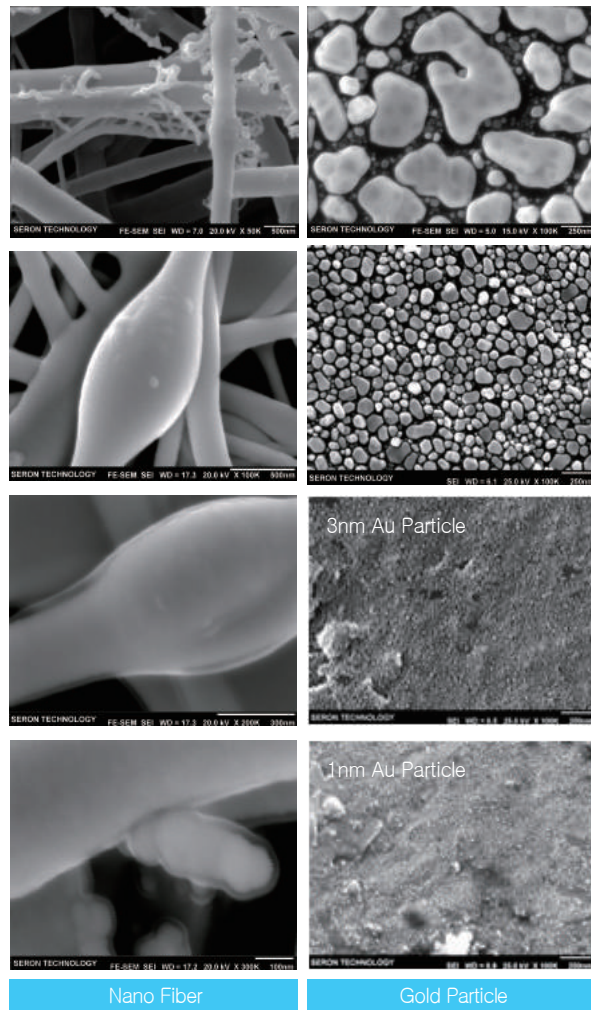
VISION



HISTORY

- 2000. SEM Development started- Mirero Inc.
- 2002. IS2000 Model Launched - Resolution 8nm
- 2003. AIS2003 Model Launched - Resolution 5nm
- 2005. "Excellence Educational-Industrial Cooperation Case" awarded from the Governor of Gyeonggi Province
AIS2100 Model Launched - Resolution 3.5nm
Developed the world first 'Micro E-beam Joining System'
- 2006. Built Import Duties for SEM(Trade Ministry)
Awarded 'Merit Capital Good's' (Minister Citation)
Low-Vacuum SEM developed
- 2007. Independent Division, Seron Technologies Inc. founded
- 2009. Research Institute, Venture, Innobiz Selection
Promising Export Firm, Gyeonggi Promising Firm Selection
- 2010. Awarded Innovative Technology Prize(AIS 2300)
Conical SEM developed
AIS2300C/AIS2100C Launched -Resolution3.0nm
- 2011. SME Merit citation
- 2012. Compact SEM, AIS1800C/AIS2000C Launched
Max. 180uA Probe Current SEM Optics developed
2단 Lenses Optics developed
- 2013. Hybrid XEM (SEM+X-ray) developed
- 2014. Tablet Mini SEM Launched AURA100/AURA200
The first FE SEM development success in Korea
- 2016. FE-SEM Launched
LaB6 Premium SEM Launched





FE-SEM

Field Emission Scanning Electron Microscope

SEMIRON 5000

Since the very first Korean SEM in 2000, Seron Technologies Inc. has devoted to advanced R&D technology and resulted in SEMIRON5000, the first Korean FE SEM, designed by Seron's own electron optic technology. SEMIRON5000 is Schottky type high resolution FE-SEM equipped with 65° conical objective lens, which is optimized for large sample inspection in short working distance with unlimited attachment of analysis detectors such as EDS, EBSD, and WDS.

- 65° conical objective lens
- High image resolution and pixel resolution (8192X6144)
- Upgrade driver for High scan speed
- Multi-tasking window GUI
- Auto Stepping & Tiling for large sized image file
- Various image filters for noise reduction
- Powerful measurement SW package
- Strong image processor & analysis Package

Specifications

MODEL	SEMIRON 5000
ELECTRON OPTIC SYSTEM	
Electron Gun Source	Schottky FE-Tip
Resolution	1.0 nm @ 30KeV SE/ 2.0nm @BSE
Magnification	10X ~ 1,000,000X
Image	Secondary Electron Image SEI, Backscattered Electron Image, TSEM(Optional)
Beam Scan Mode	Search, Inspection, Photo (3step)
Accelerating Voltage	~ 30kV (Continuous Voltage Change)
Bias System	Linked with Acc. Voltage plus continuous voltage control
Gun Alignment	Auto-Gun Alignment (Using Histogram)
Lens System	Electromagnetic lens, Electrostatic Lens 60° Conical Object Lens
Image Shift	X/Y (330/325um), Image Rotation (360°)
Detector	ET-Type SE Detector (SE-BSE image mode without BSE detector for uncoated sample inspection) & CCD
Automation Function	Auto-Focus, Auto-Stigmatism, Auto Contrast/Brightness, Emission Current, Auto-stepping & Tiling, Auto photograph by pre-setting, etc
Operation System	Multi Tasking Window GUI, Remote Control Adjustment. etc.
DISPLAY	
Digital Imaging	Area Mode (640X480), Inspection Mode (960X640, 1024X768, 2048X1536), Photo(2048 X 1536 ~ 8192 X 6144)
IMAGE ANALYZER	
Image Analysis	Multi-Focusing/Image Tiling/3D-View/Enhancement/Color Transformation/Histogram Frequency Filter & User-Define Filter/ 다양한 이미지 Noise Filters, Blob Analysis, Material Analysis package
Measurement S/W	AOI(Area-of-Interest), Measurement Tools, File format change(Excel) etc.
STAGE SYSTEMBe equipped with Precision Micro Stepping Motor	
Movement (X/Y/Z) mm	50/ 70/ 65 mm (Option: Large Stage&Chamber)
Tilt / Rotation	~ 60° (Max 90°) / 360° Endless
Stage Motorization	5-Axis Motorized Stage Auto-stepping & Tiling, Navigation & Retrieval Positioning
VACUUM SYSTEM	
Vacuum	High Vacuum Mode($\leq 2 \times 10^{-4}$ mbar)
Vacuum Control Type	Full automation with safety system
Vacuum System	Rotary Pump + Turbo Pump / Ion Pump including Vacuum Sensor
OTHERS	
Options	BSE, EDS, WDS, EBSD, TSEM, Load-lock Chamber etc.

DESK-TOP SEM SERIES

AURA 100

- 2-Stage Lens Optic System
- Accelerating Voltage (5~20kV for SI Photodiode BSE)
- Magnification : 30,000X with BSE Detector
(Additional Digital Zoom 2X, 4X, 8X)
- Area Mode(640X480),
Inspection Mode(960X640~2048X1536),
Photo 3840X2880
- Stage Stroke : X,Y(40mm)/Z(5~40 mm/Rotation(360°)/
Tilt(0~45°)
- Auto-focus/Auto-Stigmator/Auto-Contrast-Brightness/Auto-
Gun Alignment & etc.
- Charge-up Reduction Mode
- Multi-Tasking UI Window
- Equipped with Powerful S/W
- Equipped with AOI Measurement Tool
- Dimension Approx. 388(W) X 600(D) X 565(H)



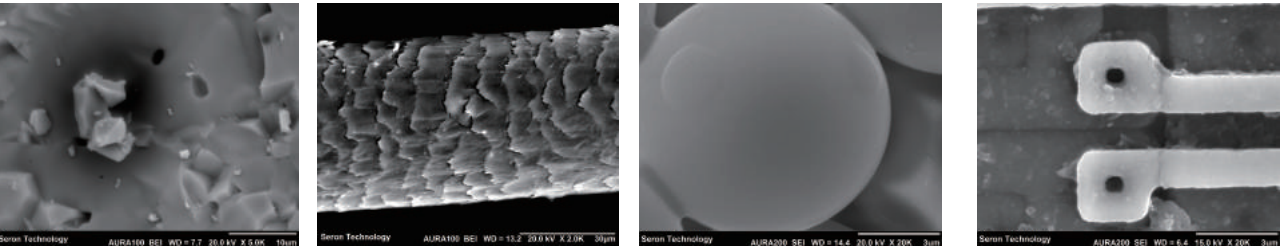
AURA 200

- Resolution:~Less than 5nm @30kV (20kV Standard)
- Accelerating Voltage : 1kV~20kV (Option:30kV)
- Magnification: ~ Max. 150,000X
(Additional Digital Zoom-In 2X, 4X, 8X)
- Detector: SE Detector / BSE Detector(Option)
- Area Mode(640X480),
Inspection Mode(960X640~2048X1536),
Photo 3840X2880 (Option: Max 8192X6144 with Scan
board upgrade Stage
Stroke : X,Y(40mm)/Z(5~40mm)/Rotation(360°)/Tilt(0~45°),
Stage Motorization (Option: X/Y/R)
- Auto-focus/Auto-Stigmator/Auto-Contrast-Brightness/ Auto-
Gun Alignment & etc.
- Charge-up Reduction Mode
- Multi-Tasking UI Window
- Be Equipped with Powerful S/W
- Be Equipped with AOI Measurement Tool
- Dimension Approx. 388(W) X 600(D) X 638(H)



Features

- 1) High performance in reasonable price Mini SEM
- 2) Applied an aberration reduction Technology Optic Designe
- 3) Low KV Mode (SEM Image Obtain without Coating)
- 4) Slim and Portable Size
- 5) Powerful Measurment & Analysis Software
- 6) High scan speed & high pixel resolution



Application Data

COMPACT SEM SERIES

AIS1800C



Features

- Low KV(from 0.6kV) – Without Coating
- Improvement of internal vibration, heat, EMI Problem
- The World's best high resolution mini SEM
- Minimum Space:540(W) X 570(D) X 1300(H)mm
- High EDS Compatibility(TOA 25°)
- Aberration reduction technology for better resolution
- Applicable for TSEM , STEM-IN-SEM etc.
- Additional Digital Zoom 2X, 4X, 8X

MODEL	AIS1800C (Compact Mini SEM)
ELECTRON OPTIC SYSTEM	
Resolution	5.0 nm @ 20kV SE, 4.0nm @30kV SE
Magnification	10X ~ 200,000X (Max.) (Digital Zoom 2X, 4X, 8X)
Accelerating Voltage	0.6kV~30kV
Electron Gun Type	Tungsten Filament
Image Shift	250 μ m (X,Y), Image Rotation (360°)
Detector	ET-Type SE Detector (SE-BSE Conversion Mode Without BSE detector for Non-coating sample inspection)
Automation Function	Auto-Gun Alignment , Auto-Focus, Auto-Stigmatism, Auto Contrast/Brightness, Emission Current & etc.
DISPLAY	
Frame Memory	Area Mode(640X480), Inspection Mode(960X640, 1024X768, 2048X1536) Photo Mode (2048X1536 ~ 8192X6144)
IMAGE ANALYZER	
Image Analysis & Measurement S/W	Multi-Focusing/ Image Tiling/ 3D-View/Enhancement/ Color Transformation/ Filters/ Histogram, Point Measurement, Various Image Filter, AOI(Area-of-Interest) & etc.
STAGE SYSTEM	
Movement (X/Y/Z) mm	40/ 40/ 40mm
Tilt / Rotation	0°~60°/ 360° Endless
Stage Motorization	Standard : 5-Axis Manual Stage Option : 3-Axis(X,Y,R) Motorized Stage, Position Retrieval (Auto-Stepping & Tiling Function for wide FOV & Ultra Pixel resolution)
VACUUM SYSTEM (Low Vacuum System : Option)	
Vacuum	High Vacuum Mode(~10 ⁻⁵ Torr)
Vacuum Control Type	Full automation with safety system
Vacuum System	Rotary Pump + Turbo Pump
OPTION ITEMS	
Analysis Tool	EDS, BSE, TSEM, 3D Reconstruction S/W & etc.

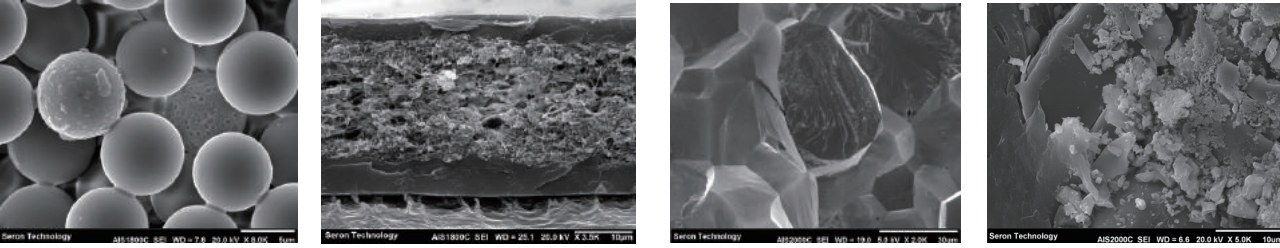
AIS2000C



Features

- Low KV Image (0.6KeV) Without Coating
- Proven model – stability and high performance
- 5-Axis Compact SEM with practical price
- Easy to operate and easy to maintain
- Powerful analysis S/W package
- Applicable for TSEM , STEM-IN-SEM etc.
- Additional Digital Zoom-In 2X, 4X, 8X

MODEL	AIS2000C (Compact Normal SEM)
ELECTRON OPTIC SYSTEM	
Resolution	3.0 nm @20/30kV SE
Magnification	10X ~ 300,000X (Max.) (Digital Zoom 2X,4X, 8X)
Accelerating Voltage	0.6kV~30kV
Electron Gun Type	Tungsten Filament
Image Shift	250 μ m(X,Y), Image Rotation (360°)
Detector	ET-Type SE Detector (SE-BSE Conversion Mode Without BSE detector for Non-coating sample inspection)
Automation Function	Auto-Gun Alignment , Auto-Focus, Auto-Stigmatism, Auto Contrast/Brightness, Emission Current & etc.
DISPLAY	
Frame Memory	Area Mode(640X480), Inspection Mode(960X640, 1024X768, 2048X1536) Photo Mode (2048X1536 ~ 8192X6144)
IMAGE ANALYZER	
Image Analysis & Measurement S/W	Multi-Focusing/ Image Tiling/ 3D-View/Enhancement/ Color Transformation/ Filters/ Histogram, Point Measurement, Various Image Filter, AOI(Area-of-Interest) & etc.
STAGE SYSTEM	
Movement (X/Y/Z) mm	40/ 40/ 40mm
Tilt / Rotation	0~ 60° / 360° Endless
Stage Motorization	Standard : 5-Axis Manual Stage Option : 3-Axis(X,Y,R) Motorized Stage, Position Retrieval (Auto-Stepping & Tiling Function for wide FOV & Ultra Pixel resolution)
VACUUM SYSTEM (Low Vacuum System : Option)	
Vacuum	High Vacuum Mode(~10 ⁻⁵ Torr)
Vacuum Control Type	Full Automation with Safety System
Vacuum System	Rotary Pump + Turbo Pump
OPTION ITEMS	
Analysis Tool	EDS, BSE, TSEM, 3D Reconstruction S/W & etc.



Application Data

NORMAL SEM SERIES

NORMAL SEM SERIES



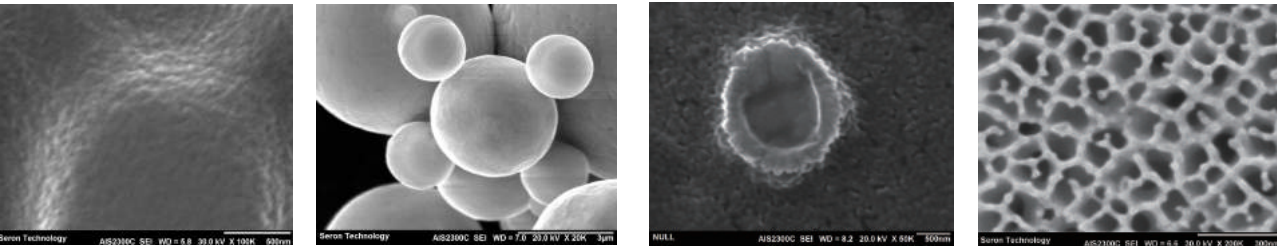
AIS2300C

Features

- Fast Scan Speed
- High stability and high performance
- High magnification, Low kV
- User friendly Analysis S/W
- Easy to operate and easy to maintain
- Applicable for TSEM , STEM-IN-SEM etc.
- Additional Digital Zoom-In 2X, 4X, 8X
- ET-SE Detector for SE/BSE image

Specifications

MODEL	AIS 2300C
ELECTRON OPTIC SYSTEM	
Resolution	3.0 nm 30kV SE, 4.0nm BSE
Magnification	10X ~ 1,000,000X (Max.)
Accelerating Voltage	0.6kV~30kV (Min. 0.2kV)
Electron Gun Type	Tungsten Hair-pin Filament
Optic Lens	Electromagnetic Lens System
Image Shift	250 μ m (X,Y), Image Rotation(360°)
Detector	ET-Type SE Detector (SE-BSE Conversion Mode Without BSE Detector for Non-Coating Sample Inspection)
Automation Function	Auto-Gun Alignment, Auto-Focus, Auto-Stigmatism, Auto Contrast/Brightness, Emission Current etc.
DISPLAY	
Frame Memory	Area Mode(640X480) Inspection Mode(960X640, 1024X768, 2048X1536) Photo Mode (2048X1536 ~ 8192X6144)
IMAGE ANALYZER	
Image AnalyzerParticle Counter&Measurement S/W	Multi-Focusing/ Image Tiling/ 3D-View/Enhancement/ Color Transformation/ Filters/ Histogram/ Excel Data/ Various Image Filter/ Blob Analysis (Single/Multiple/Grouping)/ Point Measurement/ AOI(Area-of-Interest) & etc.
STAGE SYSTEM Support Super Ultra High Pixel Resolution for paper work (Auto stepping & Tiling)	
Movement (X/Y/Z) mm	60/ 70/ 65 mm (Option: Large Stage & Chamber)
Tilt / Rotation	-20°~60° (Max. 90°) / 360° Endless
Stage Motorization	Standard : 3-Axis(X,Y,R) Motorized Stage, Position Retrieval Auto-Stepping & Tiling Function for wide FOV & Ultra Pixel resolution) Option : Additional Axis Motorization(T,Z) is available
VACUUM SYSTEM	
Vacuum	High Vacuum Mode(~10 ⁻⁵ Torr) / Low Vacuum Mode (Option)
Vacuum Control Type	Full Automation with Safety System
Vacuum System	Rotary Pump + Turbo Pump
OPTION ITEMS	
Analysis Tool	EDS, BSE, TSEM, 3D Reconstruction S/W, CCD Camera & etc.



Application Data



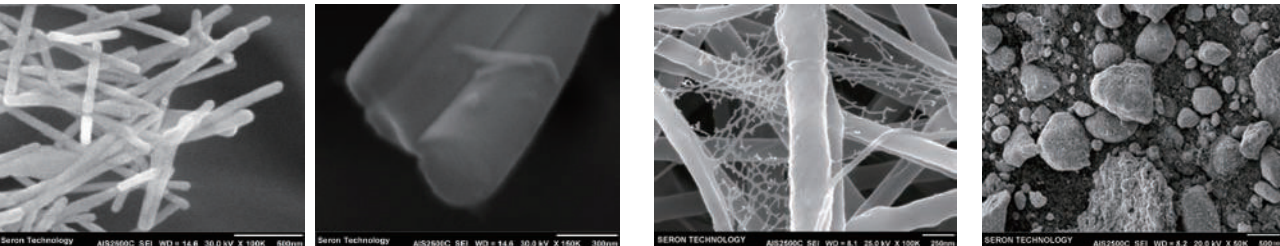
AIS2500C

AIS2500C is equipped with LaB6 so that the operator can obtain a high resolution image. It has advantage of surface image observation. AIS2500C use Mu-metal alloy on shielding for minimizing magnification and upgrading durability. 65°Conical Object lens is designed in order to achieve a high-resolution image of wide specimen. In addition, AIS2500C has optimal resolving power through

- 65°Conical Lens installed (for wide specimen)
- Provide Resolving Power & high pixel resolution images
- Ultrafast scanning control driver installed
- Provide multitasking window
- Allow big data processing, storing and filing by Auto-stepping & tiling
- High performance Analysis S/W & Measurement S/W

Specifications

MODEL	AIS 2500C
ELECTRON OPTIC SYSTEM	
Electron Gun Source	LaB6 Filament Cathode
Resolution	2 nm @ 30KeV SE/ 3nm @BSE
Magnification	10X ~ 1,000,000X
Image	Secondary Electron Image(SEI), Option: Backscattered Electron Image(BEI), TSEM
Accelerating Voltage	0.6kV~30kV (Max. 0.2kV)
Gun Alignment	Auto-Gun Alignment (Using Histogram)
Condenser Lens	Electromagnetic 2 stages
Objective Lens	65° Conical Object Lens (1 stage)
Image Shift	330 / 325 μ m (X/Y), Image Rotation(360°)
Detector	ET-Type SE Detector (SE-BSE Conversion Mode Without BSE Detector for Non-Coating Sample Inspection)
Automation Function	Auto-Gun Alignment, Auto-Focus, Auto-Stigmatism, Auto Contrast/Brightness, Emission Current Auto-stepping & Tiling, Auto photograph by pre-setting etc.
Operation System	Multi Tasking Window GUI, Remote Control Adjustment Function, etc.
DISPLAY	
Frame Memory &Scan Speed	Area Mode (640X480), Inspection Mode (960X640, 1024X768, 2048X1536) Photo Mode (2048X1536 ~ 8192X6144)
IMAGE ANALYZER	
Image Analyzer Particle Counter	Multi-Focusing/ Image Tiling/ 3D-View/Enhancement/ Color Transformation/ Filters/ Blob Analysis (Single/Multiple/Grouping)/ Histogram/ Excel Data/ Point Measurement/ Various Image Filter, etc.
STAGE SYSTEM Support Super Ultra High Pixel Resolution for paper work (Auto stepping & Tiling)	
Movement (X/Y/Z) mm	60/70/ 65 mm (Option: Large Stage & Chamber)
Tilt / Rotation	-20°~60° (Max. 90°) / 360° Endless
Stage Motorization	Standard : 3-Axis(X,Y,R) Motorized Stage Position Retrieval (Auto-Stepping & Tiling Function for wide FOV & Ultra Pixel resolution) Additional Axis Motorization(T,Z) is available
VACUUM SYSTEM (Low Vacuum System : Option)	
Vacuum	High Vacuum Mode(~10 ⁻⁷ Torr) / Low Vacuum Mode (Option)
Vacuum Control Type	Full automation with safety system
Vacuum System	Rotary Pump + Turbo Pump / Ion Pump
OPTION ITEMS	
	BSE, EDS, WDS, EBSD, TSEM, Load-lock Chamber & etc.



Application Data

GUI

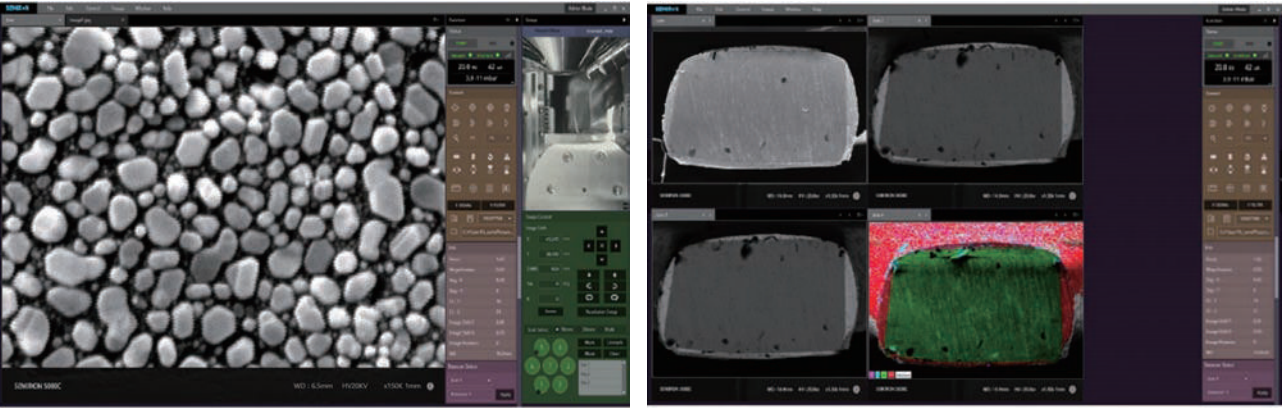
New GUI based on Multi-Tasking Window

Innovative, modern UI design for operative convenience



- Focus on key features in simplified screen composition elements
- Provide acustomizing arrangement by frequency of use
- Minimize unnecessary movement of mouse pointer and attention
- Allow re-arrangement of UI composition upto monitor resolution
- Use 'Short Cut' function instead of HW controller in order to improve efficiency
- Minimize operative error by Providing operatot with guidance and feedback

- ◆ Optimal operating system is developed for perfect linkage of newly designed C# Platform and UI by upgrading SEM Scan generator and control driver. This upgrade also allows internal LAN based on Linux for high speed processing.
- ◆ New GUI provides multi-tasking function for handling various instructions simultaneously for example, live image, saved image, internal SEM CCD image and detector image.
- ◆ Scanning speed is significantly improved in order to monitor live image in 1024X768 pixel resolution. Up to 8192X6144 pixels resolution is also available
- ◆ A choice of beginner mode or expert mode is available for the operator. 'Jog & Shuttle' can be replaced with 'remote control' on screen. Additional hot key functions maximize operation speed and convenience.
- ◆ It is designed to enable drag and drop components into functional units. This allows the user to customize the UI directly according to preference and this application can be applied on dual monitor.



ANALYSIS S/W I

AIS SEM is provided with professional measuring S/W

AIS SEM series' graphic User Interface is a remarkable image analysis and measurement S/W.

The 'Multi-focus function' is only for AIS SEM and is specialized for auto-correction for images with significant depth of focus.

Auto-Tiling function provides panoramic image that composes images automatically through image polarity.

Particle Counter function provides statistics process and charts of various characteristics such as particle's distribution, size and circular chart. There are many professional image enhancement functions such as Histogram, Frequency Filter, and User Define Filter.

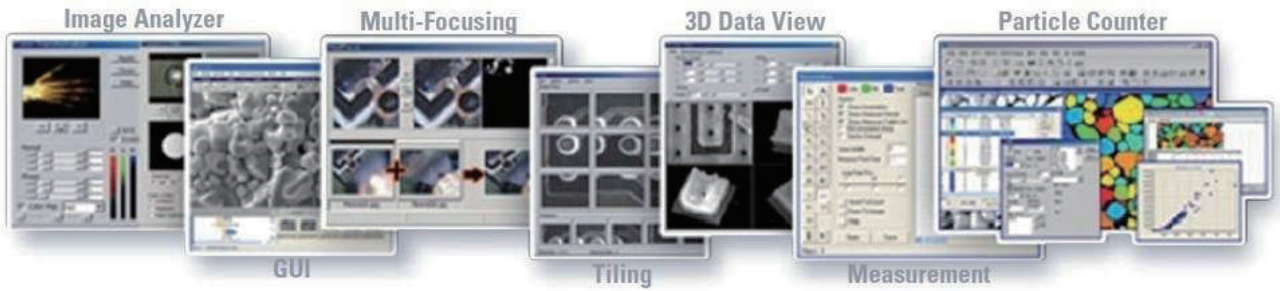
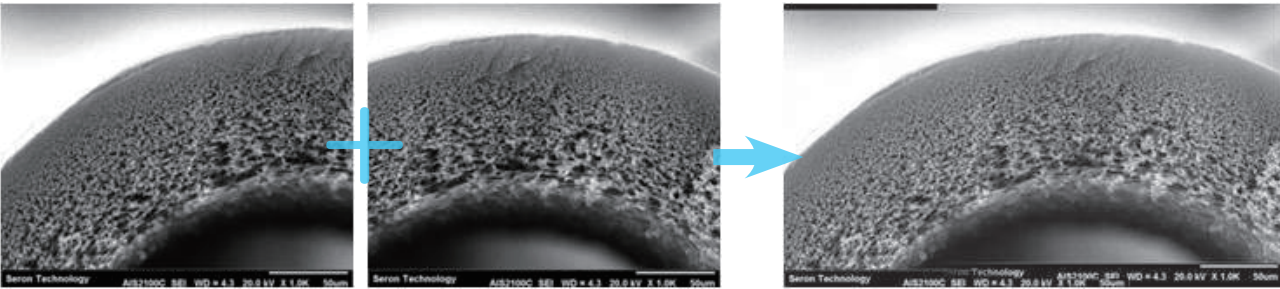
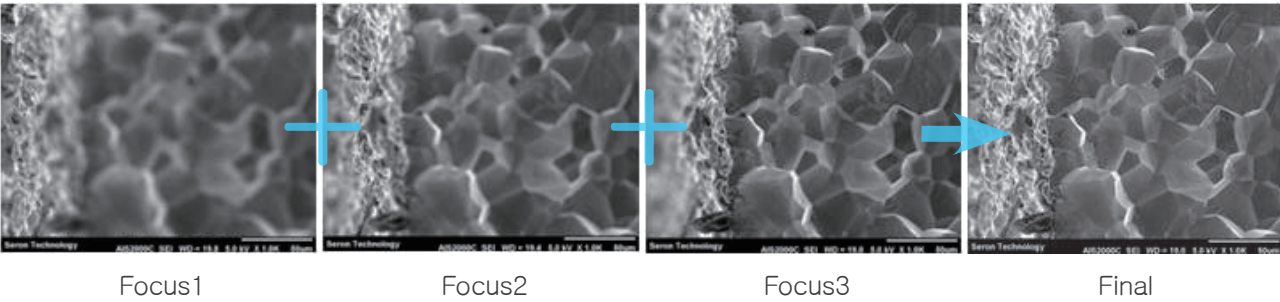


Image Tiling automatically makes several images to one single image with images' polarity



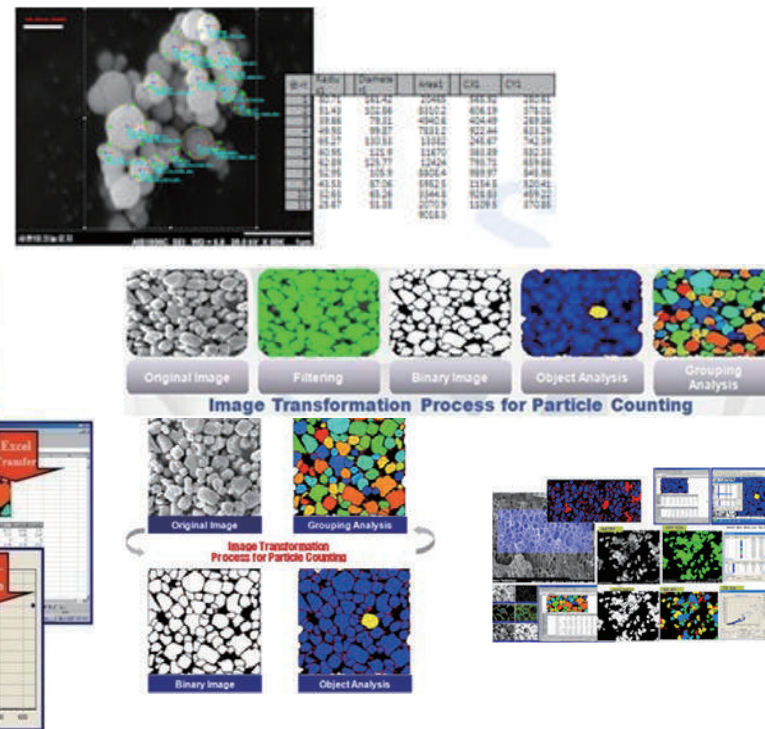
Multi-Focusing Specimen depth difference can vary significantly, however this function uses beam shift to change focusing depth and take several images of them to compose. After composing, it provides a clear single image of specimen



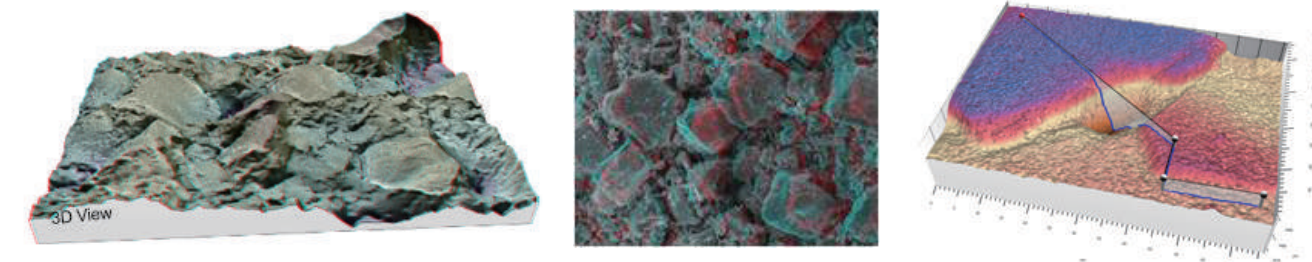
ANALYSIS S/W II

Particle Count

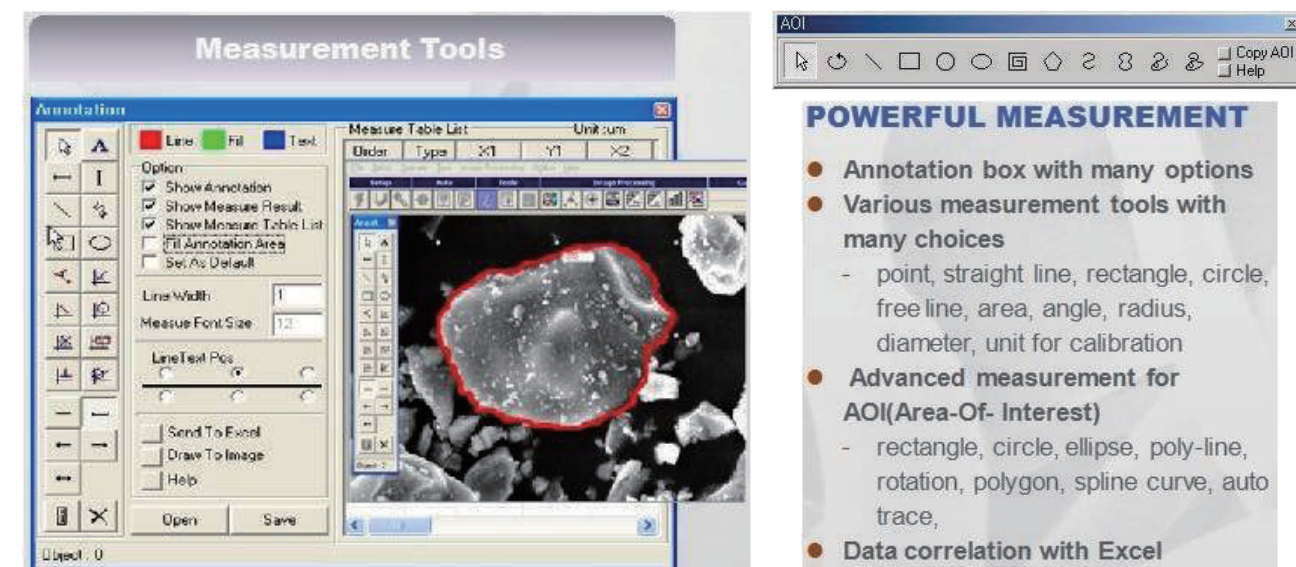
Powder Counting
Grain Size measurement and distribution chart
Powder distribution chart and area analysis
Porosity distribution chart and measurement
Circular chart
Multi-Area counting



3-Dimensional Reconstruction Analysis (Option)



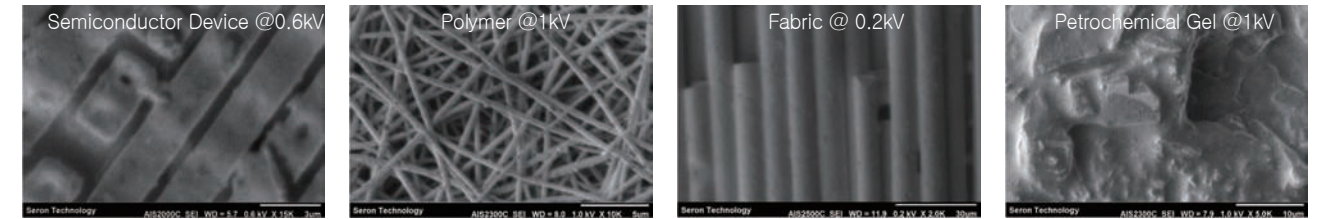
AOI (Area of Interest)



APPLICATION NOTE

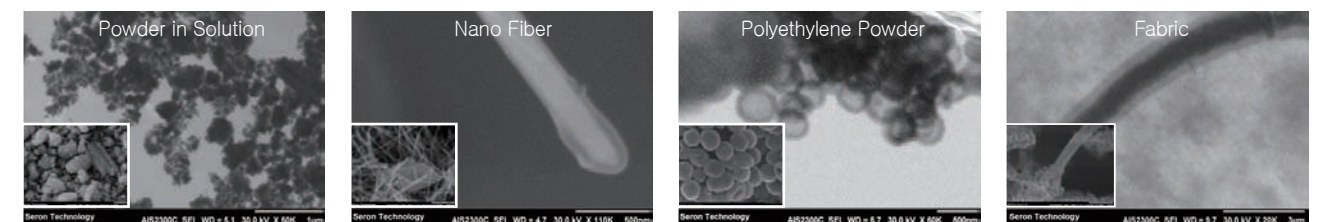
Low KV

The non-conductive samples in low-voltage (0.2 ~ 5kV) can be observed in non-coating state.



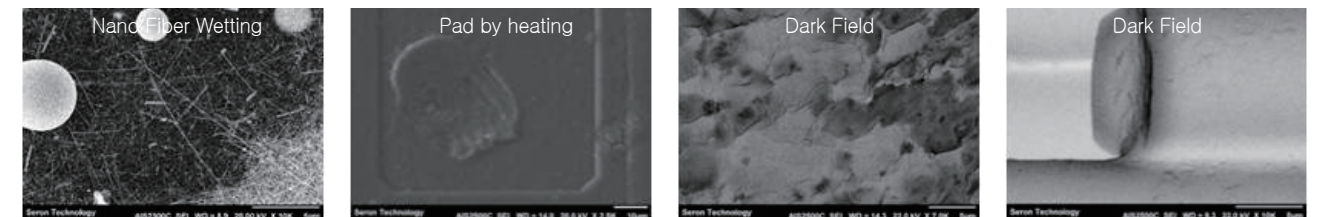
TSEM

This patent technology is useful in observing the surface and transmitted images of Nano-Size Sample such as Nano Wire and powder simultaneously.



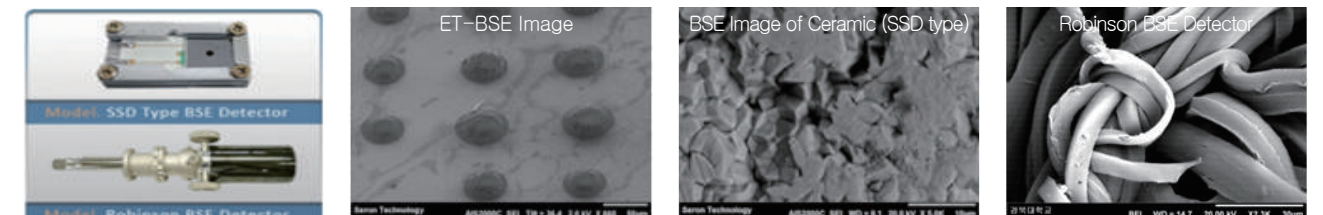
Heat SEM & Dark Field

Heat SEM is suitable for analysis of phase transitions and changes of material structure over 1000°C, Dark Field is for Particle Inspection



BSE Image

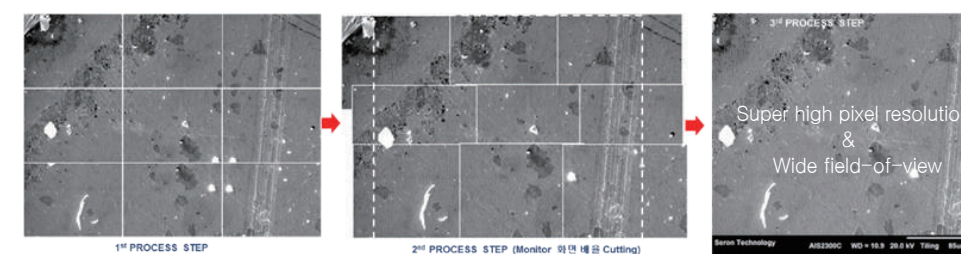
ET-BSE Detector provides BSE image without additional detectors. Si Photodiode BSE and Robinson BSE Detector are also available options.



Auto Stepping & Tiling

Auto-Stepping is a patent function for making and processing a wide high resolution image. With Auto-Stepping function, user can obtain high resolution wide image of specimen. This function provides stage moving automatically and taking images of a wide area. After this step, all pictures are collated in one volume through Auto-Tiling.

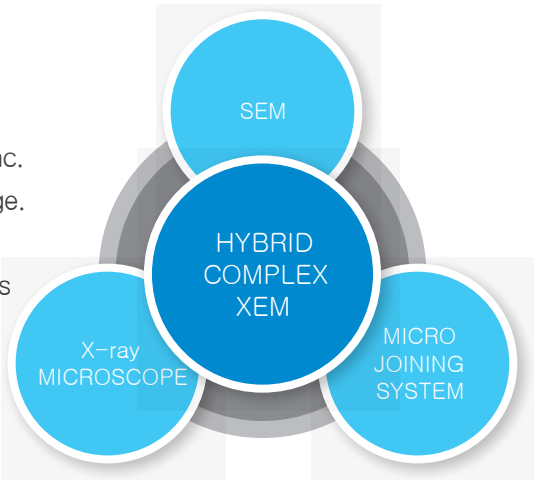
Auto align- Auto focus- Auto stigma- Auto Contrast/brightness- Auto photograph - Auto positioning → Auto Tiling



Combination of Scanning Electron Microscope and Micro Focus X-ray

HYBRID XEM

Hybrid XEM is a fusion instrument that provides surface observation image (SEM) and transmission image (X-ray) simultaneously. It is designed specifically for Nano-technology. Seron Technologies Inc. has developed this machine for measuring Sub-Micro size X-ray image. Hybrid XEM is designed by Seron's own technology. It can provide high contrast image with low kV and this feature provides a range of application



HYBRID COMPLEX XEM

Hybrid Complex E-beam System provides X-ray transmission image, nanostructure surface image and E-beam Micro-joining concurrently

기술 소개 (Technical Characteristics)

This Unique complex E-Beam Equipment combines SEM (Scanning Electron Microscope), X-Ray Microscope and E-beam joining system all in one.

적용 사례 (Applications)

After taking surface image, you can emit weak electron energy on a wide area to harden surface of specimen or emit strong beam on tiny area to bond it. You can also compare SEM

SEM + MICRO FOCUS X-RAY IMAGE + MICRO E-BEAM JOINING

○ E-BEAM MICRO JOINING & SINTERING

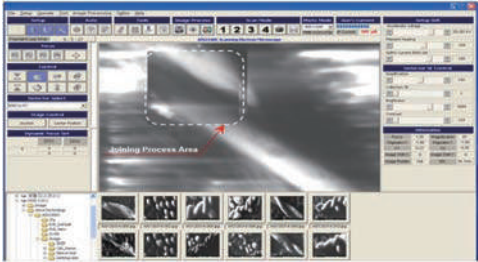
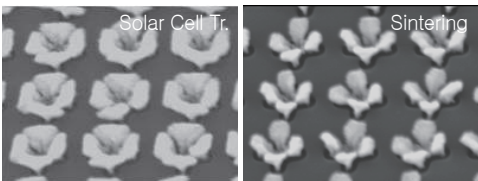
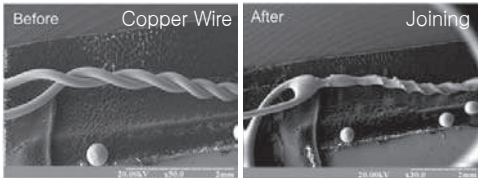
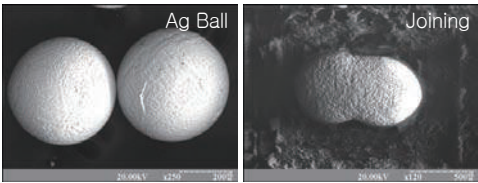
○ X-RAY IMAGE

○ SEM IMAGE

Electron Beam Micro Joining System – Joining and Sintering

AIW 50

'Micro E-beam Joining' is the first development in the world by Seron Technologies Inc. in 2005. Various institutions, universities and laboratories around the world are using this for advanced technology development. AIW50 model is all-in-one system of surface scanning, joining and sintering. Joining system with electron beam is the most applicable for joining yet minimizes the thermal strain with small focus point and raises degree of integration. AIW50 is E-beam is a leading equipment designed for the next Nano-mechatronics generation.



On Joining Process



APPLICATION

- 1) Weld for metal (smaller than micro-size)
- 2) Semiconductor packaging and sintering
- 3) Sensor and shielding
- 4) Surface welding between different type materials

Specifications

Resolution(SEM Mode)	8.0mm (@WD) Depends on Probe Current W.D. ~30 mm @ Micro-Joining Process
Acceleration Voltage	1.0 KV ~ 35KV
Visual Inspection Source	Electron induced Display (Tungsten Hair Pin Type)
Probe Current	nA ~pA for SEM, Max. ~ 100 μA (Guaranty Spec. 50 μA)
Magnification	10X~200,000X
Detector	High Sensitivity E-T detector, SE & BSE Image Acquisition Mode
Others	CCD, Faraday Cage, and etc.