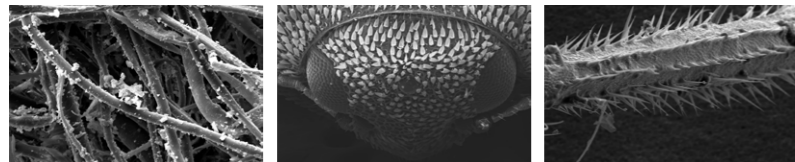


Cube Series / Genesis Series / Veritas Series

Navigate, Explore, ... and Discover In Every Research Area



EmCrafts Co., Ltd.

254 Docheok-ro, Docheok-myeon, Gwangju-si, Gyeonggi-do 12814, Korea

Tel +82-31-8027-2752 Fax +82-31-763-4467 Email sales@emcrafts.com

www.emcrafts.com

High-Performance Scanning Electron Microscope

Cube Series / Genesis Series / Veritas Series

Navigate, Explore, ... and Discover In Every Research Area





Navigate, Explore, ... and Discover In Every Research Area

High-Performance
Scanning Electron Microscope

CONTENTS

01 Applications

02 Tabletop SEM [Cube-Series]

03 Compact SEM [Genesis-Series]

04 Big Chamber SEM [Veritas-Series]

05 Software

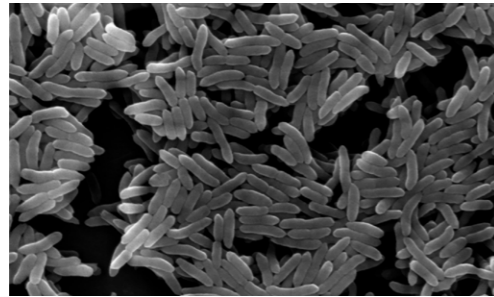
06 Optional Device

- EDS
- Coater
- BSE
- Holder
- Filament
- Critical Point Dryer
- Freeze Dryer
- Cool Stage
- Polishing Machine
- Mounting Machine
- 3D Reconstruction SW

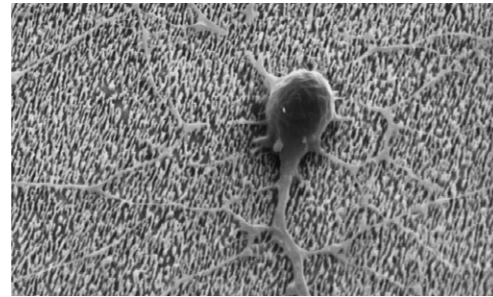
01 Applications



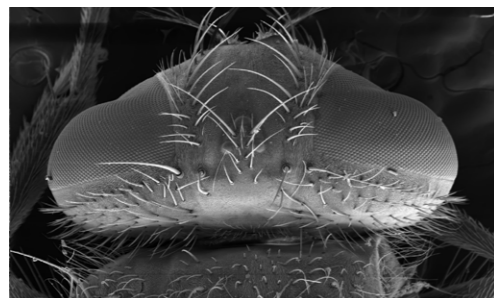
Life Science



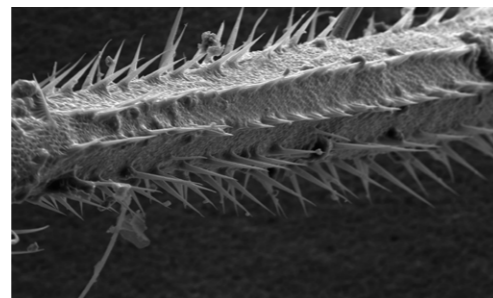
Bacteria



Neuron



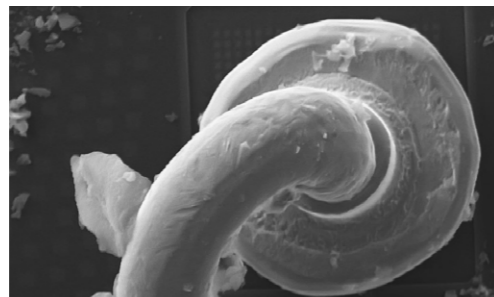
Insect(Fly's head)



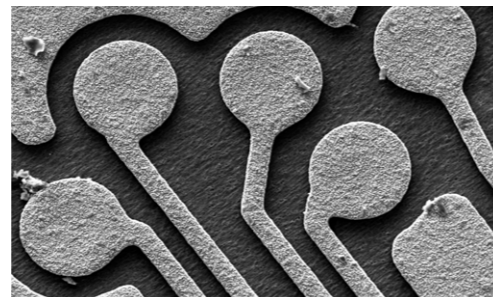
Insect(Fly's leg)



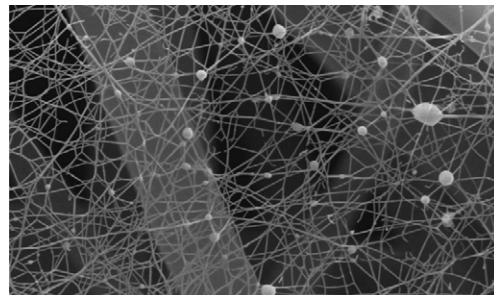
Electronics



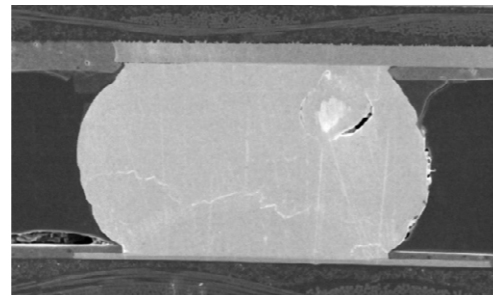
Wire bonding



Printed Circuit



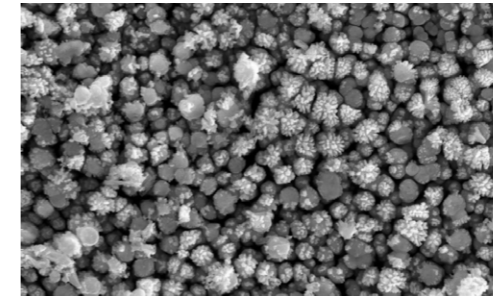
Nano Fiber



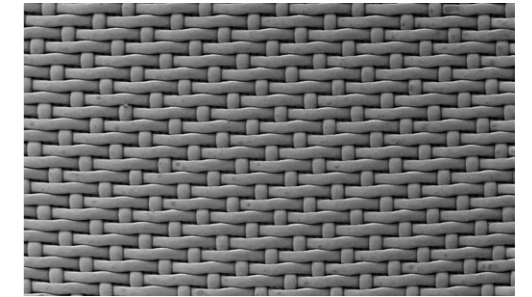
Semiconductor Package



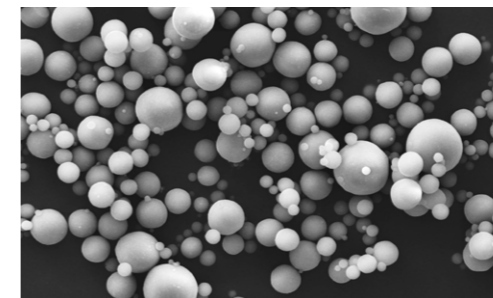
Material Science



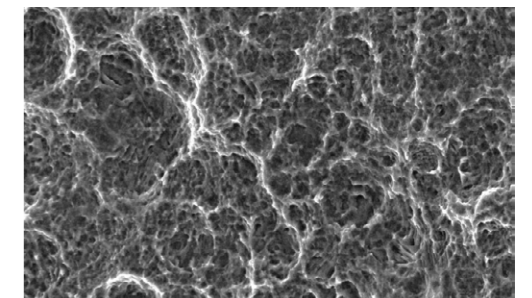
Cadmium Oxide



Fabric



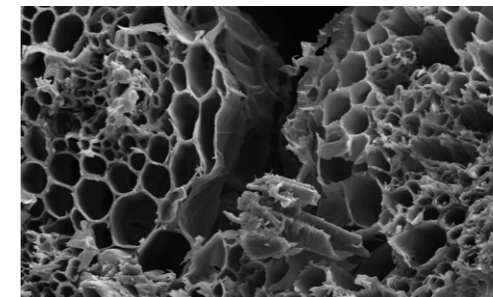
Powder



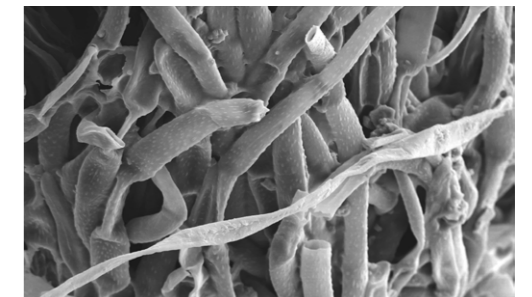
Dental Implant



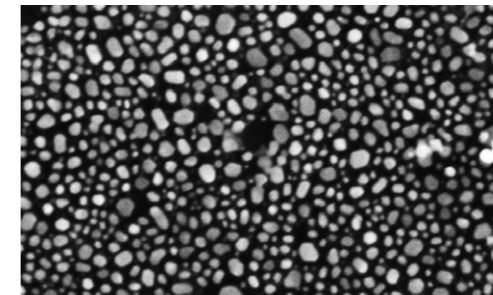
Natural Resource



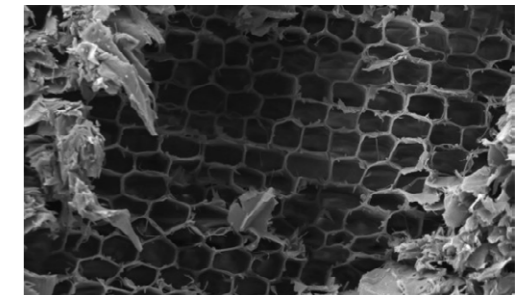
Leaf Cross Section



Stamen



Gold Powder

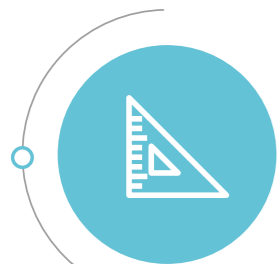


Cross section of a tree

02 Tabletop SEM Cube-Series

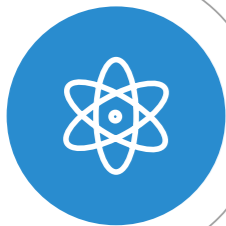
- Most Affordable and Portable
- Full 5-Axis Eucentric Stage
- Integrated EDS System

Magnification	x20 ~ x200,000
Stage	X,Y : 40mm / Z : 5~20mm / T : -20~20° / R : 360°
Maximum Sample Size	60mm(H), 30mm(V)



Space Efficiency

Cube-series is most compact Tabletop SEM in the world for its portability and space efficiency. Users can move their SEM by themselves by following the Customer Services directions.



5-Axis Eucentric Stage

Cube-series is the only Tabletop SEM which provides 5-axis eucentric stage(motorized or manual) in the world. Eucentric tilt is essential for 3D reconstruction function.



More Affordable Solution

Each laboratory can own its SEM and EDS system on its budget. EmCrafts' Cube-series is a highly customizable system so that each laboratory can configure its own system. Please contact our sales department for your requirements.

Installation Footprint



CUBE-Series specification

Model	Cube-1000	Cube-1100	Cube-1000A	Cube-1100A
Stage	5-axis Manual X,Y : 40mm (-20mm ~ 20mm) Z : 5 ~ 20mm / T : -20 ~ 20° / R : 360°		3-axis Motorized X,Y : 40mm (-20mm ~ 20mm) / R : 360° 2-axis Manual Z : 5 ~ 20mm / T : -20 ~ 20°	
Variable Pressure	X	0	X	0
Vacuum Mode	High Vacuum only (1×10^{-3}Pa)	High Vacuum Mode (1×10^{-3}Pa) Low Vacuum Mode (10-230Pa)	High Vacuum only (1×10^{-3}Pa)	High Vacuum Mode (1×10^{-3}Pa) Low Vacuum Mode (10-230Pa)
Vacuum System	Fully Automated Evacuation System -Turbo molecular pump (Vacuum ready within 3 minutes) -Rotary vane pump -Electrical valve system			
Electron Gun	Precentered Tungsten Filament			
Detector	SE (ET-type)	SE (ET-type) BSE (4channel, Semiconductor)	SE (ET-type)	SE (ET-type) BSE (4channel, Semiconductor)
Resolution	5.0nm (SE Image)	5.0nm (SE Image) 6.0nm (BSE Image)	5.0nm (SE Image)	5.0nm (SE Image) 6.0nm (BSE Image)
Magnification	x20 ~ x200,000			
Acceleration Voltage	500V ~ 30kV			
Objective IRIS	20/20/50/100µm (Variable aperture)			
Image Shift	±50µm			
Maximum Sample Size	Horizontal: 60mm, Vertical: 30mm			
Advanced Scan Mode	Dynamic Focus, Point & Line Scan, Tilt Compensation			
Working Distance	0-20mm			
Automatic Function	Auto Brightness/Contrast, Auto Focus, Auto Gun Alignment, Auto Saturation, Auto Filament / Bias			
Image Format	JPG, TIFF, BMP, PNG			
Display Mode	Focus Mode : 320x240 pixel, Resizable Preview Mode : 800x600 Slow Mode : Applicable to both preview and focus mode Photo Mode : Up to 3200x2400			
Dimension(mm)	Installation Dimension : 1200(W) x 600(D) - Main System : 400(W) x 500(D) x 580(H) - Control Box : 500(W) x 260(D) x 370(H)			
Supplied Accessories	Factory-centered Filament Cartridge 1box(10units), Specimen Mounts 1box(10units), Tweezer, Carbon Tape, Hex. Driver 0.89mm (1 ea.), Hex. T Wrench 2.5mm (2 ea.)			
Operation Device	Windows 10-based All-in-One 21.5" Workstation -100% controlled by keyboard and mouse			
Optional Devices	Chamber Camera LaB ₆ /CeB ₆ upgrade 3D Imaging EDS(Cube-1000X All-in-one Model of SEM-EDS) E-beam Lithography			
Power Supply	Single Phase : 100 ~ 240VAC, 50/60Hz, 1kVA			

03 Compact SEM Genesis-Series

- 5-Axis Eucentric Stage
- More Value in Less Space
- Straightforward & Intuitive Manual Stage (Genesis-1000 / 1100)
- More Versatile 5-Axis Motorized Stage (Genesis-2020 / 2120)
- Observation of Non-Conductive Sample (Genesis-1100 / 2120)

Genesis series is a high-performance W-filament SEM with x300K magnification and 3nm resolution.

High performance and versatility are integrated in a stylish design which is the most compact of the world in the same category.

EmCrafts-Patented vacuum system enables faster specimen exchange. (within 3min.)

Universal extension ports are available for future upgrade and user customization.

Due to factory-centered filament cartridge, filament exchange is easy and quick.

Images are saved in various formats and can be easily restored for annotation simply by clicking on the thumbnails.



Cost-Effectiveness

- Genesis series are most affordably priced
- Perfect solution for any laboratory



Easy Maintenance

- **Filament Burn out Notification**
- **Precentered Filament**
Only 1-2 Minutes are Required for a Filament Replacement
- **Remote Diagnostics**
Electrical Checkpoints are Probed and Reported



Genesis 1000/1100

- Intuitive 5-axis manual eucentric stage on Genesis-1000/1100 provides easy and straightforward way to move specimens.
- Variable pressure capability of Genesis-1100 enables users to observe non-conductive samples such as biological samples.

Magnification	x10 ~ x300,000
Stage	X,Y : 40mm / Z : 5~45mm / T : -20~90° / R : 360°
Maximum Sample Size	96mm(H), 50mm(V)

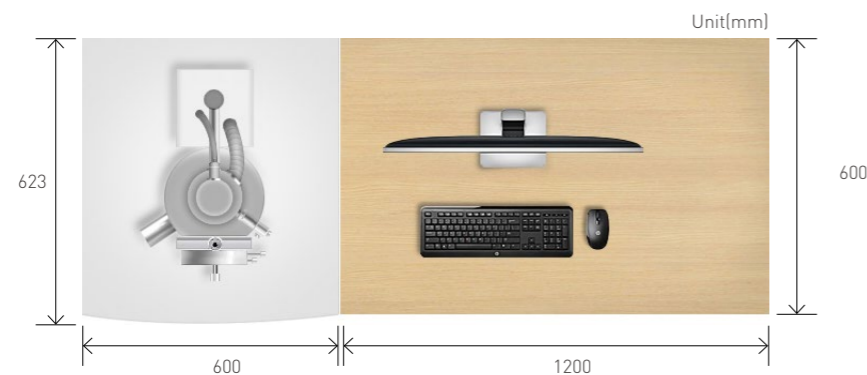


Genesis 2020/2120

- Genesis-2020/2120 provides 5-axis motorized eucentric stage in the same compact design.
- Intuitive "Point & Go" operation enables effortless stage movement in a quick manner.
- Position save and restore function is useful especially for multi-specimen mount.

Magnification	x10 ~ x300,000
Stage	X : 90mm, Y : 60mm / Z : 5~60mm / T : -20~90° / R : 360°
Maximum Sample Size	150mm(H), 60mm(V)

Installation Footprint



GENESIS-Series specification

Model	Genesis-1000	Genesis-1100	Genesis-2020	Genesis-2120
Stage	5-axis Manual X : 40mm (-20mm ~ 20mm) Y : 40mm (-20mm ~ 20mm) Z : 5 ~ 45mm T : -20° ~ 90° R : 360°		5-axis Motorized X : 90mm (-45mm ~ 45mm) Y : 60mm (-30mm ~ 30mm) Z : 5 ~ 60mm T : -20 ~ 90° R : 360°	
Variable Pressure	X	0	X	0
Vacuum Mode	High Vacuum only (<math> < 9 \times 10^{-3} \text{Pa}</math>)	High Vacuum Mode (<math> < 9 \times 10^{-3} \text{Pa}</math>) Low Vacuum Mode (10~230Pa)	High Vacuum only (<math> < 9 \times 10^{-3} \text{Pa}</math>)	High Vacuum Mode (<math> < 9 \times 10^{-3} \text{Pa}</math>) Low Vacuum Mode (10~230Pa)
Vacuum System	Fully Automated Evacuation System - Turbo molecular pump(Vacuum ready within 3 minutes) - Rotary vane pump - Electrical valve system			
Electron Gun	Precentered Tungsten Filament			
Detector	SE(ET-type)	SE(ET-type) BSE(4channel, Semiconductor)	SE(ET-type)	SE(ET-type) BSE(4channel, Semiconductor)
Resolution	3.0nm (SE Image)	3.0nm (SE Image) 5.0nm (BSE Image)	3.0nm (SE Image)	3.0nm (SE Image) 5.0nm (BSE Image)
Magnification	x10 ~ x300,000			
Acceleration Voltage	200V ~ 30kV			
Objective IRIS	20/20/50/100μm(Variable aperture)			
Image Shift	±50μm			
Maximum Sample Size	Horizontal : 96mm, Vertical : 50mm		Horizontal : 150mm, Vertical : 60mm	
Advanced Scan Mode	Dynamic Focus, Point & Line Scan, Tilt Compensation			
Working Distance	0~45mm		0~60mm	
Automatic Function	Auto Brightness/Contrast, Auto Focus, Auto Gun Alignment, Auto Saturation, Auto Filament / Bias			
Image Format	JPG, TIFF, BMP, PNG			
Display Mode	Focus Mode : 320x240 pixel, Resizable Preview Mode : 800x600 Slow Mode : Applicable to both preview and focus mode Photo Mode : Up to 3200x2400			
Dimension(mm)	Installation Dimension : 1800(W) x 600(D) - Main System: 600(W) x 623(D) x 1350(H), 130Kg - Rotary Pump : 454(W) x 134(D) x 121(H), 22Kg			
Supplied Accessories	Factory-centered Filament Cartridge 1box(10units), Specimen Mounts 1box(10units), Tweezer, Carbon Tape, Hex. Driver 0.89mm (1 ea.), Hex. T Wrench 2.5mm (2 ea.)			
Operation Device	Windows10 -based All-in-One 21.5" Workstation -100% controlled by keyboard and mouse			
Optional Devices	EBSD(Electron Back Scattered Diffraction) EDS(Energy Dispersive Spectroscopy) WDS(Wavelength Dispersive Spectroscopy) CL(Cathodoluminescent) Imaging Chamber Camera LaB ₆ /CeB ₆ Upgrade 3D Imaging Raman Spectroscopy E-beam Lithography			
Power Supply	Single Phase : 100 ~ 240VAC, 50/60Hz, 1kVA			

04 Big Chamber SEM Veritas-Series

- High Performance and Productivity
- Large Scale Stage Movement

Veritas-series has 5-Axis eucentric motorized stage to provide easier measurement of large scale samples.

Magnification	x10 ~ x300,000
Stage	X,Y : 120mm / Z : 5~65mm / T : -20~90° / R : 360°
Maximum Sample Size	210mm(H), 65mm(V)



Application



Large Samples Analysis

Veritas-series can analyze large-scale samples conventional SEMs cannot.
ex : Wafer, disk



Non-destructive Samples Analysis

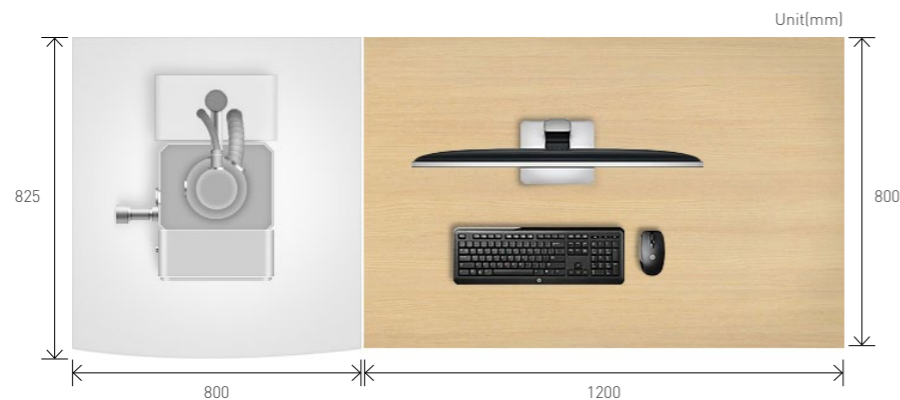
Able to analyze samples without cutting
ex : PCB, Semiconductor pattern Analysis



Heavy Samples Analysis

Able to analyze heavy samples up to 2kg
ex : Rock, Iron Ore

Installation Footprint



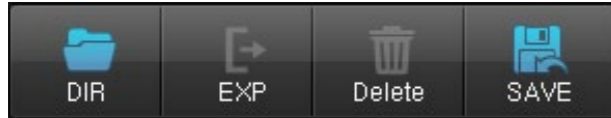
VERITAS-Series specification

Model	Veritas-3000	Veritas-3100
Stage Type	5-axis Motorized X,Y : 120mm(-60mm~60mm) Z : 5~65mm T : -20°~90° R : 360°	
Variable Pressure	X	0
Vacuum Mode	High Vacuum Mode (9×10^{-3}Pa)	High Vacuum Mode (9×10^{-3}Pa) Low Vacuum Mode(10 ~ 230Pa)
Vacuum System	Fully Automated Evacuation System - Turbo molecular pump (Vacuum ready within 3 minutes) - Rotary vane pump - Electrical valve system	
Electron Gun	Precentered Tungsten Filament	
Detector	SE Detector	SE Detector BSE Detector (4channel, Semiconductor)
Resolution	3.0nm (SE Image)	3.0nm (SE Image) 5.0nm (BSE Image)
Magnification	x10 ~ x300,000	
Acceleration Voltage	200V ~ 30kV	
Objective IRIS	20/20/50/100μm (Variable aperture)	
Image Shift	±50μm	
Maximum Sample Size	Horizontal: 210mm, Vertical: 65mm	
Advanced Scan Mode	Dynamic Focus, Point & Line Scan, Tilt Compensation	
Working Distance	0 ~ 65mm	
Automatic Function	Auto Brightness/Contrast, Auto Focus, Auto Gun Alignment, Auto Saturation, Auto Filament / Bias	
Image Format	JPG, TIFF, BMP, PNG	
Display Mode	Focus Mode : 320x240 pixel, Resizable Preview Mode : 800x600 Slow Mode : Applicable to both preview and focus mode Photo Mode : Up to 3200x2400	
Dimension(mm)	Installation Dimension : 2000(W) x 800(D) -Main System : 800(W) x 825(D) x 1500(H), 200kg -Rotary Pump : 454(W) x 134(D) x 212(H), 22kg	
Supplied Accessories	Factory-centered Filament Cartridge 1box(10units), Specimen Mounts 1box(10units), Tweezer, Carbon Tape, Hex. Driver 0.89mm (1 ea.), Hex. T Wrench 2.5mm (2 ea.)	
Operation Device	Windows 10-based All-in-One 21.5" Workstation 100% controlled by keyboard and mouse	
Optional Devices	Chamber Camera LaB ₆ /CeB ₆ upgrade 3D Imaging Raman Spectroscopy EDS(Energy Dispersive Spectroscopy) EBSD(Electron Back Scattered Diffraction) WDS(Wavelength Dispersive Spectroscopy) CL(Cathodoluminescence) Imaging E-beam Lithography	
Power Supply	Single Phase : 100 ~ 240VAC, 50/60Hz, 1kVA	

05 Virtuoso

Easy-to-Use Operation Software

Image Save & Export



Annotation Tool



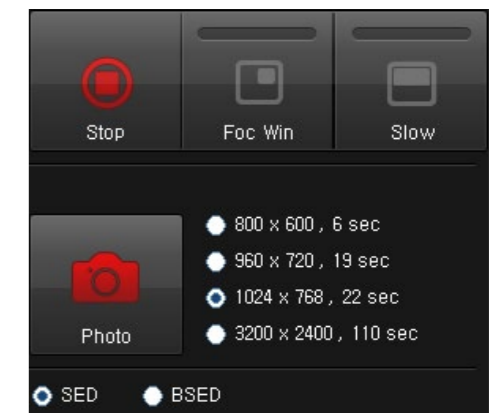
Image Parameter Control



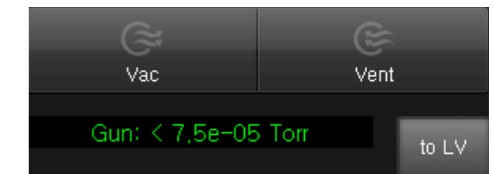
Automatic Functions



Vacuum Control & Status Monitor



Observation Mode Selection



Various Image Formats
JPEG, TIFF, BMP, PNG

Observation Mode
Focus Window Mode
TV Mode
Slow Scan Mode
Photo Mode

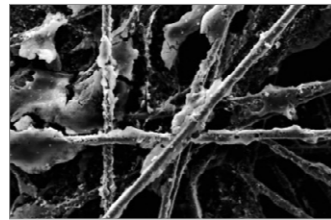
Automatic Functions
Filament/Bias
Brightness/Contrast
Gun Alignment
Focus
Stigmator

User Friendly Functions
Multi-User environment
Wobble
Filament burn-out alarm
Customizable annotation

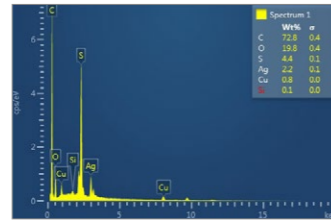
06 Optional Device

1. EDS SYSTEM

- LN2-free operation, Silicon Drift Detector.
- Detects elements from Be(4) to Cf(98).
- Premium Resdution of 129 eV is available.
- Quantitative Analysis, Qualitative Analysis, Multi-Point Analysis, LineScan, Mapping.
- EDS Maker: Oxford, Thermo, Bruker, EDAX, Evex.



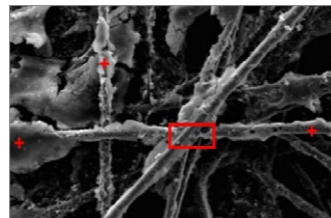
SEM Image



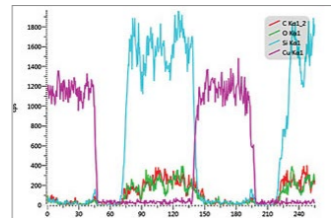
Qualitative Analysis

Element	Line Type	Apparent Concentration	k Ratio	Wt%	Wt% Sigma	Standard Label	Factory Standard	Standard Calibration Date
C	K series	6.67	0.06666	72.81	0.42	C-Vit	Yes	
O	K series	2.32	0.00782	19.76	0.42	SiO2	Yes	
Si	K series	0.05	0.00037	0.07	0.01	SiO2	Yes	
S	K series	2.72	0.02340	4.42	0.06	FeS2	Yes	
Cu	K series	0.45	0.00451	0.78	0.05	Cu	Yes	
Ag	K series	1.18	0.01185	2.16	0.06	Ag	Yes	
Total:				100.00				

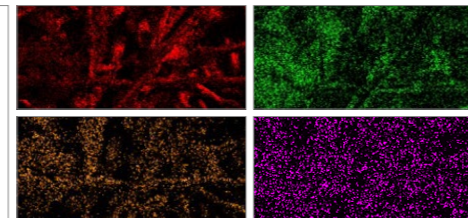
Quantitative Analysis



Point and Area Analysis



Line Scan



Mapping

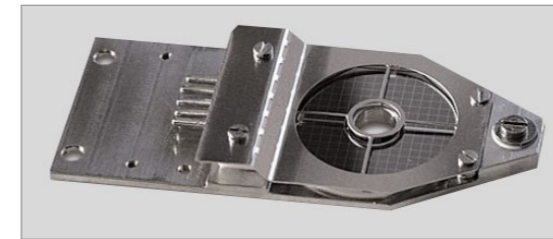
2. ION SPUTTER COATER



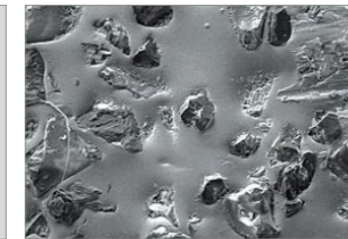
- Operating principle : Top Electrode discharge system
- Ionization power : ~50mA(Max : 500V)
- Target : 50mm(Ø) x 0.1mm thick, Disc type(Au, Pt)
- Instrument case : 270(W) x 470(D) x 385(H)
- Power requirements : 220V / Single phase AC 50/60Hz, 10A
- Weight : 22kg
- Rotary Pump : 16L/min[at 60Hz]

3. BSE Defector

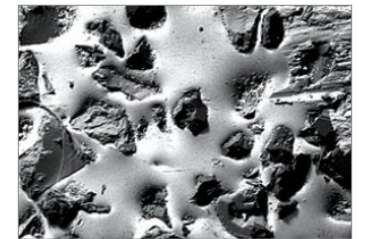
- Semiconductor Type, 4 Channel Detector.
- BSE detector make it possible that sample with non-coating is observable and the boundary interface of alloy sample can be disentangled.



BSE Defector



SE Image

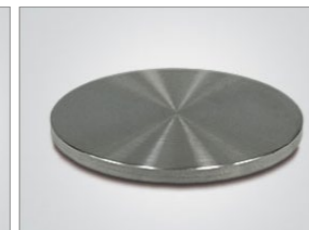


BSE Image

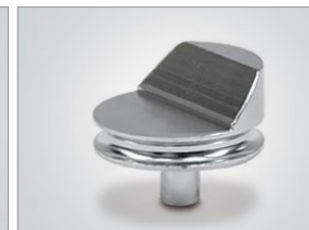
4. Holder



Multi Holder for 7 pin Stubs



Big Mount



45° Pin Stub Holder



Set Screw Vise

5. Filament



LaB₆ Filament



Factory-Centered Filament Cartridge

6. Critical Point Dryer

- Critical point dryer is an instrumental device which is used to preprocess biological specimens such as plants, insect, liver tissue, nerve cell, brain tissue etc.
- At critical point, the specimen is dried using CO₂. The original shape of specimen would be maintained and analyzed without causing surface tension by moisture and necrosis of biological tissue by dehydration.



7. Freeze Dryer

- Freeze dryer is to fix, dehydrate biological specimen with minimal shrinking and deformation.
- Electronic temperature control ranging from 0°C to 40°C. Rapid adjustment of temperature, 10 minutes for adjustment from 40°C to 5°C.

8. Cool Stage

Cool stage offers a flexible heating/cooling to observe biological specimen. Biological specimen can be observed using cool stage with minimal dehydration and deformation at lower temperature. Easily damaging Specimen by E-beam is also observable using cool stage.

9. Polishing Machine



The top of the range automatic polishing machines.

- **Powerful** Fitted with powerful motors controlled by a frequency controller!
- **Reproducible** Built-in memory stores all your polishing processes!
- **Efficient** All the settings are completely adjustable and programmable!
- **Simple** Design and touch pad control!
- **Intelligent** All the Technological experience goes into the most complete polishing machine on the market!

10. Mounting Machine

Emcrafts offers super short mounting times and maximum user-friendliness. Speed is further improved by using the optional dosing system.

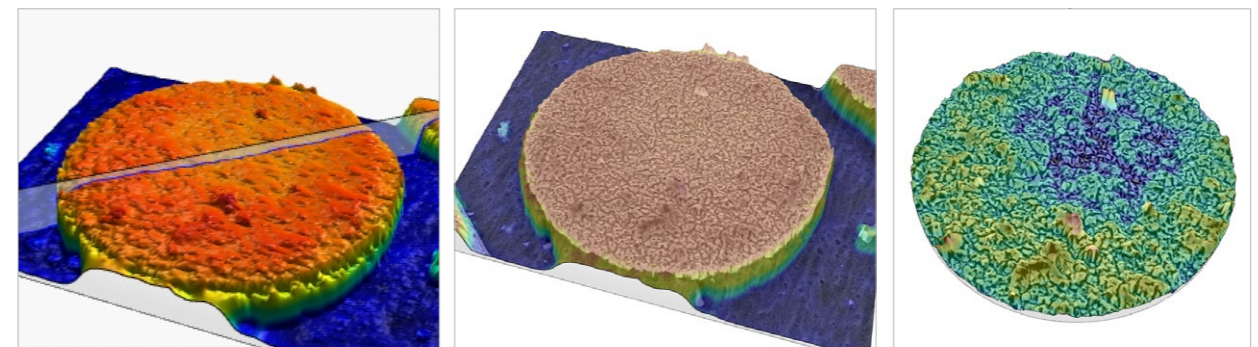


Powerful hydraulic system

- Fast heating and cooling using new heating and cooling technology
- Available dual sample products with intermediate piston
- Two cylinder sample products available in different sizes
- Requests for up to 4 sample products at once are possible
- 18 preset functions according to resin and mold size
- Good sample product system with preheating
- Faster cycle with optimized cooling system.

11. 3D Reconstruction S/W

- Many nano-scale require depth information but most optical microscope and scanning electron microscope haven't delivered successful solutions so far. EmCrafts Products supplies state-of-the-art 3D reconstruction software which is capable of 3D imaging from multiple images at different angles or illuminations which can replace expensive solutions such as atomic force microscope.



12. More advanced applications are available

- EBSD(Electron Back Scattered Diffraction)
- WDS(Wavelength Dispersive Spectroscopy)
- CL(Cathodoluminescence) Imaging
- Chamber Camera
- Raman Spectroscopy
- Etc.