High-Performance Scanning Electron Microscope

Cube Series / Genesis Series / Veritas Series

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

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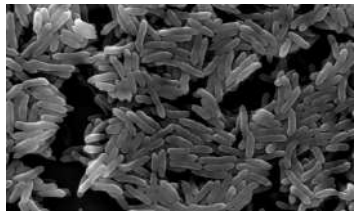
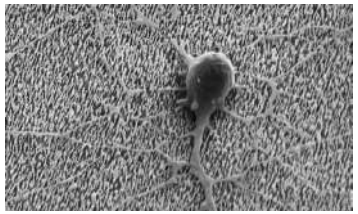
High-Performance
Scanning Electron Microscope

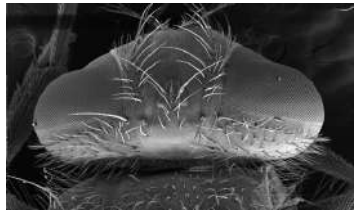
CONTENTS

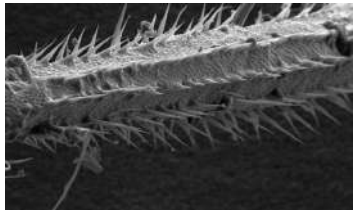
01 Applications

Life Science

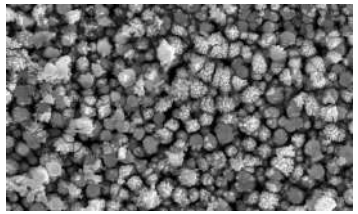

Bacteria

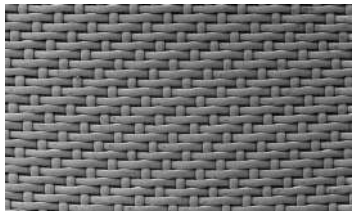

Neuron

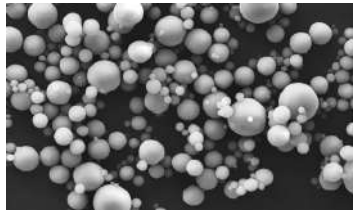

Insect(Fly's head)

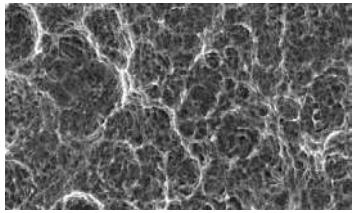

Insect(Fly's leg)

Material Science

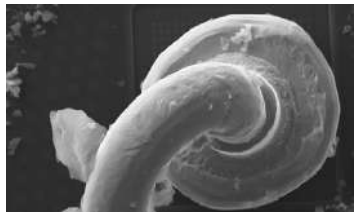

Cadmium Oxide

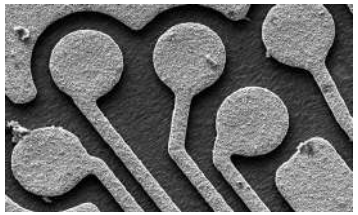

Fabric

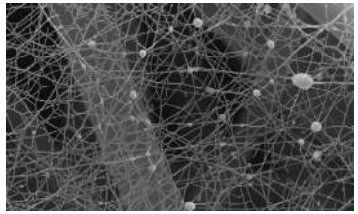

Powder

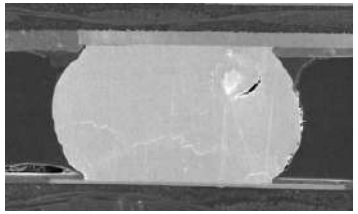

Dental Implant

Electronics

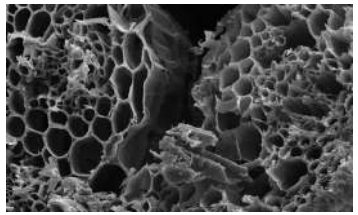

Wire bonding

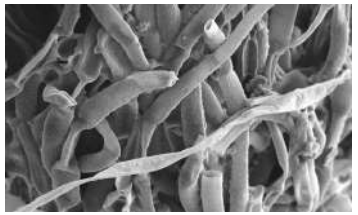

Printed Circuit

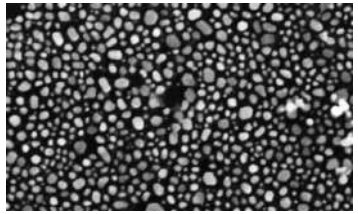

Nano Fiber

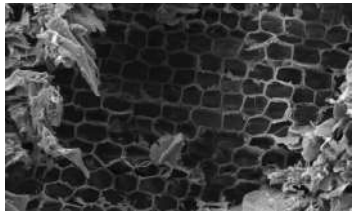

Semiconductor Package

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 Euccentric 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.

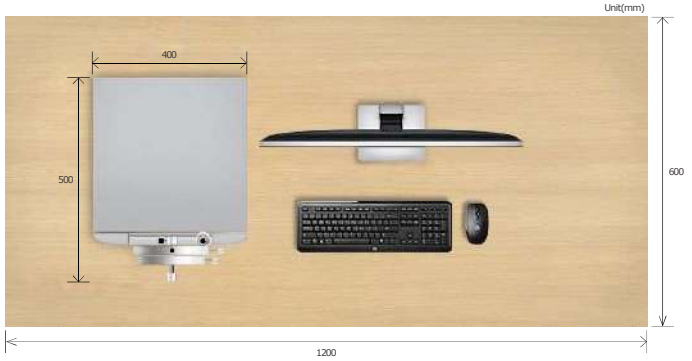
5-Axis Euccentric Stage

Cube-series is the only Tabletop SEM which provides 5-axis euccentric stage(motorized or manual) in the world. Euccentric 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	O	X	O
Vacuum Mode	High Vacuum only ($<9\times10^{-3}$Pa)	High Vacuum Mode ($<9\times10^{-3}$Pa) Low Vacuum Mode (10~230Pa)	High Vacuum only ($<9\times10^{-3}$Pa)	High Vacuum Mode ($<9\times10^{-3}$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) x600(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 Euccentric 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 euccentric 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.

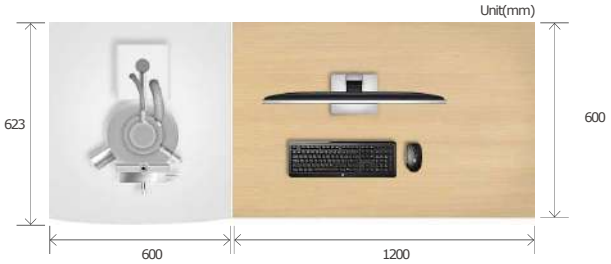
Magnification	x10 ~x300,000
Stage	X,Y : 40mm / Z : 5~45mm / T :-20~90°/ R : 360°
Maximum Sample Size	96mm(H), 50mm(V)

Genesis 2020/2120

- Genesis-2020/2120 provides 5-axis motorized euccentric 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	O	X	O
Vacuum Mode	High Vacuum only (<9×10⁻³Pa)	High Vacuum Mode (<9×10⁻³Pa) Low Vacuum Mode (10~230Pa)	High Vacuum only (<9×10⁻³Pa)	High Vacuum Mode (<9×10⁻³Pa) 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 : 320×240 pixel, Resizable Preview Mode : 800×600 Slow Mode : Applicable to both preview and focus mode Photo Mode : Up to 3200×2400			
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 euccentricmotorized stage to provide easier measurement of large scale samples.

Magnification	x10 ~x1,000,000
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

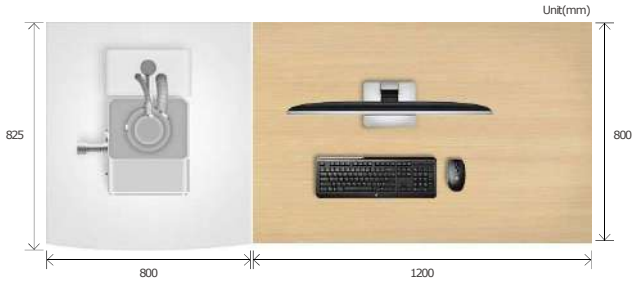
Non-destructive Samples Analysis

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

Heavy Samples Analysis

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

Installation Footprint



VERITAS-Series specification

Model	Veritas-LaB6	Veritas-3100
Stage Type	5-axis Motorized X,Y : 120mm(-60mm~60mm) Z : 5~65mm T : -20°~90° R : 360°	
Variable Pressure	X	O
Vacuum Mode	High Vacuum Mode (<9×10⁻³Pa)	High Vacuum Mode (<9×10⁻³Pa) Low Vacuum Mode(10 ~230Pa)
Vacuum System	Fully Automated Evacuation System - Turbo molecular pump (Vacuum ready within 3 minutes) - Rotary vane pump - Ion pump - Electrical valve system	
Electron Gun	Lanthanum hexaboride(LaB_6) Filament	Precentered Tungsten Filament
Detector	SE Detector BSE Detector (4channel, Semiconductor)	SE Detector BSE Detector (4channel, Semiconductor)
Resolution	2.0nm (SE Image) / 4.0nm (BSE 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) x800(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 24" Workstation I 100% controlled by keyboard and mouse	
Optional Devices	Chamber Camera 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

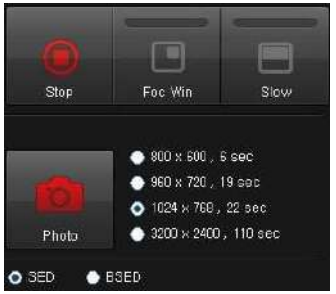
Image Save & Export

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

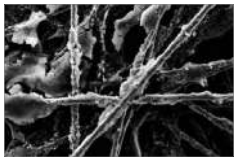
Automatic Functions
Filament/Bias Brigh tness/Contrast Gun Alignment Focus Stigmator

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

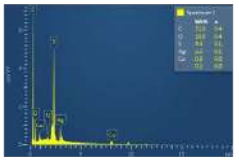
06 Optional Device

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.



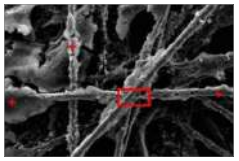
SEM Image



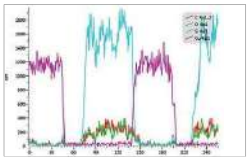
Qualitative Analysis

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	L series	1.18	0.01185	2.16	0.06	Ag	Yes	
Total:				100.00				

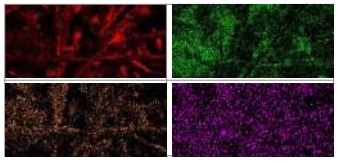
Quantitative Analysis



Point and Area Analysis



Line Scan



Mapping

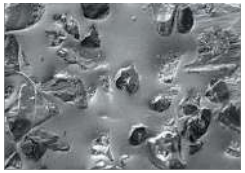
2. ION SPUTTER COATER

- 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) x470(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 Detector



SE Image

BSE Image

4. Holder

Multi Holder for 7 pin Stubs

Big Mount

45°Pin Stub Holder

Set Screw Vise

5. Filament

LaB_6 Filament

Factory-Centered Filament Cartridge

6. Critical Point Dryer

- Critical point dryer is an instrumental device which is used to pre process biological specimens such as plants, insect, liver tissue, ne rve cell, brain tissue etc.
- At critical point, the specimen is dried using CO_2. The original shape of specimen would be maintained and analyzed without causing s urface tension by moisture and necrosis of biological tissue by de hydration.

7. Freeze Dryer

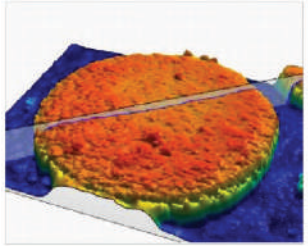
- Freeze dryer is to fix, dehydrate biological specimen with minimal shrinking and deformation.
- Electronic temperature control ranging from 0°C to 40°C. Rapid adjustment of temperature, 10 minutes for adjustment from 40°C to 5°C.

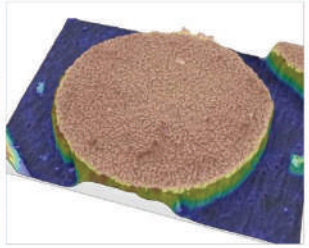
8. Cool Stage

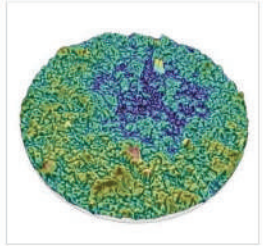
Cool stage offers a flexible heating/cooling to observe biological specimen. Biological specimen can be ob served using cool stage with minimal dehydrationand deformation at lower temperature. Easily damaging S pecimen by E-beam is also observable using cool stage.

9. 3D Reconstruction S/W

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







10. More advanced applications are available

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

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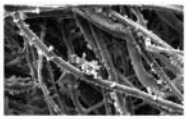
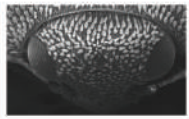
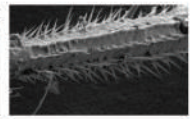

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