

# Mini SEM

## Scanning Electron Microscopes



- ◆ Magnification range 24 - 24,000X
- ◆ Images up to 2048 x 2048 pixels
- ◆ Images up to 2048 x 2048 pixels
- ◆ Sample loading in less than 30 seconds
- ◆ Total weight 55 kg (120 lbs)
- ◆ Automated sample control
- ◆ Very low energy consumption

Please contact us for a quotation and prepare to be pleasantly surprised...

- ◆ Life Science
- ◆ Material Science
- ◆ Biological
- ◆ Cosmetics
- ◆ Education
- ◆ Pharmaceuticals
- ◆ Medical
- ◆ Geology
- ◆ Failure Analysis
- ◆ Textiles
- ◆ Forensics
- ◆ Compliance
- ◆ Military
- ◆ Home Inspection
- ◆ Healthcare
- ◆ Automotive

# About Mini - SEM

## What is the Mini-SEM?

The Mini-SEM is a table-top, high resolution, high magnification, high performance electron microscope.

The Mini-SEM combines the power and performance of a traditional SEM, with the ease of use you would expect from a table-top version.

Mini-SEM is a "bridge" between optical microscopy and scanning electron microscopy.

Until today, your choice of affordable, easy-to-use high-resolution imaging tools was limited. With our electron microscope you are able to view on the submicron and nano scale.

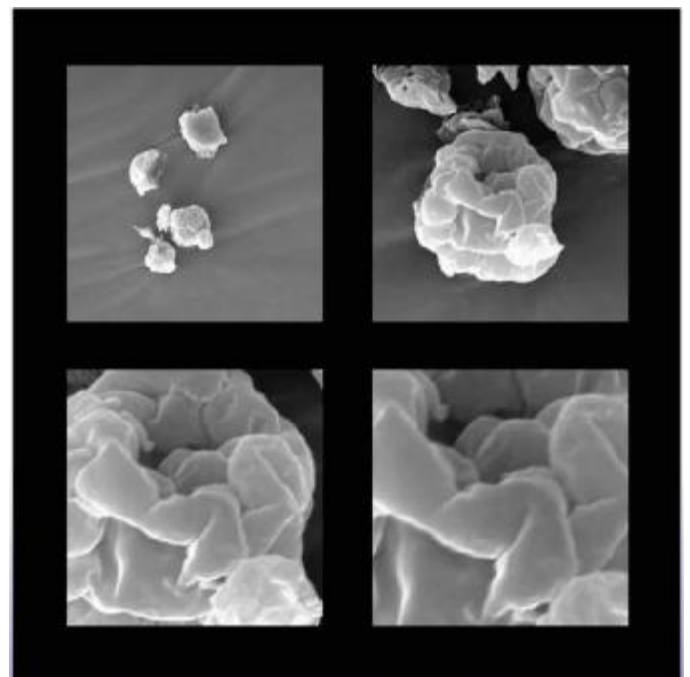
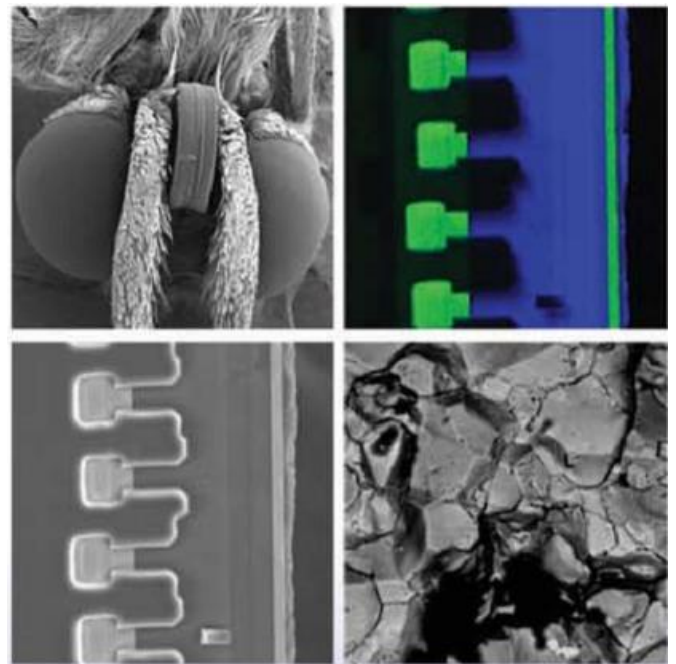
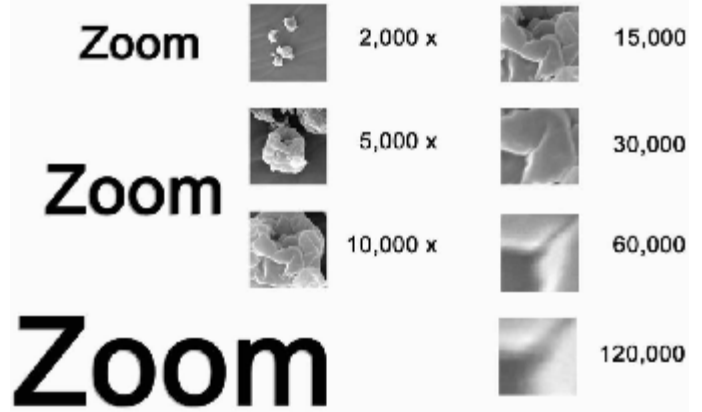
Our personal scanning electron microscope (SEM) helps you see beyond the limits of optical.

With 20 times the magnification of a conventional light microscope, the SEM combines high resolution imaging with extreme ease-of-use. Engineers, researchers, educators and students can make high-quality sub-micron images with as little as 10 minutes of training.

The system is ideal for detailed imaging of sub-micron particles, fibers, microtools, electronic components and more. The optical camera, motorized stage and touch-screen user interface work together to help you easily navigate to a region of interest from a 24X "bird's eye view".

**Superb image quality will help create new ways to ramp up production and speed up the time to root cause analysis.**

We propose you a high-resolution personal scanning electron microscope with an optical camera for never-lost navigation. Its innovative touch-screen user interface and control knob let you quickly produce high-quality electron microscope images with minimal training. The system can handle a wide range of samples with minimal preparation and are loaded instantly with our patented low vacuum load-lock technology. Images are saved on a USB memory stick or network storage location for off-line analysis, measurements and distribution.



## Optical Microscope



- Magnification – Maximum 1,000 X
- Image Quality – Limited depth of focus
- Image Gray Scale – limited shades/poor contrast
- Operation – Easy
- Size – Small
- Power – 110 Volts
- Results – Fast
- No X-ray - No Elemental Composition

## Mini-SEM



- Magnification – 24 X to 24,000 X
- Image Quality – Great depth range
- Image Gray Scale – thousands of shades
- Operation – Easy
- Size – Slightly large than Optical Microscope
- Power – 110 -220Volts
- Results – Fast
- Elemental Composition

## SEM



- High Maintenance Costs
- High Operating Cost
- Training – Extensive Knowledge Required
- Size – Equal to the size of a SMART CAR
- Sample Preparation time = Long time
- Sample Analysis time = hours
- Magnification – Ultra High > 100,000 X

## Mini-SEM



- Low or No Maintenance Cost
- Low Operating Cost
- Training - Limited Knowledge required
- Size – Equal to that of a Color Laser Printer
- Sample Preparation time = Minutes
- Sample Analysis time = minutes
- Magnification = High 24 X to 24,000 X

# Applications

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## Surface Characterization

- Cracks
- Delamination
- Fractures
- Coatings
- Grain Structures
- Surface Roughness

## Particles and Features

- Contamination
- Inclusions
- Wear Debris
- Aerosols
- Trace Evidence
- Size, Shape, Composition

## Elemental Composition

- Distribution
- Phase Segregation
- Oxidation
- Corrosion
- Material Identification

## Metallurgical applications

Use the Mini-SEM to perform microstructural analysis of metals to identify variances that occur after heat treatment, as well as to determine composition and stress distribution and spatial positioning (Elemental Mapping).

## Pharmaceutical

Resolve images and view the morphology of fine particles at higher magnification of light microscopes. Bridge the gap between light microscopy and transmission electron microscopy.

## Education and Research

Mini-SEM brings the science of the real world to your classroom and laboratory. Now anyone, including students, can image cells, insects, pollen, minerals, nanoparticles effortlessly. Speed up development and research by enabling all to use techniques previously allowed only to researchers in national laboratories.

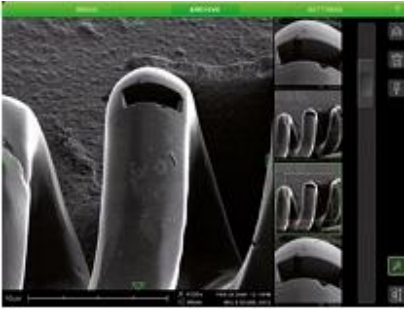
# Brilliant images, high throughput, ease of use

## Superb image quality

The Mini-SEM has an innovative user interface and intuitive touch screen controls. This allows superb quality images to be produced with minimal operator training. A unique electron optical design reduces the complexity normally associated with electron microscopes.



Main screen



Archive screen

## Fast sample preparation

The Mini-SEM is designed to handle a wide range of samples with minimal preparation by using application specific sample holders.

## Instant sample loading

Samples are loaded instantly with Mini-SEM's patented vacuum technology. Insert the sample holder, close the door and the Mini SEM is ready to go.

## Shortest time to image

The first optical image appears within five seconds. Twenty seconds later a first electron optical image will be visible.

## Never lost navigation

You always know your position on the sample with Mini-SEM's never lost navigation. Onscreen insets provide a clear overview of the sample. Overviews of the optical and electron optical images provide clear reference points at all times. The sample can easily be moved by touching the feature of interest on the screen; the motorised stage will instantly move to the desired position.

## Stub Sample Holder

This standard holder is designed for high resolution (30 nm) imaging and can accommodate 3D type samples.



## Metallurgical (mount) sample holder

This (optional) holder supports resin mounted samples (schlieffen). Embedding and polishing are common techniques used to create flat samples for microscopic investigation.



## Charge Reduction Sample Holder

This (optional) holder virtually eliminates the need for sputter coating. Samples such as paper, polymers, organics, ceramics and coatings can now be imaged in their natural state, providing more valuable back scatter material contrast information.



## Micro Tool Holder

This (optional) holder makes it possible to image a wide range of axial shaped objects such as drilling bits and milling tools. The holder has been specially designed for the micro manufacturing market, where the Mini-SEM is used as a quality inspection tool in order to meet and maintain the high quality standards in this type of industry.



### Phenom quickly pays for itself

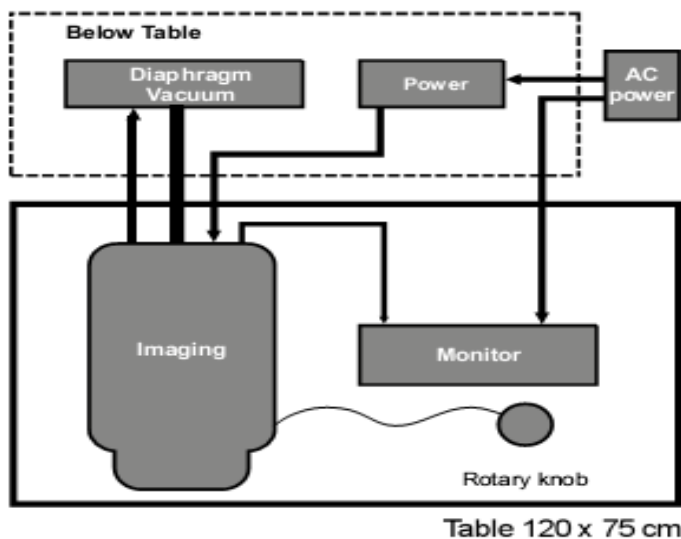
The Mini-SEM offers a fast Return on Investment (ROI) because of its economical price, which is comparable with medium class light microscopes, whereas its performance is way beyond.

For a fraction of the cost of outsourcing electron optical imaging, a company can bring high resolution imaging in-house for everyone to use.

### System details

- Magnification range 24x – 24.000x
- Dimension imaging module 286 x 566 x 495 mm – 50 kg
- Touch screen controls
- Image options – JPEG, TIFF both in 456<sup>2</sup>, 684<sup>2</sup>, 1024<sup>2</sup>, 2048<sup>2</sup> pixels
- Sample load time < 30 seconds

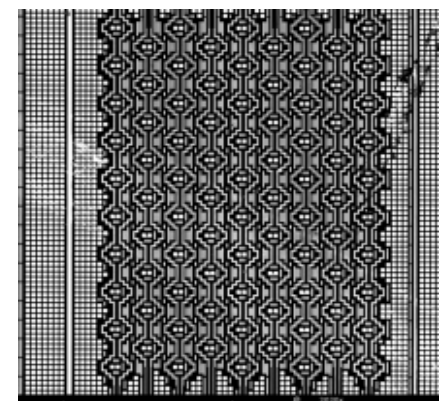
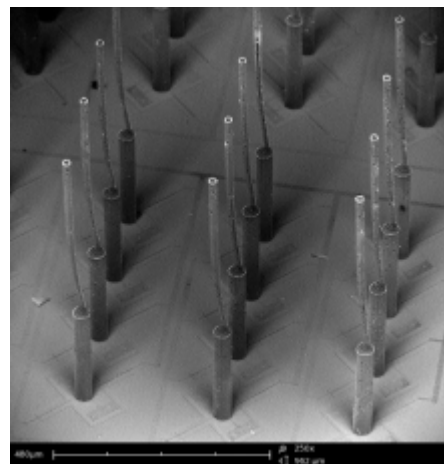
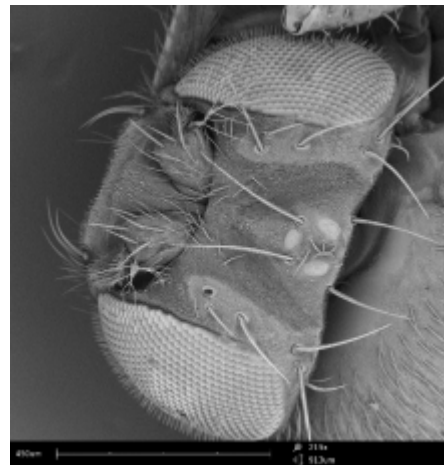
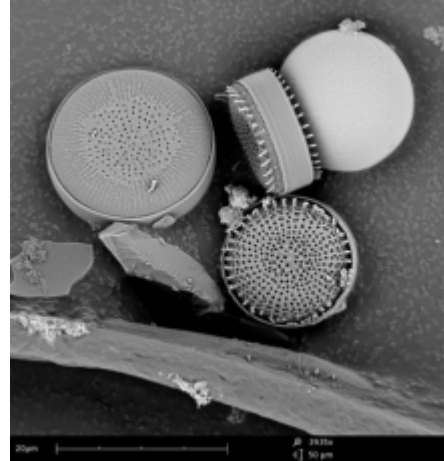
### Fibermetric System configuration



# Detailed Specifications

|  |  |
|--|--|
| <b>System</b>  | Imaging module, 17" touch screen monitor, rotary knob, diaphragm vacuum pump, power supply, USB 2.0 flash drive  |
| <b>Imaging Modes</b><br>• Light Optical<br>• Electron Optical  | Magnification fixed: 24X<br>Magnification range: 120X to 24,000X<br>Digital zoom: max. 12X   |
| <b>Illumination</b><br>• Light Optical<br>• Electron Optical   | Selectable axis and off-axis LEDs<br>Long lifetime thermionic source<br>(5 kV accelerating voltage)  |
| <b>Digital Image Detection</b><br>• Light Optical<br>• Electron Optical                                      | Color CCD camera<br>High sensitivity backscatter electron detector (compositional and topographical modes)   |
| <b>Image Format</b>  | JPEG, TIFF, BMP  |
| <b>Image Resolution Options</b>  | 456 x 456, 684 x 684, 1024 x 1024 and 2048 x 2048 pixels   |
| <b>Data Storage</b>  | USB 2.0 flash drive  |
| <b>Sample Stage</b>  | Computer controlled motorized X and Y  |
| <b>Sample Size</b>   | 25 mm (dia) x 30 mm (h)  |
| <b>Sample Loading Time</b><br>• Light Optical<br>• Electron Optical  | < 5 s<br>< 30 s  |
| <b>Dimensions &amp; Weight</b><br>• Imaging module<br>• Diaphragm vacuum pump<br>• Power supply<br>• Monitor | 286 (w) x 566 (d) x 495 (h) mm, 50 kg<br>145 (w) x 220 (d) x 213 (h) mm, 4.5 kg<br>156 (w) x 300 (d) x 74 (h) mm, 3 kg<br>375 (w) x 203 (d) x 395 (h) mm, 4.6 kg |
| <b>Room Temperature</b>  | 15°C ~ 30°C (59°F ~ 86°F)  |
| <b>Humidity</b>  | <80%RH   |
| <b>Power</b>   | Single phase AC 110 - 240 Volt, 50/60 Hz, 300 W (max.)   |
| <b>Recommended Table Size</b>  | 120 x 75 cm, load rating of 100 kg   |

Mini-SEM images



# Designed for faster, better, easier fiber analysis

## Turning insight into value

Now, direct observation and measurement of micro and nano fibers is faster, better and easier than ever before. With the Fibermetric™ system you can load and image samples in about 30 seconds. Magnifications up to 24,000 times produce accurate information on a large range of fibers as small as 100nm in diameter. Automated measurement generates all the statistical data you need in minutes, and unlike other SEM-based solutions, no laboratory infrastructure or trained microscopist are required.

- **Save time**
- **Get all your statistical data, automatically**
- **See and measure nearly any micro/nano fiber**

The Fibermetric system is a new member of the MINI-SEM family, the world's first personal electron microscopes. These high resolution desktop imaging systems are easy to operate; everyone on your team can now see beyond the power of light to generate more accurate measurement data, faster than ever before. With its affordable price, ease-of-use, speed and accuracy, the Fibermetric system gives you a rapid return on investment and a sustainable competitive advantage.



## Automated measurement

CFM – Click Fiber Measure. This feature will determine automatically if the image elements selected are fibers or pores.

For fibers, it will measure thickness. For pores, it will measure the enclosed surface area. AIC – Automated Image Characterization.

After manual selection of an area of interest on the image, automated measurements of fiber diameter and pore surface area are readily available. The area of interest can be the entire image or any area selected from the image by the user.