



## Evex Mini-SEM

Miniature  
Scanning Electron Microscope  
with X-ray NanoAnalysis

[www.mini-sem.com](http://www.mini-sem.com)

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# Evex Mini-SEM

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Evex Mini-SEM is a high resolution desktop digital imaging tool that is fast and easy to use. Go from sample insertion to 30,000 x (120,000 digital Zoom) magnification in less than seconds.

Evex Mini-SEM is so easy to operate even a caveman can use it! Use it in research to discover next generation materials. Use it in manufacturing to investigate failures. Use it in education so you can inspire the next generation of scientists.

# So easy a “child” can use it!

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- Easy Operation – AutoEverything!
  - Auto Focus
  - Auto Brightness/Contrast
  - Auto Saturation
  - Just Click to get an Image!
  - Just Click to get spectrum & Identify composition!
- Easy Maintenance
- Start using Mini-SEM in minutes!

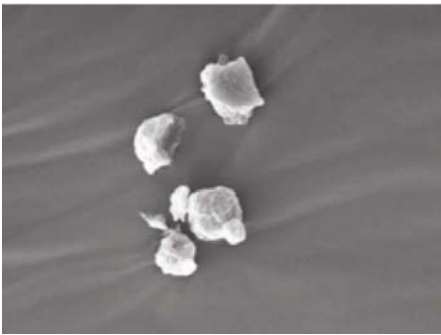


# *Super Fast*

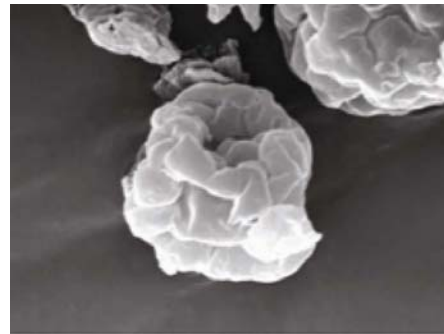
*0 to 120,000 - Less Than 2 Minutes*

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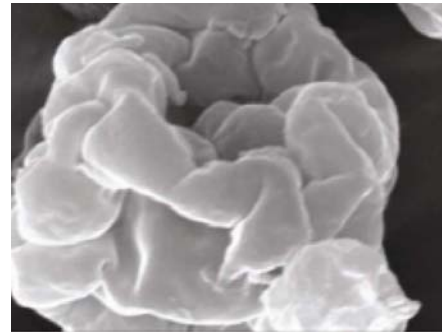
2,000 X



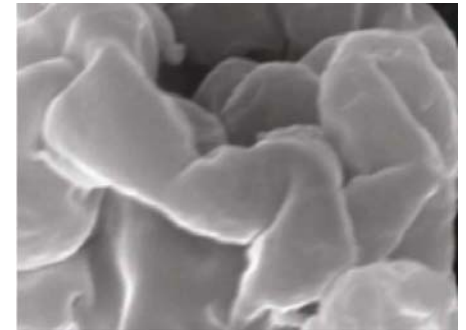
5,000 X



10,000 X



20,000 X



# Powerful enough for your industry

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

# Evex Mini-SEM 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

# Typical Applications

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## **Metallurgical applications**

- Use the Evex 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**

- Evex 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.

## Optical Microscope

vs

## Evex Mini-SEM



- **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

- **Magnification – 10 X to 120,000 X**
- Image Quality – Great depth range
- Image Gray Scale – thousands of shades
- Operation – Easy
- Size – Slightly large than Optical Microscope
- Power – 110 Volts
- Results – Fast
- Elemental Composition

SEM

vs

Evex Mini-SEM



- **Capital Cost = High Greater than \$250,000**
- 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**



- **Capital Cost - Moderate Less than \$200,000**
- 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 30 X to 100,000 X**

Hitachi TM-1000

vs

Evex Mini-SEM



- **Magnification = 10,000 X**
- Backscatter Only = 256 Gray Scale Image
- **Secondary Detector - None**
- Low Vacuum = Low Magnification
- **Low Vacuum = Lowest Elemental Detection = Sodium Na (11) (EDS not optimized - Geometry)**
- Acceleration Voltage = 15 Kev
- Biological Mode = Yes
- **Mapping = Not Optional**
- Spot Mode = Not Optional
- **Stage Automation = Not Optional**
- IR Chamber Camera = Not Optional



- **Magnification 30,000 X (120,000 Digital Zoom)**
- Backscatter = 256 Gray Scale Image
- **Secondary Detector = 4096 Gray Scale Image**
- High Vacuum = High Magnification
- **High Vacuum = Lowest Element = Boron (5) – (EDS collection Optimized – Good Geometry)**
- Acceleration Voltage – Variable 1-15 Kev or 1-30 Kev
- Biological Mode = Bio-pod
- **Mapping = Optional**
- Spot Mode = Optional
- **Stage Automation = Optional**
- IR Chamber Camera = Optional

# Evex Mini-SEM Specifications

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## **Electron Microscope Specification**

Magnification	30,000 x (Digital Zoom x 4 ~ 120,000 x)
Acceleration Voltage	1 kv ~ 30 kv (variable)
Detectors	SEI, BEI, EDS
Image Size	4096 x 4096
Image Format	JPG, TIFF, BMP, PNG
Data Display	Micron Bar, Magnification. Date, Kv
Voltage	110 volts / 220 volts

# Work Station Specification

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## Workstation

3.0 GHZ Processor

1.0 GB Memory

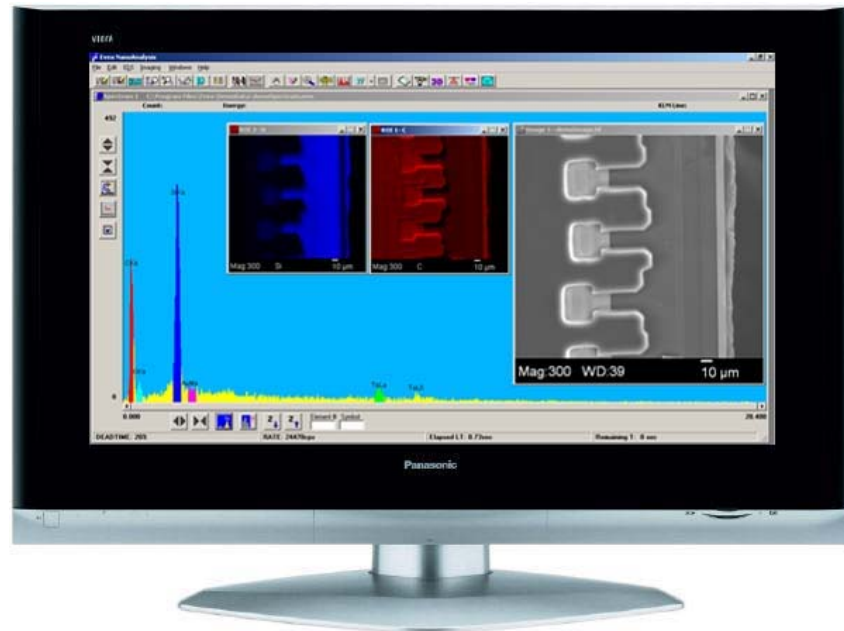
Microsoft Windows XP OS

160 GB Hard Drive

22" LCD Display

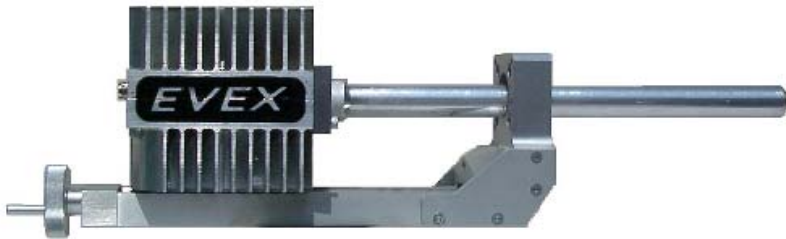
Network Card

Microsoft Office - Optional



# Evex X-ray Detectors

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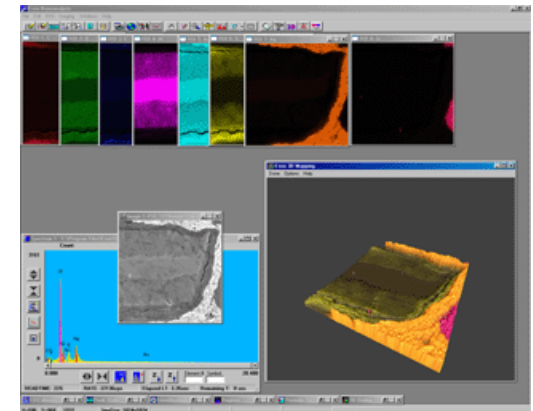
## High Speed Liquid Nitrogen Free X-ray Detector (QDD)

Detector Window	SSUTW	SUTW	UTW	Be
Lowest Element Detection	Be 4	B 5	C 6	Na 11
Resolution	128 FWHM @ 5.9keV MN-Ka 1,000 cps			
Sensor Size	10mm, 20mm, 30mm			
Cooling	Peltier = No Liquid Nitrogen			

# Evex NanoAnalysis Features

## Image Acquisition Module

- Image Processing
- Image Analysis
- Image Operations
- Image Filters
- Thermal Imaging
- Image Measurement / Annotation
- Easy Report Writing
- AutoSave



## Spectral Acquisition Module

- Spectral Processing
- Spectral Analysis
- Qualitative Analysis
- Quantitative Analysis
- Monte Carlo Simulation
- Detector Geometry Wizard
- Auto ID with Peak Labeling
- Auto Region of Interest (ROI)
- Automatic Calibration & Logging
- Easy Report Writing
- AutoSave

## Elemental Mapping

- Standard Elemental Mapping
- Ultra Fast Mapping
- Line Scan
- Point Mode & MultiPoint
- AutoAnalysis (Spectra at Every Pixel)
- ColorSEM - Quick Rendering
- Focus Mapping
- Thermal Mapping
- Easy Report Writing
- AutoSave

## Advanced Features

- Chemical Typing
- Trace Sensitive Analysis
- Critical Measurement
- 3D Mapping
- 3D Measurement
- AutoAnalysis (Spectra at Every Pixel)
- Remote Conferencing
- Stereo Imaging
- Synchro-Analysis

# Sample Images

