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Datasheet

Phenom Pharos Desktop SEM

The faster, higher-resolution desktop solution

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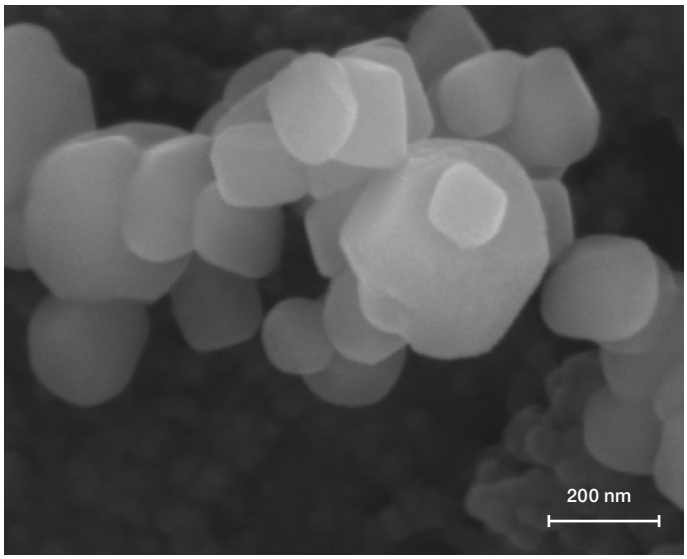
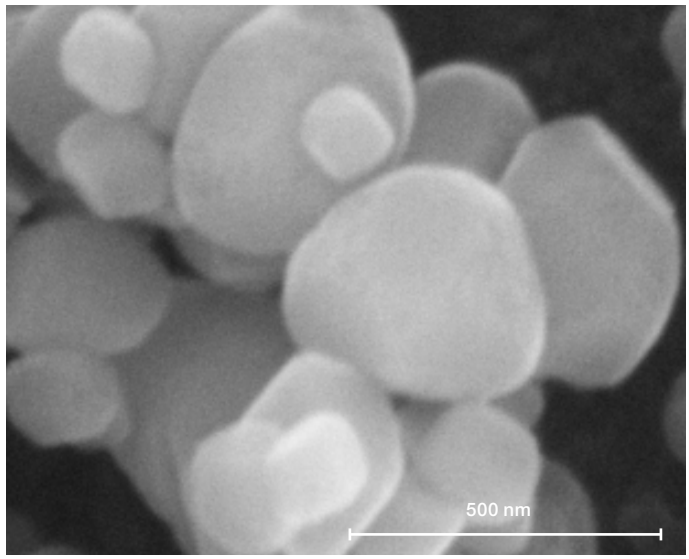
Phenom Pharos Desktop SEM vs floor model tungsten filament SEM



Phenom Pharos Desktop SEM
$CaCO_3$ (Pd coated)
15 kV SE image @ 200,000x



Floor model tungsten filament SEM
$CaCO_3$ (Pd coated)
15 kV SE image @ 200,000x

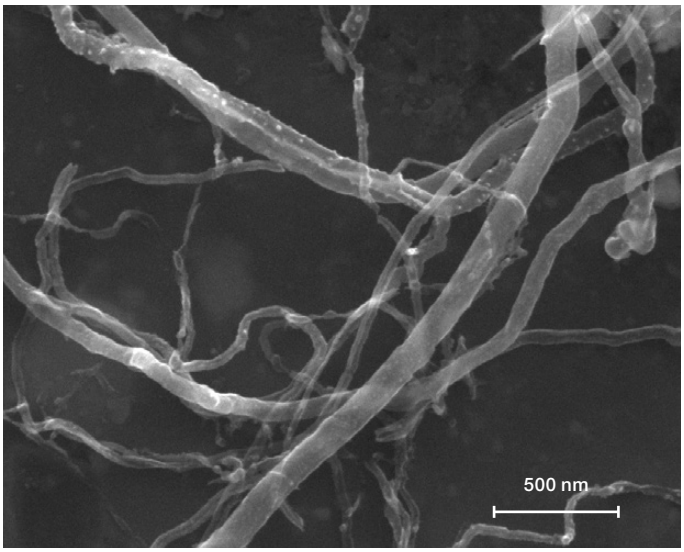
The Thermo Scientific™ Phenom™ Pharos Desktop scanning electron microscope (SEM) is equipped with an FEG source that produces crisp, high-brightness images, making the benefits of FEG accessible to everyone. It is also easy to operate, from the initial installation to actual usage, thanks to its intuitive design. The advanced hardware design and detectors enable a fast time to image and easy, foolproof handling.

High-brightness images

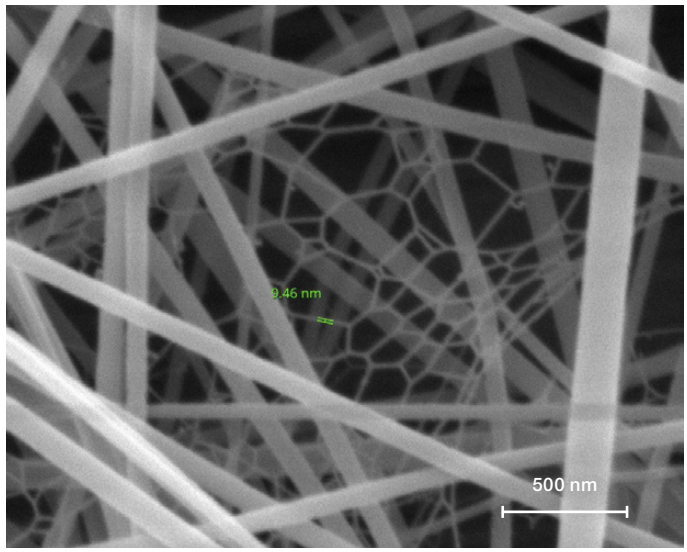
The Phenom Pharos Desktop SEM is designed in such a way that the power of an FEG source, like crisp, high-brightness images, can be accessed by all. Every interaction is easy and intuitive, starting with the ordering process: one code provides a fully functional FEG SEM with a backscattered electron detector (BSD). Options include a secondary electron detector (SED) and/or energy-dispersive X-ray detector (EDX), along with sophisticated analytical software.

Fast and easy

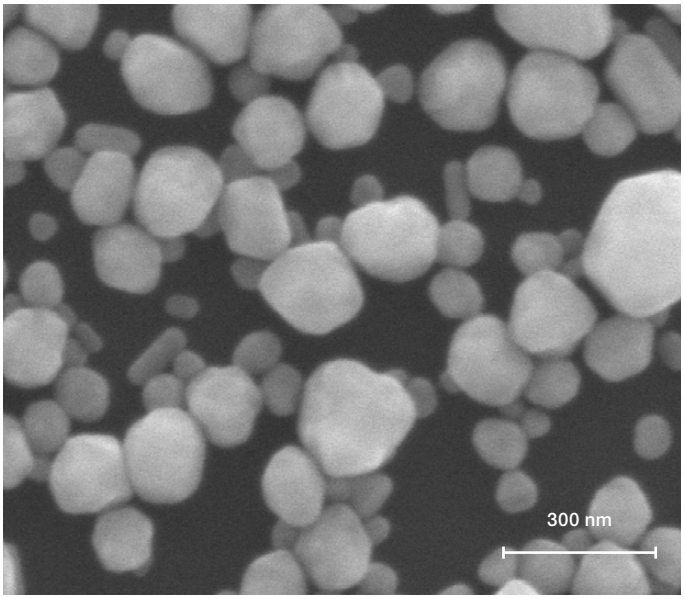
The installation process is also straightforward. A (solid) table is required for placement of the Phenom Pharos Desktop SEM, and, after connecting the cables, the initialization process starts automatically when you switch on the power. Once the instrument is ready, a sample can be loaded easily into the SEM, where an image is created with the standard navigation camera. Via the intuitive user interface (UI), you can switch to SEM imaging mode in less than 25 seconds. Thanks to the column design, high-resolution imaging (2.5 nm with secondary electrons (SE)) is done at the same working distance as analytical work. And with the advanced detectors, image acquisition time is only seven seconds or less. This easy operation and intuitive UI enable a very high throughput on an FEG SEM, making the benefits of FEG accessible to everyone.



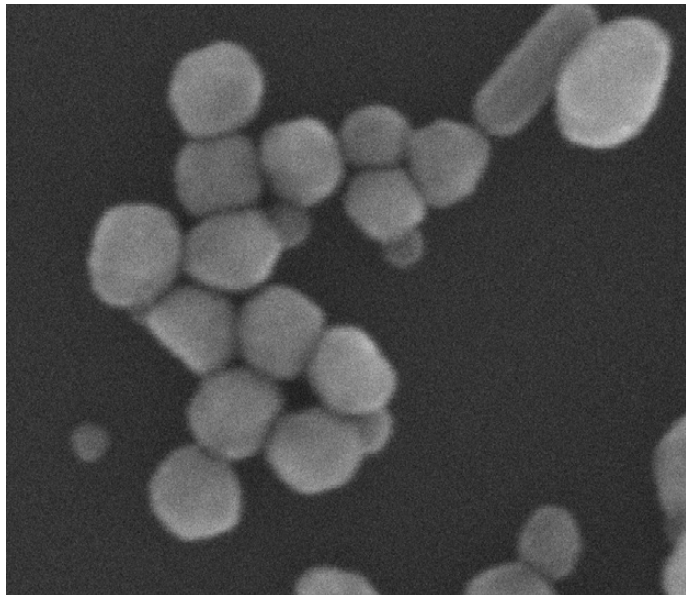
Phenom Pharos Desktop SEM
Multiwall carbon nanotubes
10 kV SE image @ 100,000x



Phenom Pharos Desktop SEM
Electrospun nanofibers
5 kV SE image @ 100.000x



Phenom Pharos Desktop SEM
Ag nanoparticles
15 kV SE image @ 200,000x



Floor model tungsten filament SEM
Ag nanoparticles
30 kV SE image @ 200,000x

Imaging specifications

Maximum SEM magnification

1,000,000x

Acceleration voltage range

2 kV - 15 kV

SEM resolution

- 2.5 nm (SE), 4 nm (BSE) at 15 kV
- 10 nm (SE) at 3 kV

Sample size

- Up to 25 mm (Ø)
- Up to 100 mm (h)

Stage

Standard motorized X-Y stage

Max. stage travel (X:Y)

18 mm x 18 mm

Detector

Standard	Backscattered electron detector
Optional	Secondary electron detector EDX detector

Electron source

FEG

Vacuum observation mode

Integrated low-/medium-/high-vacuum modes available

System specifications

Dimensions and weight

Imaging module	286(w) x 566(d) x 545(h) mm, 53 kg
Diaphragm vacuum pump	145(w) x 220(d) x 213(h) mm, 4.5 kg
Power supply (x2)	156(w) x 300(d) x 74(h) mm, 3 kg
Monitor	375(w) x 203(d) x 395(h) mm, 7.9 kg
ProSuite	Optional Thermo Scientific™ Phenom™ ProSuite System including: 19” monitor with PC and network router mounted 375(w) x 250(d) x 395(h) mm, 9 kg

Requirements

Ambient conditions

Temperature	15°C ~ 30°C (59°F ~ 86°F)
Humidity	Between 20% and 80% RH
Power	Single phase AC 110–240 Volt, 50/60 Hz, 400 W (max.)

Recommended table size

150 x 75 cm, load rating of 100 kg

Energy-dispersive X-ray spectroscopy (EDS) specifications

Detector types

	• Silicon Drift Detector (SDD) • Thermoelectrically cooled (LN_2 free)
Detector active area	25 mm^2

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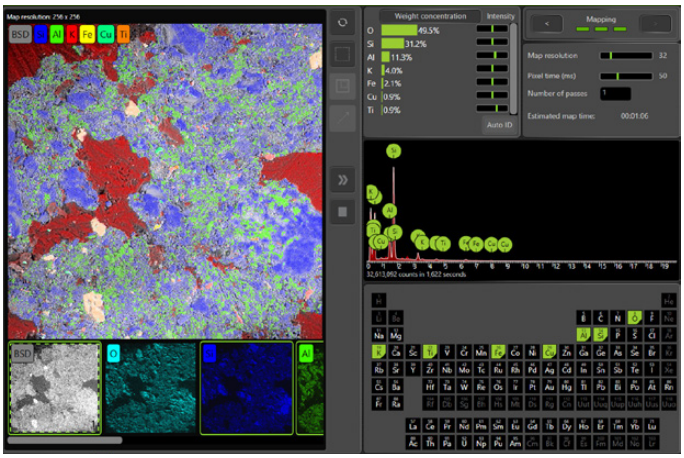
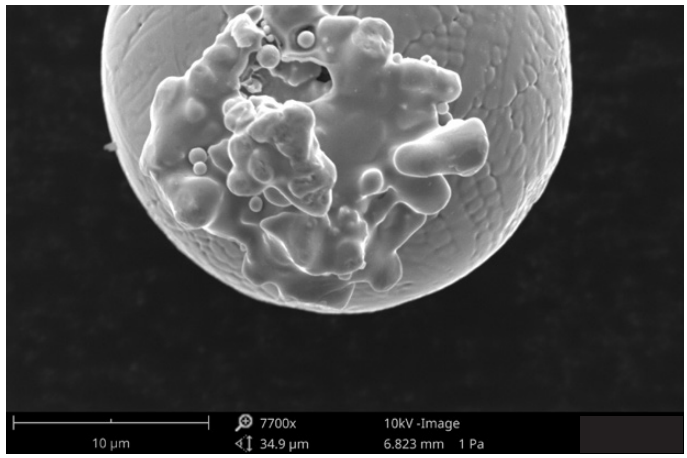


EDS mapping of geological sample



SED image of particles

OPTIONAL:
Elemental Mapping and Line Scan

The Elemental Mapping functionality visualizes the distribution of elements throughout the sample. The selected elements can be mapped at a user specified pixel resolution and acquisition time. The real-time mapping algorithm shows live buildup of the selected elements. One simple click starts you working with the Elemental Mapping and Line Scan functionality of the Phenom Pharos Desktop SEM. The Line Scan functionality shows the quantified element distribution in a line plot. This is especially useful for coatings, paints and other applications with multiple layers. All results of both the Elemental Mapping and Line Scan functionality can be easily exported by using an automated report template.

Secondary electron detector

A secondary electron detector (SED) is an available option on the Phenom Pharos Desktop SEM. The SED collects low-energy electrons from the top surface layer of the sample. It is therefore the perfect choice to reveal detailed sample surface information. The SED can be of great use for applications where topography and morphology are important. This is often the case when studying microstructures, nanostructures or particles.

High diversity in applications

You can gain more insights with the Phenom Pharos Desktop SEM within specific SEM applications by using a broad range of sample holders, such as metallurgical, temperature-controlled, electrical feed-through, and tilt and rotation. Simply exchange sample holders to fulfill specific requirements for your application.

Elemental Mapping and Line Scan specifications	
Elemental Mapping	
Element selection	10 individual user specified maps, plus backscatter image and mix-image
Backscatter image and mix-range	
Selected area	Any size, rectangular
Mapping resolution range	16x16 – 1024x1024 pixels
Pixel dwell time range	1–250 ms
Line Scan	
Line Scan resolution range	16–512 pixels
Points dwell time range	50–250 ms
Total number of lines	12
Report	
Docx format	

SED specifications
Detector type
Everhart-Thornley

Find out more at **thermofisher.com/phenom-pharos**

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