

# Phenom ProX

The perfect all-in-one desktop SEM



## Phenom ProX

All-in-one imaging & analysis system

### Fully integrated EDS

Elemental analysis is as easy as imaging with fully integrated EDS

### Multiple acceleration voltages

Between 5 kV and 10 kV for high resolution images and 15 kV for great analysis results

## Magnification

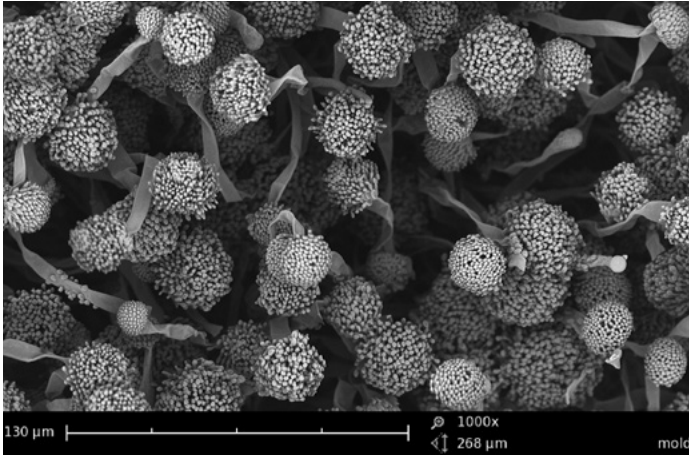
Magnification range up to 130,000x

### Elemental Mapping & Line Scan

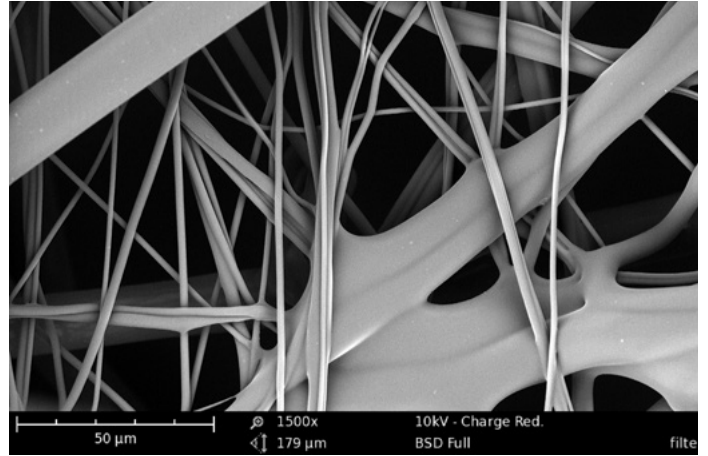
Revealing the distribution of elements within the sample

### Never lost navigation

Swift navigation to any region of interest



Coffee mold



Filter material

The Phenom ProX desktop scanning electron microscope (SEM) is the ultimate all-in-one imaging and X-ray analysis system. With the Phenom ProX desktop SEM, sample structures can be physically examined and their elemental composition determined. Besides point analysis, the optional Elemental Mapping and Line Scan software allows further analysis of the distribution of elements.

### Phenom ProX

All Phenom-World products are intuitive to use, fast to create results and built to high quality standards. These core principles have been used to develop and create the Phenom ProX spectroscopy system for best in class imaging and analysis. As well as viewing three dimensional images of microscopic structures, there is often a need to identify the different chemical elements in a specimen.

This is accomplished in the Phenom ProX with the Element Identification (EID) software package and a specially designed and fully integrated Energy Dispersive Spectrometer (EDS). The Phenom ProX is the most extended solution for fast and user friendly imaging and analysis. This is enhanced by additional sample holders that allow for example sample tilting and cooling for imaging an even greater diversity of samples.

## Imaging Specifications

### Imaging modes

- Light optical                      Magnification range: 20 - 135x
- Electron optical                · Magnification range: 80 - 130,000x
- Digital zoom max. 12x

### Illumination

- Light optical                      Bright field / dark field modes
- Electron optical                · Long lifetime thermionic source (CeB<sub>6</sub>)
- Low, imaging, spot analysis and mapping mode, beam currents selection
- Acceleration voltages        · Default: 5 kV, 10 kV and 15 kV
- Advanced mode: adjustable range between 4,8 kV and 15 kV imaging and analysis mode
- Resolution                        ≤ 10 nm

### Digital image detection

- Light optical                      Color navigation camera
- Electron optical                High sensitivity backscattered electron detector (compositional and topographical modes)

### Image formats

JPEG, TIFF, BMP

### Image resolution options

456 x 456, 684 x 684, 1024 x 1024 and 2048 x 2048 pixels

### Data storage

- USB flash drive
- Network
- ProSuite PC

### Sample stage

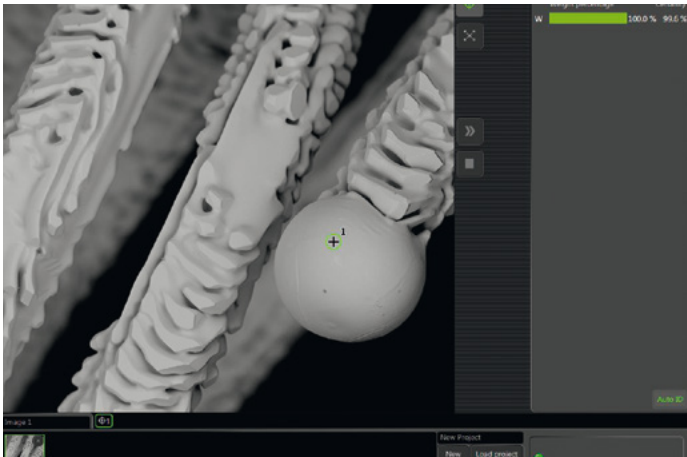
Computer controlled motorized X and Y

### Sample size

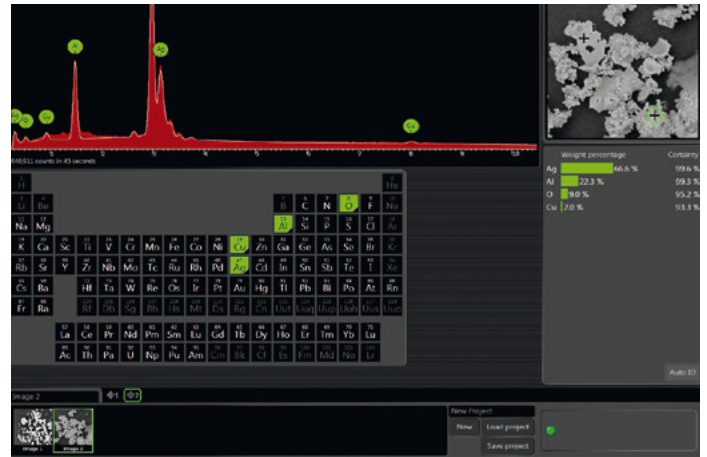
- Up to 32 mm (Ø)
- Up to 100 mm (h)

### Sample loading time

- Light optical                      < 5 s
- Electron optical                < 30 s



Light bulb



EDS mapping

### Step by step data collection

A dedicated software package is included and installed on the ProSuite PC to control the fully integrated EDS detector. Analysis has become as easy as imaging, since there is no need to switch between external software packages or computers.

The EDS-technique analyzes X-rays generated by the electrons from the electron beam interacting with the sample. The Phenom CeB<sub>6</sub> electron source generates the highest number of X-rays in its market segment.

The EID software package allows the user to identify any hidden elements within the sample via the spot mode analysis. All results are verified using iterative peak stripping deconvolution. The step by step guided process within the software helps the user to collect all X-ray results in an organized and structured way. Optionally, this software can be expanded with the Elemental Mapping and Line Scan option.

## EDS Specifications

<b>Detector type</b>	• Silicon Drift Detector (SDD)
	• Thermoelectrically cooled (LN <sub>2</sub> free)
• Detector active area	25 mm <sup>2</sup>
• X-ray window	Ultra thin Silicon Nitride (Si <sub>3</sub> N <sub>4</sub> ) window allowing detection of elements B to Am
• Energy resolution	Mn Kα ≤ 137 eV
• Processing capabilities	Multi-channel analyzer with 2048 channels at 10 eV/ch
• Max. input count rate	300,000 cps
• Hardware integration	Fully embedded

<b>Software</b>	• Integrated in Phenom ProSuite
	• Integrated column and stage control
	• Auto-peak ID
	• Iterative strip peak deconvolution
	• Confidence of analysis indicator
	• Export functions: CSV, JPG, TIFF, ELID, EMSA

**Report** Docx format

## System Specifications

### Dimensions & weight

• Imaging module	286(w) x 566(d) x 495(h) mm, 50 kg
• Diaphragm vacuum pump	145(w) x 220(d) x 213(h) mm, 4.5 kg
• Power supply	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	375(w) x 250(d) x 395(h) mm, 9 kg

Standard ProSuite System including:  
19" monitor with PC and network router mounted

### Requirements

#### Ambient conditions

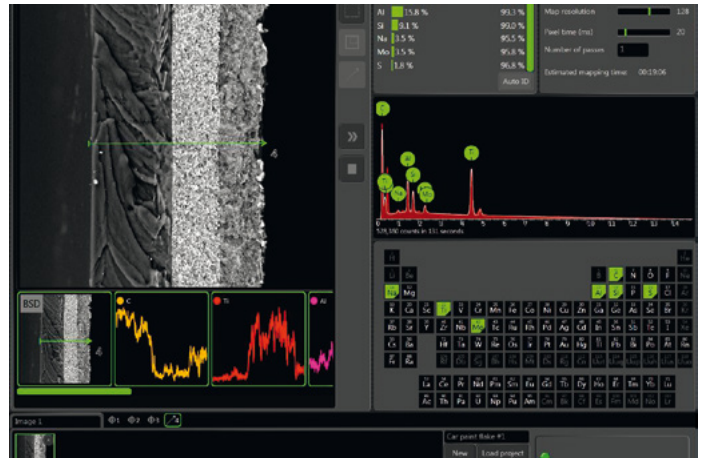
• Temperature	15°C ~ 30°C (59°F ~ 86°F)
• Humidity	< 80% RH
• Power	Single phase AC 110 - 240 Volt, 50/60 Hz, 300 W (max.)

**Recommended table size**

150 x 75 cm, load rating of 100 kg



Mapping of material



Line scan along a material

### Elemental Mapping and Line Scan

Elemental Mapping reveals the distribution of elements within the sample. The selected elements can be mapped at a user specified pixel resolution and acquisition time. The real-time mapping algorithm shows live build up of the selected element maps while storing spectra of each pixel. This allows elements to be added or removed at any time during or after the mapping process. Mixing any number of elements with the backscattered electron image gives users a clear insight into the distribution of elements within the sample.

Mapping can be done on the image as a whole or to save time, on a Selected Area (SA). Any area can be selected in a rectangular shape on the image location. Line Scan allows analysis to be performed over a selected line. The number of points and dwell time per point can be selected individually. A line profile of every selected element is displayed on the screen. On top of that, the results can be easily exported and reported via an automated template. Multiple analyses can be performed in sequence without user intervention.

### Elemental Mapping and Line Scan Specifications

#### Elemental Mapping

- Element selection 10 individual user specified maps, plus backscatter image and mix-image
- Selected area Any size, rectangular shaped
- Mapping resolution range 16 x 16 – 512 x 512 pixels
- Pixel dwell time range 10 – 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