Phenom ProX

The perfect all-in-one desktop SEM

Phenom ProX
All-in-one imaging & analysis system

Fully integrated EDS
Analysis is as easy as imaging with fully integrated EDS detector and software

Multiple acceleration voltages
Between 5 kV and 10 kV for high resolution images and 15 kV for great analysis results
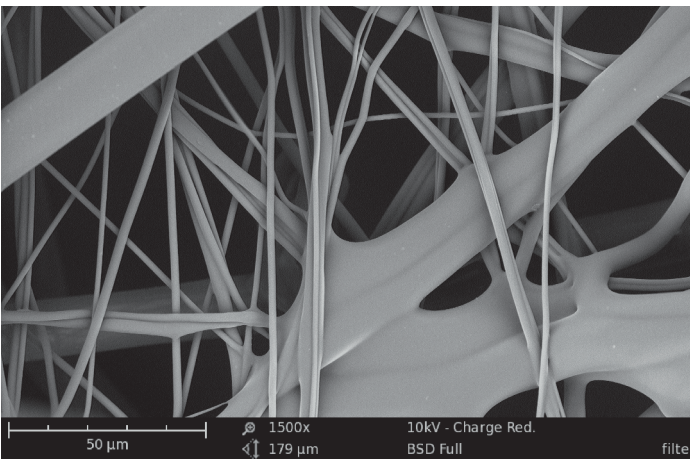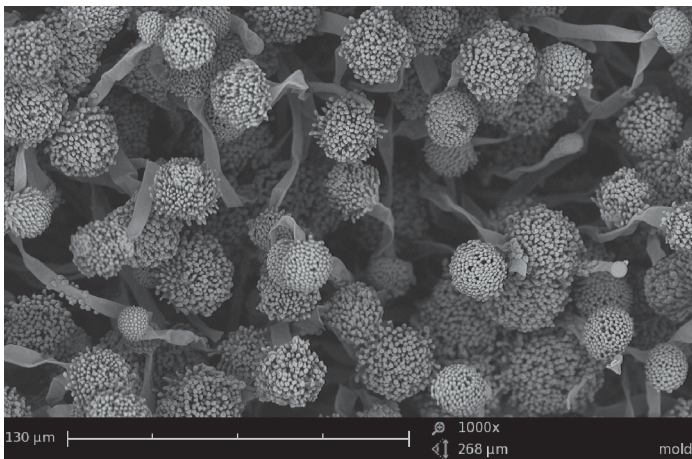
Magnification
Magnification range up to 130,000x

Elemental Mapping & Line Scan
Revealing the distribution of elements within the sample

Never lost navigation
Swift navigation to any region of interest

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| 130 µm | | | | ⊘ 1000x | |
| | | | | ◁↕ 268 µm | mold |

| | 50 µm | | ⊘ 1500x | 10kV - Charge Red. | |
| | | | ◁↕ 179 µm | BSD Full | filte |

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 Dispensive 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_6) 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	≤ 14 nm

Digital image detection

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

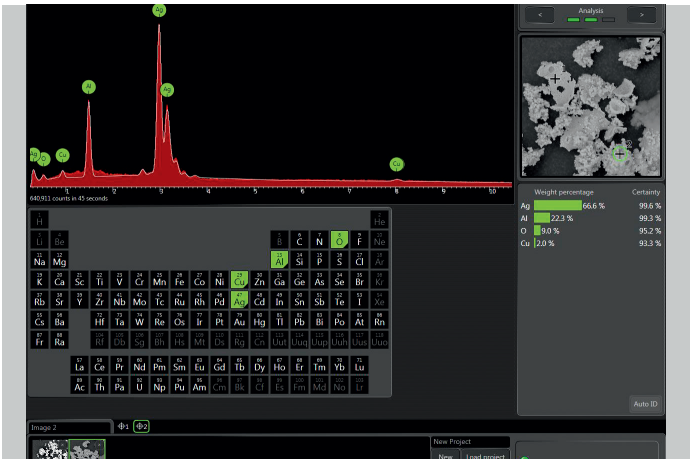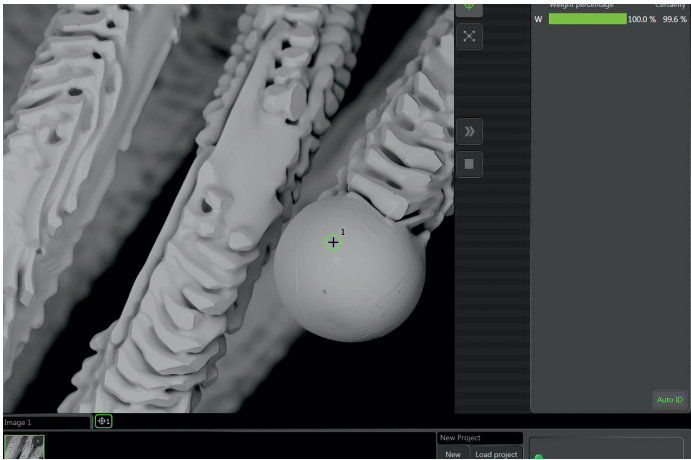|	
Image formats	JPEG, TIFF, BMP
Image resolution options	456 x 456, 684 x 684, 1024 x 1024 and 2048 x 2048 pixels
Data storage	USB flash drive Network ProSuite PC
Sample Stage	Computer-controlled motorized X and Y
Sample size	Up to 32 mm (Ø) Up to 100 mm (h)

Sample loading time

> Light Optical	< 5 s
> Electron Optical	< 30 s

Step-by-step data collection

A dedicated software package is included and installed on the Pro Suite 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_6 electron source generates the highest number of X-rays in its market segment.

The element identification 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

| Detector type	Silicon Drift Detector (SDD)
	Thermoelectrically cooled (LN_2 free)
> Detector active Area	25 mm^2
> X-ray window	Ultra-thin Silicon Nitride (Si_3N_4) 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
Software	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	Standard 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	< 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
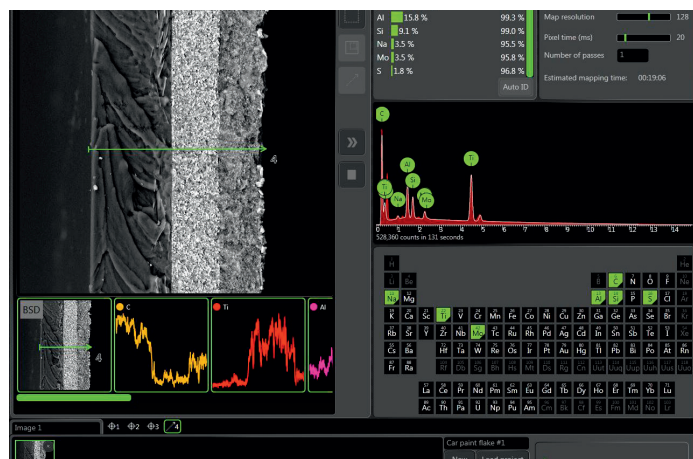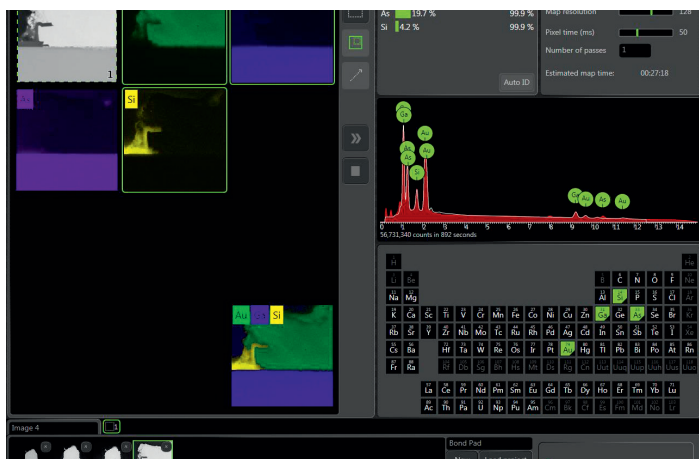
Elemental Mapping and Line Scan

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 backscatter 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   16x16 – 512x512 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

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