Phenom ProX G6 Desktop SEM
Desktop SEM with EDS capability for robust, effortless, and versatile elemental analysis

The sixth generation of the Thermo Scientific Phenom ProX Desktop SEM fills the gap between light microscopy and floor-model SEM analysis, expanding the capabilities of research facilities. It offers fast, high-resolution imaging in addition to an integrated energy dispersive spectroscopy (EDS) detector for robust, easy-to-use, rapid elemental analysis.

Expand your research facility’s capabilities
Fast and easy to use, the Thermo Scientific™ Phenom™ ProX G6 Desktop SEM can be used to relieve the burden of routine analysis for common samples from floor-model SEM instruments. Instrument configuration and the sample loading mechanism ensure quick imaging with minimal time spent tuning between experiments.

Facility users of any experience level can quickly begin producing high-quality results with the Phenom ProX G6 Desktop SEM. Its long-lifetime CeB₆ source offers high brightness while requiring low maintenance. Additionally, the Phenom ProX G6 Desktop SEM’s high stability and small form factor allow it to be used in practically any lab environment because it does not require specialized infrastructure or expert oversight.

Element IDentification (EID)
The Phenom ProX G6 Desktop SEM is equipped with an EDS detector to obtain more material insights with element identification via X-ray analysis. Thanks to the design of the SEM column, high-resolution imaging is done at the same working distance as EDS analysis, resulting in an even faster workflow.

Key Benefits
- Expand research capabilities—Offload work from your floor-model SEMs
- Fully integrated EDS detector—High-resolution imaging at same working distance as EDS analysis for faster workflow
- Easy to learn, easy to use—Users of any experience level can quickly start producing results
- Fast, high-resolution imaging—Long-lasting, high-brightness CeB₆ electron source
- No specialized infrastructure—High stability and small form factor allow it to be used in practically any lab environment

Platinum-coated metal grid (BSD).
Platinum-coated metal grid (SED).
Imaging specifications

Imaging modes

Light optical Magnification range: 27-160x
Electron optical Magnification range: 160–350,000x

Illumination

Light optical Bright field / dark field modes
Electron optical Long lifetime thermionic source (CeB₆)

Acceleration voltages
- Default: 5 kV, 10 kV and 15 kV
- Advanced mode: adjustable range between 4.8 kV and 20.5 kV

Resolution
- ≤6 nm (SED)
- ≤8 nm (BSD)

Detector

Standard • Energy dispersive spectroscopy detector
- Backscattered electron detector
Optional Secondary electron detector (enabled for live mixing with BSE)

Digital image detection

Light optical Color navigation camera

Image formats

JPEG, TIFF, PNG

Image resolution options

960x600, 1920x1200, 3840x2400 and 7680x4800 pixels

Data storage

Network, workstation with SSD

Sample stage

Computer-controlled motorized X and Y

Sample size

- 25 mm diameter (up to 32 mm as option)
- 35 mm height (up to 100 mm as option)

Sample loading time

Light optical <5 seconds
Electron optical <30 seconds

Live EDS gives you immediate element identification via point & click in imaging mode, while more advanced analysis, including the optional EDS line scan and EDS fast mapping, can be done via the integrated EID application.

Step-by-step data collection

The dedicated software package, Element IDentification (EID), is used 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 CeB₆ electron source is used to generate the highest X-ray count rate in its market segment, allowing for fast results.

The EID software package allows you to identify nearly all materials in the periodic table, starting from boron (5) and ranging up to californium (98). It is a perfect analysis tool for a wide range of samples and applications. Projects can be stored locally or on the network, where they can be analyzed at a later stage or offline.

The EID software package runs smart algorithms with advanced peak analysis to optimize the auto-identification functionality, while still allowing for manual adjustments at any time in the analysis process. The intuitive step-by-step process within the software helps you collect all X-ray results in an organized and structured manner.

EDS specifications

Detector type • Silicon Drift Detector (SDD)
- Thermoelectrically cooled (LN₂ free)

Detector active area 25 mm²

X-ray window Ultra thin silicon nitride (Si3N4) window allowing detection of elements B to Cf

Energy resolution Mn Kα ≤132 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 user interface
- Integrated column and stage control
- Auto-peak ID
- Iterative strip peak deconvolution
- Export functions: CSV, JPG, TIFF, ELID, EMSA

Report

Docx format
A secondary electron detector (SED) is optionally available. 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. Once installed, the Phenom ProX G6 offers live mixing of backscattered and secondary electrons images to combine compositional and topographic data.

### Long-life CeB₆ source

The CeB₆ (cerium-hexaboride) source has several advantages: first, the high brightness it provides compared to tungsten makes it much easier to obtain high-quality images with many details; second, the lifetime of the source is very long, and maintenance can be scheduled, enabling you to obtain the results you are looking for, even after a long (automated) run. The lifetime is extended as much as possible via our intelligent software; the source is hibernated when the Phenom ProX G6 Desktop SEM is not in use. In case the source needs to be replaced, this can be done on-site.

#### System specifications

**Dimensions and weight**

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimensions</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imaging module</td>
<td>286(w) x 566(d) x 495(h) mm, 50 kg</td>
<td></td>
</tr>
<tr>
<td>Diaphragm vacuum pump</td>
<td>145(w) x 220(d) x 213(h) mm, 4.5 kg</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>156(w) x 300(d) x 74(h) mm, 3 kg</td>
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</tr>
<tr>
<td>Monitor (24&quot;)</td>
<td>531.5 (w) x 250 (d) x 515.4 (h) mm; 6.7 kg</td>
<td></td>
</tr>
<tr>
<td>Workstation</td>
<td>92.5 (w) x 305.6 (d) x 343.5 (h) mm, 8 kg</td>
<td></td>
</tr>
</tbody>
</table>

**Requirements**

**Ambient conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>15 °C ~ 30°C (59°F ~ 86°F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>Between 20% and 80% RH</td>
</tr>
<tr>
<td>Power</td>
<td>Single phase AC 100–240 Volt, 50/60 Hz, 153 W average, 348 W max</td>
</tr>
</tbody>
</table>

**Recommended table dimensions**

150x75 cm, load rating of 100 kg

**Secondary electron detector**

The standard detector in the Phenom ProX G6 Desktop SEM is a four-segment backscattered electron detector (BSD) that yields sharp images and provides topographical contrast information.
### Element mapping and line scan specifications*

<table>
<thead>
<tr>
<th><strong>Element Mapping</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element selection</strong></td>
<td>User-specified individual element maps, plus BSD and mix image</td>
</tr>
<tr>
<td><strong>Selected area</strong></td>
<td>Any size, rectangular</td>
</tr>
<tr>
<td><strong>Mapping resolution range</strong></td>
<td>32x32-960x960 pixels</td>
</tr>
<tr>
<td><strong>Pixel dwell time range</strong></td>
<td>1–500 ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Line Scan</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Line Scan resolution range</strong></td>
<td>16–512 pixels</td>
</tr>
<tr>
<td><strong>Points dwell time range</strong></td>
<td>10–500 ms</td>
</tr>
<tr>
<td><strong>Element selection</strong></td>
<td>Auto ID or manual</td>
</tr>
</tbody>
</table>

**Reporting**

Docx format

**SED specifications**

| **Detector type** | Everhart Thornley |

* Optional