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Welcome to Pathfinder

The premier platform for EDS/WDS analysis in the electron microscope

ThermoFisher SCIENTIFIC

Pathfinder X-ray Microanalysis Software

Meeting the need for fast, accurate and automated operation on the electron microscope, Thermo Scientific™ Pathfinder™ X-ray microanalysis software is at the heart of SEM/EDS and SEM/WDS data acquisition, analysis and reporting. Pathfinder software is built upon the latest principles in X-ray microanalysis such as automatic peak identification, background subtraction and matrix corrections for quantitative analysis. All information is acquired as a Spectral Imaging dataset. Thanks to our optimized use of computing technology, acquisitions are lightning fast – even with low X-ray counts.

To get the most out of your analytical microscope, Pathfinder software features quantitative X-ray mapping to provide the most accurate elemental information from your sample. But since materials do not exist simply as elements, but are rather found in a chemical matrix, our exclusive Thermo Scientific™ COMPASS™ algorithm uses Spectral Imaging data to extract all of the unique components (phases) in your sample. This avoids the pitfalls of analyzing materials by element and presents the truest representation your sample's composition.

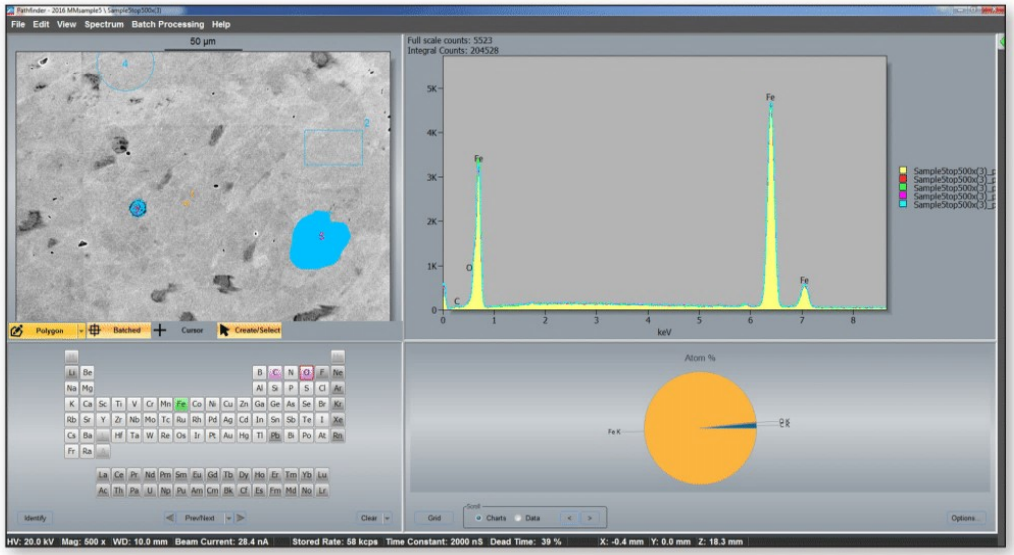
Join the trek to better EDS and WDS analysis with our unique Pathfinder X-ray Microanalysis software.

Basecamp

Pathfinder software is built on a platform that creates powerful, intuitive and ultra-fast analytical performance for electron microscopy. **Basecamp** provides all of the necessary tools to get started, including well-established Thermo Scientific data processing routines such as automatic peak identification, peak deconvolution and background subtraction. It includes Spectral Imaging which captures all of the data in your sample collected during acquisition on the microscope.

Basecamp Features

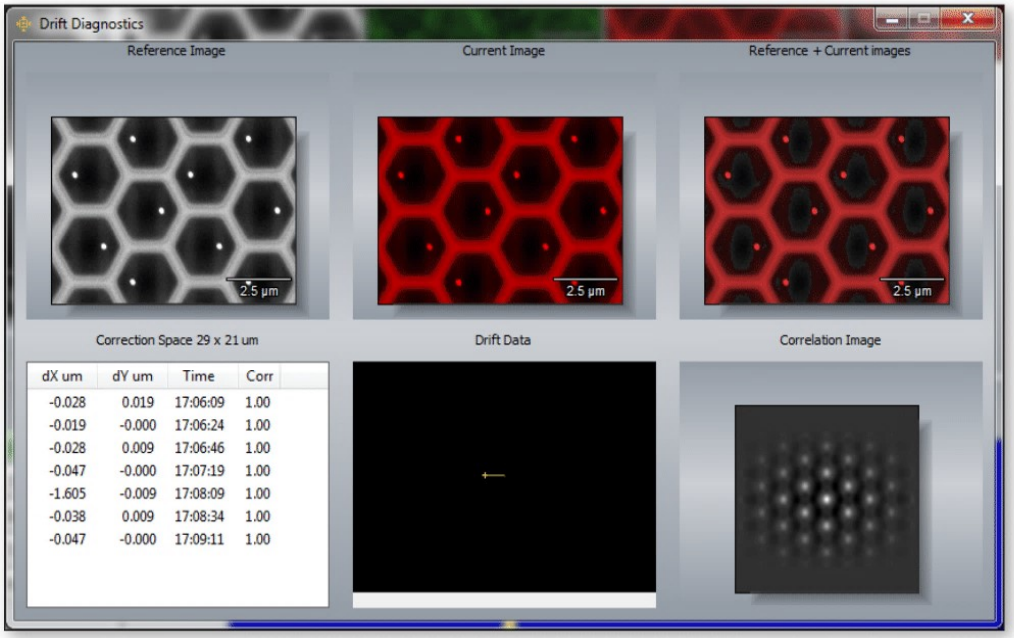
- Seamless user interface with full 64-bit operating system compatibility for Microsoft® Windows® 7, Windows 8 and Windows 10
- Preset ‘quick start’ modes and user-developed custom power modes for greater efficiency
- Complete range of data acquisition techniques, including Spectrum, Point and Shoot, Line scan and Mapping with Full Spectral Imaging
- Automatic peak ID and quantification
- Advanced algorithms for background subtraction, peak deconvolution and quantitative analysis for outstanding accuracy in data analysis with a single mouse click
- Single-click data reporting to Microsoft Word®, PowerPoint® or PDF
- Unlimited off-microscope site license and full compatibility with internal data servers that enables a truly “take your data anywhere” approach for off-line data analysis



Point and Shoot mode

Alpine

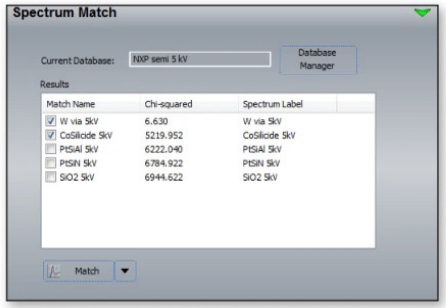
The foundation from Basecamp is advanced EDS/WDS elemental mapping. **Alpine** introduces quantitative elemental mapping with full background subtraction, peak deconvolution and matrix corrections. This level provides quantitative analysis at every pixel in the map, giving you the highest accuracy in elemental mapping.



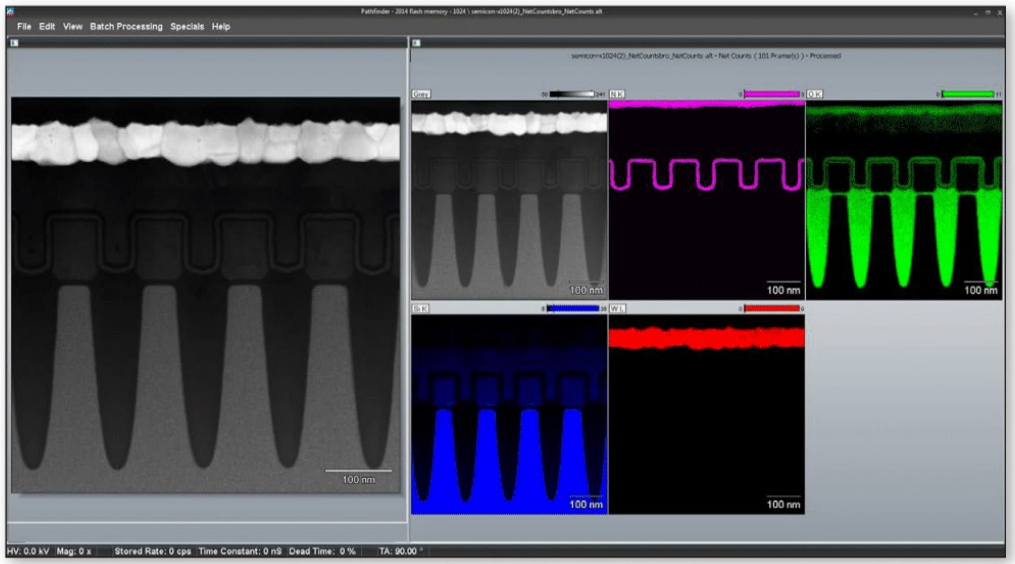
Setting up Drift Compensation

Alpine Features

- Live-time quantitative maps calculated and displayed as the data is acquired
- Batch extractions support 2D and 3D mosaic capability
- Real-time Automated Drift Compensation using proprietary concurrent gray advanced FFT algorithm
- Advanced Spectral Match database for automatic spectral identification

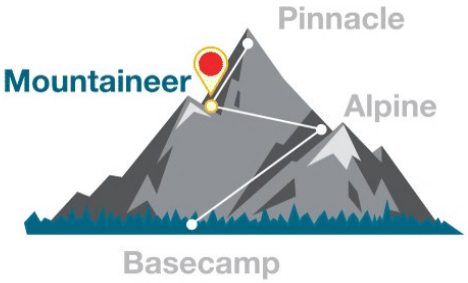


Spectral Match database



Quantitative mapping results

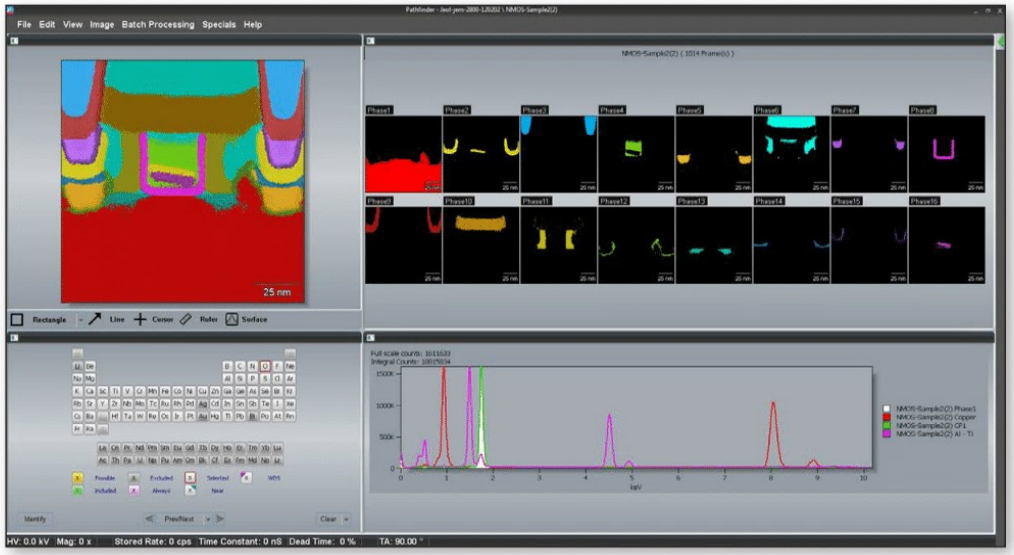
Mountaineer



Bringing you to a new level of X-ray microanalysis. **Mountaineer** incorporates our exclusive Thermo Scientific COMPASS* principal component analysis (PCA), making it the perfect complement to secondary electron and backscattered electron imaging. Using Spectral Imaging data, the software employs proprietary multivariate statistical analysis techniques to extract the dominant components that define the material under study and then statistically classifies these components into distinct phases.

Mountaineer Features

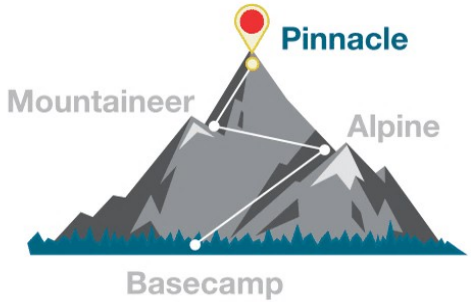
- Ultra-fast analysis with SEM/EDS acquisition completed in less than one minute, including analytical results from low X-ray counts with complex phase maps
- Complete and comprehensive phase mapping that locates minor or trace elements within even the most complex matrices, finding a needle in a haystack features
- Reduced complexity using spatial deconvolution, spectra are automatically optimized for a more confident analysis
- Automated and programmatic acquisitions and analyses, providing the one and only unmistakable answer to your analysis each time you run



COMPASS phase maps

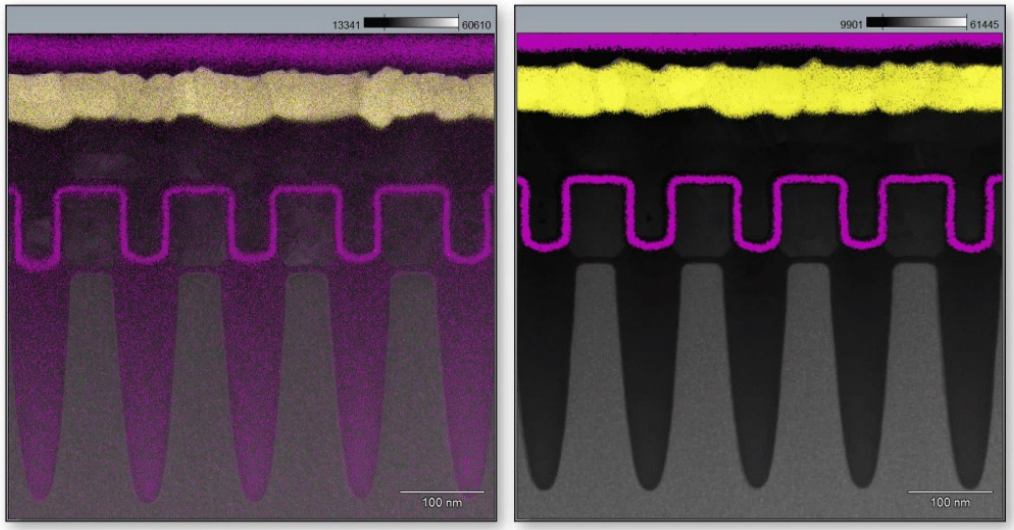
* Based on the algorithms developed by Paul Kotula at Sandia National Labs, defined in US Patents 6,684,413 and 6,675,106 and exclusively licensed to Thermo Fisher Scientific.

Pinnacle



Reach the pinnacle of your analysis with X-ray imaging filters and automated analysis. **Pinnacle** provides 29 filters for smoothing, edge-finding, sharpening and erosion/dilation that enhance the quality of your image and effectively compensate for low X-ray collection maps. While leaving the essential data intact, these filters draw the eye to key features of interest.

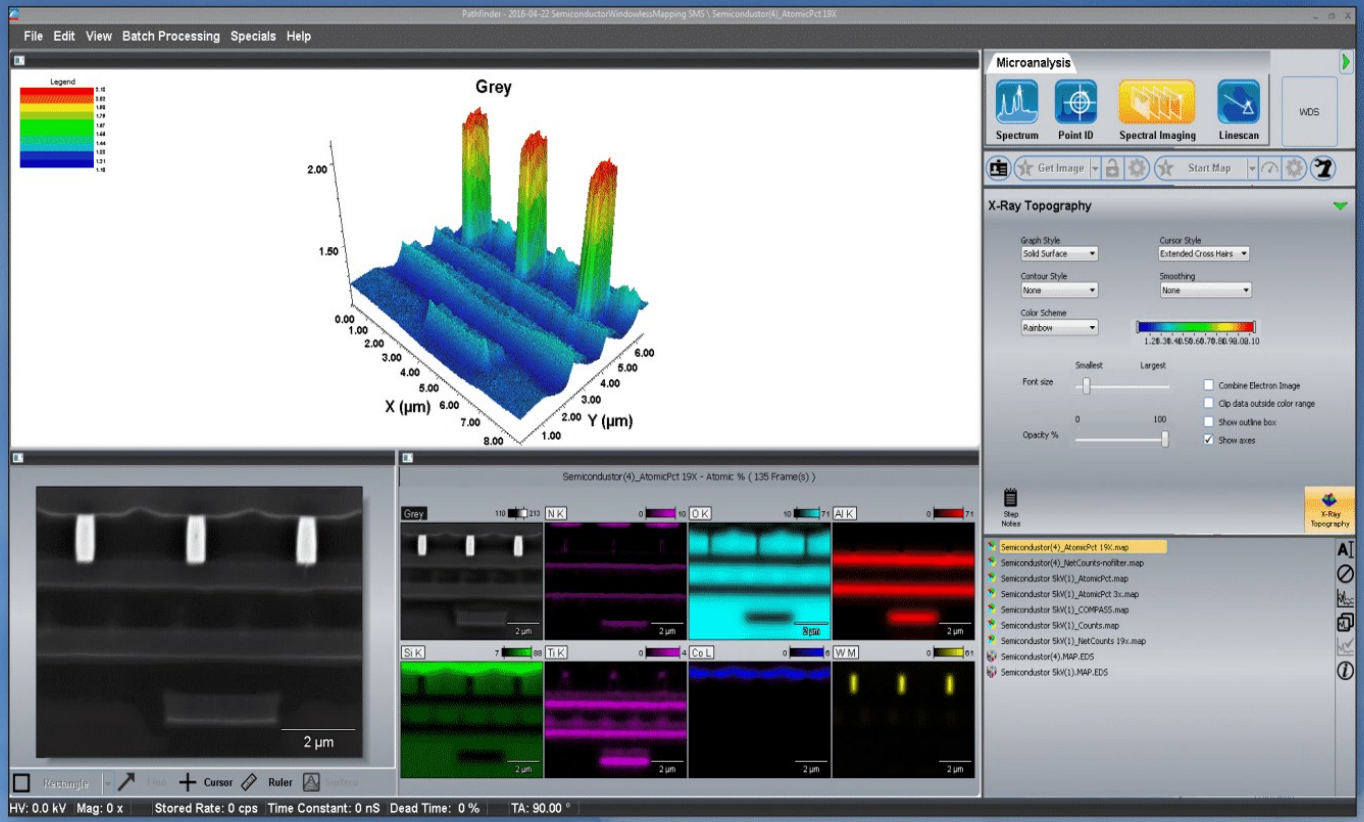
Fully automate your analysis with stage control for multi-frame mapping, stage-motion line scans and multi-point analysis over the entire range of stage motion enables the efficient collection of very large area maps.



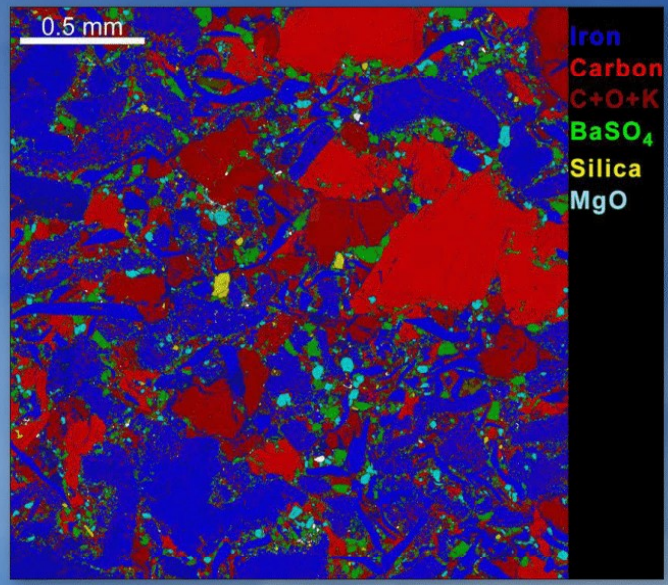
Phase map unfiltered and filtered

Pinnacle Features

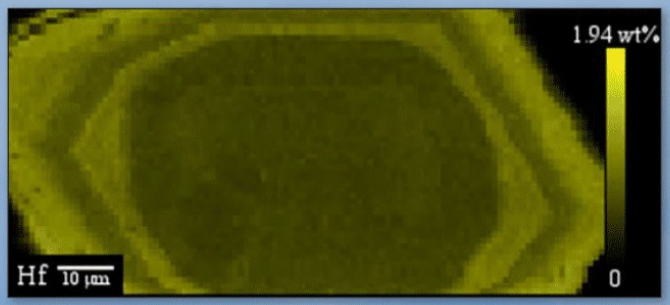
- Automated Analysis mode to maximize your productivity with fully-automated stage control and templated acquisitions to run very large area mosaics, large area stage maps or line scans or repeating an acquisition over many pre-selected areas
- Full suite of 29 X-ray image filters to smooth, sharpen and highlight key regions that clarify your mapping results and provide the cleanest, brightest and most resolved elemental and phase maps
- Topographical X-ray element maps that help the analyst to visualize the relative scale of key features within the material



X-ray topography



5000 pixel × 5000 pixel stage map



Quantitative WDS stage map

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Enabling Microanalysis Success – X-ray Detectors and Electronics

Thermo Scientific™ NORAN™ System 7 Analyzer Electronics

Driving data from X-ray detectors to the software, analyzer electronics collect more than 1,000,000 X-ray counts per second per detector. A distributed processing architecture provides maximum data throughout running a real time operating system and a combination of digital pulse processors and a digital imaging board all connected to the host Microsoft Windows PC via Ethernet.

Thermo Scientific™ UltraDry™ EDS X-ray Detector

Silicon drift detector technology establishes the foundation for the UltraDry EDS X-ray detector. Advanced field-effect transistor (FET) integration and a proprietary preamplifier stage create the extraordinary operating space that enables the superior performance of the UltraDry detector. The offered range of crystal active areas (10 mm^2, 30 mm^2, 60 mm^2, 100 mm^2) and the smallest in class packaging envelope provides the greatest solid angle of collection with electronic noise virtually eliminated.

Thermo Scientific™ MagnaRay™ Parallel Beam WD Spectrometer

The MagnaRay Parallel Beam WD spectrometer uses two X-ray optical technologies to collimate diverging X-rays. For low energies, a grazing incidence optic has the greater efficiency; at higher energies (> ~2.5 keV), a polycapillary optic has greater efficiency. WDS offers significant resolution improvements with peak overlaps virtually eliminated giving you order of magnitude improvement in peak-to-background sensitivity enhances trace element detection. Parallel beam WDS with its hybrid optic gives a great improvement in intensity in the low energy spectral region, in which most overlaps occur, in comparison to conventional WDS.