**FEI™**



## Key Benefits

- Fully automated workflow
- Easy-to-use user interface
- High throughput
- Flexible fiducial support
- Low kV cleaning per slice
- Wide screen support

# EDS3™

## Automated serial sectioning for 3D energy dispersive x-ray spectrometry

EDS3 is a software package that automates the process of cutting a series of cross sections of a specimen using the FIB and acquiring energy dispersive x-ray spectrometry (EDS) data from every cross section. The resulting data set can be used to reconstruct a 3D profile of the chemical composition of the sample. The latest version of the software enables an easy step-by-step setup process and remote monitoring of the acquisition process. EDS3 control software is compatible with most detectors of various vendors (supported by a vendor-specific plug-in).

Data acquisition, storage and viewing of images is managed in Projects. Each new Project can be set up easily from the user interface using a step-by-step process and represents an experiment on a sample at one particular area of interest. Multiple consecutive projects can be defined for the same sample. The setup process includes many options for enabling and defining sample preparation features like a protective layer, a rough cut and anti-shadow angles. After setup, the execution of the Project(s) automates the slicing and image acquisition process and can be left unattended. Status and progress of a running Project can be monitored and reviewed. Projects can be halted and resumed: the software can use existing fiducials for alignment. After completion of the automated run, image data can be viewed sequentially and optionally further processed or converted into a movie.

EDS3 utilizes the latest features of FEI's DualBeam™ technology to automatically mill through a sample and image consecutive slices. The latest version supports Green Clean Pattern, a technique that prepares the sample's cut face by milling a user defined number of slices during setup. This enables immediate data acquisition during the automated run. FIB Cleaning is a new feature that can be enabled to get an improvement in the acquired EDS image data: after milling, the image area is first exposed to a low kV ion beam current that will clean the surface from undesired artifacts.

Non-conductive samples are accommodated by using several integrated features such as drift suppressed milling and charge neutralization mode. Low vacuum electron beam imaging is enabled for supporting instruments (Versa 3D™) enabling 3D imaging and analysis of an even more extensive range of samples.

## Setup process

The picture depicts the milling parameter screen during the setup process. The outline of the blue box depicts the region of interest, the yellow box the milling/acquisition area and the red box the area of the fiducial.
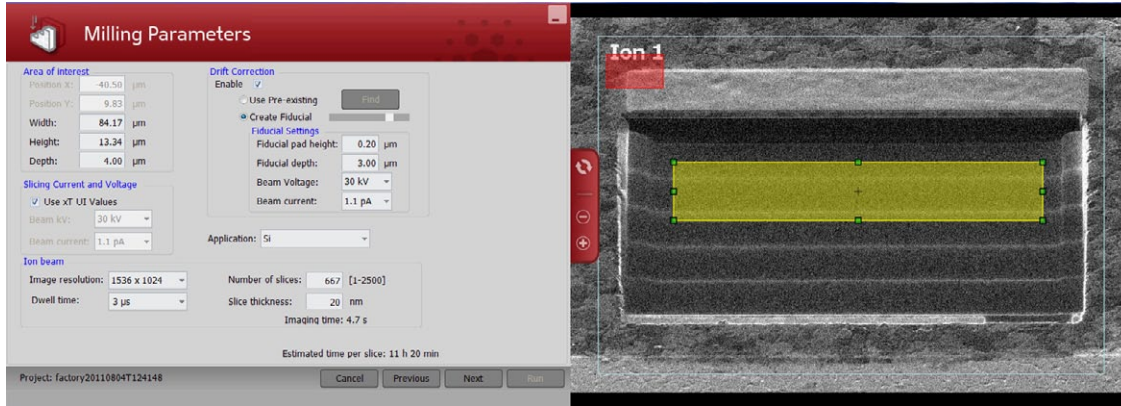


## Data acquisition and reconstruction of the chemical composition of a Al/Ti/C sample
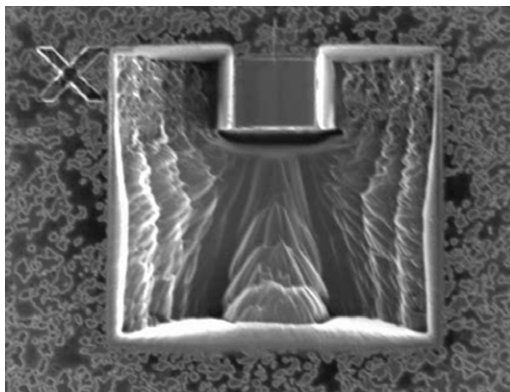


The picture to the left shows the top view of the sample area during the acquisition process as imaged using the ion beam.

In the upper left corner, it shows the fiducial that is used for drift correction.

EDS3 supports fiducials for the FIB and SEM and it provides the option to use existing fiducials or to create a new one at the beginning of the automated process.

The following pictures depict snapshots of a reconstructed movie using Resolve RT* that blends the presence of specific elements in the 3D volume. Colours are being used to indicate a specific element: yellow – Al, red – Ti and blue – C.
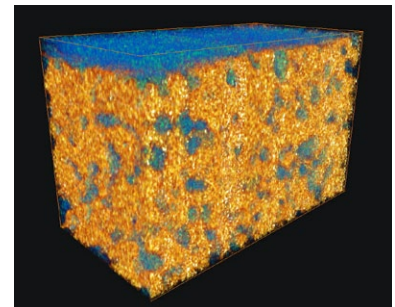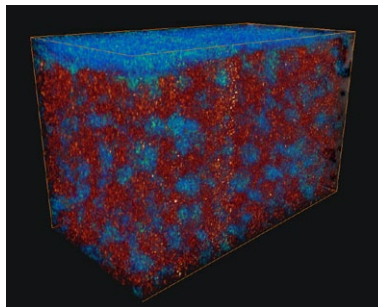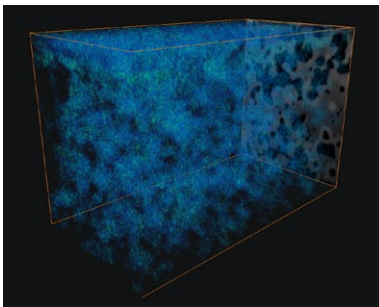


*ResolveRT, Amira and Avizo are high-performance 3D visualization software packages from VSG (an FEI Company), and can be ordered separately. More information can be found at www.vsg3d.com

— Learn more at FEI.com —