

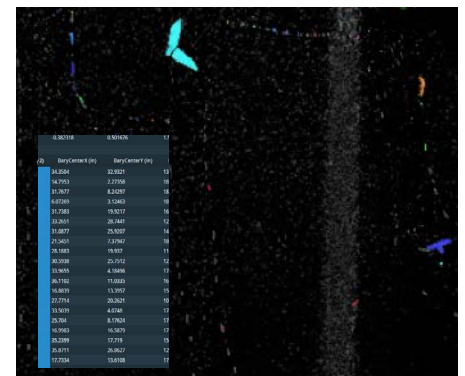
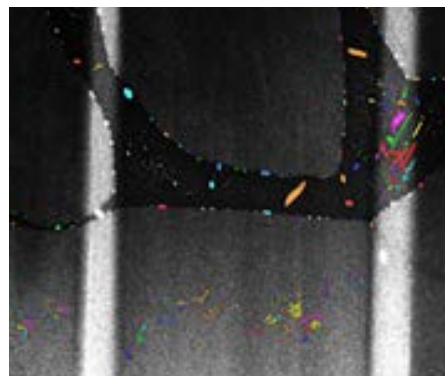
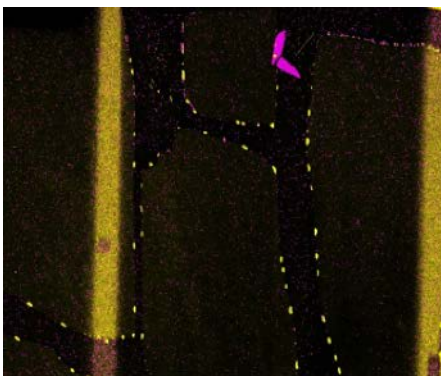
## Software

## Analysis of particles, precipitates, and inclusions

### Go from segmenting a dozen particles a day to several hundred

When developing new metals or alloys, you need plenty of time to characterize the materials to increase yield. Because the process of analyzing particles, precipitates, and inclusions is tedious, highly manual, and prone to errors, speeding up the analysis of materials is generally not advisable.

What is needed is an automated way to analyze precipitates which is accurate, fast, and reproducible, and allows you to work with different types of data (from 2D images or stacks of images all the way to full volumes) and different types of modalities (from 2D electron microscopy to 3D tomography).



Thermo Scientific™ Avizo™ Software can import the data for analysis because it supports a wide variety of file formats. Once the dataset is imported, the data usually needs to be prepared for analysis using image enhancement tools to “clean” it and make it ready for analysis. After the image is enhanced, and before the analysis can be performed, the individual features need to be identified. This is called “segmentation,” and many segmentation tools are available in Avizo Software.

These tools range from manual to fully automated, they can be combined, and they include the ability to train a deep learning model which can be used for fully automated segmentation of the particles, precipitates, and inclusions. Once segmented, each feature is individually identified. From there, analysis and

classification may be performed through measurement and quantification. Many different parameters may be defined, including size, shape, distribution, volume fraction, or other classification criteria which may be customized according to what is relevant. The result is a comprehensive table containing all the necessary measurements needed for the analysis.

Thanks to the ability of Avizo Software to perform these critical tasks, what was previously highly manual and tedious is now automated, allowing users to analyze hundreds of particles in a day instead of only a dozen before such automation. Furthermore, since the analysis is much more automated, it can be performed by different operators while ensuring consistency of the results.

Learn more at [thermofisher.com/avizometals](https://thermofisher.com/avizometals)

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AN0202-EN-06-2022

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