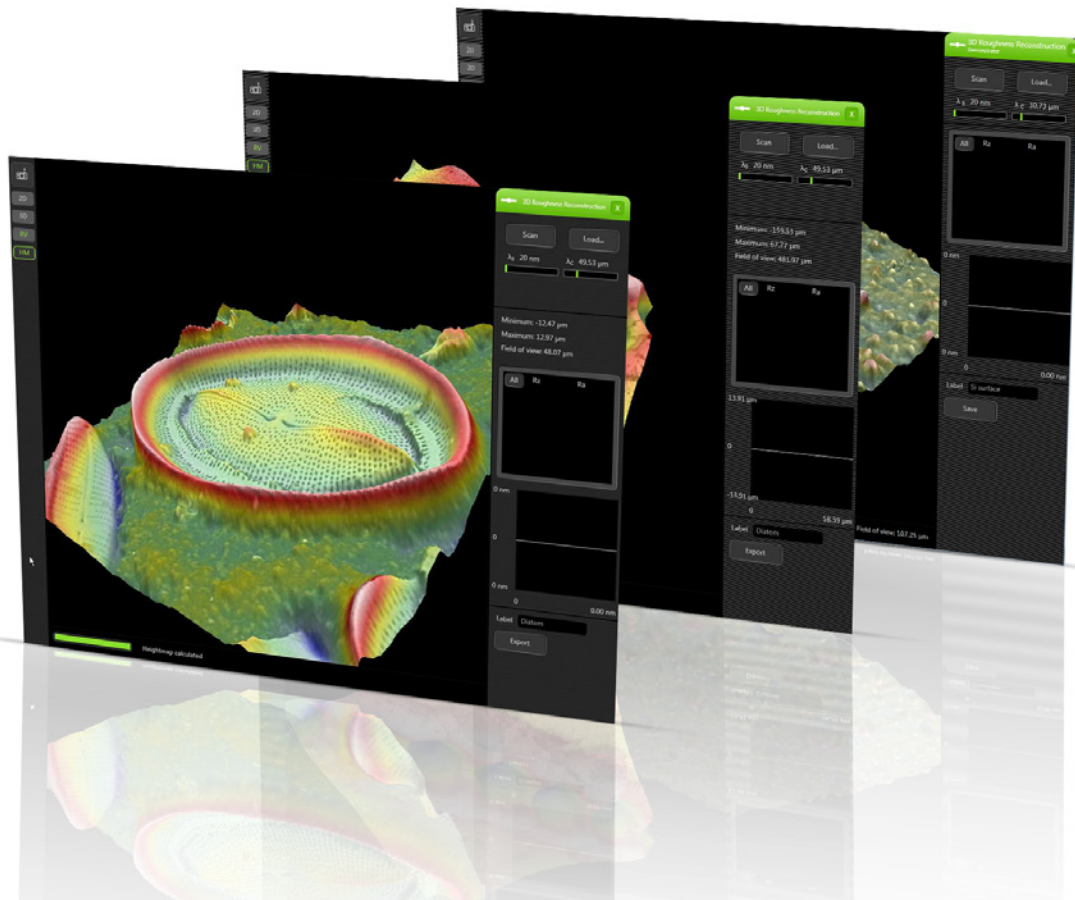


3D Roughness Reconstruction Software

Make images understandable for a larger group of users



Direct method

Outperforms optical and mechanical measurement systems

Automated user interface

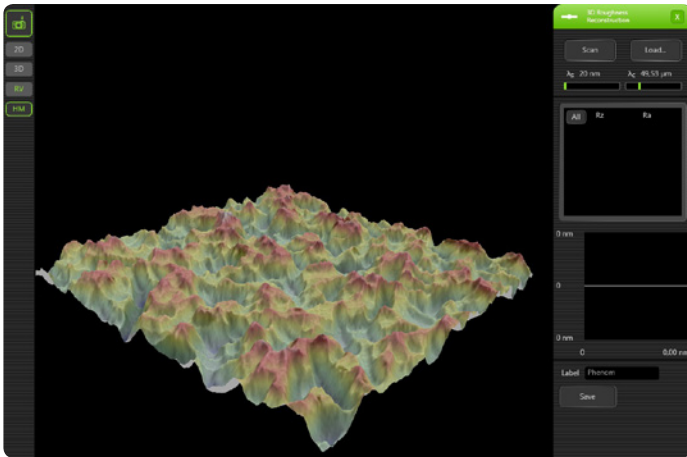
Intuitive fully automated user interface

Shape from shading

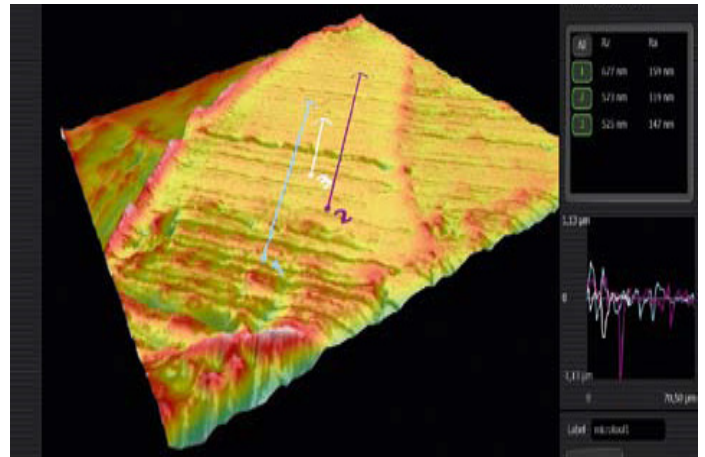
Based on 'shape from shading' technology, no stage tilt required

Reconstruction

Fast reconstruction



Roughness reconstruction and colored height map of abrasive material



The 3D Roughness Reconstruction view contains three profile measurement lines. The table on the right contains measurement results Rz and Ra

With the 3D Roughness Reconstruction application, the Phenom desktop SEM is able to generate three-dimensional images and submicrometer roughness measurements. Based on "shape from shading" technology, 3D imaging helps to interpret sample characteristics and makes images understandable for a larger group of users.

3D

3D imaging helps to interpret sample characteristics and makes images understandable for a larger group of users. It is often difficult, for example, to identify dents, scratches and burrs from flat 2D images.

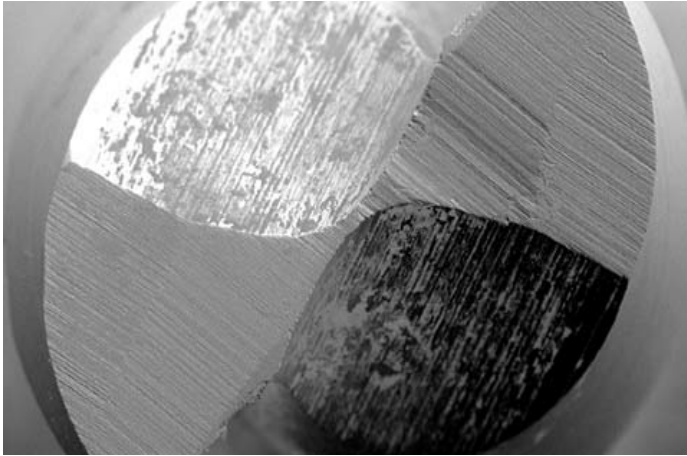
Roughness

Measuring the average roughness (Ra) and the roughness height (Rz) is critical for controlling and understanding production processes. By using SEM imaging for data collection, a much better resolution can be achieved than by using traditional (indirect) methods.

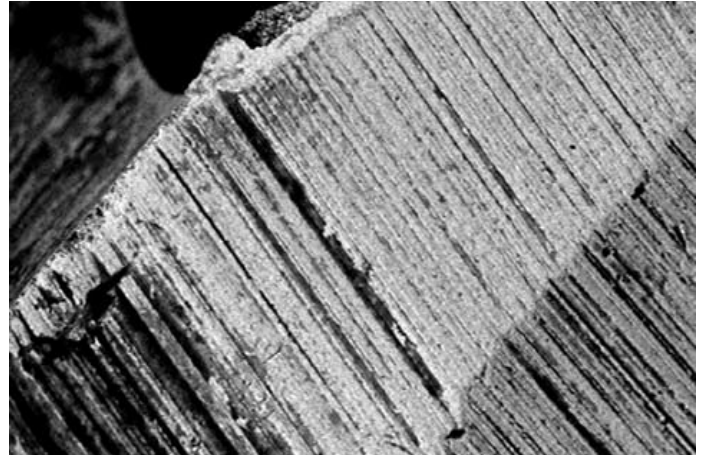
The 3D Roughness Reconstruction application is a desirable addition to the Phenom desktop SEM when one or more of the following are required:

- > Quality control in machining
- > Texture analysis
- > Evidence characterization
- > Defect & failure analysis
- > Wear analysis-tribology

The 3D Roughness Reconstruction application is available in the Phenom ProSuite that contains multiple Phenom desktop SEM specific applications.



Drill bit, top view at 600x magnification



Drill bit, top view at 2900x magnification

Benefits

- > Outperforms optical and mechanical measurement systems:
 - High resolution
 - Insensitive for reflective samples
 - Direct method
 - Non-destructive
- > Intuitive fully automated user interface
- > Based on 'shape from shading' technology, no stage tilt required
- > Integrated solution
- > Fast reconstruction

Specifications

Automated 3D image creation

Full 3D
2D or 3D with colored height indication
Filtered 3D for surface roughness

Output

Line profiles
CSV files
2D/3D view images

Automated roughness measurement

Ra (average roughness) and Rz (roughness height)
User-set waviness filtering
Up to 5 line measurements

Part of the Phenom ProSuite

Network storage enabled
Phenom integrated system

Height profile

Position identification

CSV – automatically generated statistical data

FOV 2 mm to 10 μ m

3D reconstruction in just a few seconds

512x512 pixel resolution



ProSuite

ProSuite is an optional application system that has been developed to further enhance the capabilities of the Phenom system. ProSuite enables maximum information to be extracted from images obtained on the Phenom imaging system. It offers multiple solutions to specific application needs. ProSuite contains standard applications such as Automated Image Mapping and Remote User Interface. Optional applications are FiberMetric and 3D Roughness Reconstruction. Virtually all the properties of a sample can be revealed using the Phenom desktop SEM in combination with ProSuite.

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.

ProSuite Specifications

System	Automated collection of images Real-time remote control Intuitive single-page user interface Standard applications included: Automated Image Mapping & Remote User Interface
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Optional 3D Roughness Reconstruction

Based on "shape from shading" technology, no stage tilt required
Fast reconstruction

FiberMetric

Fast and automated collection of all statistical data
Large range of fibers and pores can be measured

ParticleMetric

Morphology and particle size data for submicron particle applications

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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