

Phenom Micro Tool & Tilt-Rotation Sample Holder

Tilt and rotation allow easy sample positioning



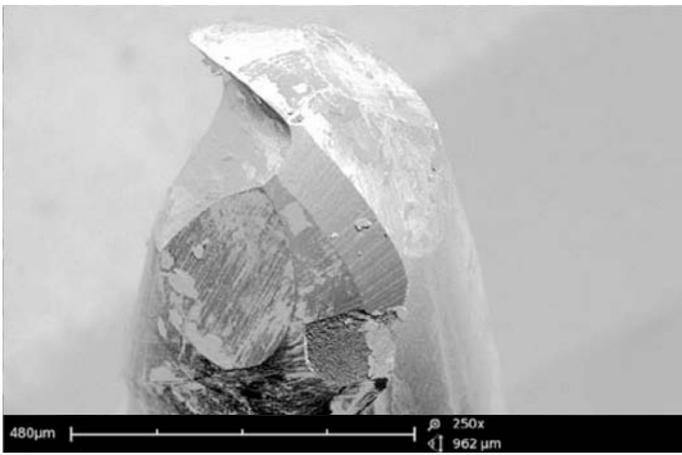


For imaging axial-shaped objects

The micro-manufacturing sector contains companies that produce micro tools such as drills, end mills, routers, boring bars engraving tools, etc. These precision tools can have submicron diameters and tight tolerances. They are used in a large variety of applications, including the electronics, medical/dental, automotive, semiconductor and optical industries. High precision, reproducibility and state of the art quality control are the key factors for producing reliable products.

Scanning electron microscopy is an accepted technique for achieving and maintaining these standards. The combination of the micro tool sample holder and the Phenom desktop scanning electron microscope (SEM) makes imaging at high magnifications with a large depth of focus possible.

The Phenom is the only electron microscope that is able to load and image these axial-shaped samples in their original state, enabling inline inspections without time consuming sample preparation.



Top of drill bit at 40° tilt angle and 250x magnification

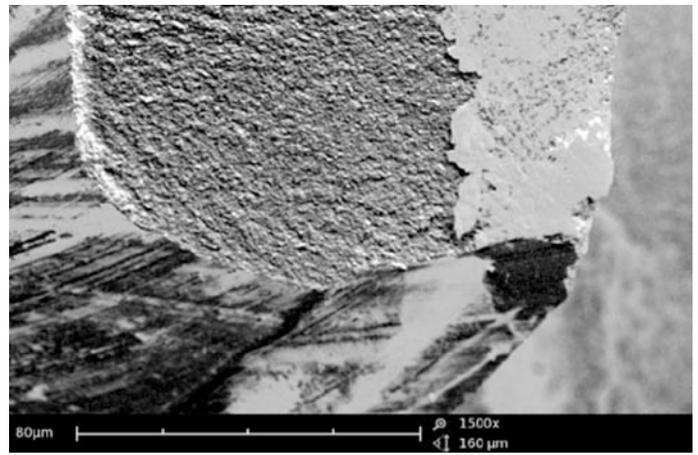


Image of same drill bit as left but focused on defect at 1,500x magnification

Micro Tools

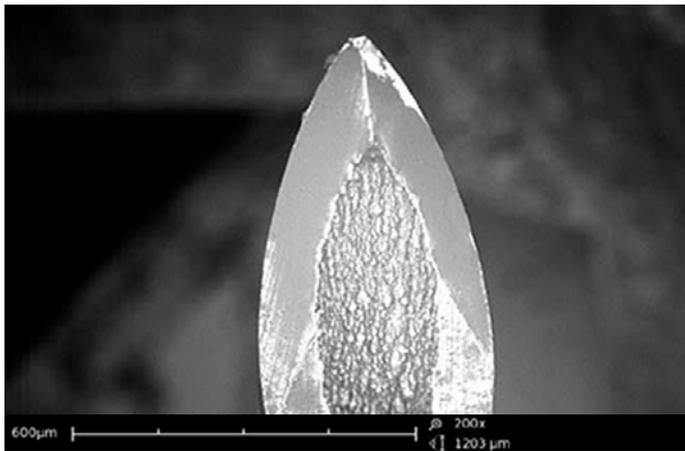
Performing measurements on axial-shaped tools such as drillbits and milling tools requires magnifications in the submicron range.

The Phenom desktop SEM offers a total quality management solution. It supplies the data needed to control the whole manufacturing process:

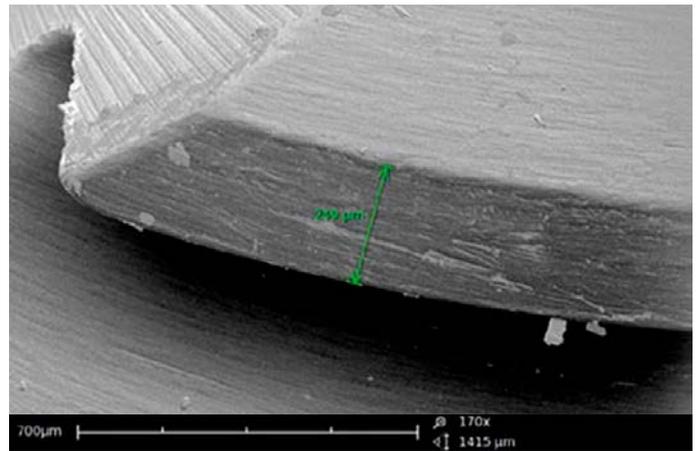
- Incoming inspection of micro tools
- Monitoring of micro tool condition and wear during manufacturing
- Inspection of the finished product.

The low magnification image provides an overview of the top of a drill bit. The large depth of focus is what gives SEM images a striking three dimensional perspective. For this reason, Phenom images of three dimensional objects are superior to those from a light microscope, even at low resolution and low magnification.

Wear, the condition of the cutting edges, coatings, defects and surface roughness can be monitored.



Dental needle at 200x magnification



Topographic image containing point-to-point measurement

Axial-shaped objects

The Thermo Scientific™ Phenom Micro Tool Sample Holder can accommodate any axial-shaped micro-manufactured parts such as needles, fibers, (fuel) injectors and pencils.

The sample is clamped inside the holder and can instantly be loaded into the Phenom. It can be aligned, rotated and tilted to optimize the position of the sample.

The ability to switch from topographical to compositional mode make it fast and easy to collect different types of data. The topographical mode generates images that can be used to investigate surface structure and to measure height differences in the sample. The compositional mode generates images that can be used to identify coating wear and material contrast.

With the Phenom desktop SEM, it is possible to perform a point-to-point measurement.

The Phenom can store images in various image formats. TIFF and JPEG images contain so-called “header” information. The header enables calibrated measuring by a large variety of measurement software packages.

Specifications

Sample diameter

0.5 - 10 mm

Sample length

10 - 100 mm

Tilt angle

-5° to +40°

Rotation angle

-35° and +35°

Find out more at thermofisher.com/phenomworld