

# Materialography

## Specimen preparation and hardness testing

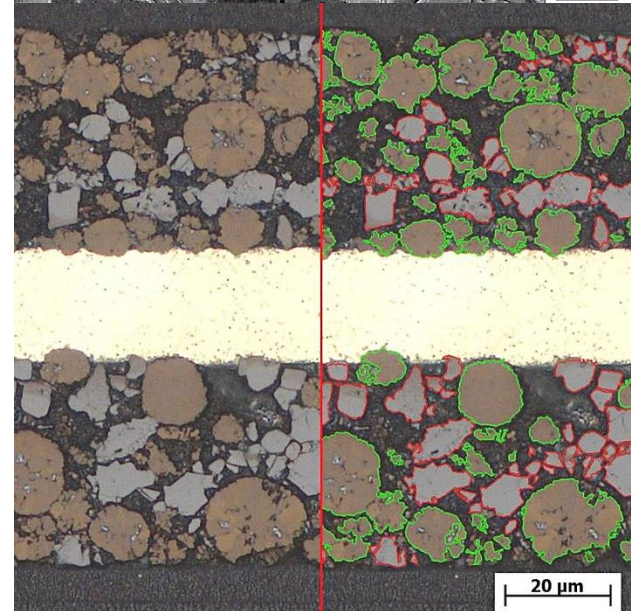
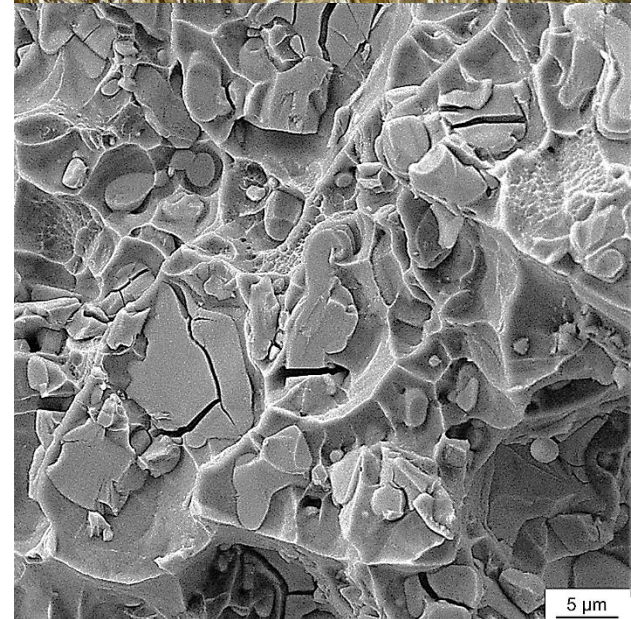
- Serial metallographic specimen preparation at highest quality with cold or warm embedding
- Special preparation of coating out of thin and thick layers in all types of material
- Chemical or thermic etching and physical contrasting e.g. sputtering
- Macro-, micro- and nano-hardness testing including hardness profile
- All types of materials e.g. steel, aluminum, titanium-alloys, non-ferrous metals, hard/soft magnets, ceramics composite materials, polymers, carbon fiber composites
- Samples out of components or whole devices e.g. motors, tools, conductor boards, actuators, sensors, components with soldered and welded connection

## Light- and electron microscopy, tomography

- Latest light- and scanning-electron-microscopy for easy routines and special methods such as MosaiX, EDX, EBSD, WDX, FIB
- Automated large-scale image acquisition and correlative microscopy
- Non-destructive 3D-computertomography e.g. for target dipping, quality control, benchmark analysis

## Material engineering assessment

- Materialographic analysis including expert evaluation as a presentable document
- Quantitative texture analysis e.g. purity degree of steel, porosity distribution, particle size distribution, according to different standards
- All operations are solution-oriented and cost efficient, on request as raw-data only
- Short handling times, on request as fast as possible with express handling
- You set the goals ...  
... we deliver methods and solutions.



# Technical Equipment

## Preparation technique and hardness testing

- Wet-cutting machine for fine and rough cuts
- Struers grinding and polishing machine
- Struers electrochemical preparation, Buehler vibration-polishing machine, Leica ion-polishing machine
- Carl Zeiss Crossbeam FIB with laser preparation
- Different hardness testers for macro- and microhardness

## Light optical and scanning electron microscopy

- Macro-analysis and stereo microscopy
- Carl Zeiss light microscopy, automated with scanning-stages, hardware autofocus etc.
- Multiple Carl Zeiss scanning electron microscopes with the latest technology
- Fast and precise analysis, e.g.: EDX, WDX, EBSD, Crossbeam-FIB, ATLAS 3D

## Computed tomography

- Phoenix v|tome|x s computer tomography
- Two x-ray tubes: nano focus (180 kV), micro focus (240 kV) for e.g. steel components
- Resolution of detail approx. 1  $\mu\text{m}$  (nanofocus-tube)
- Max. sample dimension approx. 250 mm

## Microscopy- and analysis software

- Microscopy software Carl Zeiss AxioVision, Zen 2 Core, Imagic IMS-image data base
- Volume Graphics VGStudio, AVIZO 3D Software for quantitative 3D-analysis
- Special Matworks software-tools

In collaboration with Aalen University, Materials Research Institute

