

# SCIENTIFIC TECHNICAL SERVICES

## GfE Fremat GmbH Diagnostics Services

### METALLOGRAPHY

#### Sample preparation

- abrasive cutting machinery  
Discotom-6/Accutom/diamond wire saw
- cold, warm and UV embedding
- cutting and polishing using a semi-automatic preparation technique Abramin/Tegramin
- material-specific microstructural contrasting/etching (chemical)

Our preparation has the aim of achieving the best possible quality including a high rate of reproducibility and the efficient utilization of time and materials.

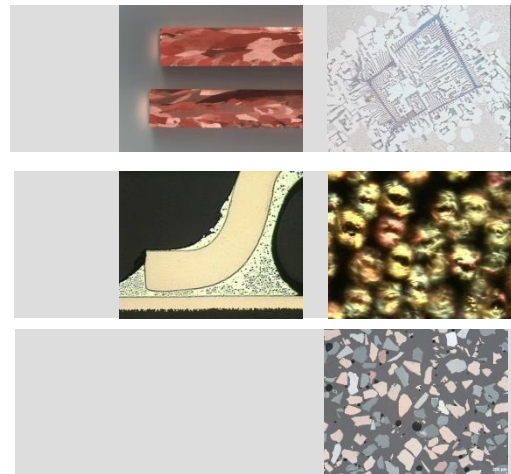


#### Evaluation and documentation

Modern image archiving

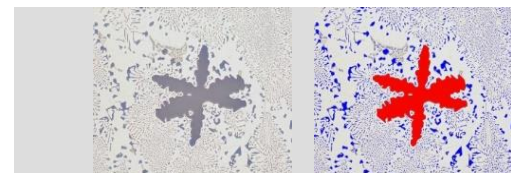
- digital camera (macro photography)
- stereomicroscopy
- light microscopy (Axiovert CA25; Neophot 32)  
bright field, dark field, polarized light, fluorescence contrast, differential interference contrast
- reporting in digital and paper form
- determination of coating thickness\*
- grain size analysis\*
- client support and consultation by the responsible employee or a team of experienced company staff

\* in accredited field



#### Quantitative Metallography

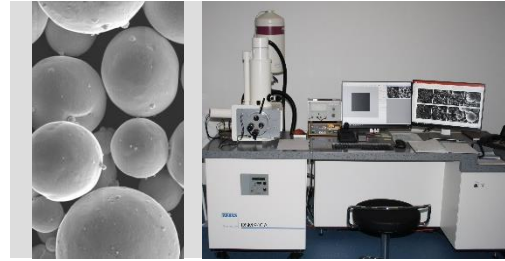
- analysis software  
Grain size analysis of single and multiphase materials.  
Analysis of phase fractions and porosities etc.



## MICROANALYSIS

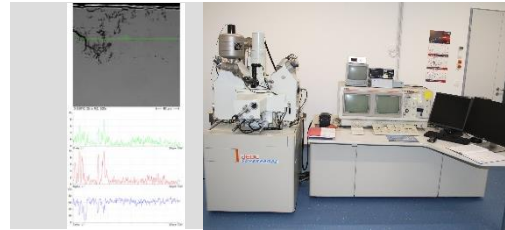
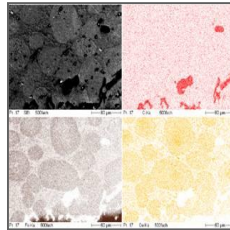
### Scanning electron microscopy (DSM 940A)

- investigations of surfaces and micro-sections by means of high magnification
- elemental scanning maps
- linescans
- energy dispersive analysis (EDX)



### Microprobe (JEOL Superprobe) with wavelength dispersive (WDX) and energy dispersive analysis (EDX)

- element determination by means of high resolution
- elemental scanning maps
- linescans



## MATERIAL TESTING

- hardness measurements based on various methods (HV\*, HB\*, HM, HRC – KB250 u, v-test, fischerscope)
- tensile\* and pressure tests (AGG100kN Shimadzu; inspect table 50kN)
- tearing tests (wire)
- adhesion tests\*
- heat treatment in laboratory annealing systems with temperature regulation and monitoring

\* in accredited field



## PHYSICAL EXAMINATIONS

In the physical laboratory, the spray powders, the sprayed layers and other materials are characterized by different methods:

- laser diffraction (wet/dry)
- determination (pure, bulk, vibration or hydrostatic density)
- rill ability
- dilatometric measurements up to 1600 °C

