

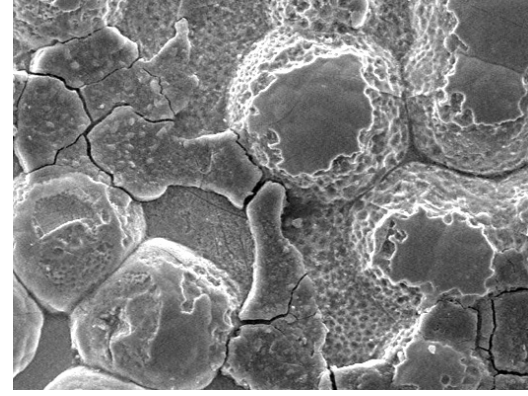
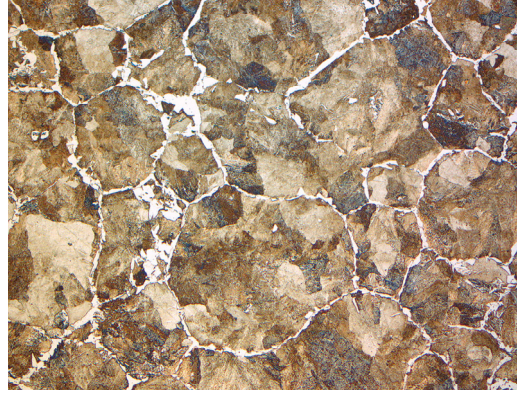
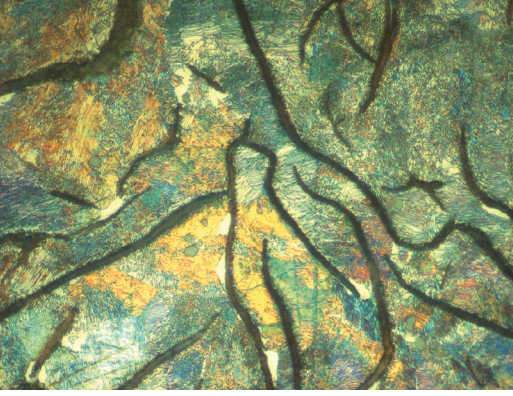
Metallography

Metallography for industrial and consumer goods

Metallography is a discipline of metallurgy. Its task is the qualitative and quantitative description of the structure of metallic materials by means of microscopic methods. Due to the increasing number of composites and the emergence of new, further developed materials, the term „materialography“ has also prevailed, since this covers the entire material spectrum. For our material examiners and metallographers, very good knowledge of the materials science and the properties or the processing of metals is indispensable, in order to avoid errors in the preparation of the samples and the later structure assessment. We investigate and evaluate the most diverse metallic materials in order to solve material-related problems in the areas of development, quality assurance or damage analysis.

Our range of services in the field of metals includes

- ▶ **Grinding preparation** (macro- and micro-grinding)
- ▶ **Structural evaluation** (structural analysis, heat treatment state, hardness profile, edge decarburization)
- ▶ **Determination of non-metallic inclusions** (DIN 50602, DIN EN 10247, ASTM E45a)
- ▶ **Weld seam analysis** (dimensional inspections, structural examinations (cracks, voids), assessment of irregularities in thermal joining processes according to DIN EN ISO 5817 and DIN EN ISO 13919-1)
- ▶ **Material determinations of metals/non-ferrous metals** (Optical Emission Spectroscopy (OES)/Chemical determination of alloy components
 - Low alloy steel
 - High-alloy steel
 - Aluminum wrought and cast alloys
 - Copper/brass/bronze
 - Magnesium
 - Titanium + titanium alloys
- ▶ **EDX analysis with REM analysis/microanalysis and structural analysis for the determination of the chemical composition of impurities and alloy components**
- ▶ **Hardness tests**
- ▶ **Microsection microstructural examination**
 - Particle size determination
 - Determination of porosity according to VW 50093, VW 6093
 - Primary silicon-crystal evaluation
- ▶ **Break analysis/crack investigation** (breakage, continuous fracture, brittle fracture, hydrogen embrittlement)
- ▶ **REM line scan and mapping**
- ▶ **Microphotographic determination of the recognizable grain size of steel** according to DIN EN ISO 643
- ▶ **Microstructure of cast iron** according to DIN EN ISO 945-1



- ▶ **Arc welded joints on aluminum and its alloys - evaluation groups of irregularities** according to DIN EN ISO 10042
- ▶ **Standard specifications of nickel-cobalt steels** according to ASTM F15 - 04
- ▶ **Determination of grain size** according to ASTM E112 - 13
- ▶ **Toothed gears** according to ISO 14104 - abrasive fire test - chemical method
- ▶ **Implants for surgery** according to DIN EN ISO 5832 - Metallic materials - Part 3: Wrought titanium 6-aluminium 4-vanadium alloy"
- ▶ **6-line X-ray restorative analysis**
- ▶ **Layer thickness measurement in cross section** according to DIN EN ISO 2808
- ▶ **Carrying out the Strauss test** according to DIN EN ISO 3651-2 with subsequent microscopic evaluation
- ▶

We perform the following hardness tests

- ▶ Rockwell according to DIN EN ISO 6508-1
- ▶ Brinell according to DIN EN ISO 6506-1
- ▶ Vickers according to DIN EN ISO 6507-1
- ▶ Vickers micro-hardness test according to DIN EN ISO 6507-1
- ▶ Vickers hardness profile tests:
 - CHD according to DIN EN ISO 2639
 - SHD according to DIN EN ISO 10328; DIN ISO 15787

Other services you can profit from

As a central and international DEKRA laboratory service provider, our experts offer an interdisciplinary range of tests covering chemical safety and material quality. These include environmental and hazardous material analyses, pollutant and emission tests of consumer goods and technical products, tests of operating materials and components, material analyses of plastics and metals, material tests, environmental simulation tests and damage analyses. Our DIN EN ISO/IEC 17025 accredited laboratories of DEKRA Automobil GmbH in Germany are located in Bretten, Halle, Saarbrücken and Stuttgart. In addition, we offer a variety of further testing and certification options in our worldwide DEKRA laboratory network.

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