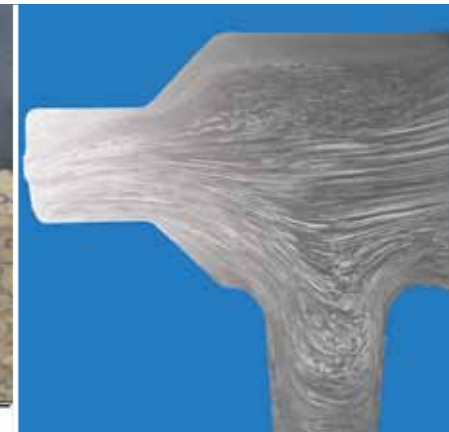
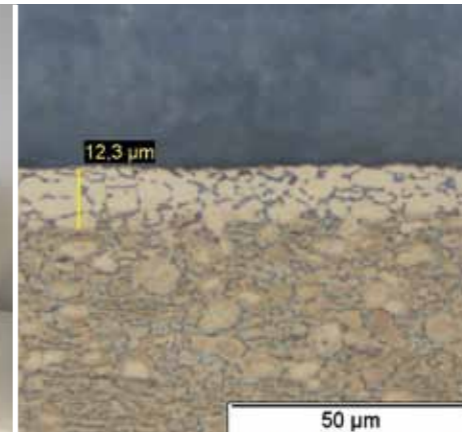
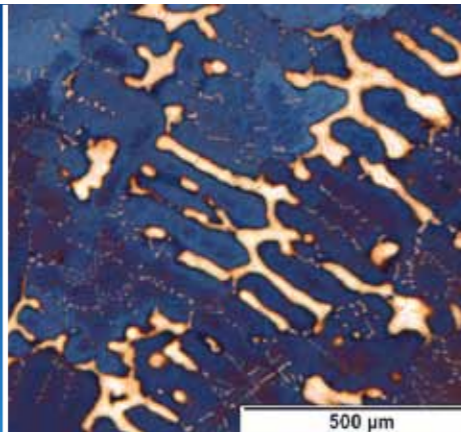




WHEN YOU NEED TO BE SURE **AEROSPACE TESTING**





WHEN YOU NEED TO BE SURE

The aerospace industry is one of the most exciting industries of the world. New technologies and new materials provide excellent products, outstanding performance and safety – on a global scale.

Performance and safety demands require materials and component testing according to the high quality standards of the aerospace industry.

SGS is your qualified partner for release testing of components from the aerospace industry. SGS also offers you comprehensive services in the areas of auditing, supply chain quality, R&D support as well as failure and damage analysis.



Materials Testing Laboratory

NADCAP - RELEASE TESTING

In a worldwide cooperation program the major aerospace manufacturers have introduced Nadcap in order to ensure compliance with the high quality standards. The SGS lab in Dortmund has received Nadcap certification from the Performance Review Institute (PRI), which recognizes it as a qualified partner for Nadcap Approval Tests. Aerospace industry and its suppliers can now rely on a qualified partner for product release testing.

On the basis of the Nadcap certification within the scope of Materials Testing Laboratories (MTL) SGS in Dortmund carries out metallographic investigations and hardness testing on metallic materials according to the following Nadcap test codes

- L Metallography (General)
- L1 Microindentation (Vickers)
- L2 Near Surface Examinations – Alloy Depletion
- L5 Near Surface Examinations – Microindentation (Vickers)
- L8 Alpha Case: Wrought Titanium
- L10 Near Surface Examinations – Carburization
- L11 Metallography (Other)
- LS Surface Conditions
- XL Metallography (Macro)
- M3 Vickers Hardness

Selected examples for tests from our Nadcap portfolio

- Structure analysis e. g. testing of heat treatment or grain size determination from metallographic specimen
- Layer thickness determination also on rugged interfaces, i. e. local variable layer thickness
- Evaluation of remelting and recasting layers
- Determination of the alpha case layer thickness on components made of wrought titanium
- Vickers hardness tests on surfaces, in bulk material as well as in the surface near regions

You will benefit from our Nadcap services through permanent and temporal cost reduction by outsourcing of tests e. g. in case of capacity overload. We are present for all independent test laboratory requirements.

TESTING AND DAMAGE ANALYSIS

An interdisciplinary team of engineers, technicians and scientists offers our customers from the aerospace industry target oriented solution strategies. Our DIN EN ISO/IEC 17025 accredited test laboratory in Dortmund is available to serve you with highest quality standards. We support you in the evaluation of systems, components and their materials, in R&D related questions or in complex failure analysis.

METHODS

In the business partnership with SGS you have access to all modern procedures of preparation, testing, and analysis e. g.

- Materialographic specimen preparation incl. microstructure evaluation, thin cross-sections, microtome sections or focused ion beam preparations (FIB) of materials and components of all kind
- All light microscopy imaging techniques in reflection and transmission including digital microscopy
- Scanning electron microscopy (SEM) with energy dispersive X-ray spectroscopy (EDX)
- Glow discharge optical emission spectroscopy (GDOES)
- Surface analysis by TOF-SIMS, XPS and AES
- Chemical polymer analysis by FT-IR, DSC, TGA, DMA, GPC, HP-LC and GC-MS
- 3D computerized tomography and radioscopy
- Scanning acoustic microscopy (SAM) and ultrasonic immersion testing
- Mechanical technological tests

By means of these methods and our expertise we safeguard you and your products.

METALLIC MATERIALS

In aerospace engineering metallic materials have to meet high requirements with respect to temperature gradients, chemical attack, and mechanical stress. In addition to quality control SGS supports its customers with all kind of metallographic investigations for feedstock testing or even in damage case.

Especially against the background of our Nadcap certification our metallographic laboratory provides the most modern laboratory equipment. We prepare and evaluate all metallic materials.

Selected examples for tests on metallic materials

- Metallographic investigations e. g. on turbine blades: microstructure, diffusion effects, surface structure, welded joints
- Characterization of damages as a result of cracking, fracture or shear, e. g. caused by severe temperature gradients, materials fatigue or excessive internal stresses
- Characterization of fatigue e. g. plastic deformation as a result of shear of stressed joints, like e. g. rivets or welded joints
- Characterization of functional coatings concerning layer quality, coating defects, delamination, corrosion, composition and coating structure, e. g. on engine components coated with DLC, nitrides or cubic boron nitride

COMPOSITE MATERIAL & POLYMERS

The simultaneous formation of the component and its material is the most significant feature during CFRP processing. This synthesis resulting in high anisotropic material characteristics requires state-of-the-art testing technologies, in order to ensure zero-defect series products.

Safety relevant failures e. g. fiber mat undulations, porosities in the prepreg laminates or delaminations can be characterized by methods in non destructive testing (NDT).

In addition to the classic NDT methods, e. g. ultrasonic testing, thermography or X-ray radioscopy SGS offers innovative methods e. g. high resolution 3D computerized tomography or scanning acoustic microscopy (SAM), in order to detect defects in the internal CFRP structure.

Destructive testing is used to analyze porosities, coating errors, separations or micro cracks in more detail by cross sectioning and subsequent microscopic evaluation.

Selected examples for investigations on composite based materials

- 3D computerized tomography for the characterization of process failures like delaminations, voids or undulations
- Determination of prepreg layer orientation by means of materialographic sections and/or computerized tomography
- Investigations on sections of coated carbon fiber reinforced polymer (CFRP) components for characterization of coating errors e. g. paint spots, craters and separations.

ELECTRONICS

Every pilot at all times must be able to rely on the aircraft systems, the electrical and electronics on board. We analyze e. g. control units, sensors, actuators, printed circuit boards or connectors for electromagnetic compatibility (EMC), and expose them to mechanical and/or climatic stress tests or carry out failure analysis. Our laboratories are accredited by RTCA/DO-160, MIL-STD-461 and MIL-STD-810.



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