We are your ideal partner with regard to national and international testing requirements, whether for materials, components or structures. Our engineers will be pleased to help you implement testing programs and assist with the standardisation and certification of materials.
C(T)-SPECIMEN ACCORDING TO ASTM E1820

MICROSTRUCTURE ANALYSIS

TECHNOLOGICAL TESTS

3D COORDINATE MEASUREMENT

CHEMICAL ANALYSIS

MIXED MODE LOADING

MEASUREMENT OF FATIGUE CRACK GROWTH RATES ACC TO ASTM E647

FRACTURE TOUGHNESS TESTS

TESTING UNDER MEDIAL INFLUENCE

CRACK FACE ANALYSIS

FRICITION AND WEAR TESTING

MICROSTRUCTURE ANALYSIS

TECHNOLOGICAL TESTS
At the beginning of a design phase, the question of materials selection arises. The selected material forms a basis and must withstand a wide variety of stresses and strains in later use. Mechanical testing provides you with the ideal basis for determining the material performance that you require for your project.

**MECHANICAL TESTS**

**STATIC LOAD TESTING**
- Tensile test
- Fracture toughness
- Compression test
- Bending test
- Torsion test
- Shear test
- Stress rupture test
- Bearing test
- Hardness test (Brinell, Rockwell, Vickers)

**CYCLIC LOAD TESTING**
- Fatigue test (HCF, LCF, TMF)
- Determination of cyclic deformation curves
- Determination of S-N curve (Wöhler)
- Fracture mechanics/crack propagation
- Fracture mechanics/determination of threshold value

**SURFACE QUALITY TESTING**
- Profilometry
- Roughness parameters

**IMPACT LOAD TESTING**
- Charpy impact test
- Pellini test
- Impact/crash test

**TECHNOLOGICAL TESTING**
- Connection elements testing
- Junkers test (bolted joints)
- Soldered, brazed and welded joints
- Riveted and adhesively bonded connections
- Component testing
CHEMICAL ANALYSIS
The laboratory has various spectrometers for qualitative and quantitative element analysis. We can identify materials and components with regard to the type of material or check the element content requirements. By local analysis, it is possible to identify corrosion products, operating residues or wear particles, for example.

<table>
<thead>
<tr>
<th>TEST SPECTRUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Optical emission spectroscopy (Al, Cu and Fe materials)</td>
</tr>
<tr>
<td>- EDX analysis (local element analysis)</td>
</tr>
</tbody>
</table>

TRIBOLOGICAL TESTING
Friction and wear behaviour of materials or coatings can have a considerable influence on the functionality of a part or of the entire component. Our test laboratory determines the application behaviour of the test objects for you, by having regard to technological parameters, and advises you on how to optimise the service life of your product.

<table>
<thead>
<tr>
<th>TEST SPECTRUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Testing the abrasion resistance (of metals, plastics, ceramics and coatings)</td>
</tr>
<tr>
<td>- Determining the friction coefficient</td>
</tr>
<tr>
<td>- High-speed abrasion testing</td>
</tr>
<tr>
<td>- Component oriented test rigs</td>
</tr>
</tbody>
</table>

TESTING UNDER MEDIAL INFLUENCE
Environmental and chemical influences during the production and use of your materials and components can adversely affect the quality of the products. In our test laboratory, we determine the loading capacity of the test objects under real and extreme conditions in accordance with generally accepted standards or to your individual specifications.

<table>
<thead>
<tr>
<th>TEST SPECTRUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Steels (intergranular corrosion: Huey test or Strauss test, for example)</td>
</tr>
<tr>
<td>- Aluminium materials (intergranular corrosion: ASSET test, for example)</td>
</tr>
<tr>
<td>- Aluminium materials (exfoliation corrosion, e.g. NAMLT test)</td>
</tr>
<tr>
<td>- Metals (stress corrosion)</td>
</tr>
<tr>
<td>- Metals used in aerospace applications (intergranular corrosion, pitting corrosion)</td>
</tr>
<tr>
<td>- Mechanical with medial influences</td>
</tr>
</tbody>
</table>

SAMPLE MANUFACTURING
Our machining centre enables us to produce samples according to your requirements. From raw materials, semi-finished products and components, we produce high-quality test specimens according to national and international regulations or according to your specifications, regardless of whether the materials are high-strength metallic materials, ceramics, plastics or composite materials.

<table>
<thead>
<tr>
<th>TEST SPECTRUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Abrasive cutting methods</td>
</tr>
<tr>
<td>- Waterjet cutting</td>
</tr>
<tr>
<td>- Automated grinding, turning, milling and drilling machines</td>
</tr>
<tr>
<td>- Eroding</td>
</tr>
<tr>
<td>- Blast cleaning</td>
</tr>
<tr>
<td>- 3D coordinate measurement of sample tolerances</td>
</tr>
<tr>
<td>- Application of strain gauges and crack monitoring films</td>
</tr>
</tbody>
</table>
MATERIALOGRAPHY

In our laboratories, we examine both metallic and non-metallic materials. The following standard preparation and analysis techniques are available for examining the microstructure, surface structure and surface layer structure and, if necessary, the damage characteristics. Based on this, we can answer your questions regarding development, quality assurance and damage assessment.

TEST SPECTRUM

- Light and scanning electron microscopy
- Evaluation of the microstructure
- Evaluation of the welded, soldered and brazed seam quality
- Determination of grain size
- Determination of inclusion content
- Measurement of layer thickness
- Surface layer characteristics (decarburisation, alpha case, corrosion, oxidation)
- Determination of cell sizes (PUR), homogeneity (PE) and carbon black dispersion (PE)

DAMAGE ANALYSIS

Experienced material engineers are supporting your damage cause clarification on machines, facilities or components. The type of damage and its origin are identified with the help of mechanical, material-analytical and materialographic examination methods. We put you into the position to clarify an occurred damage, e.g. caused by unsuitable materials selection, overloading, heat treatment inconsistencies, corrosion, friction or wear.

ADDITIONAL SERVICES

In our own NDT laboratory, but also at your premises, we can make statements regarding the quality of your metal and plastic test objects. Our test personnel are qualified according to ISO 9712 and EN 4179.

NONDESTRUCTIVE TESTING

- Ultra sonic test (UT)
- Eddy current test (ET)
- Magnaflux test (MT)
- Penetration test (PT)
- Optical test methods (ARAMIS, PONTOS)
- Visual inspection
- Tap test
- Thermography (TT)

SOFTWARE SOLUTIONS

We have the ideal solution and customised training for you – whether for simulation and calculation or for the administration of your test and material data in a specially developed database.

WIAM® ICE

The WIAM® software products assist you in finding and comparing information and presenting it graphically. Most importantly, they allow networking of this information within the company, thus promoting innovation.

WIAM® FATIGUE RIFEST

Determine calculated arithmetical proof of strength for mechanical engineering parts with WIAM® fatigue RIFEST in accordance with the recognised FKM guideline. This is a calculation algorithm with a uniform structure for all applications and is used by analysis and design engineers in the field of mechanical engineering and related areas of industry.
PUTTING THE WORLD TO THE TEST

IMA Materialforschung und Anwendungstechnik GmbH (IMA Dresden) is an internationally operating company for engineering services and scientific-technical consulting around qualification, validation and monitoring of materials, components and products. Located between research and industry, we will accompany you, if desired, along the entire development of a product with comprehensive engineering competence. As we work in many sectors involving traffic engineering, plastics and metal industry and others, we can offer you a head-start with our comprehensive know-how.

We work according to German, international standards and we are certified according to DIN EN 9100 and ISO 14001. Nearly all relevant test laboratories are accredited according to DIN EN ISO/IEC 17025. The test labs have most modern test-, measure- and control technology over an area of more than 10,000 m² test field.

BENEFIT FROM THE COMPETENCE OF IMA DRESDEN FOR YOUR MATERIALS TESTING.

As an independent test provider we guarantee reliable results and strict confidentiality. Our credo of thinking and acting like our customers was not carelessly formulated. It contains an earnest pursuit of engineering perfection, which merges intelligent solutions with sustainable usable result at fair prices. This, of course, also includes the flexibility to respond to all kinds of request and, in doing so, to provide peak performances which are not possible elsewhere. Each of our employees bears a portion of this responsibility.

Please do not hesitate to contact us for any questions or inquiries at ima@ima-dresden.de

CONTACT

Thomas Mottitschka  
Materials Testing  
Tel.: +49 (0)351 8837-587  
Fax: +49 (0)351 8837-530  
thomas.mottitschka@ima-dresden.de

Dr. Bernd Donat  
Materials Special Testing  
Tel.: +49 (0)351 8837-590  
Fax: +49 (0)351 8837-530  
bernd.donat@ima-dresden.de

Marco Klemm  
Materialography  
Tel.: +49 (0)351 8837-2248  
Fax: +49 (0)351 8837-530  
marco.klemm@ima-dresden.de

Imprint  
IMA Materialforschung und Anwendungstechnik GmbH  
Wilhelmine-Reichard-Ring 4 • 01109 Dresden

Follow us:  

www.ima-dresden.de  

Photo credits:  
Page 1) test bench: JazziRT/iStock//background: everythingpossible/iStock  
Page 2) from l.t.r: Mrs ya/Shutterstock/sykonos/iStock//JazziRT/iStock//Page 4) JazziRT/iStock//Page 5) technological testing: Mrs ya/Shutterstock//„chemical composition testing: ktjxowls/iStock//„testing under medial loading“, „wear test“: sykonos/iStock  
Page 6) background: Vixit/Shutterstock