BOSSARD
Proven Productivity

Expert Test Services

Assembly Technology Expert

EXPERT TEST SERVICES

“Bossard has ISO/IEC 17025-accredited test laboratories on three continents.”

Customers benefit from laboratory know-how and the most modern measuring and testing facilities. They form the basis for reliable quality assurance and product quality.

EXPERT TEST SERVICES

Content

"The independent confirmation of characteristic values of components and products is taking on an increasingly important role in today's market environment."

WHEN YOU WANT TO BE SURE

The accredited testing laboratory for fastening technology

The correct specification plays an important role in many areas of fastening technology. Bossard meets this challenge with state of the art testing laboratories all around the world.

Competent partner

Your goods must meet the requirements of your target market. Identifying and meeting these requirements is a difficult challenge. We help you, no matter where and in what industry you operate.

Documented safety

Many machines and devices must meet certain precautions before they can be used. The fasteners used often play a crucial role in this. Therefore for critical applications written proof that the fasteners have the prescribed strength and many other properties is required.

Tested quality

When developing products, you need a proven and independent inspection to ensure that the requirements and high standards expected of you are complied with at every stage. We help you in risk reduction and quality assurance as well as the fulfillment of the relevant and statutory requirements for your components and products.

Independent, accredited test authority

Independence means we provide accredited testing laboratory services in the USA, Europe and Asia in accordance with internationally recognized standards and offer a very reliable quality of services. We reduce the risk for you and your customers and give you complete confidence that we are committed to quality on the strength of our expertise and efficiency.

On the following pages please find Expert Test Services we offer to our customers. Not all are provided in every country but for all challenges we find solutions within our network.

A BENCHMARK FOR PERFORMANCE

Global competence

Take advantage of numerous Bossard quality and testing laboratories around the world, three of which are accredited independent test centers, and of our global expertise with a focus on fastening technology.

You can find Bossard's 14 quality and test laboratories in Europe, America and Asia.

"We are determined to exceed the requirements of our global customers and to give them maximum added value."

"Reliable measurement results from your Bossard quality and test laboratory."

EXPERT TEST SERVICES

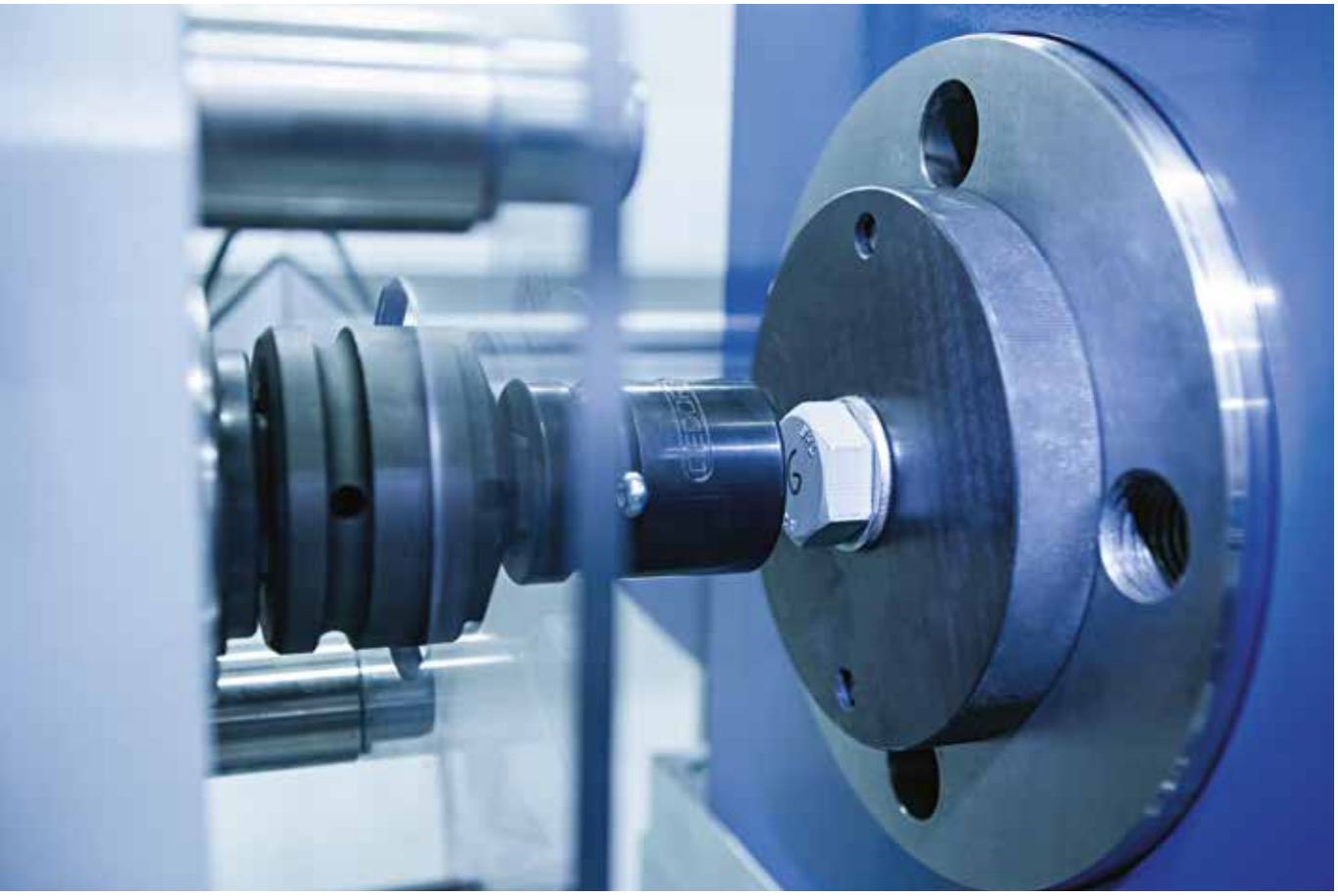
Tensile and compression strength testing

- The tensile test is a standardized material testing procedure.
- The yield point, tensile strength, elongation at fracture and other mechanical characteristics can be determined.
- Our measurement / test range:
  - Testing machine 1: M3 – M33 with max. 600 kN.
  - Testing machine 2: Universal brackets with max. 50 kN.

EXPERT TEST SERVICES

Hardness tests / hardness profile measurements

- Testing of case hardness, hardness profile, surface hardness, core hardness.
- Testing of mechanical properties.
- Primarily measure indentations are used.
- Our measurement / test range:
  - Micro hardness: HV0.01 – HV1
  - Macro hardness: HV1 – HV100
  - Rockwell hardness: HRC



EXPERT TEST SERVICES

Friction coefficient testing / torsion testing

- To know the clamping force of your bolted joint is essential.
- By knowing the friction coefficient, the clamp force and tightening torque is determined.
- Friction appears in the thread, under the screw head and on the nut contact side.
- Friction absorbs 80 % of the tightening torque.
- We recommend performing friction coefficient testing to ensure process capability of screw tightening.
- On our friction coefficient test benches, we measure from 1 Nm – 4000 Nm.
- To get a statistical value we recommend verifying 12 test samples per joint.

EXPERT TEST SERVICES

Torque analysis

- The torque analysis can be done in our **laboratories or mobile** at our customer's location.
- Know the process reliable tightening torque of your application.
- Use your original working pieces made of plastics and metals.
- For thread forming screws no given tightening torques are available, therefore tightening torque needs to be evaluated and depends on:
  - Material strength,
  - Length of thread engagement,
  - Hole diameter,
  - Clamping part,
  - Friction,
  - And more.
- On our test bench, tightening torques in the range of 0.1 – 150 Nm can be evaluated our mobile measuring sensors torques from 0.1 Nm to 1500 Nm.
- The delivered tightening torque can vary depending on the assembly tooling and the "hardness" of the joint.

EXPERT TEST SERVICES

Coating thickness measurement

- The coating thickness is measured by X-ray.
- For verifying and ensuring the required protective coating thicknesses.
- Our measurement / test range:
  - Zinc-, nickel-, chrome-, zinc flake-, gold and silver coating etc.
  - Measurable up to three coats.

EXPERT TEST SERVICES

Spectral analysis

- Identification of a wide range of materials.
- Quality control of semi-finished and finished products.
- Our measurement / test range for elements based on:
  - Fe: 31 different elements
  - Al: 31 different elements
  - Cu: 29 different elements
  - Ni: 21 different elements
  - Ti: 14 different elements

EXPERT TEST SERVICES

Fastening optimization

- Sometimes it is not easy to find the right fastener.
- The range of suitable fasteners is huge and may influence the subsequent processes.
- Unnecessary or incorrectly specified fasteners raise costs in the supply chain as well as in production and assembly.
- We support you with the service in choosing the optimal fastener for your application.
- If desired, we provide you with the right specifications too.

EXPERT TEST SERVICES

Loosening analysis

- For highly loaded bolted joints the right clamping force is essential.
- To retain clamping force over the lifetime of the joint, especially joints under heavy vibration, additional securing may be needed.
- There are many ways of securing a bolted joint all depending on the securing element and its function.
- The following factors, among others, have be considered:
  - Vibrations.
  - Forces to transmit.
  - Temperature of use.

EXPERT TEST SERVICES

Corrosion analysis

- Corrosion can appear on many components as well as fasteners.
- Apart from optical and mechanical problems it leads to customer claims.
- To avoid corrosion a certain background knowledge is indispensable.
- Reliable countermeasures will eliminate or reduce any corrosion.
- Many kinds of corrosion protection systems make the selection difficult.
- We support you in finding the right corrosion protection system in materials and coatings.

EXPERT TEST SERVICES

Salt spray test

- Corrosion resistance test.
- Comparison of different corrosion preventive coatings.
- Salt spray testing is a standardized test for the evaluation of the corrosion protection.
- In the test chamber test pieces will be sprayed by a saline solution.
- Test procedure will last up to 1000 hours.
- Our measurement / test range:
  - EN ISO 9227 NSS (salt spray test).
  - EN ISO 6270-2 AT (alternating condensation atmosphere).

EXPERT TEST SERVICES

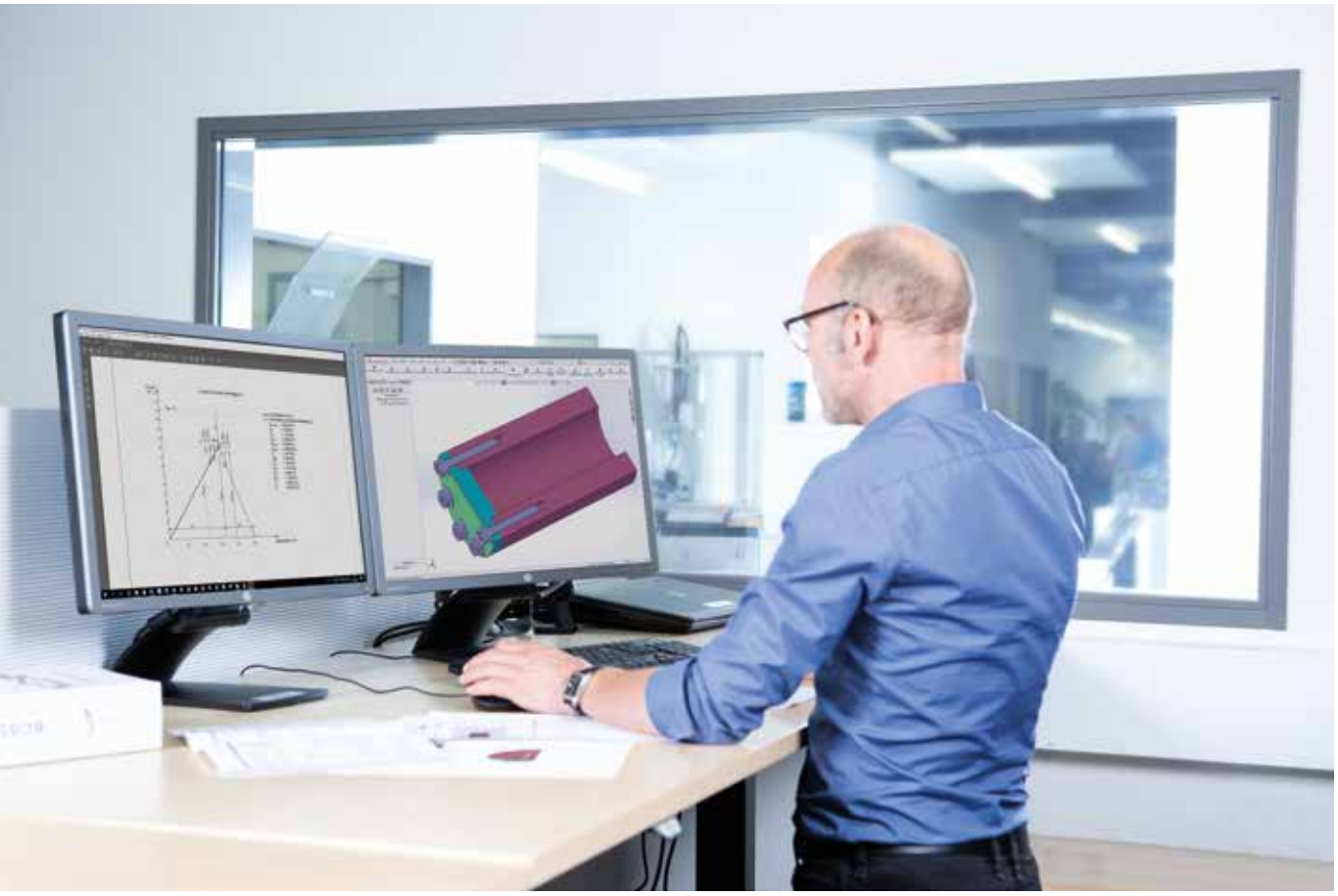
Ultra-sonic preload measuring

- The right clamping load is essential for the function of heavy duty bolted joints.
- When tightening a screw, it generates a pre-load, which is strongly influenced by friction and applied assembly tooling.
- Therefore, the generated pre-loads can vary enormously.
- Measuring of pre-load/clamping force cannot be done easily.
- With a special ultra-sonic measuring device, the change of the length of the screw can be evaluated.
- By knowing this change the pre-load can be diagnosed very precisely.
- We are able to conduct measurements on-site at your application, as well a check of the pre-load after the usage is performed.
- Screws need to be prepared and calibrated upfront.

EXPERT TEST SERVICES

Failure analysis

- Failure of bolted joints can slow down or stop production.
- Changing to new screws is a fast but not very permanent solution.
- The root cause of joint failures can vary, such as:
  - Change of friction conditions.
  - Too high/low tightening torque.
  - Loss of pre-load due to setting.
  - Corrosion.
  - Additional operation load and many more.
- Finding the root cause is crucial in defining a solution and preventing future failures.
- We perform professional failure analyses supported by our test laboratories.



EXPERT TEST SERVICES

Joint design calculation

- Load and stress of critical bolted joints can be calculated.
- Observing recommendations from bolted joint calculations can prevent joint failure.
- Many key factors of bolted joints are considered in calculations, such as:
  - Contact surface pressure.
  - Variation of friction.
  - Method of assembly.
  - Different kind of expansion coefficient of components and fasteners.
- Our calculations are based on the MDESIGN tool.
- Recommendation in optimization potential is given for design and assembly, all based on independent judgment.

OUR SERVICE MODEL

Six Expert Services

Expert Test Services is one of the six Assembly Technology Expert services. With more than 185 years of experience in the fastening industry, we provide a wide range of engineering services. Each module contributes to improving your productivity.

Expert Walk

We take an in-depth look at your production facility. We examine all workstations and assembly lines. Our engineering experts study fasteners and tools you are using and determine how to proceed leaner and smarter.

Expert Assortment Analysis

To reduce your total cost of ownership, we streamline your bill of materials by identifying opportunities for fastener rationalization. We work with proven analytical processes, application audits and state-of-the-art methodologies and techniques.

Expert Education

We empower you to become an expert in the full range of assembly technologies. In our seminars and e-learning, you learn about the essentials and secrets of fastening, from novice level to mastery.

Expert Teardown

We disassemble your product and examine every inch of it. Focusing on the fasteners, their design, their functionality and their assembly procedure, we identify the best fastening solution and the cost-saving potential for you.

Expert Design

Having the right fastener at the right time at the right place is crucial for your success. We provide you with technical solutions and access to big data to find the most practical part for you.

Expert Test Services

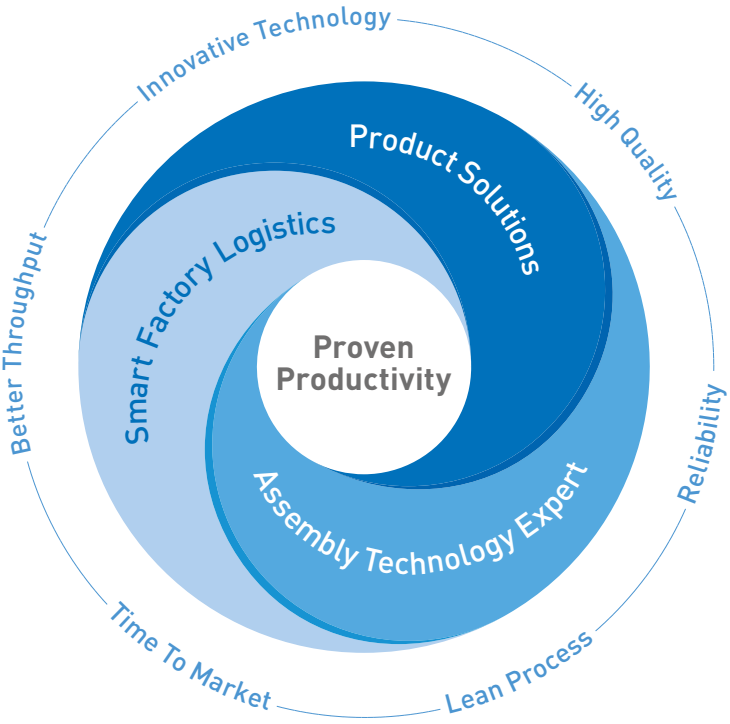
Bossard's test laboratories in Europe, America and Asia have cutting-edge measuring and testing equipment at their disposal. They guarantee that your manufacturing reliably meets quality requirements and that your production procedures are flawless.

"Expert Test Services is one of six Assembly Technology Expert services. Each part contributes to improving your productivity step by step."

Find out more at:
www.bossard.com

BUSINESS MODEL

Assembly Technology Expert as part of the whole



From years of cooperation with our customers, we know what makes a proven and sustainable impact. We have identified what it takes to strengthen the competitiveness of our customers. We therefore support our customers in three strategic core areas.

First, we find optimal product solutions by evaluating and selecting the best fastening part for the intended function in our customers' products.

Second, from the moment our customers begin to develop a new product, our Assembly Technology Expert services deliver the smartest solutions for all possible fastening challenges.

And third, we optimize our clients' production in a smart and lean way using Smart Factory Logistics, our methodology, intelligent logistics systems and tailor-made solutions.

Understood as a promise to our customers, "Proven Productivity" contains two elements: First, it demonstrably works. And second, it sustainably and measurably improves the productivity and competitiveness of our customers.

This philosophy motivates us each and every day to always remain one step ahead.

www.bossard.com