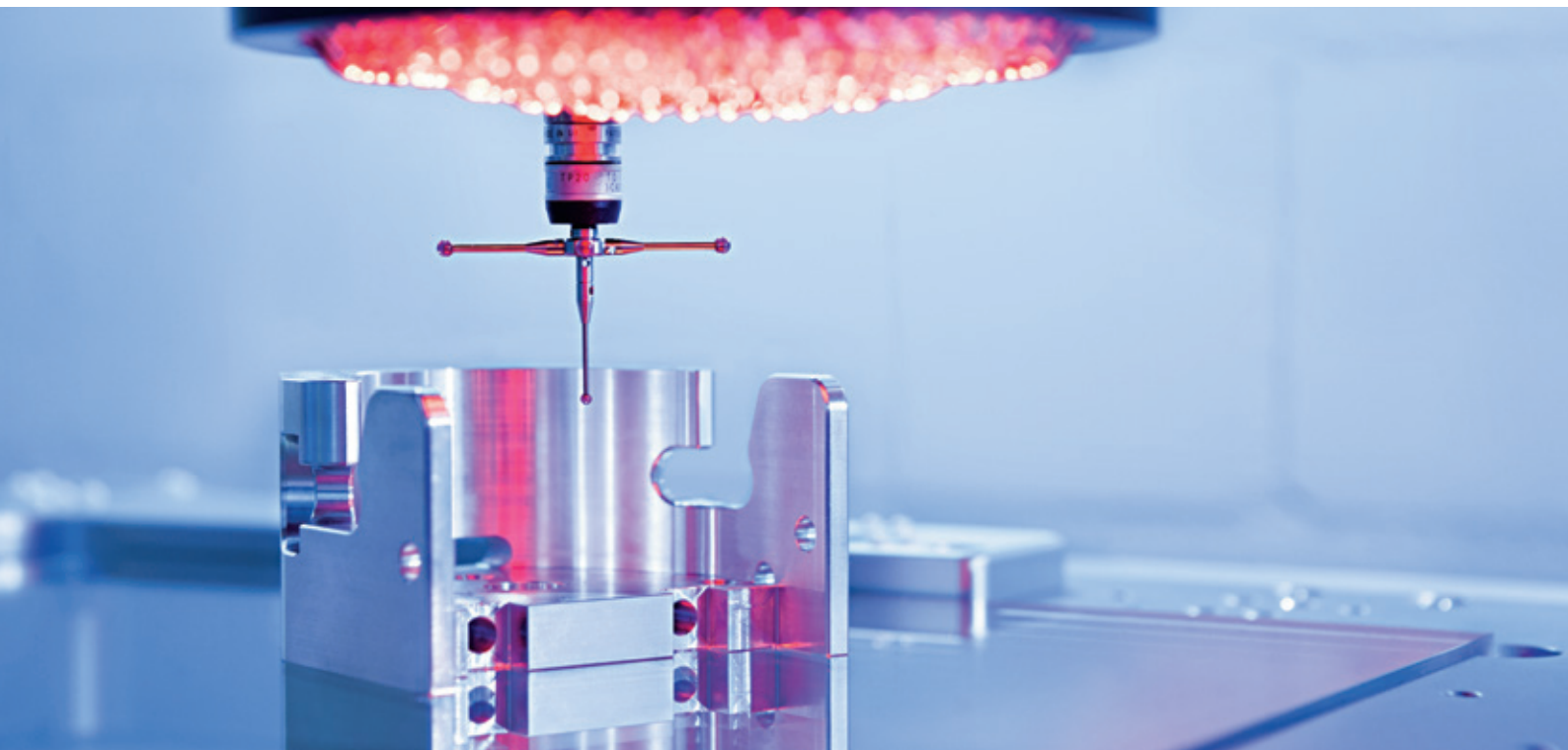


BOSSARD

Proven Productivity



Test laboratory

When you want to be sure



When you want to be sure

Bossard has ISO/IEC 17025-accredited test laboratories in all three regions of the world. Customers benefit from laboratory know-how and the most modern measuring and testing facilities. They form the basis for reliable quality assurance and sound product quality.

Bossard AG
Steinhauserstrasse 70
P.O. Box
CH-6301 Zug

Phone +41 41 749 66 11
Fax +41 41 749 66 22
labor@bossard.com
www.bossard.com



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T SERVICE SUISSE D'ESSAI
S SERVIZIO DI PROVA IN SVIZZERA
SWISS TESTING SERVICE



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Swiss site: Accredited, with the exception of multi-sensor technology

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Test laboratory

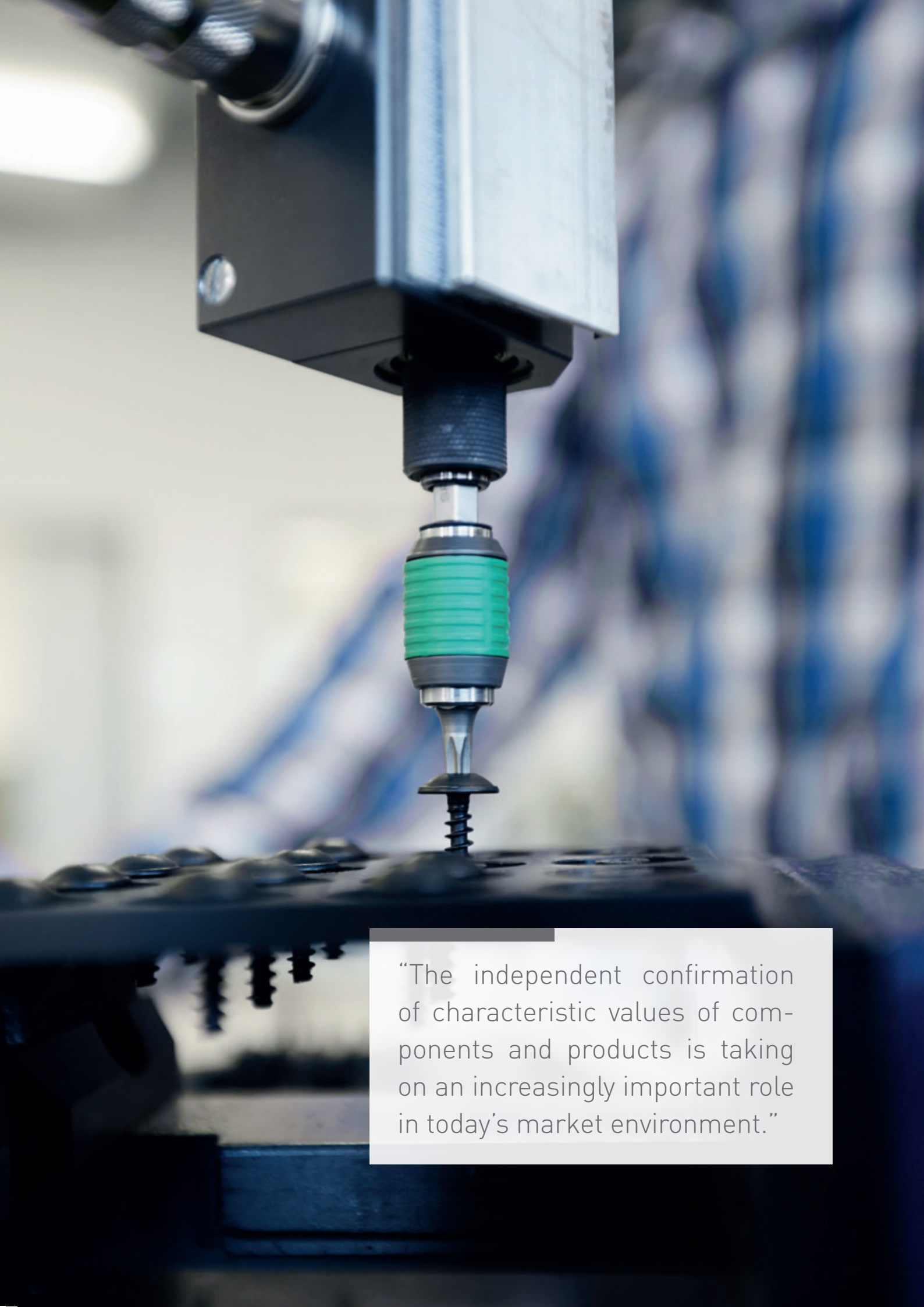
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“The independent confirmation of characteristic values of components and products is taking on an increasingly important role in today’s market environment.”

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 a state of the art testing laboratory.

Competent partner

To ensure that you have complete access to the market, your goods must meet the requirements of your target market. Identifying and meeting these requirements is a difficult challenge. Our services and our technical expertise in fastening technology help you in the process of understanding and satisfying the requirements of a market, 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. Thus for example for screws on pressure tanks in chemistry, fasteners in air- and space travel, bolts in track vehicles and much more.

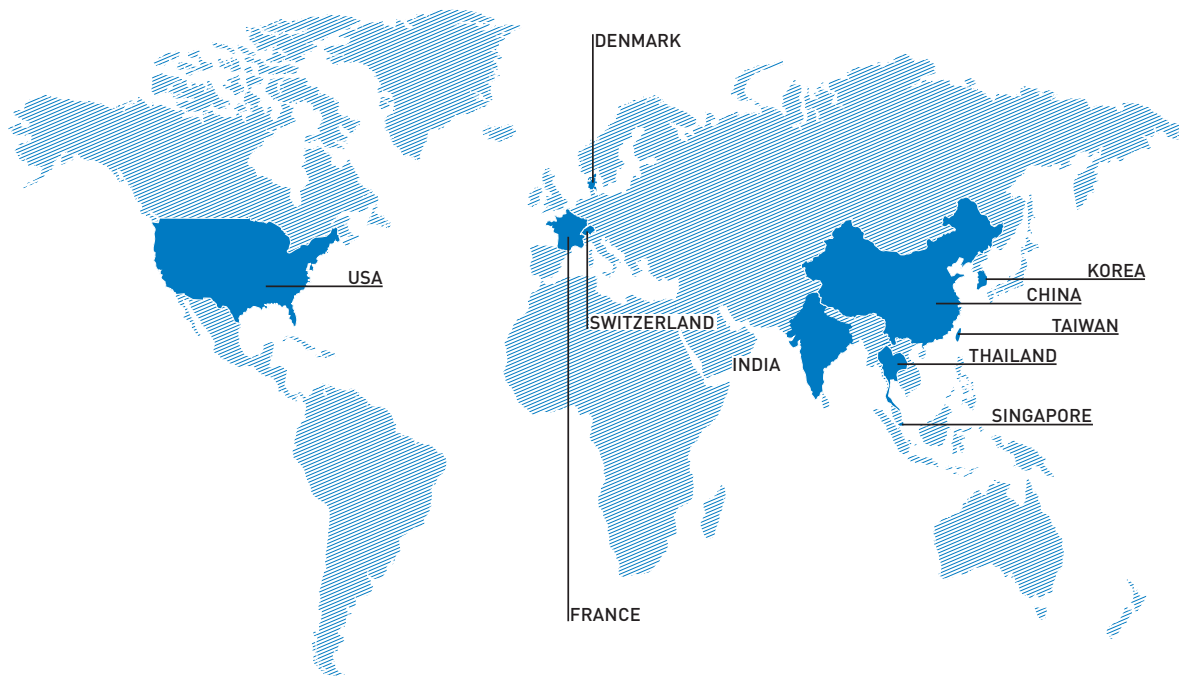
Tested quality

Whether developing products, projects or processes, you need a proven and independent inspection to ensure that both the legal requirements and high standards expected of you are complied with at every stage.

Our comprehensive range of leading test services for fastening technology, which are carried out by qualified and experienced staff, 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 that we have been accredited in accordance with internationally recognized standards and offer a very reliable quality of services. This gives you an additional guarantee that the certificates issued by us are reproducible and objective. 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. Our quality management is furthermore a guarantor of high product quality and competence, which you as a client can always rely on.



You can find the Bossard quality- and test laboratories in 10 countries around the world.

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

A benchmark for performance

Global competence

Take advantage of our ten 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.

Globally consistent quality

Take advantage of our technology sites to achieve fast access to foreign markets and innovative connection solutions while maintaining consistently high quality.

Quality is not just about technology. This means: We bring our global expertise to the customer and, no matter where in the world you are looking for market access, the Bossard quality and testing laboratories can be of benefit to you in obtaining approvals and certifications with expert advice, comprehensive expertise and all the necessary services.

Measurement results of the highest standard

In our quality- and test laboratories we use industry standards and individual customer requirements to go over your products with a fine toothcomb. In combination with ISO/IEC 17025 accreditation we have reliable competence in testing, which are both available to the customer for tests accompanying development, special tests and complete tests. Both nationally and internationally, laboratory accreditation is seen as a recognized and reliable indicator of technical competence. Clear adherence to normative specifications ensures that the measurement results delivered enjoy the highest level of confidence. This is also guaranteed by our competent specialist staff. Our customers can

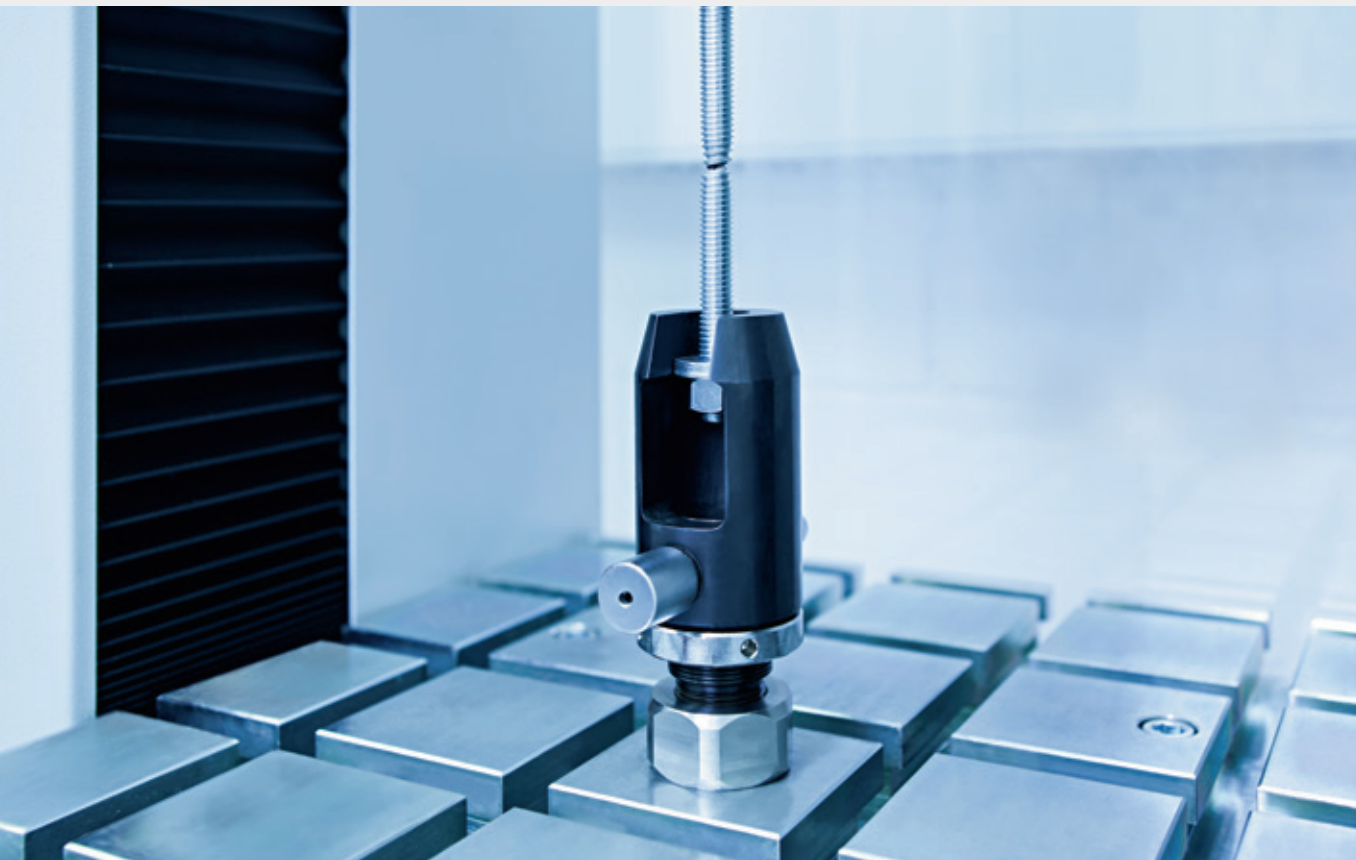
rely on a system of international agreements and achieve a form of international recognition. In this way their products can be accepted more easily on domestic and foreign markets. This recognition helps you in turn to reduce costs by the need for renewed inspections in another country being reduced or excluded.

To ensure that the products comply with the quality requirements of the customer, systematic advance quality planning is required. The Advanced Product Quality Planning process (APQP) accompanies the development of the product to ensure that all customer requirements are met in a timely manner.

The ISO/IEC 17025-accredited testing laboratory in Zug, Switzerland with its high-quality facilities allows you a variety of individual, complex and combined test methods, depending on customer requirements.

As a customer you benefit from a high reliability and reproducibility of the measurement results delivered, such as for example hardness- and strength tests, corrosion test, coefficient of friction and roughness measurements, coat thickness measurement and spectral analysis. Complementary engineering services complete the range.

So you can be sure!



Mechanical test methods

Tensile- and compression strength testing

Verification of mechanical properties

The tensile test is a standardized standard procedure in materials testing and is used to determine the yield point, tensile strength, elongation at fracture and other material characteristics. It belongs to the quasi-static, destructive test methods.

Measurement / test range

Testing machine 1:

Tensile test/test load
M3 - M33 max 600 kN

Testing machine 2:

Tensile test/test load / pull out tests
M3 - M6 max 50 kN



Mechanical test methods

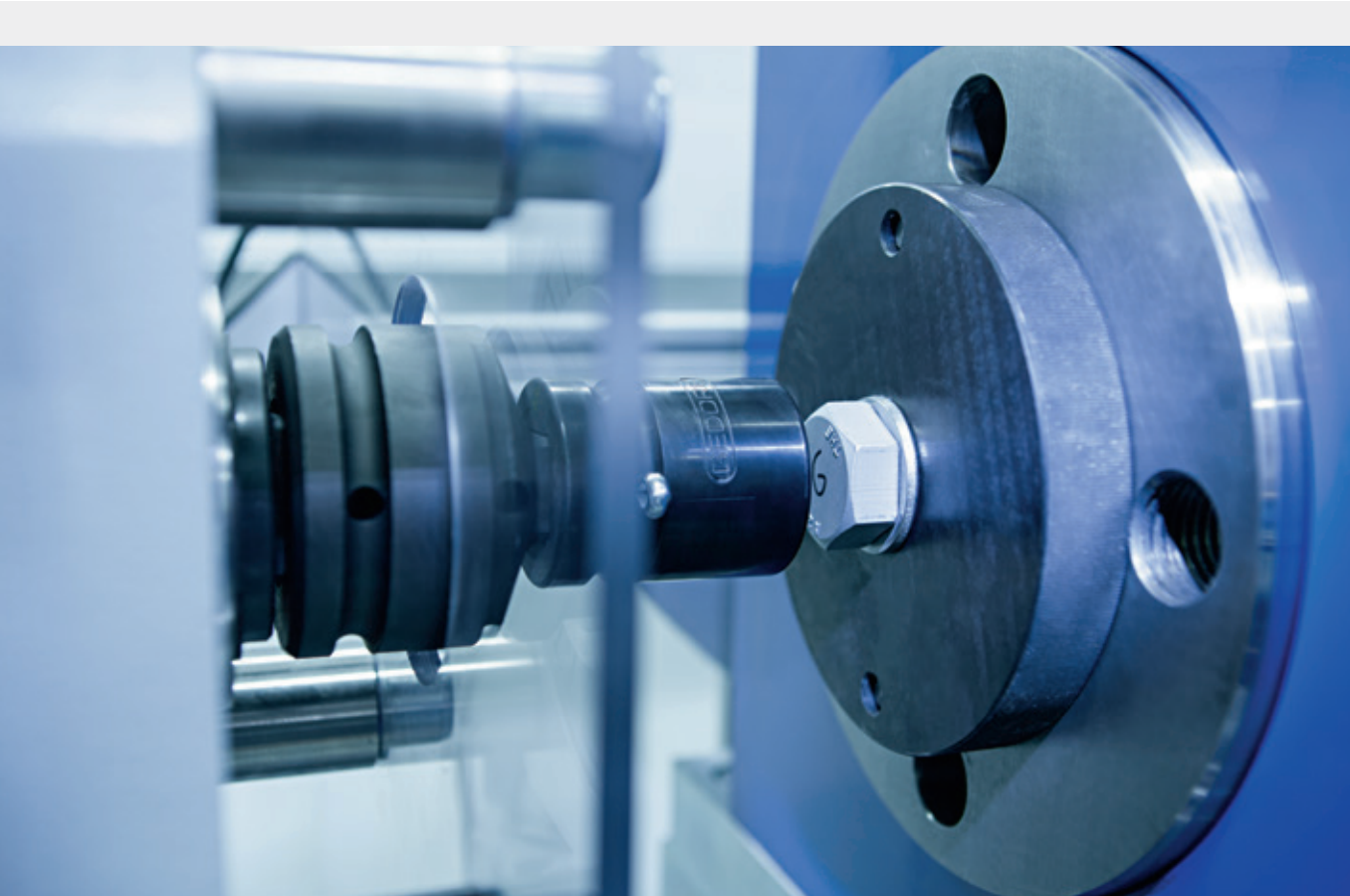
Hardness tests / hardness profile measurements

Testing of case hardness, hardness profile, surface hardness, core hardness and testing of mechanical properties.

In materials science, especially for metals, test methods are primarily used which measure indentation hardness. This involves standardized test pieces being pressed into the workpiece under set conditions. The surface or depth of the permanent indentation is subsequently determined.

Measurement / test range

Micro hardness: HV0.01 - HV1
Macro hardness: HV1 - HV 100
Rockwell hardness: HRC



Mechanical test methods

Frictional coefficient testing/torsion testing

- Ensuring process capability of screw mountings
- Output of pre-loading force / torque and friction values
- Statistical analysis with curve progression and corresponding table values
- Investigations of various factors influencing friction under specified conditions
- Checking the operation of thread locks

Measurement/test range

Measurement range: M3-M16 (max. 200kN/500 nm)

Measurement range: M20-M36 (max. 700kN/4000 Nm)



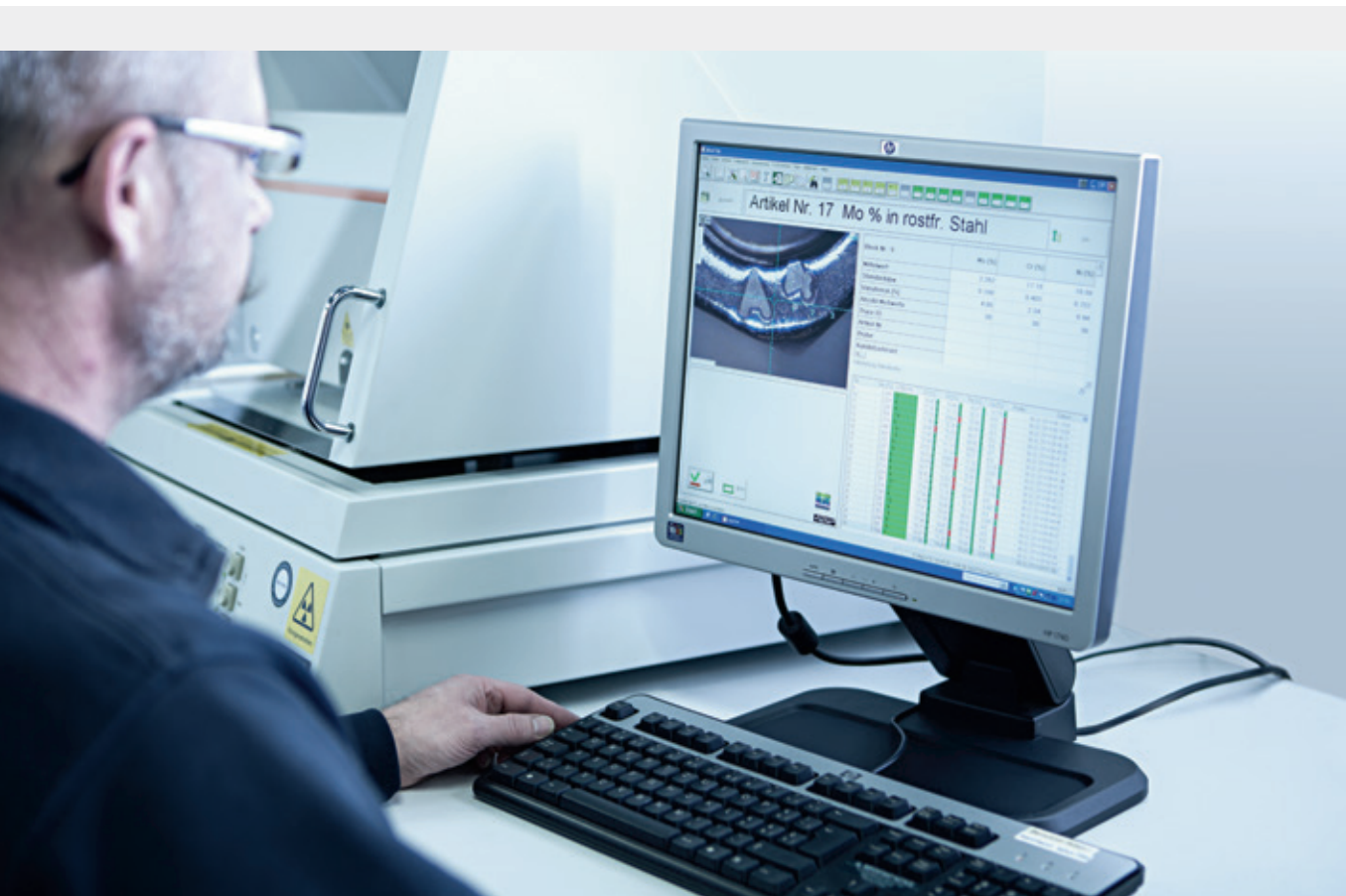
Mechanical test methods

Screw-in - and over-screwing tests

- Ensuring process-safe assembly
- Testing to determine tightening torques, e.g for directly screwing into plastic and metal
- Creep test of pre-stressing forces for determining run-down -, initial - and starting torque

Measurement/test range

Measurement range: 0.1 - 150 Nm/60kN



Geometric test methods

Coat thickness measurement

Coat thickness measurement and material analysis by means of X-ray fluorescence for verifying and ensuring the required protective coat thicknesses.

X-ray fluorescence is the emission of characteristic secondary (or fluorescent) x-rays from a material that has been stimulated with high-energy radiation. The phenomenon is used in X-ray fluorescence analysis for the determination of the elemental composition of metals.

Measurement/test range

Measurement range: Zinc-, nickel-, chrome-, zinc flake-, gold- and silver coating etc. (measurable up to three coats)



Chemical test methods

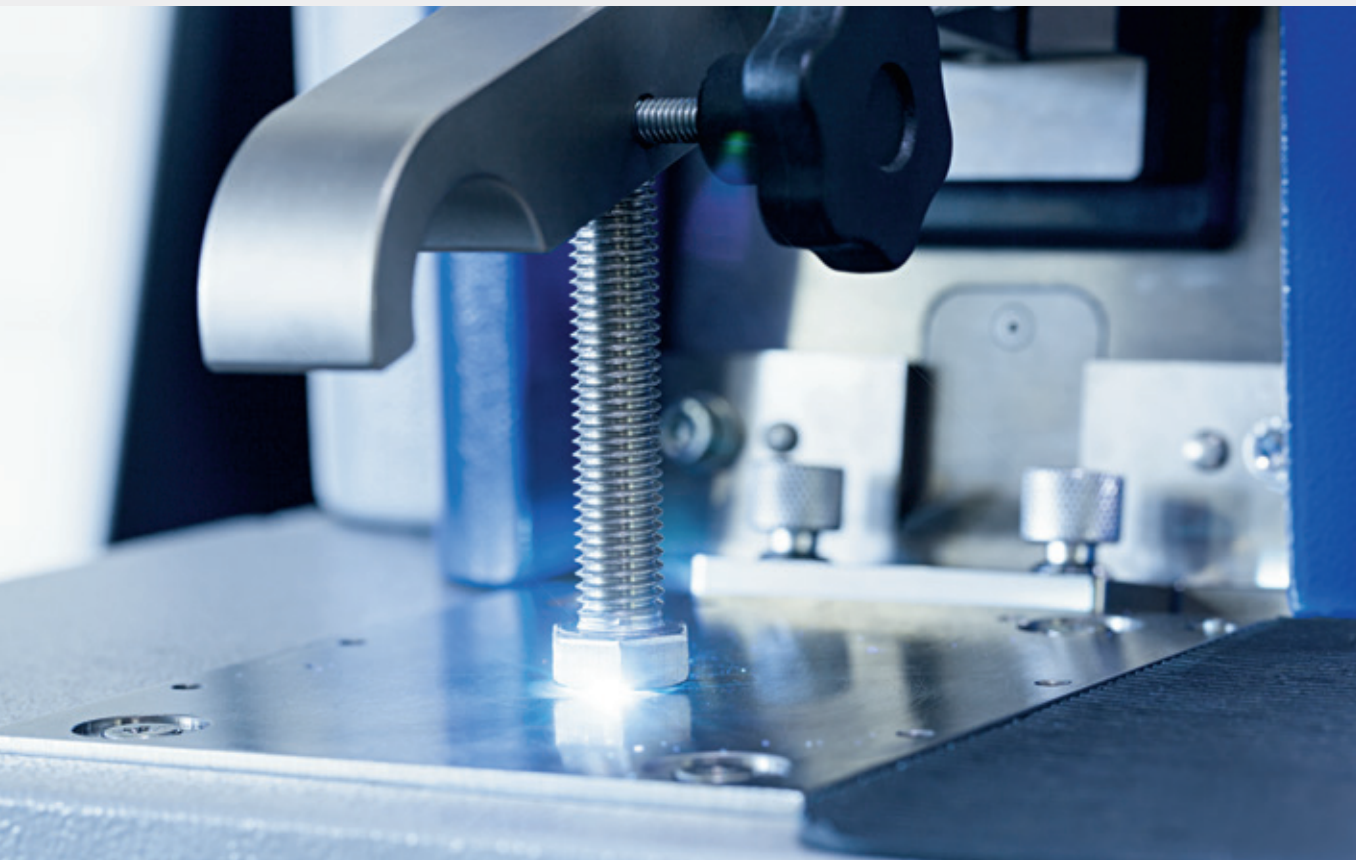
Environmental simulation

- Corrosion resistance test
- Comparison of different corrosion preventive coatings

Salt spray testing is a standardized test for the evaluation of the corrosion protection effect of organic coatings, metallic coatings, or chemical or physical surface treatments. Various national or international standards (e.g. DIN EN ISO 9227) govern the performance of this test. The test pieces are positioned under standardized conditions in a test chamber where a sprayed saline solution (normally a solution of sodium chloride) works on the test pieces for up to 1,000 hours.

Measurement/test range

Testing for EN ISO 9227 NSS (salt spray test) and EN ISO 6270-2 AT (alternating condensation atmosphere)



Chemical test methods

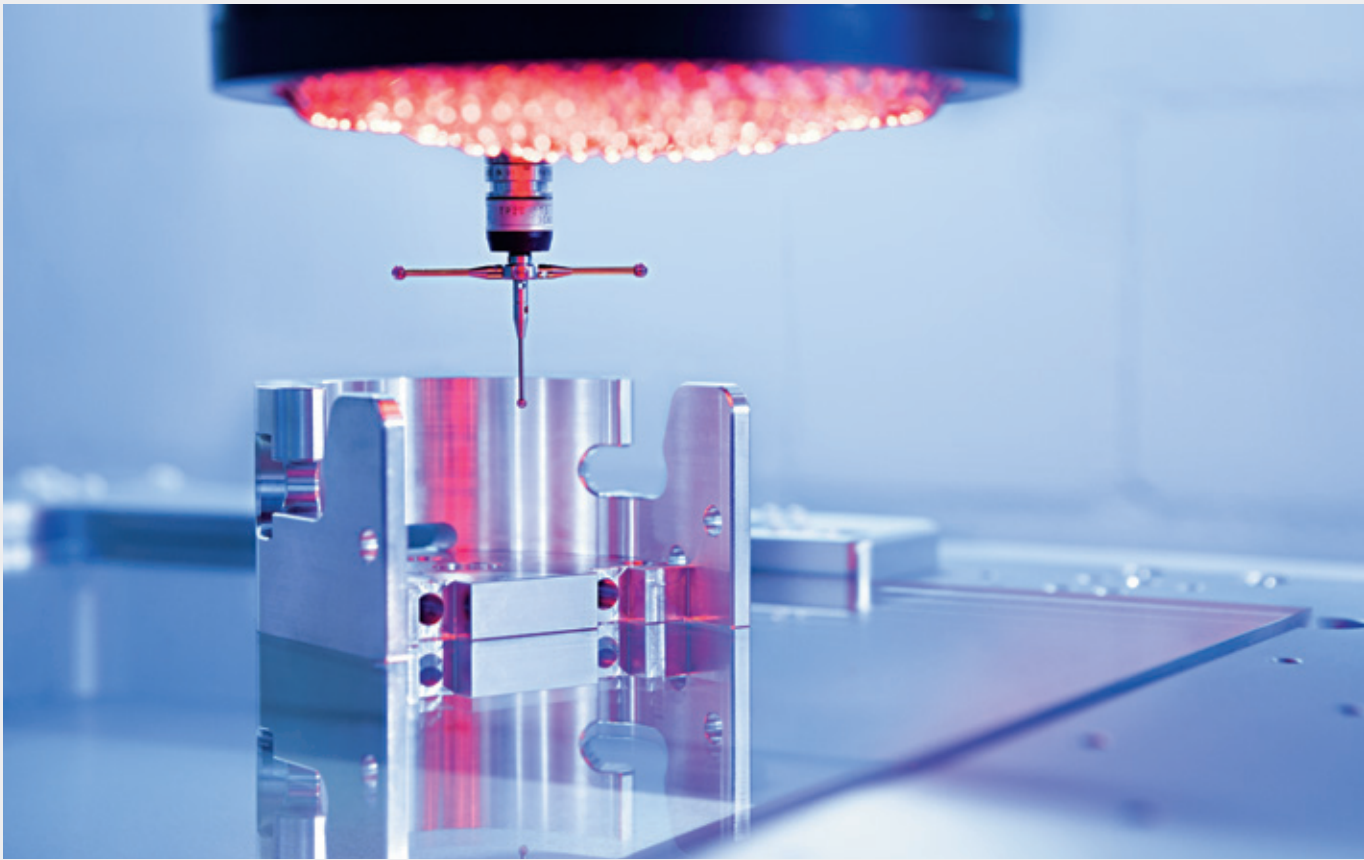
Spectral analysis

- Identification of a wide range of materials
- Quality control of semi-finished and finished products
- Incoming goods inspections
- EN 10204 test certificate for acceptance procedure test certificates

Measurement/test range

Measuring range for elements based on:

Fe: 31 different elements
Al: 31 different elements
Cu: 29 different elements
Ni: 21 different elements



Optical measuring method

Multi-sensor technology

The multi-sensor technology uses the advantages and strengths of multiple sensors to fully cover a measuring task. This involves linking measurement data from multiple sensors to a multi sensor data record. Optical sensors play a significant role in this process. These sensors measure very quickly and without contact, and are also suitable for sensitive components and surfaces. In addition, points measured by touch provide additional information about the object being measured.

Measurement / test range

Measurement range: 315×315×160 mm

Object being measured max. 10 kg

Precision: XY axis 2.6 + L/175

Z axis 3.0 + L/150



Visual test methods

Microscopic analysis and surface roughness

The roughness method, based on the profile method (surface measurement) is used to determine surface roughness. This includes a two - or three-dimensional profile of the surface is measured and using standardized procedures the various roughness parameters calculated that characterize the surface roughness.



“Reliable measurement results from your Bossard quality- and test laboratory.”

Complementary technical services

Joined-up expertise

The quality of the connection along the entire chain of added value, from manufacturer to use of the fastening parts, is an important prerequisite for your success.

Application engineering

Bossard Engineering offers specialist consultancy for optimizing all aspects of fastening technology. Even if it is a case of defining optimal, cost-effective and reliable fastenings at the development stage, we are your competent partner.



Transferring knowledge

Every year Bossard offers seminars in which you can learn about new trends and innovations in fastening technology. Furthermore, Bossard organizes [customer-specific seminars](#) which enable us to convey the themes of your applications and examples and demonstrate intelligent solutions for assembly- and fastening requirements.

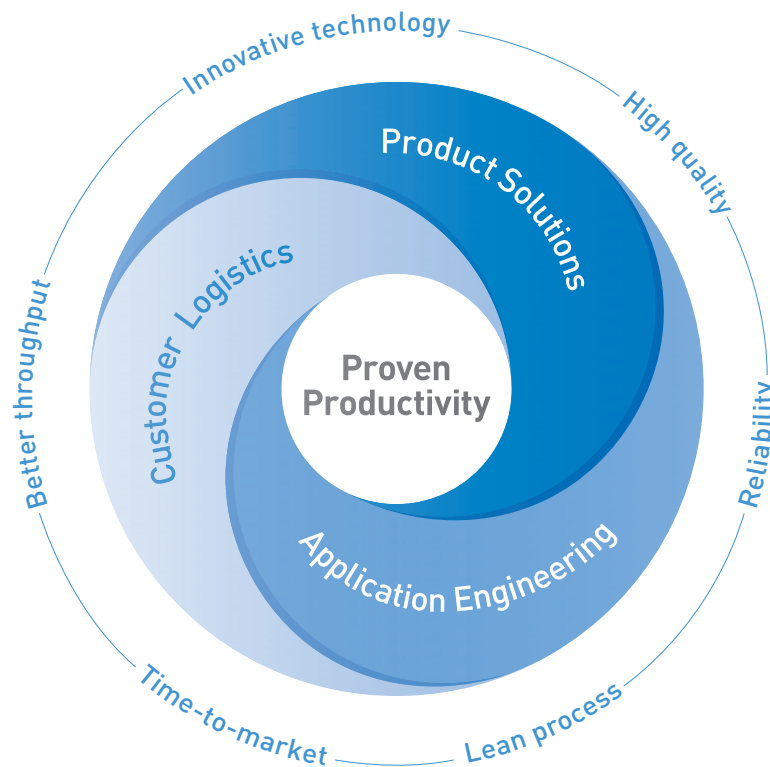


Online Expert Tools

Bossard's [calculators and converters](#) are intended for engineers, technicians, designers and students who work with the development and assembly of screw fasteners. The modern [CAD-Tool](#) will assist you in product- and design decisions with animations, two- and three-dimensional aspects of different detailed excerpts and other intelligent functions. Visit us at www.bossard.com or in the [app store](#).



The strategy for success



Proven Productivity – a promise to our customers

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


Firstly, when finding optimal [product solutions](#), that is in the evaluation and use of the best fastening part for the particular function intended in our customers' products.

Secondly, from the moment in which our customers begin to develop a new product, our [application engineering](#) delivers the smartest solutions

for all possible fastening challenges. And thirdly in the most streamlined [customer logistics](#), that is in the reduction or even elimination of procurement costs along our customers' entire supply chain.

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

And this for us is a philosophy which motivates us every day to always be one step ahead.



Bossard AG
Steinhauserstrasse 70
P.O. Box
CH-6301 Zug

Phone +41 41 749 66 11
Fax +41 41 749 66 22

labor@bossard.com
bossard.com