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## Railway

Smart solutions for the railway sector



«Fastening solutions for railway applications from A to Z. Bossard is your one-stop shop.»



## SMART SOLUTIONS FOR THE RAILWAY SECTOR

# Better connected

We are the experts for all fastening technologies in railway applications.

The railway sector is characterized by a rising demand for reliability, speed and punctuality. To make trains faster and more economical, light-weight materials are used increasingly. In addition, short throughput times in production and lean maintenance of the trains should be ensured. We understand these trends as well as the resulting challenges, and provide fasteners that meet the highest safety and quality standards, helping our customers increase their efficiency and productiv-

ity. Our engineers will be pleased to advise you in regards to alternative fastening solutions, innovative developments or specific material requisitions. If the best solution for your application does not yet exist, we will develop it with you in order to ensure that it meets your unique needs. On the following pages, we present a selection of our products and their main benefits for specific applications. Of course, many of the products can also be used in numerous other applications.



### One-stop shop

- Fasteners for train construction
- Fasteners for mechanical purposes



### Engineered parts

- In-house engineering know-how
- International network of specialized partner companies



### Optimal delivery conditions

- We are on the spot with more than 70 subsidiaries worldwide
- Short response and delivery times
- E-Shop for all catalog products



### Own testing laboratories

- ISO/IEC 17025-accredited test laboratories in 10 countries around the world.
- Comprehensive mechanical, optical, geometric and chemical test methods



### Professional consulting

- Comprehensive engineering services
- Customer trainings for fastening solutions



### Smart Factory Logistics

- B- and C-part management
- IoT ready
- Smart, lean and reliable

SMART SOLUTIONS FOR THE RAILWAY SECTOR

# Applications

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## Supply units (p. 6)



## Railcar body (p. 8)



## Bogie (p. 10)

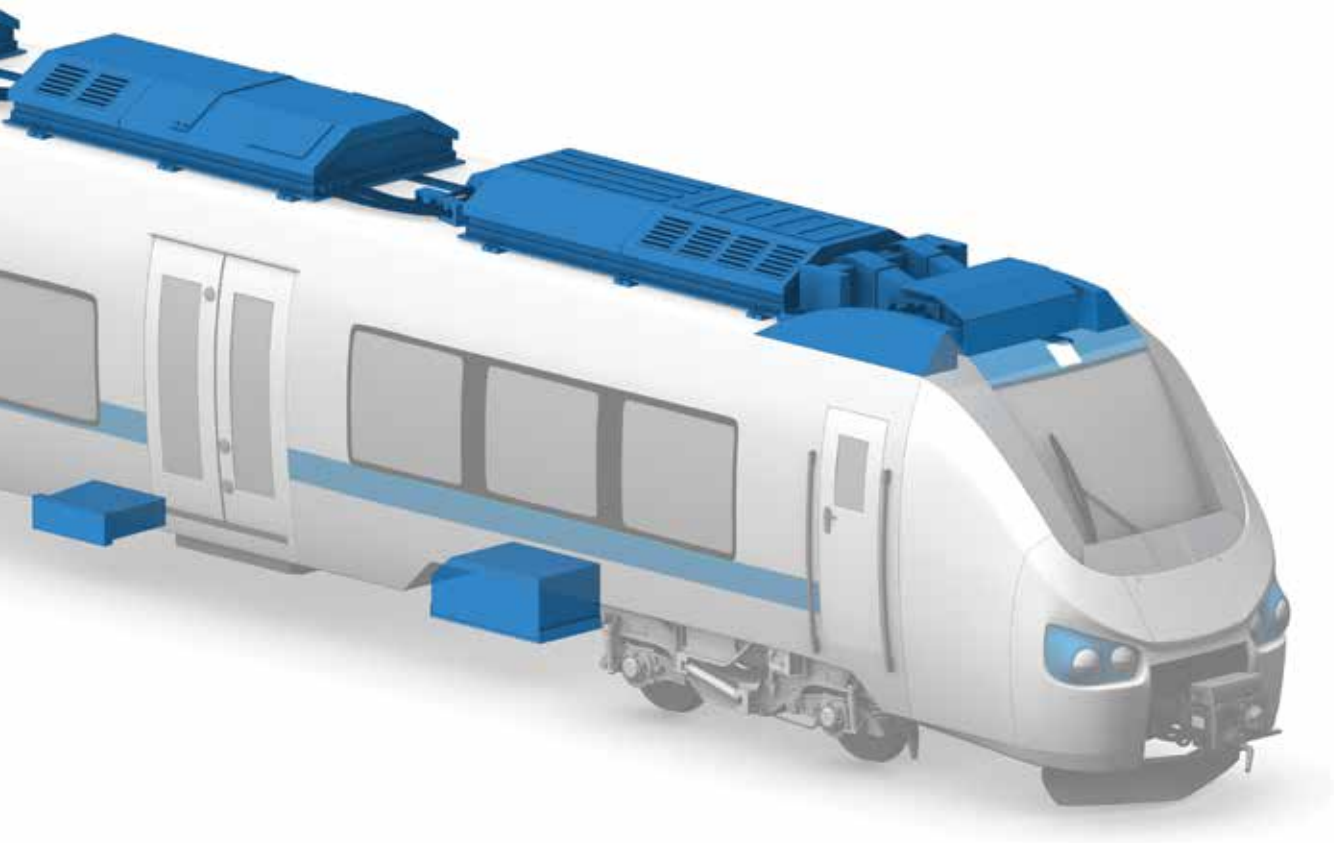


Energy supply (p. 16)



Interior (p. 12)





## SAFETY AND MAINTAINABILITY

### Supply units

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In this application, the comfort of the passengers as well as a fast accessibility for maintenance and inspection of the equipment are paramount.

The connecting elements must above all be:

- Quickly replaceable
- Captive
- Reusable for assembly and disassembly
- Suitable for easy and safe mounting

## SUPPLY UNITS

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### CABLE GLANDS

Cable glands for safe mobility

- For highest demands on fire behavior
- Versions certified for the railway industry in brass and plastic
- Product range streamlining thanks to high sealing and clamping areas



### COMPRESSION LATCHES

Designed for quick and safe installations

- Industry proven latches reduce maintenance costs
- Made of corrosion resistant steel
- Vibration-resistant closing mechanism



### HOSE CLAMPS

Heavy-duty clamps for the most demanding assemblies

- Can be mounted without removing the hose
- Beveled edges protect the hose from damage
- High-strength bolt with captive nut and spacer system

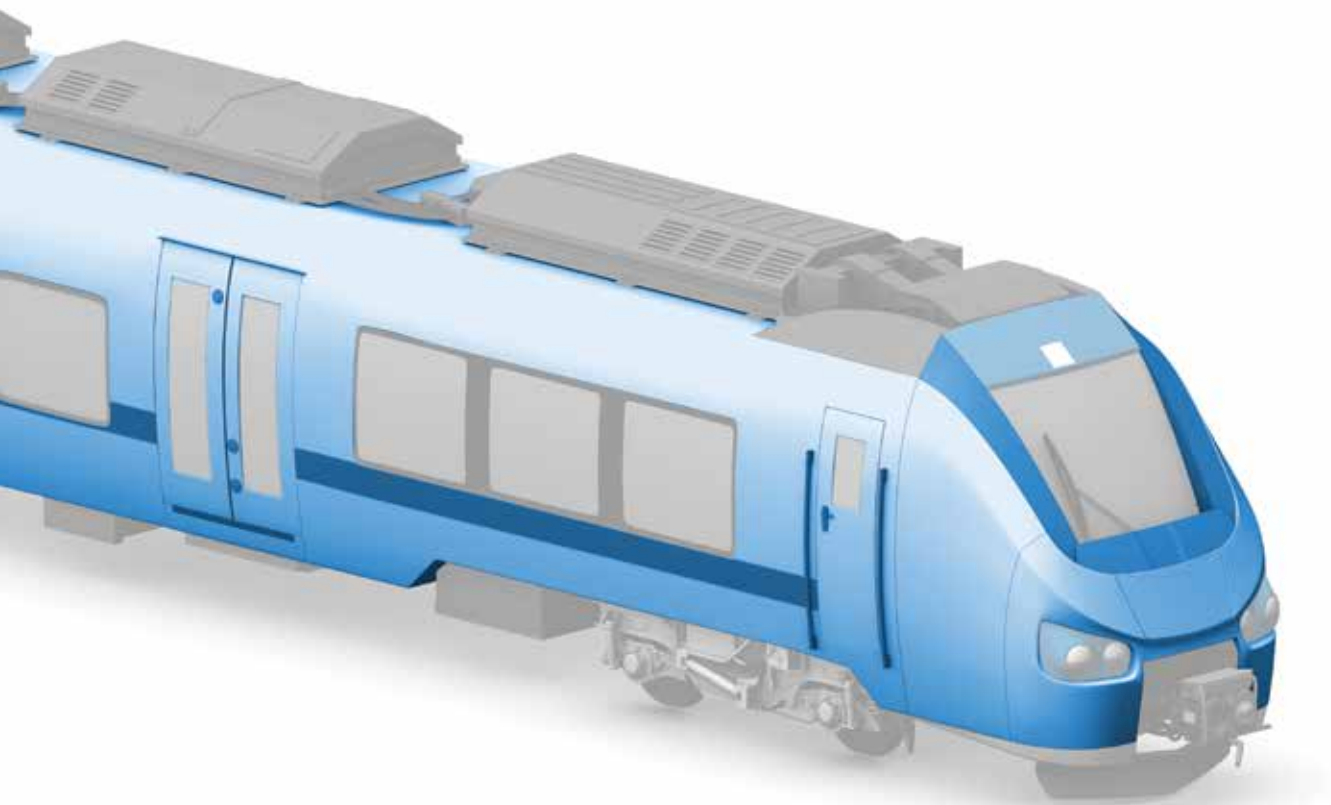


### HIGH STRENGTH THREADED INSERTS

Prevent rotation due to torsion or vibration, even at the highest tightening torques

- Highly durable
- Repair of damaged threads
- Pre-assembled key locks eliminate rotation





## QUICK AND EASY INSTALLATION

### Railcar body

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In this central application, structural stability and reliability are essential to guarantee passenger safety.

We therefore recommend fasteners that fulfil the following prerequisites:

- Easy to assemble and disassemble
- Made of high-strength materials
- High corrosion resistance
- Compliance with high safety standards



## RAILCAR BODY

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### SLOTTED SELF LOCKING NUTS

Locking function for various applications in the train

- Very high temperature and corrosion resistance
- Retaining clamp load even under high temperature changes
- Vibration resistance under high dynamic stress
- Reusable



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### LOCK BOLTS

Permanent and vibration resistant mechanical fastening

- Fast and automatic installation process without retorque
- Visual installation indicator on collar ensures correct installation



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### GROUNDING STUDS

Bolts to discharge leakage current

- Permanent grounding connection on steel plate
- Easy and process reliable installation due to battery powered installation tool
- Above-average clamping range of stud



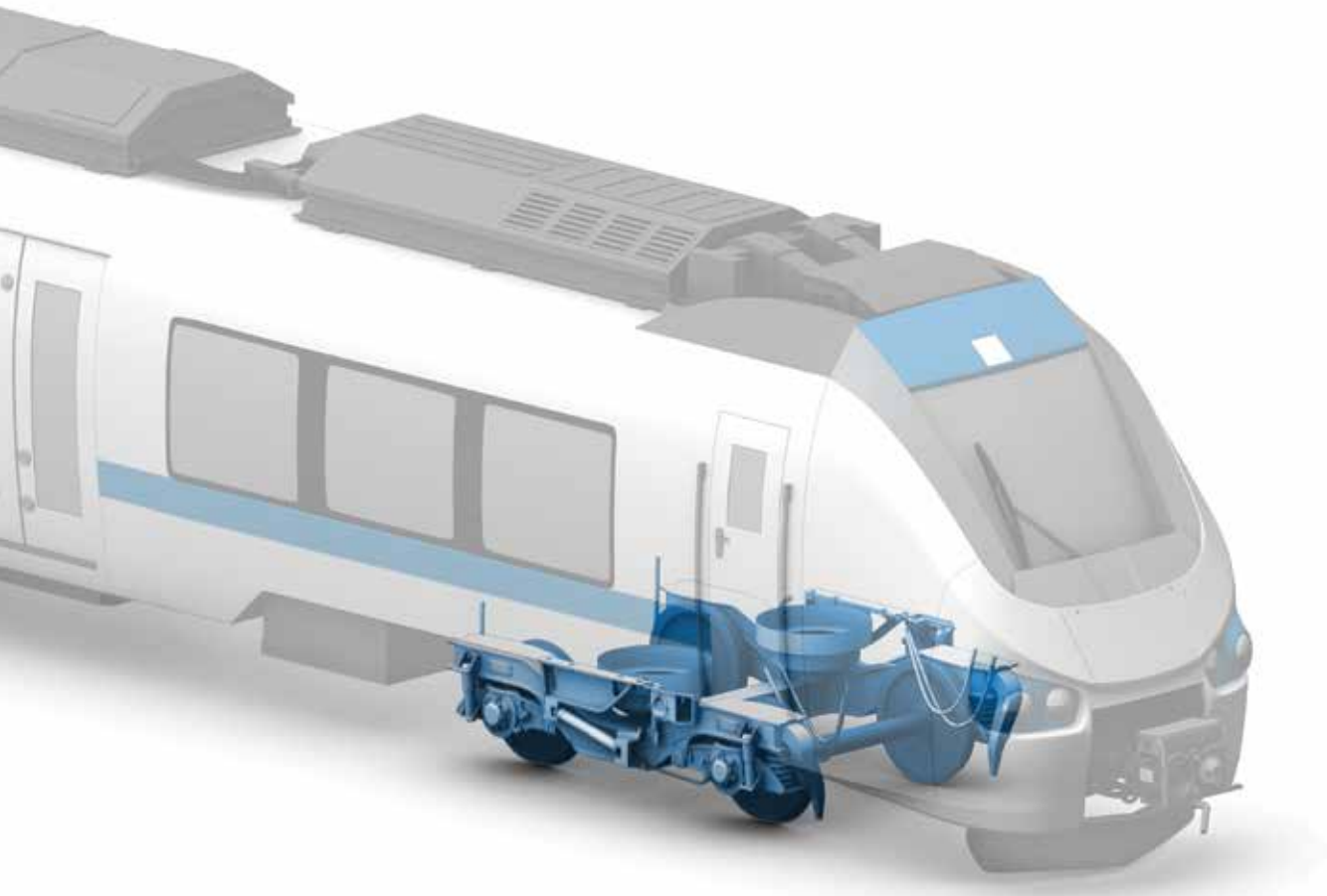
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### TENSIONER NUTS

Precise and economical mounting of large bolts and studs

- Simple and safe tightening of large size bolts through any hand tools
- Enormous clamping force available
- No thread galling
- Tightens stud/bolt in pure tension





## STABILITY AND DURABILITY

### Bogie

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The bogie plays a vital role in the train. The main requirements on the bogie are operating reliability, maintainability and traveling comfort through suspension and damping.

Fasteners must above all be:

- Vibration-proof
- Corrosion resistant
- Resistant to extreme temperature changes
- Able to maintain clamp force of assembly

## BOGIE

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### LOCK WASHERS

Securing through friction and mechanical locking

- Ribbed for higher vibration resistance
- No surface damage while tightening
- No loosening and minimal loss of pretension force
- Suitable for sensitive/coated surfaces



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### WEDGE LOCKING WASHERS

Self-locking through tension

- Quick and easy installation and dismantling
- High retention of the clamp load
- High vibration and corrosion resistance
- Maximum safety against loosening



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### HEX HEAD LOCKING SCREWS

Multifunctional screws with serrated flange

- Multifunctional, serrated washer integrated in flange
- Will not become loose or unscrew
- No risk of forgetting safety washers or using wrong orientation



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### TENSION CONTROL BOLTS

Cost-efficient installation of high strength pre-loaded bolts

- Unique anti-corrosion protection that readily accepts paint
- Maintains consistent tension even under high vibration
- Safe tightening process due to high level of clamp load





## FUNCTIONALITY AND DESIGN

### Interior

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Inside the train, the emphasis is on travel comfort and safety for the passenger. Luggage racks, grab poles, seats and folding tables must withstand daily stress.

We offer fasteners which:

- Can be used in various materials
- Meet high design and functionality requirements
- Are available in different color variations
- Meet the requirements for light construction

## INTERIOR

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### HINGES

Long-lasting hinges for easy positioning of folding tables

- Constant resistance throughout the entire range of motion
- Hold mounted components securely at any desired angle
- Hinges are available in a wide variety of sizes, materials and torque ranges



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### FASTENERS FOR COMPOSITE MATERIALS

Reliable mounting in soft and composite materials

- Intelligent fasteners with high torque and tear out strength in soft materials
- Can be surface-mounted with adhesive or completely embedded
- Invisible integration into the application material



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### THREADED INSERTS

Lightweight inserts with high pull-out strength

- Provide strong thread in thin materials
- Lightweight yet stable and durable
- Clean and chip-free female thread



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### FASTENERS FOR C-RAILS

For stable yet flexible mounting

- Can easily be shifted after mounting
- Cage nuts with tolerance compensation due to floating fit in cage
- T-bolts according to railway specifications [quality class and marking]
- Reusable



## INTERIOR

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### HIGH STRENGTH BLIND RIVETS

Strong solution for structural assembly

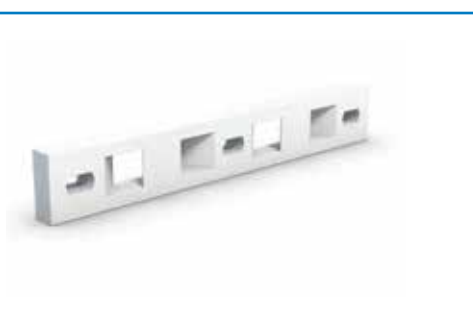
- Perfect for high-tensile applications
- One fastener replaces up to four rivets
- One side access
- Big diameter rivet
- Durable and reliable fixation



### CABLE TIE PLATES

Space-saving organization of wire bundles

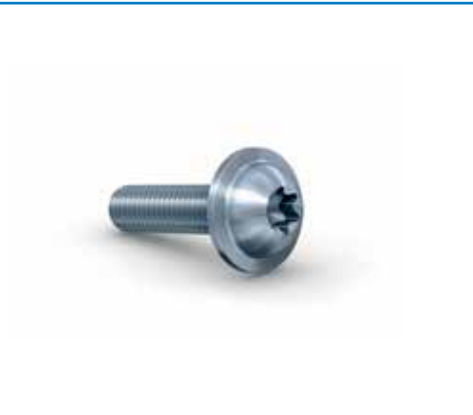
- Used to secure closely spaced wire bundles
- Low profile design keeps bundle close to mounting surfaces



### PAN HEAD SCREWS WITH FLANGE

Multifunctional screws with integrated washer in flange

- Can also be used in soft materials
- Available in different colors
- Optimal bearing area to cover large and elongated holes



### NOTCHED SCREWS

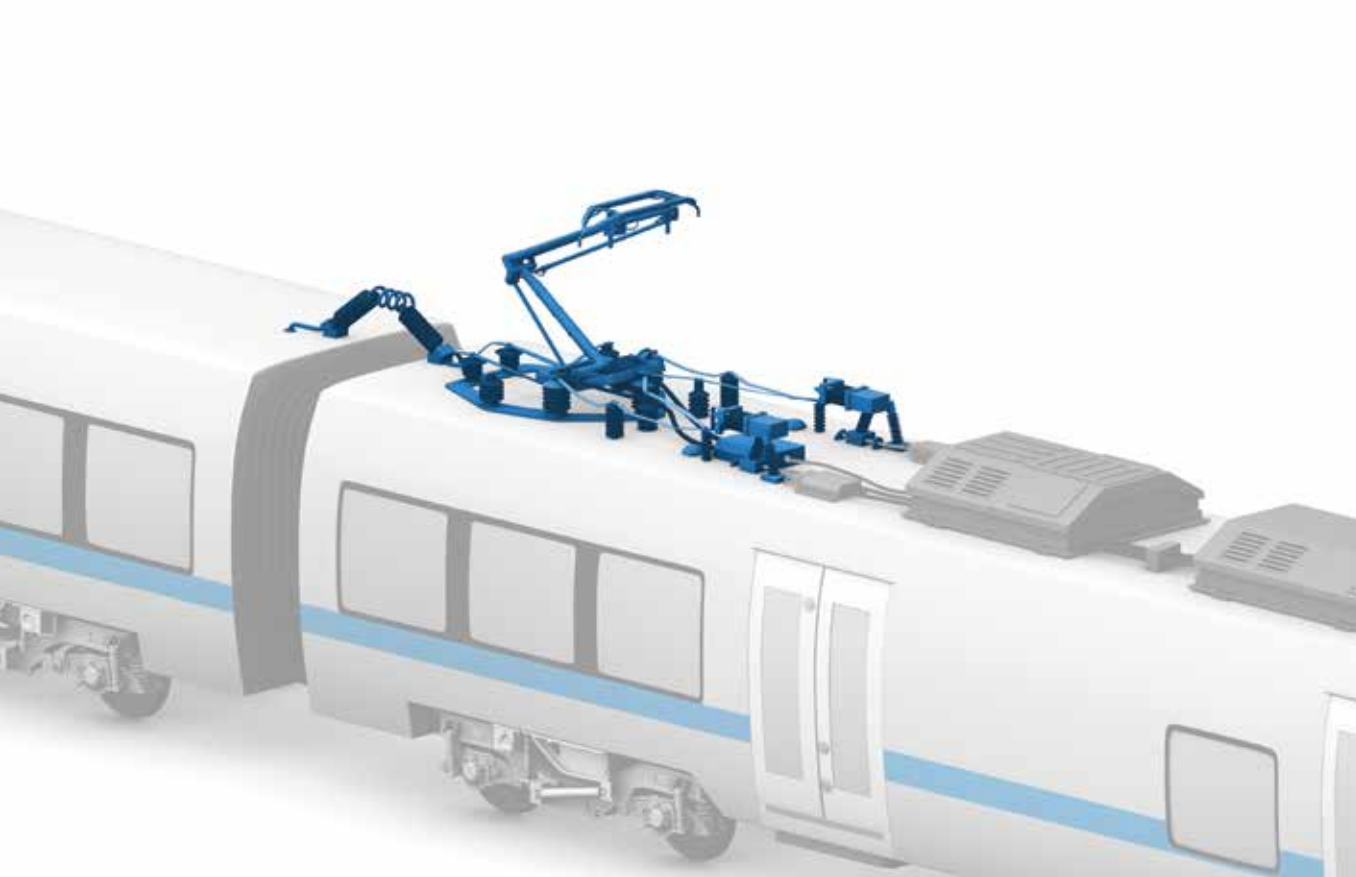
Special screws to prevent manipulation

- Full range of dimension
- Protection from manipulation / vandalism through passenger through passenger
- Special tool necessary to screw in and out





«Optimize your supply chain and your B- and C-part management with Bossard's innovative logistics solutions.»



## SAFETY AND RELIABILITY

### Energy supply

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Fasteners in this application must meet the highest safety requirements. In addition to the safety of the connection itself, fire protection is a key requirement.

Thus, the main requirements on the fasteners are:

- Corrosion resistance
- Vibration resistance
- Fire protection



## ENERGY SUPPLY

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### BARB CABLE TIES

Cable ties especially for railway applications

- Geometry guarantees maximum strength and safety, even in extreme applications
- Steel locking barb ensures stable and durable bonding
- Can be used wherever personal and asset protection have priority



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### WRAP SLEEVINGS

Facilitated bundling of pre-assembled cables

- Slotted, self-closing design allows easy draw-in of pre-assembled cables
- Suitable for subsequent installation
- Flame retardant / self extinguishing halogen-free material

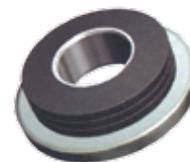


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### RESILIENT CONICAL WASHERS

Optimal tension in the screws and bolted assembly

- No loosening due to crushing, material expansion, wear or vibration
- Compensate for thermal expansion in electric applications
- Available with a combined flat washer for time savings in assembly



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### COATINGS

Lubrication for higher process security and efficiency

- Exact and clearly defined lubrication
- Cannot be forgotten
- Technically resilient
- Safe and clean

Additional benefits of our coatings: decorative color, anti-friction, temperature and corrosion resistance



## WHEN YOU WANT TO BE SURE

# The accredited testing laboratory for fastening technology

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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.

### 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.

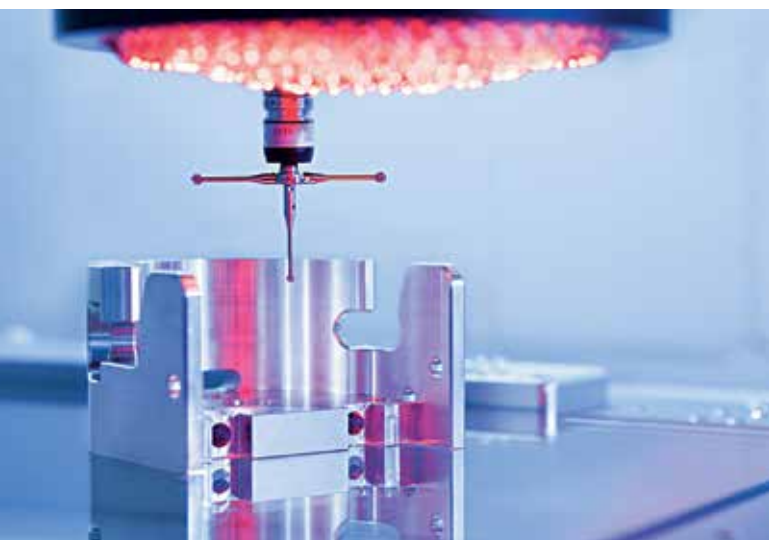
Our comprehensive range of leading test services for fastening technology, which are carried out by qualified and experienced staff, help you in risk reduction and quality assurance as well as the fulfillment of the relevant and statutory requirements for your components and products.

### Competent partner

To meet all required quality standards, Bossard has twelve accredited test laboratories in Europe, America and Asia, ensuring reliable quality assurance and flawless production quality with their cutting-edge measuring and testing equipment. Moreover, in product testing we work closely with our business partners as one team to offer you the best quality. Finding, designing and testing the right solution for your fastening challenge may also take place at one of our new state of the art design centers in Shanghai and California.

### Measurement results of the highest standard

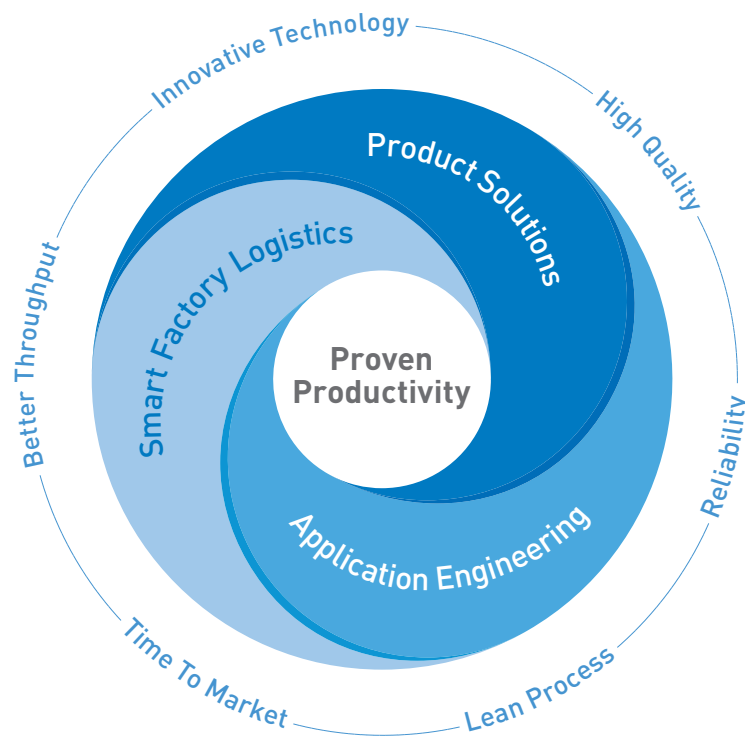
In our quality- and test laboratories we use industry standards and individual customer requirements to go over your products with a fine toothcomb. In combination with ISO/IEC 17025 accreditation we have reliable competence in testing, which are both available to the customer for tests accompanying 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.



## PROVEN PRODUCTIVITY – A PROMISE TO OUR CUSTOMERS

# The strategy for success

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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, optimising our clients' productions in a smart and lean way with **Smart Factory Logistics**, our methodology, with intelligent logistics systems and tailor-made solutions.

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.

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