



Partner of the railway industry –
expertise unites!

BÖLLHOFF

Böllhoff: **Your railway** for



Editorial

Mankind has been fascinated by the history of rail technology for centuries. The railway is one of the most important inventions of all time. Even 200 years after the development of the first locomotives, railway technology has still not reached its limits.

Today, the tracks across the world carry more transport services than ever before. The demands placed on railcar manufacturers by railway operators and, in turn on the suppliers, are challenging. Increasingly shorter product cycles, the use of new, lighter and more environmentally-friendly materials and an ever changing division of labour, requires strength of purpose, innovation and adaptability.

Böllhoff is a leading system supplier and international service provider for fastening and assembly technology; and as such is a recognised partner to railcar manufacturers and their suppliers. Be it screws, rivets, clinches or procurement and delivery systems for fasteners – the Böllhoff name stands for innovative and reliable solutions.

Read the following pages and be inspired.

expert fastening technology



Fascination

Dynamism

Innovation

Your value-added c



In order to remain competitive, railway operators have to be able to transport more and more people and goods with ever greater speed, reliability and efficiency. This, in turn, increases the performance and specification of the rail vehicles and transport systems.

Project-related business, with individual customers involving highly complex technology and relatively low batch sizes, reflect the particular challenges of the railway & transportation industry. At the same time, global competition brings immense pressure on costs and innovation. Therefore, technological potential and innovative ability ultimately determine the success of railcar manufacturers and their suppliers.



Research and development



Your modules ...



... our products

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Purchasing and logistics

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Production and
modernisation

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Quality and internationalism

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Diversity as routine

As a provider of complete solutions and systems, Böllhoff offers products and services for all areas of the railway value-added chain. Customer orientation begins with research and development.

With its procurement and delivery systems, Böllhoff delivers products and fasteners to the heart of the production process. There, customised equipment and machines designed according to the Böllhoff portfolio, ensure high efficiency. Optimised processes avoid downstream costs.

Our partnerships are based on an uncompromisingly high quality standard and a corporate culture imbued with the spirit of a family business.



Research and developo



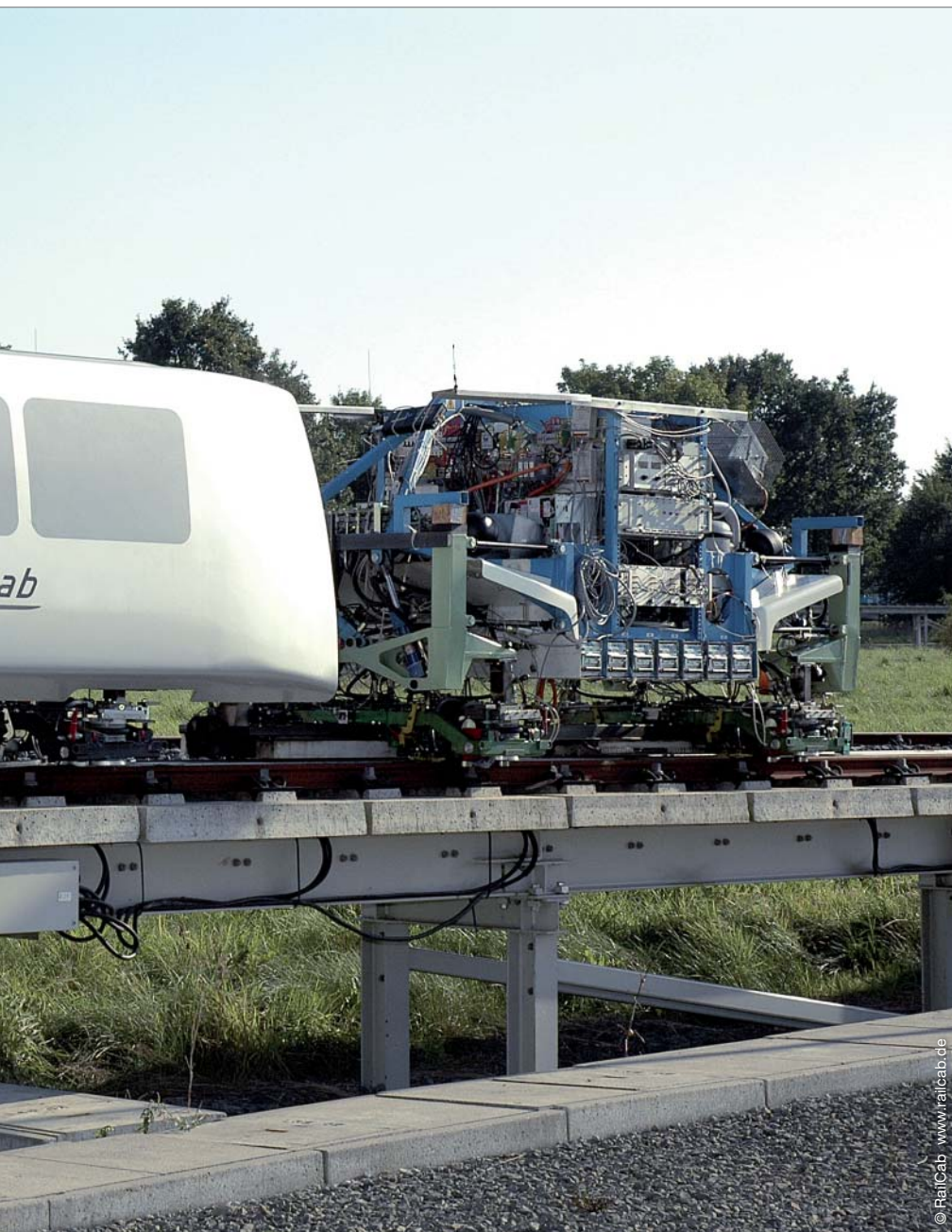
The railway industry may not always be perceived as “innovative”. But this industry can claim a high degree of technical competence in finding solutions. Faced with lengthy development stages, large-volume investment projects, with considerable public and political influence, railway operators always expect safe, functioning and innovative systems from day-one onwards.

More than ever before, research and development forms the cornerstone for major market success at low cost. In particular, this requires a high degree of flexibility and extensive know-how from suppliers.



The ECOTECH service (Economic Technical Engineering) allows railcar manufacturers and suppliers to benefit from technical advice from Böllhoff engineers. Their industrial know-how and advice covers all areas of fastener technology, corrosion protection and screw retention.

The simultaneous standardisation and optimisation of fasteners in the development stage simplifies assembly and reduces tool costs. In view of the ever faster technological development and the increased competitive pressure, this service is a crucial advantage in the railway industry.



Customer benefits at a glance

- Awareness of future trends
- Innovation management thanks to in-house research and development
- Development partnerships with companies and research institutes
- Individual application-based advice
- In-house prototype construction and testing grounds
- In-house test laboratory accredited to DIN EN ISO/IEC 17025



Case studies

Neue Bahntechnik Paderborn

The RailCab combines the conventional track system with the modern traction system using frictionless linear motor technology and could thus revolutionise rail transport. Through the ECOTECH service, Böllhoff supports this highly innovative research project by offering application-based advice for 1:1 realisation.

Siemens Transportation Systems

There is a strong demand for advice on alternative products with Cr(VI)-free surfaces. Siemens Transportation Systems therefore relies on Böllhoff's experience and competence. Böllhoff is helping its partner switch to Cr(VI)-free alternatives by providing individual application-based advice and corrosion tests in its accredited in-house laboratory.

Alstom LHB

Together with engineers from the railcar manufacturer Alstom LHB, Böllhoff has successfully optimised a component in the underfloor of the new urban train series. One of the production stages has been eliminated and the assembly time has been reduced which has led to lower production costs and increased process reliability.







Self pierce riveting instead of spot welding?

RIVSET® high strength, reliable fastening of steels, aluminium and plastics

- Particular suitable for hybrid joining
- High dynamic strength
- Form- and force-closed



Fastening without a fastener?

RIVCLINCH® form- and force-closed joining of metal sheets and profiles by cold forming

- Without additional fastener
- No surface damage to coated workpieces
- Repetitive



Thread strength?

HELICOIL® thread inserts for thread reinforcement in lightweight materials

- High-strength wear-free thread
- Corrosion and temperature resistant
- High dynamic load capacity



Thin-walled components?

RIVKLE® solution for fastening a load-bearing nut or bolt thread to a thin-walled workpiece

- Load-bearing thread
- "Blind" assembly
- Tightness, e. g. due to seal below the head



Thread in plastics?

AMTEC® metallic inserts for thread reinforcement for plastic components

- Shorter injection cycles
- Low-stress tight-fit
- No relaxation



Easy adjustment of tolerances?

FLEXITOL® systems for automatic compensation of differing production tolerances

- Easy integration into customer components
- Assembly from one side



Vibrations and noise?

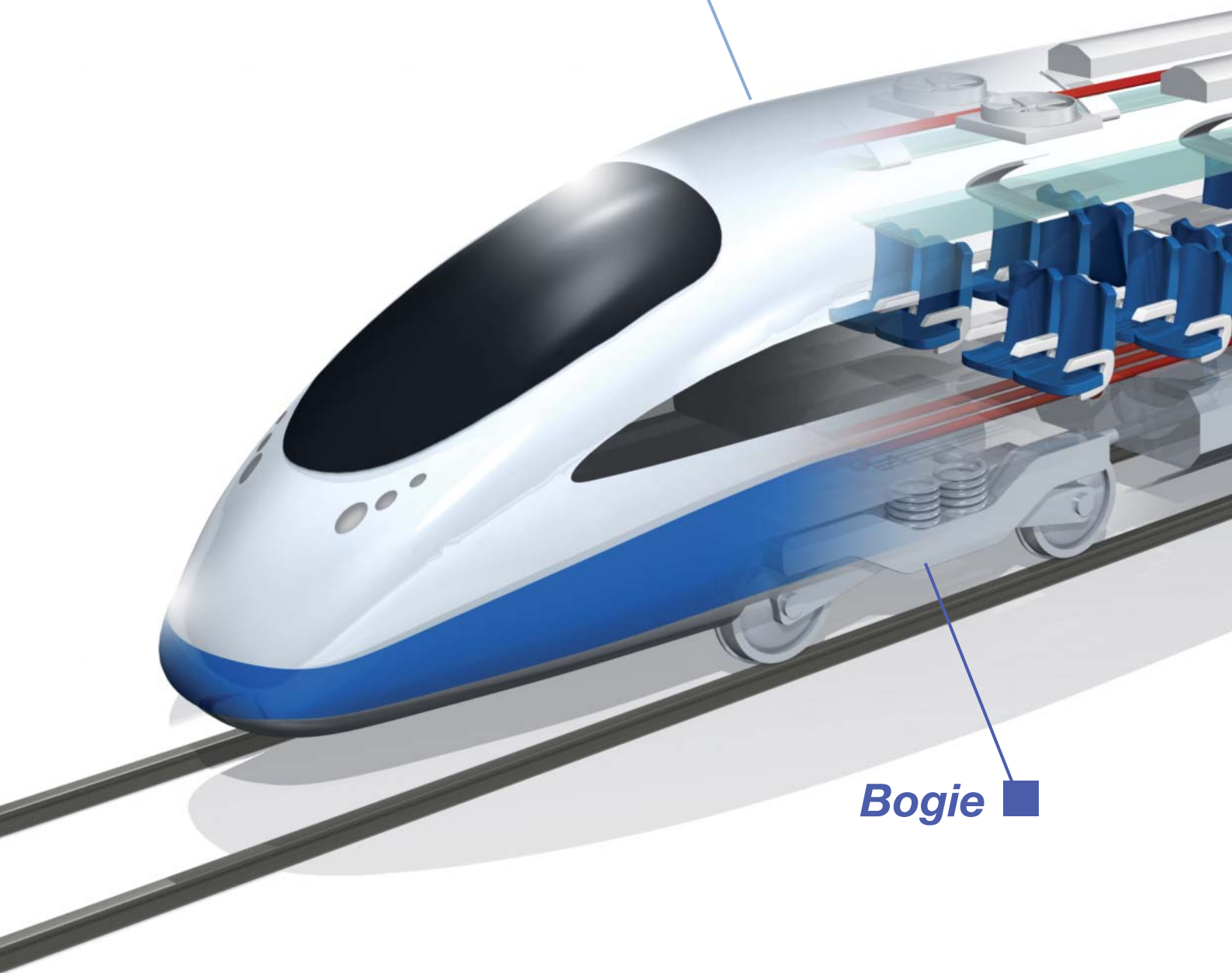
SNAPLOC® and RIVKLE® elastic fasteners and fixing systems for absorbing vibration and noise transfer

- Fast and easy assembly
- Reduction of parts
- Adaptability due to adjustable parameters

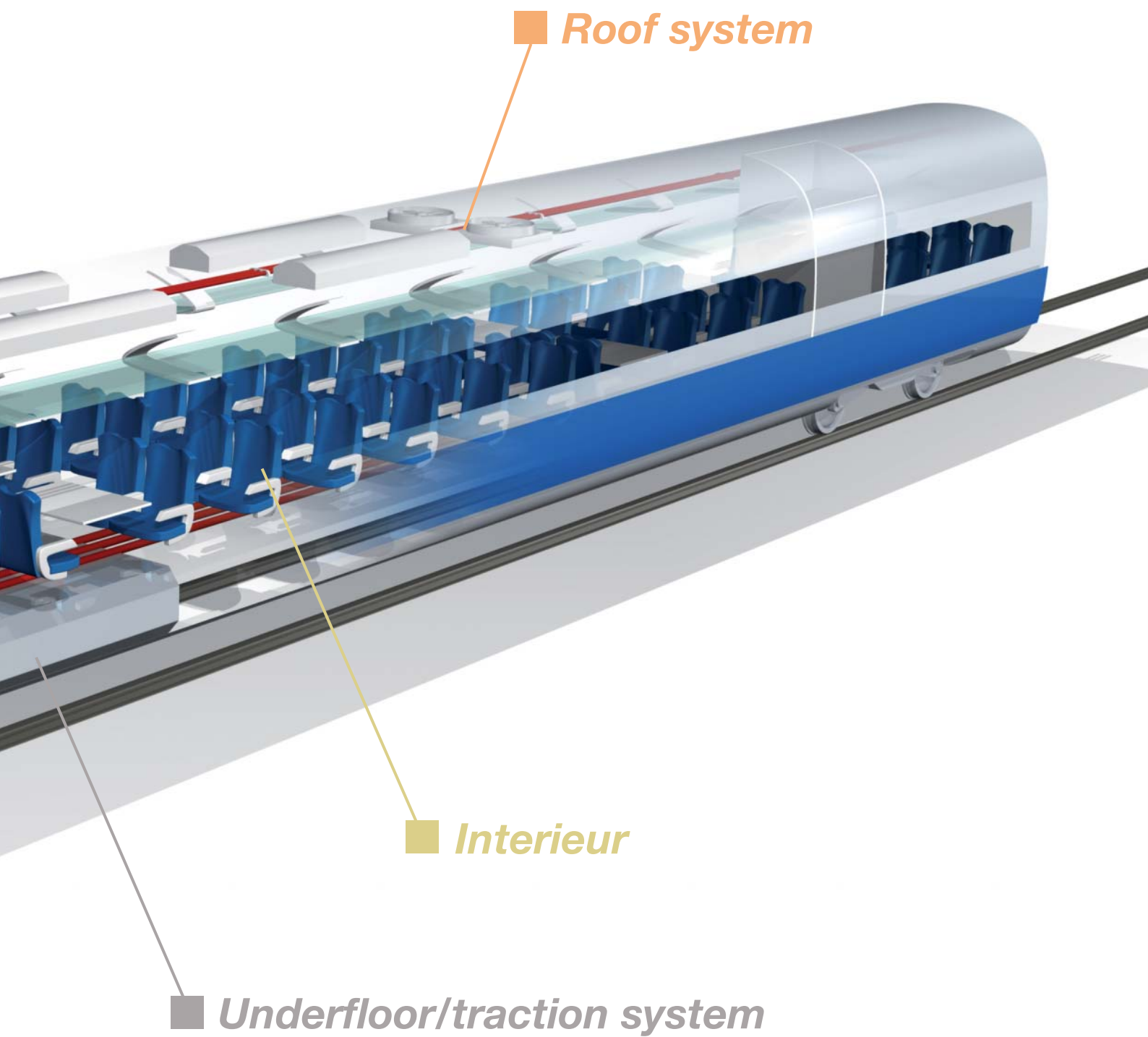


Your modules – our products

Railcar body ■



Bogie ■





Special screws for special applications?

Screws specially tailored to the railway industry

- DIN and standard screws as well as special screws with various drives and head shapes
- Cr(VI)-free coatings



The right nut for every application?

Versatile nuts for versatile fasteners

- Nuts with plastic rings or metal lock rings
- Clip nuts
- Washer nuts



Technology and diversity for slot nuts?

Customised slot nuts from profiles and elements

- Cr(VI)-free coatings
- Various materials and shapes
- Individual number, size and type of thread



Washers and discs for every application?

Height compensation and underlay with standardised and innovative components

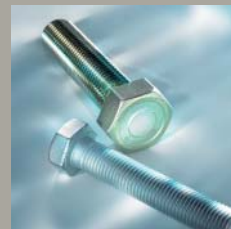
- Contact, spring and ring washers
- NORD-LOCK® and RIPP LOCK® screw locking washers
- Customised washers and discs



Large screws for complex challenges?

Screws with various coatings and strength levels

- Competence in heat-formed parts
- Transport guard on thread on request
- Screws with certificate documentation as per 3.1 and 3.2 EN 10204



Permanent and secure fastening?

All types of fastener with a wide range of clamps

- Hose and pipe clamps
- Fastening clamps
- All variants and materials



More than just fasteners?

One-stop-shop for more than fasteners to reduce number of suppliers and bundle competence

- Fastening materials e.g. cable ties
- Hydraulic and pneumatic components
- Balls, ball bearings, springs etc.



Purchasing and logis



Flexible responses to changing market conditions – this is one of the greatest challenges for the railway industry. The growing range of customer-specific requirements and the ever more sophisticated equipment in new and modernised railcars, increase the individuality of production, modernisation and maintenance. This requires optimised material and information flows. Procurement and delivery systems simplify processes, minimise stocks, prevent supply bottlenecks and reduce costs.

There must, of course, be an uninterrupted supply to the assembly and maintenance lines. Even just a missing or faulty fastener risks bringing production to a standstill.



Under the name ECOSIT® (Economic Supply in Time) Böllhoff has established a supply and stocking system – for added efficiency and cost effectiveness. Böllhoff manages the entire supply chain for its customers: material planning, buying, quality assurance, storage and the internal distribution of goods, right through to the production and maintenance area.

ECOSIT® makes processes in the railway industry permanently more reliable and simple – by reducing the number of suppliers and ensuring 100% supply capability.





Customer benefits at a glance

- Reduction in supplier diversity
- Improvement of internal processes
- Re-assignment of planning, scheduling and procurement
- Reduction in administrative effort
- Reduction in stocks, storage space and capital commitment
- 100% supply capability
- Standardisation and optimisation of fasteners



Case study

SmartBin® supply system

Many well-known railcar manufacturers and suppliers, as well as railway infrastructure manufacturers, benefit from the ECOSIT® service. One of Böllhoff's supply systems features the so-called SmartBin® technology, which was developed by Bossard in Zug, Switzerland and is licensed to Böllhoff.

The items to be stored and monitored are filled in boxes at the customer's locations. Each of these boxes is placed on electronic scales which serve as a weight detector. Böllhoff checks their weight each day online and thus ascertains the customer's current on-site stock.

As soon as the calculated stock in a box drops below the defined replacement limit, the items will be automatically reordered. In practice this has significantly reduced the stock and process costs for the customer. Process reliability has, on the other hand, increased considerably.

Production and mod



Despite high technological and, for the most part, individual customer requirements, systems manufacturers are trying to increase flexibility by developing more and more platform and modular concepts. One-time parts suppliers are now establishing themselves as specialists in partnerships or are going on to become systems suppliers.

The complexity of railcars today means that companies have to work together. Efficient and effective co-operation between manufacturers, system and component suppliers is constantly under review.



Böllhoff's flexibility and innovative strength is reflected in its wide range of fastening and assembly products for the production and modernisation of the railway industry: screws, nuts, thread inserts, quick-release fasteners, rivets, standard and custom-made parts in all the required dimensions and materials.

All fasteners and their processing systems are carefully coordinated. Production and modernisation processes can also be optimised with innovative screw and joining systems from Böllhoff.

ernisation



Customer benefits at a glance

- Short development, production and maintenance times
- International presence
- Established knowledge of the railway & transportation industry
- Recognised production planning know-how
- High level of development expertise
- Wide product range
- Customer-specific solutions



Case studies

Bombardier Transportation

The importance of deformable joining has increased considerably in recent years. Self-piercing technology is used to mechanically join either identical or dissimilar materials with high durability. This process reduces investment and running costs, eliminates rectification costs and significantly shortens production times.

Bombardier Transportation is benefiting from these advantages in the production of the new locomotive generation TRAXX DE. The new locomotive ceiling construction made of aluminium materials is joined together using Böllhoff's RIVSET® self-piercing technology.

Deutsche Bahn AG

Attitudes towards aging railcars are radically changing: there is a trend to modernisation instead of scrapping. Deutsche Bahn AG is also following this development. Well tried older railcars for regional lines are being modernised with the help of highly flexible service providers, including Böllhoff as a Q1 supplier.

Quality and international



The railway industry is a market with the highest technical demands based on high safety specifications and complex regulations. As a result, rail transport is also one of the safest modes of transport there is. For example, the European railway industry has developed IRIS (International Railway Industry Standard), an international "rail-specific" quality standard to assess suppliers in carrying-traffic.

The Böllhoff Group adopted these challenging guidelines early on and was one of the first companies in the world to be IRIS-certified. This distinction represented another major milestone for Böllhoff in its systematic quality management programme.



Böllhoff is one of the leading international service providers of fastening and assembly technology.

The headquarters of this family business, with four generations of history, is in Bielefeld. Böllhoff is a worldwide operating company with over 2000 employees and a network of companies and representatives on every continent.



Michael W. Böllhoff

Wilhelm A. Böllhoff

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Customer benefits at a glance

- Quality management certified to IRIS (International Railway Industry Standard)
- Q1 supplier to Deutsche Bahn AG
- Cooperation with Deutsche Bahn AG's goods inspection service
- Acceptance tests as per 3.1 EN 10204 and 3.2 EN 10204
- Quality management certified to ISO/TS 16949:2002
- Environmental management certified to DIN EN ISO 14001
- In-house test laboratory accredited to DIN EN ISO/IEC 17025
- Successful cooperation with leading railway manufacturers
- Cross-national presence

Case studies

Transrapid


Böllhoff supplies HELICOIL® plus screwlock for thread reinforcement in aluminium components in electronic assemblies for the large-scale Transrapid project. Advantages of the thread insert used include a precision-formed, rhombic section and a pullout protection system.

International railway industry

Operating internationally means making the most effective use of all available global resources. With Böllhoff as their partner, many manufacturing bases and maintenance and modernisation plants belonging to railcar manufacturers and suppliers, railway infrastructure manufacturers and railway operators benefit from the comprehensive range

of products and services, right across the world! The motto "Think global, act local" clearly defines one objective: optimal customer solutions at competitive prices

Böllhoff International with companies in:



Argentina
Austria
Brazil
Canada
China
Czech Republic
France
Germany
Hungary
India
Italy
Japan
Korea
Mexico
Poland
Romania
Russia
Slovakia
Spain
Switzerland
Turkey
United Kingdom
USA

Apart from these 23 countries, Böllhoff supports its international customers in other important industrial markets in close partnership with agents and dealers.

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