



Partner of the construction machinery industry –
expertise unites!

B'OLLHOFF

Böllhoff: **Your construction machinery expert** for fastening technology

Editorial

Construction vehicles are among the most fascinating vehicles of today. The bigger and stronger they are, the more impressive they are to us.

Construction, equipment and mining machinery is employed in all major construction projects worldwide. Different weather conditions, permanent action of force from vibrations as well as varying work loads heavily impact the individual machinery components. These extreme effects result in manifold challenges and requirements regarding production.

Böllhoff is a leading system supplier and international service provider for fastening and assembly technology; and as such is a recognised partner to construction machinery manufacturers and their suppliers. Be it screws, rivets, clinches or C-parts management – the Böllhoff name stands for innovative and reliable solutions.

Read the following pages and be inspired.

Fascination

Dynamism

Innovation

Your value-added chain



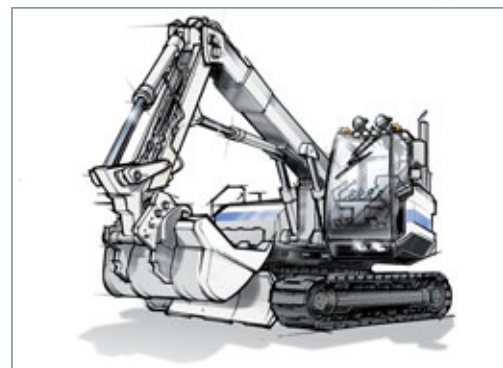
Innovative ability and technical potential are the basis for construction machinery manufacturers' and suppliers' chances of success. Global competition results in high costs and innovation pressure. Ever increasing requirements for the performance and runtime can be realised through the acceleration of technical progress. With the expansion of the variety of versions, the manufacturers satisfy customer needs and occupy market niches. To reduce manufacturing costs, modular platforms and components are developed.

Moreover, on the supplier side, there is an increasing focus on intercompany cooperation in forms of strategic partnerships aiming at an improved competence in the fields of development, production and logistics.



Research and development

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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 construction machinery value-added chain. Customer orientation begins with research and development.

With its C-parts management, 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 development



Construction machinery is exposed to extreme influences. Different weather conditions, permanent action of force, varying work loads and maintenance heavily impact the individual components. Among other things, EU directives demand a reduction in noise and vibration exposure of the driver. Apart from that, customers expect heavy-duty machinery.

To meet all demands, optimised fastening and assembly processes are often the key to realising modern material and composite construction concepts. That is why Böllhoff is positioned as a recognised service provider and system supplier with a comprehensive service competence in the field of fastening and assembly technology.



The ECOTECH service (Economic Technical Engineering) allows construction machine 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 optimisa-

tion 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 construction machinery industry.

Case study

VOLVO CONSTRUCTION

Böllhoff organised a customer fair on the factory premises of VOLVO. There, services, products and systems adapted to the specific customer needs were presented. Many of the VOLVO employees could acquire information about the current developments of the fastening technology and as well as new impulses and solutions for their work. Apart from that, the Böllhoff

experts held a presentation on the optimisation potential of fasteners and assembly processes employed by VOLVO. The basis for these results was the analysis of processes carried out in a line walk on the day of the presentation in the company production facilities.

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
- Modern CAE technique

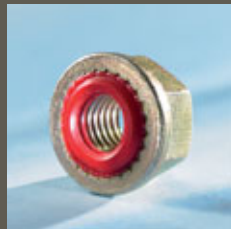






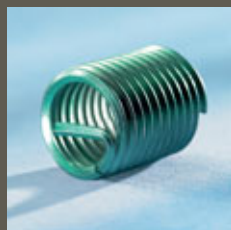
Self pierce riveting instead of spot welding?

- RIVSET® high strength, reliable fastening of steels, aluminium and plastics
- Particular suitable for hybrid joining
 - High dynamic strength
 - Form- and force-closed



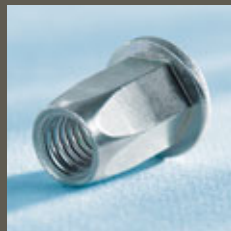
Tight connections needed?

- SEALOCK® sealing nuts and screws for reliable sealing against gaseous and liquid media under high pressure
- One-piece component
 - Captive seal
 - Several screwing-unscrewing cycles possible



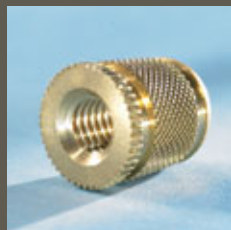
Thread strength?

- 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



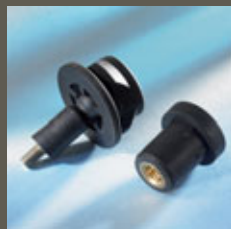
Thread in plastics?

- 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

Hydraulic system

Motor / Aggregates

Cabin / Exterior

Interior

Electrical /
Electronic equipment

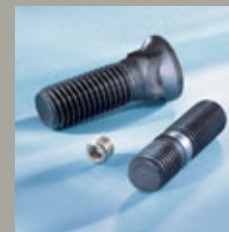
Drive / Gear box

Running gear



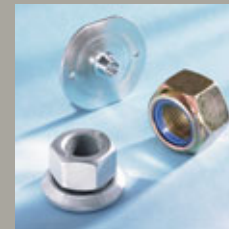
Special screws for special applications?

- Screws specially tailored to the construction machinery 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
 - Nuts with captive washer



Technology and diversity for bolts?

- Customised or standardised bolts
- Various materials and geometries
 - Individual shape, size and type
 - Head bolts, welding studs, threaded bolts, etc.



Washers and discs for every application?

- Height compensation and underlay with standardised and innovative components
- Contact, spring and ring washers
 - Nord-Lock® locking pair
 - 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 all C-parts to reduce number of suppliers and bundle competence
- Fastening materials e.g. cable ties
 - Hydraulic and pneumatic components
 - Balls, sealing rings, bushings, springs, etc.



Purchasing and logistics



Flexibility is one of the biggest challenges for the construction machinery industry. The market is subject to considerable fluctuations and high competitive pressure. The growing model diversity and the increasing degree of equipment contribute to a rise in production individuality. This requires an optimisation of material and of information flow. C-parts management systems simplify processes, minimise stocks, avoid supply shortages 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 construction machinery industry permanently more reliable and simple – by reducing the number of suppliers and ensuring 100% supply capability.



Case studies

HAMM AG

At regular intervals, the numerous unloading points in the customer's production are supplied with the most different DIN parts, parts as per drawing, fastening technologies of our own production as well as with other C-parts. Thanks to the ECOSIT® procurement system, logistic and administrative processes could be significantly reduced.

SmartBin® supply system

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

Customer benefits at a glance

- Improvement of internal processes
- Reduction in supplier diversity
- 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 C-parts



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 assembly



Up to 50 percent of the added value of a construction machinery are produced by suppliers. Yesterday's part suppliers are now establishing themselves as specialists in cooperations or develop to become system suppliers. The complexity of construction machinery today requires cross-company cooperation. New business models will considerably change the cooperation within this industry. Modern electronic media are becoming increasingly important for the coordination of tasks based on the division of labour.



Böllhoff's flexibility and innovative strength is reflected in its wide range of fastening and assembly products for the production and modernisation of the construction machinery 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 Böllhoff's innovative screw and joining systems.

Case study

BOMAG

In order to optimise assembly processes and at the same time reduce assembly and procurement costs, Böllhoff application engineering experts analysed the complete fastening technology of certain BOMAG model series. After a considerable number of tests at the certified Böllhoff laboratory, the experts recommended the use of tapping screw DIN 7500,

for example. It is used without loss of performance and with constant assembly parameters (speed, torque, etc.) at different points, independently of the material thickness. Since thread cutting and post-processing as well as the screw-nut combination are no longer necessary, production as well as assembly were considerably optimised.

Customer benefits at a glance

- Short production and assembly times
- Established knowledge of the construction machinery industry
- Recognised production planning know-how
- High level of development expertise
- Wide product range
- Customer-specific solutions



Quality and internationalism



The Böllhoff quality management is certified according to ISO/TS 16949:2002. This means a strict orientation towards the zero-defect philosophy: Continuous improvement is a constant process. Apart from that, for more than 130 years, the Böllhoff Group has proven to be a flexible and fast-working independent family business. This independence will also in the future be the pacemaker for the further development of the company. Experience creates trust. Values create connections – Joining together!



Customer benefits at a glance

- 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 construction machinery manufacturer
- Cross-national presence



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 2200 employees and a network of companies and representatives on every continent.



Michael W. Böllhoff

Wilhelm A. Böllhoff

Case studies

Construction machinery industry worldwide

The manifold construction projects as well as the different raw material deposits characterise the different structures and developments relating to construction industry in the individual countries on our planet. To meet the specific requirements and needs of these regions, more and more companies operate as construction machin-

ery manufacturers and suppliers on a global scale. However, to be able to have worldwide success, all available resources on this planet must be used efficiently. With Böllhoff as a partner, numerous international production facilities of construction machinery manufacturers and suppliers are optimally supplied with a comprehensive range of products and services – worldwide!

Brazil

Brazil is among the large regions of raw material extraction worldwide. That is why many construction machinery manufacturers and suppliers have positioned themselves there. Thanks to the local subsidiary of Böllhoff, these manufacturers, among them JCB, LIEBHERR and CNH, benefit from a comprehensive range of services.

Böllhoff International with companies in:



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

Apart from these 22 countries, Böllhoff supports its international customers in other important industrial markets in close partnership with agents and dealers.

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