

BÖLLHOFF

ECOTECH

Our engineering consulting for you:
We make your connections perfect!



ECOTECH: Introducing the connection optimisers

ECOTECH is a **unique engineering consulting service** allowing Böllhoff to leverage its role as a provider of 360° joining technology with expertise as a manufacturer and service provider to offer **technology-neutral and product-neutral solutions** for a range of industries.

This provides the customer with exceptionally high potential for cost savings in the procurement and use of joining technology. ECOTECH perfects the joining technology, making it possible to **optimise processes** and **reduce production costs**.

Existing or new screw connections are adapted to reduce overall costs. Standardisation and reduction increase sustainability in terms of using the right material and the right surface.

This brochure guides you through the different services that ECOTECH offers so that you can perfect your connections.

The ECOTECH team
for you:
Our expert colleagues
develop custom
solutions for your
requirements.

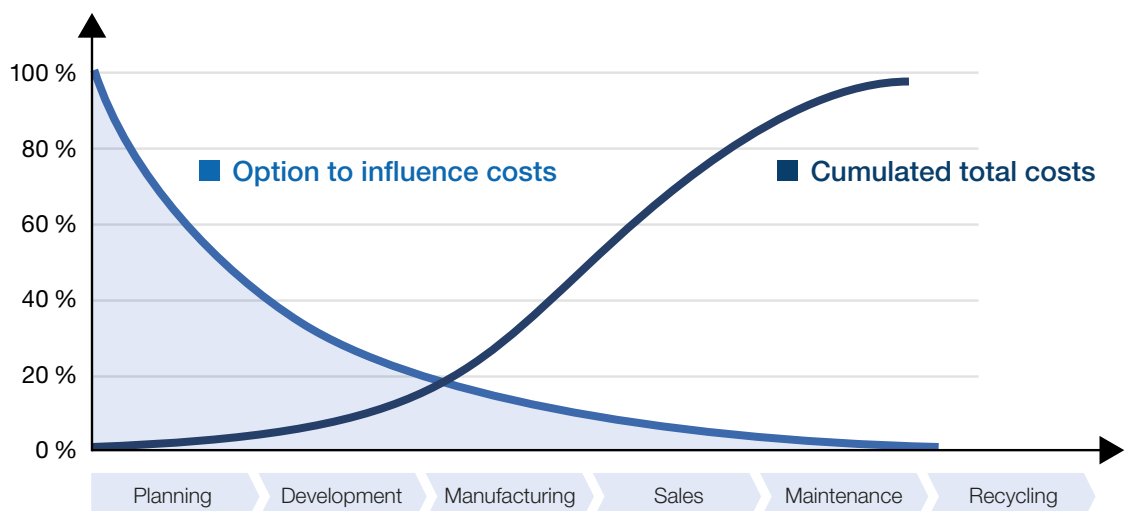




"There is still a fundamental tendency to underestimate the opportunities for cost savings through optimized joining technology!"

André Röhr,
Director of Application Technology at Böllhoff

A tip for cost savings: You have significantly more options for effectively influencing costs at the beginning of a project. As the development process advances, your options for reducing your overall costs steadily diminish.



Cost savings through optimized joining technology

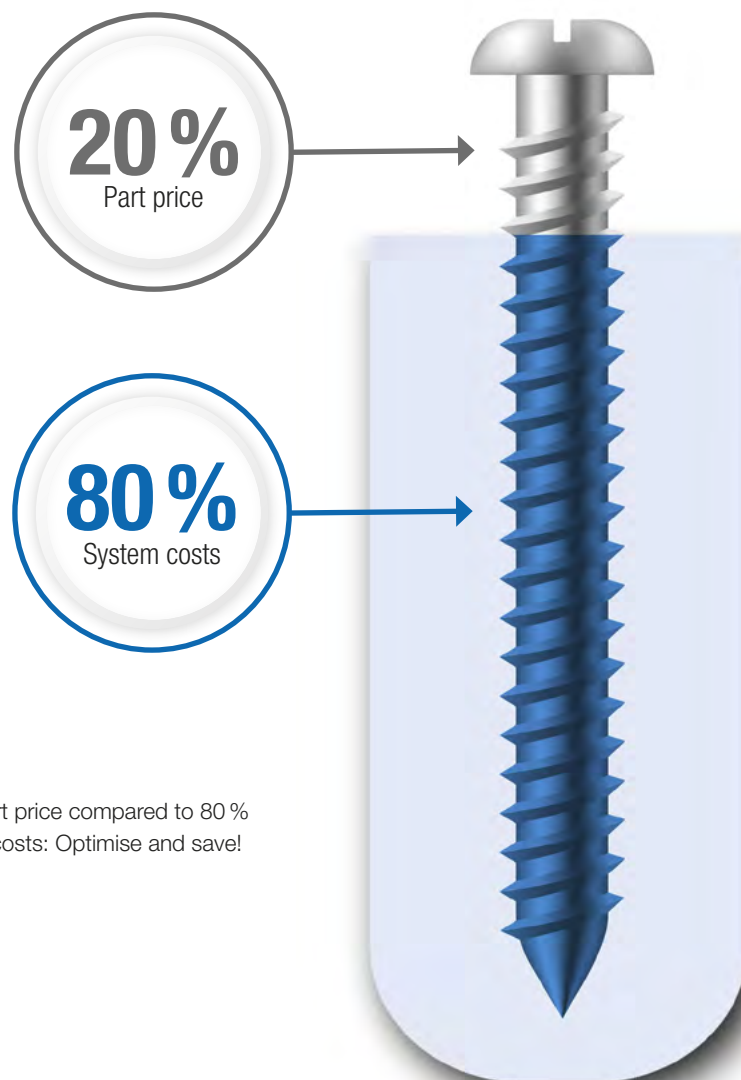
ECOTECH = ECONomical TECHnical Engineering Consulting

How can cost savings be achieved with optimized joining technology? The manufacturing costs for a new product are already largely determined during the design phase. The cost effectiveness of joining technology depends only to a minor extent on the pricing of the fasteners.

The **process costs** for the preparation and assembly of the components to be joined are much more significant.

The main cost drivers in the process are: design, procurement, quality assurance, logistics, warehousing, assembly preparation, final assembly, and capital commitment. In contrast, the part price of the fastener itself is comparatively low at around 20 %.

The earlier ECOTECH specialists are involved, the greater their positive impact on the entire value chain can be.



20 % part price compared to 80 % system costs: Optimise and save!

An overview of our services



An all-round service

Do you have a finished product or are you still in the development stage? We will analyse your product and the joining technology it uses down to the last detail. ECOTECH undertakes to help you: **identify optimisation potential**.

Our modules are perfectly integrated: They range from the specific technical solution to research and development, series production optimisation, and knowledge transfer – each component is individually tailored to your needs as part of a joint project and rounds off our range of services perfectly.





Technical solutions

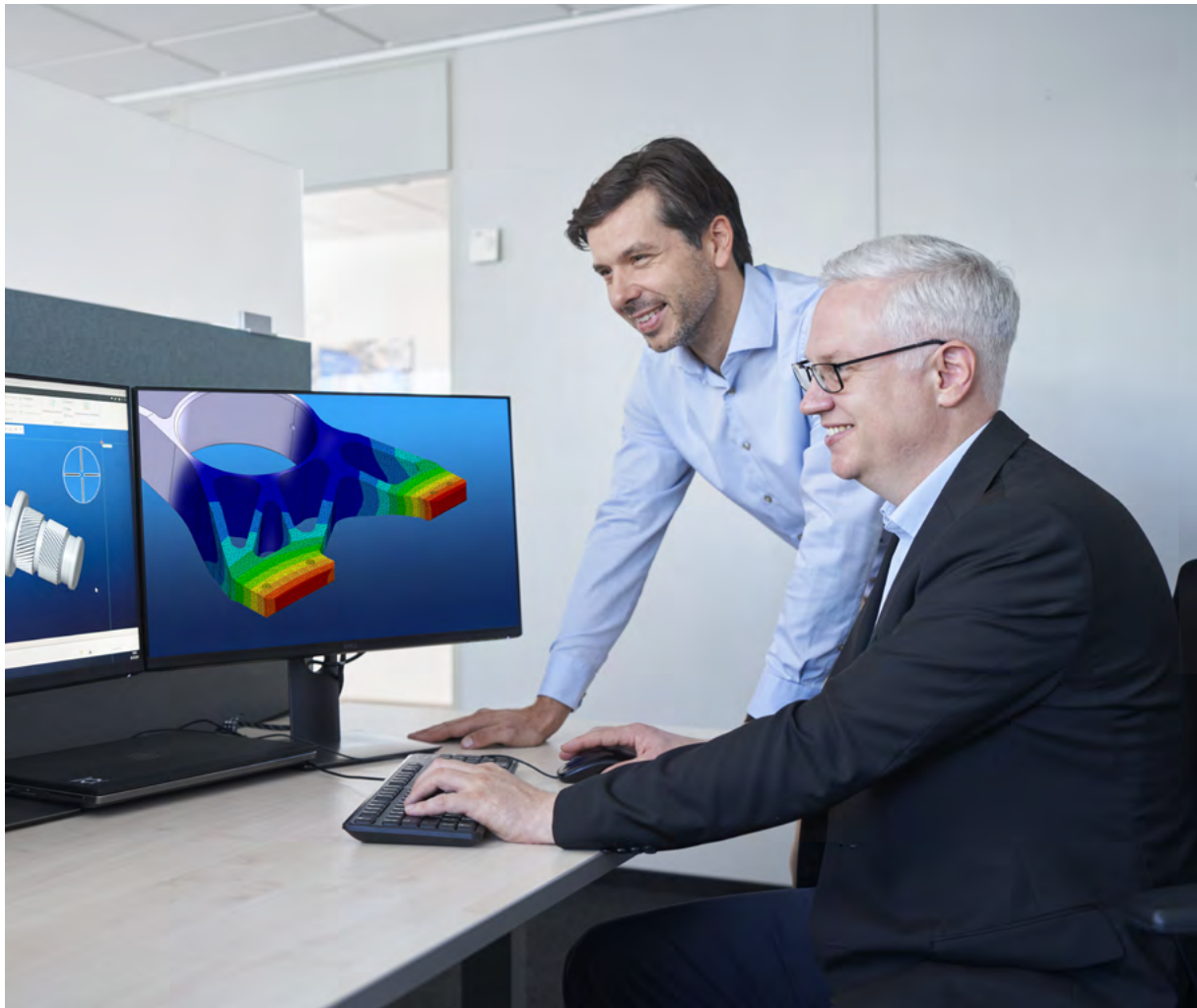
ECOTECH develops technical solutions that optimise your joining technology. This is done using **product-neutral engineering**. This means: as a provider of 360° joining technology with expertise as a manufacturer and service provider, we offer you technology-neutral and product-neutral solutions. We recommend the best possible joining technology, regardless of the product, manufacturer or brand.

We have innovative tools that help us to do this. With **CAE-based designs** and **rapid prototyping**, we quickly develop individual product suggestions and applications for you.

At the same time, we keep a constant eye on your product's technical and economic properties, thus creating a solid basis for decisions that will optimise your joining technology.

This applies both to new designs and existing applications. We are committed to this holistic approach that we call our **360° joining technology**.

Calculation, design and construction are more than just technical terms for the ECOTECH team, but a true passion.



ECOTECH practical example

RIPP LOCK®: From acute problem to innovative product

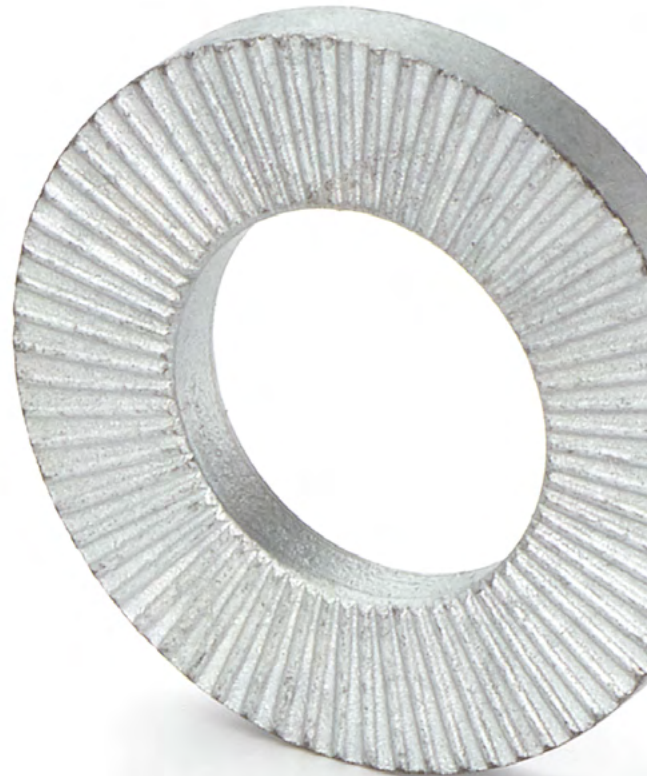
Loose or loosening screws cause **enormous damage** every day, especially in the closely synchronised processes of today's production workflows. In extreme cases, this can result in life-threatening risks, not to mention other consequences such as **production downtime, technical damage, lost time and high costs**. From our practical experience with application engineering projects, we know: This problem is becoming increasingly relevant for ever more customers. At the same time, interest in screw locking has increased significantly.

Precise analysis, custom concepts

We have found that using hardened screws in practice leads to **greater preload forces** in the connections. Conventional screw locks are no longer able to cope with these increased forces. Stability is lost and the screws begin to loosen. To manage this problem, we have developed the RIPP LOCK® self-locking washer. **The radial ribs of the RIPP LOCK® self-locking washer are key to a secure connection.** They form a positive fit with the mating surface and ensure a firm hold, even with strong vibrations and dynamic loads.

A success story

After product development, practical testing was conducted with many validation tests. The washers were tested intensively for loosening (DIN 65151), re-screwability and friction parameters in the **test laboratory** before the RIPP LOCK® washer was approved for inclusion in the Böllhoff product range. RIPP LOCK® self-locking washers have now been in use for more than 10 years. The tried-and-tested washers have set **quality standards for sustainable joining technology**.



RIPP LOCK® self-locking washers – an innovative system for secure screw connections

In the meantime, an entire universal range has emerged based on the RIPP LOCK® system. These products are used wherever an effective and economical anti-rotation device is required – even with soft and coated surfaces, slotted holes, and also for range standardisation. The system can be adapted to the most varied requirements.



Learn more about this topic in our “Böllhoff News No. 27 – Securing Threaded Connections”.

ECOTECH services

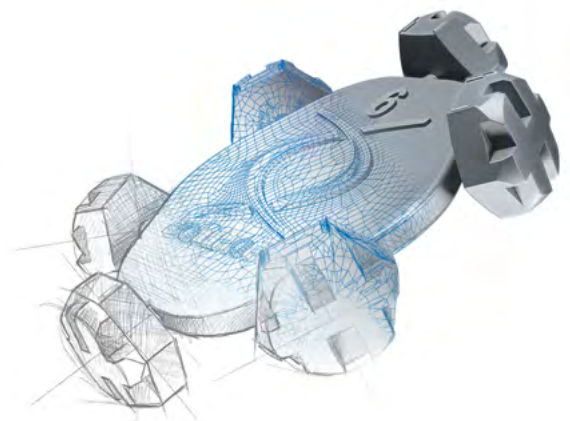
The highly-qualified experts on our laboratory team have many years of experience. Running our own testing laboratory means that we can operate independently and carry out tests quickly and without excessive shipments. This accelerates progress on your project!



Research and development

Böllhoff has its own accredited test laboratory. The advantage for you: Qualified material testers perform independent mechanical-technical, physical and chemical testing. The Böllhoff Research and Development department has its **own testing field**, where we use the **Finite Element Method (FEM)**, among others, to calculate optimisations down to the finest detail.

Good to know: **We collaborate with numerous research institutes and universities.** This ensures that our expertise is always up to date. The success of our research and development is also reflected in the large number of our **product patents**.



A Böllhoff innovation: PARRYPLUG® tamper protection for screws – developed as part of an ECOTECH project.



Series production optimisation

To optimise your production in the long term, we will be happy to support you on site with **band inspections** as well as with **tear-down analyses** in our laboratory. We have mobile testing devices for flexible deployment. We carry out vibration tests directly on site or determine friction coefficients to get precise practical data. We also perform **joining value analyses**.

The goal of these measures is clearly defined: Cost reductions through optimisation of products or manufacturing processes. The following applies: The earlier optimisation is started during product development, the more efficient it will be for you.

As a service provider that carries out its own production and development, we have the necessary experience in application and manufacturing technology to recommend the most economic joining technology.

Standardisation and **product range streamlining** are key success factors.

Our engineering team on site during assembly line inspection.





Knowledge transfer

We have a lot of knowledge to share. Thanks to our extensive expertise in joining technology, we can provide you with **comprehensive advice** on optimising your products.

This includes our **publications**, which we use to provide a range of technical content on our platforms. You also benefit from our membership in all significant **industry associations** and our **collaboration in areas such as standardisation**.

We offer a broad range of **customer seminars and training courses** to share our knowledge with you. We will gladly also provide these courses at your site – on request, we can support you in technical topics at our “Tech Days”.



See the event overview here!

We support you along your entire value chain from the initial idea to the SOP and beyond. When doing this, we apply our experience in risk management and project forecasting.



What makes **ECOTECH** unique

5 good reasons why ECOTECH pays off

1 We determine the best possible optimisation options for your processes

With precise analyses in our own test field, directly on site in your production facilities, or at digital or hybrid events, we use mobile test devices to demonstrate possible applications of the optimised joining technology.

2 We can noticeably reduce your production costs

With our technical competence, understanding of the industry and our proximity to the customer's issues, we determine the right solution for your application. We take into account the total cost of ownership and significantly increase the reliability and effectiveness of your processes.

3 We conduct our projects using agile and needs-oriented working methods

Due to our consistently technology-neutral and product-neutral approach, our work is not targeted at a single solution. We manage your joining technology projects successfully and can support you with samples using both modern and conventional prototyping processes.

4 We reduce your time to market

Thanks to the early on-boarding of our application engineers, we support your development process and take on the essential verification and validation tasks when qualifying your joining technology. This accelerates your product launch process, allowing you to focus fully on adding value to your product.

5 We act sustainably

Our goal is to create a long-term relationship, both with the type of advice we give and in terms of environmentally-friendly and cost-effective product specifications (e.g. when selecting materials and manufacturing processes)!

BÖLLHOFF



Böllhoff Group

Innovative partner for joining technology with assembly and logistics solutions.

The contact details for our locations worldwide can be found at www.boellhoff.com.

Passion for successful joining.

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