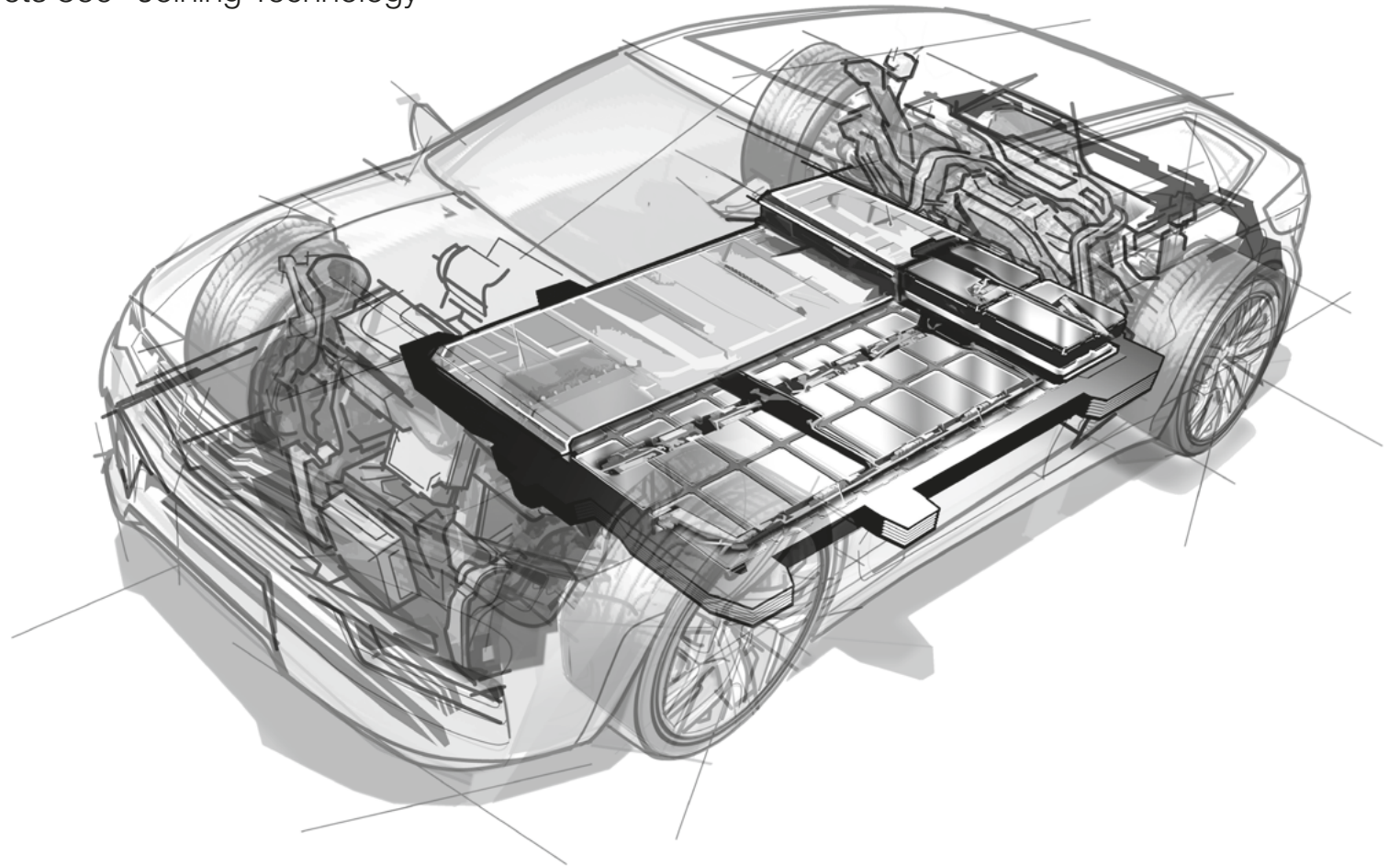
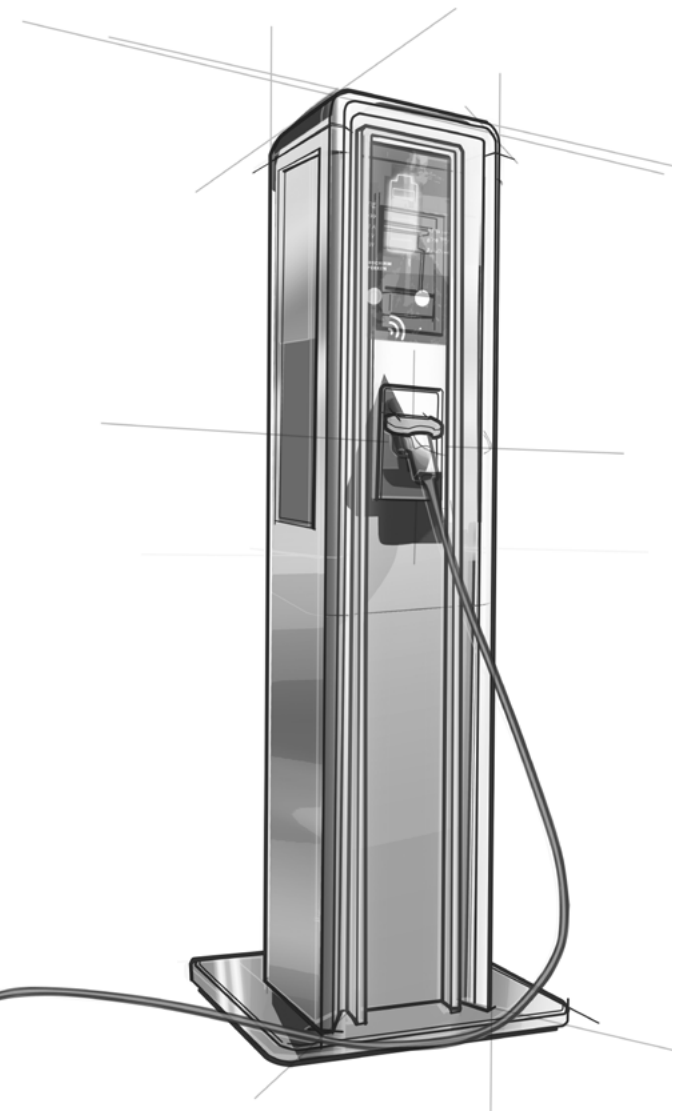


# BÖLLHOFF

E-mobility meets 360° Joining Technology



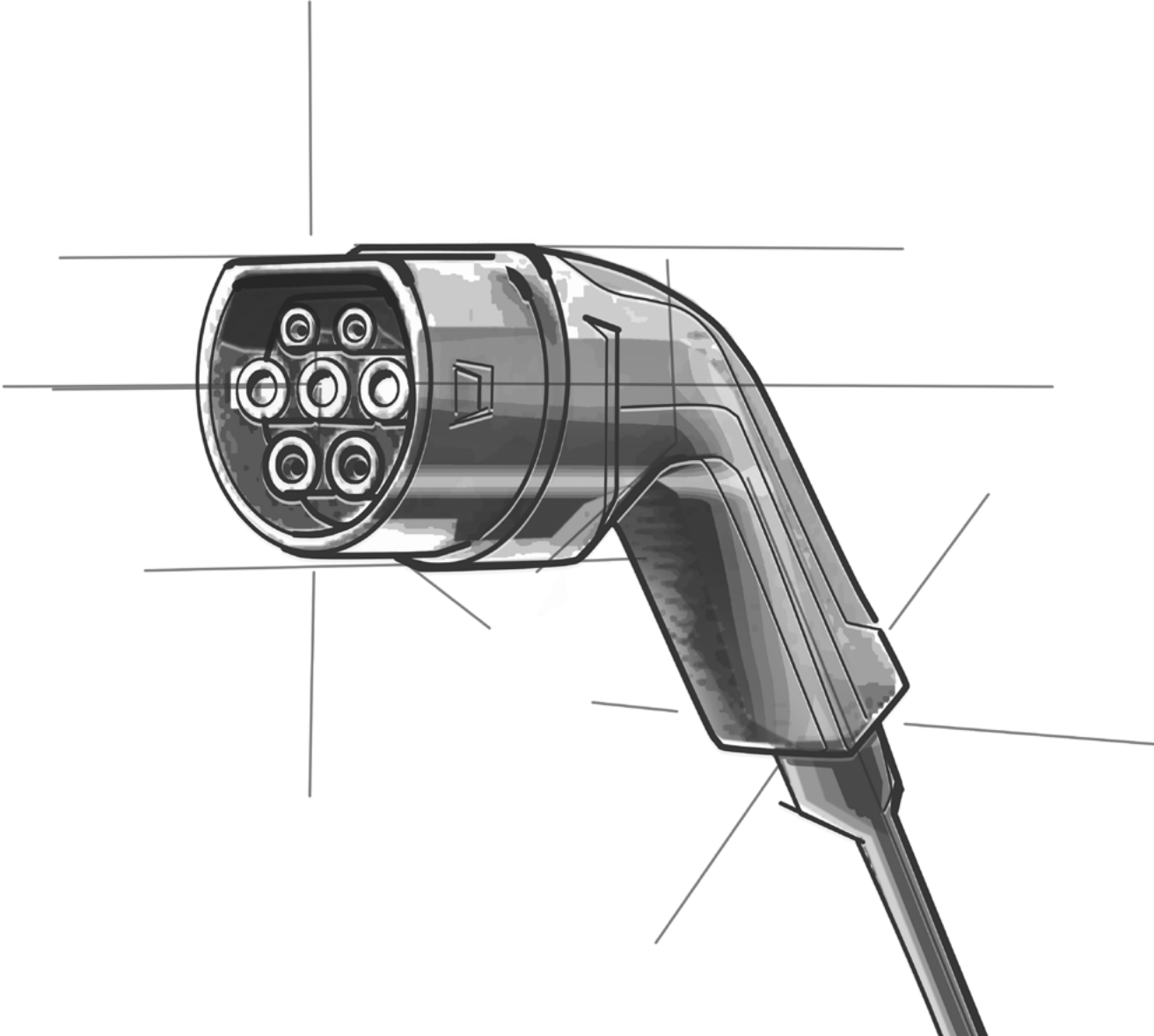


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Our InfoPoint provides additional information in the form of brochures and/or videos at the end of this brochure.



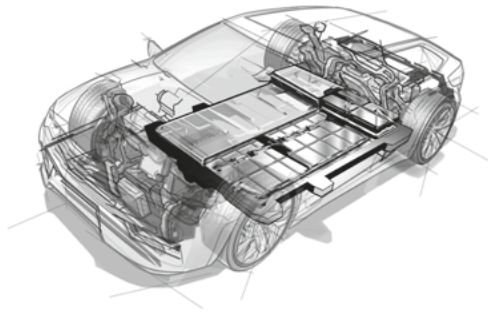
The history of the car is one of fascination and emotion, design and technology, people and brands. And at all times, the car has been and still is the driving force of progress.

To continue to be the source of product and process innovations, this industry has to rise new challenges. Not only must the car become carbon neutral on the street, but also during manufacture.

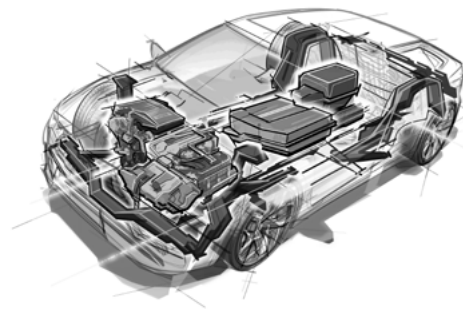
Climate-friendly and modern mobility is the driver of innovation for the further development of vehicle and drive concepts. The development of innovative technologies and solutions is necessary to reach the ambitious goals.

The technological change in the automotive industry is going at full speed.

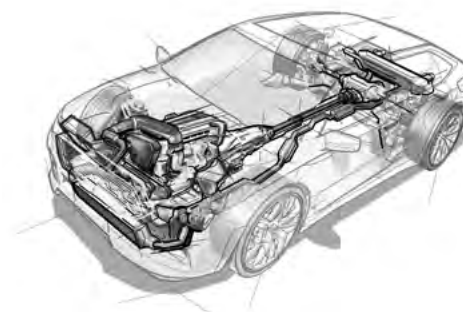




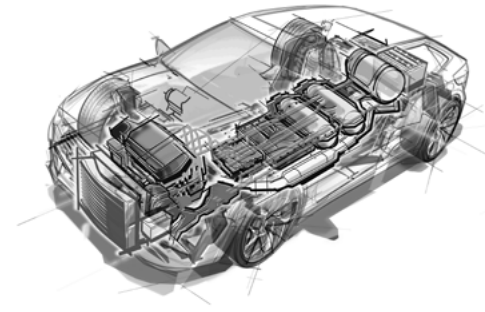
**Battery-electric drive**



**Hybrid technology**



**E-fuels**



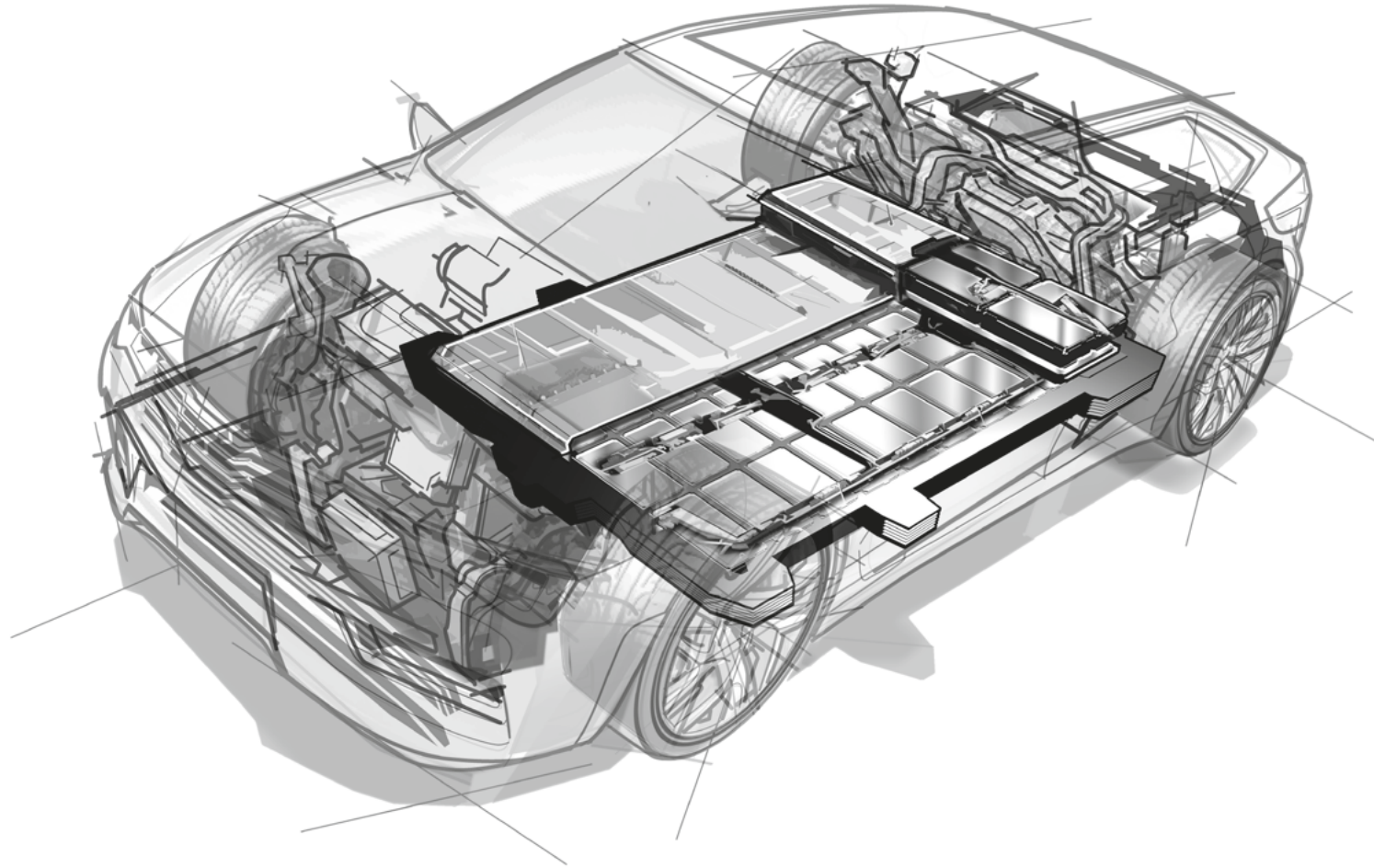
**Fuel cell-electric drive**

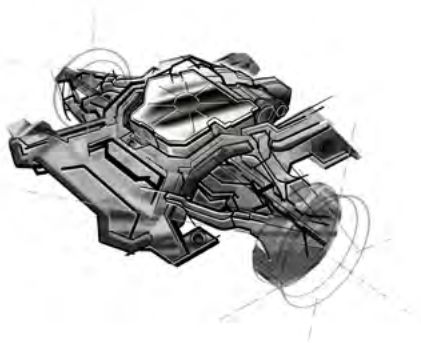
For every vehicle or drive concept that you may choose: as your partner for the 360° Joining Technology, we offer the ideal solution – standardised or customised.

Let us build the mobility of the future together, today.

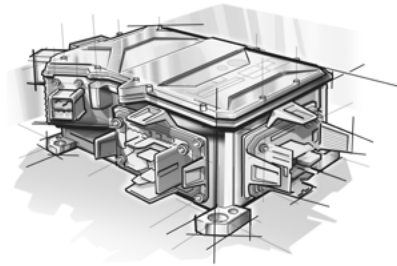
Discover our intelligent e-mobility joining solutions which represent a selection of our options.



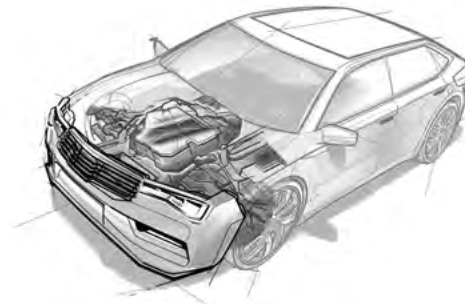




**E-machine**



**Power electronics**



**Front end**



**Battery pack**

With electromagnetic power generation and the higher speed of the e-machine, the suspension and attachment points are continuously subjected to high forces.

Let us have a look at the fastening options for an e-machine to the front or rear axle by means of screw joints, for example. Due to the low material shear strength, holding threads tapped into aluminium would strip after only a short time.

To completely rule out such damage which causes considerable costs, use our HELICOIL® thread inserts. If the damage has already occurred, you can of course use them for repair.

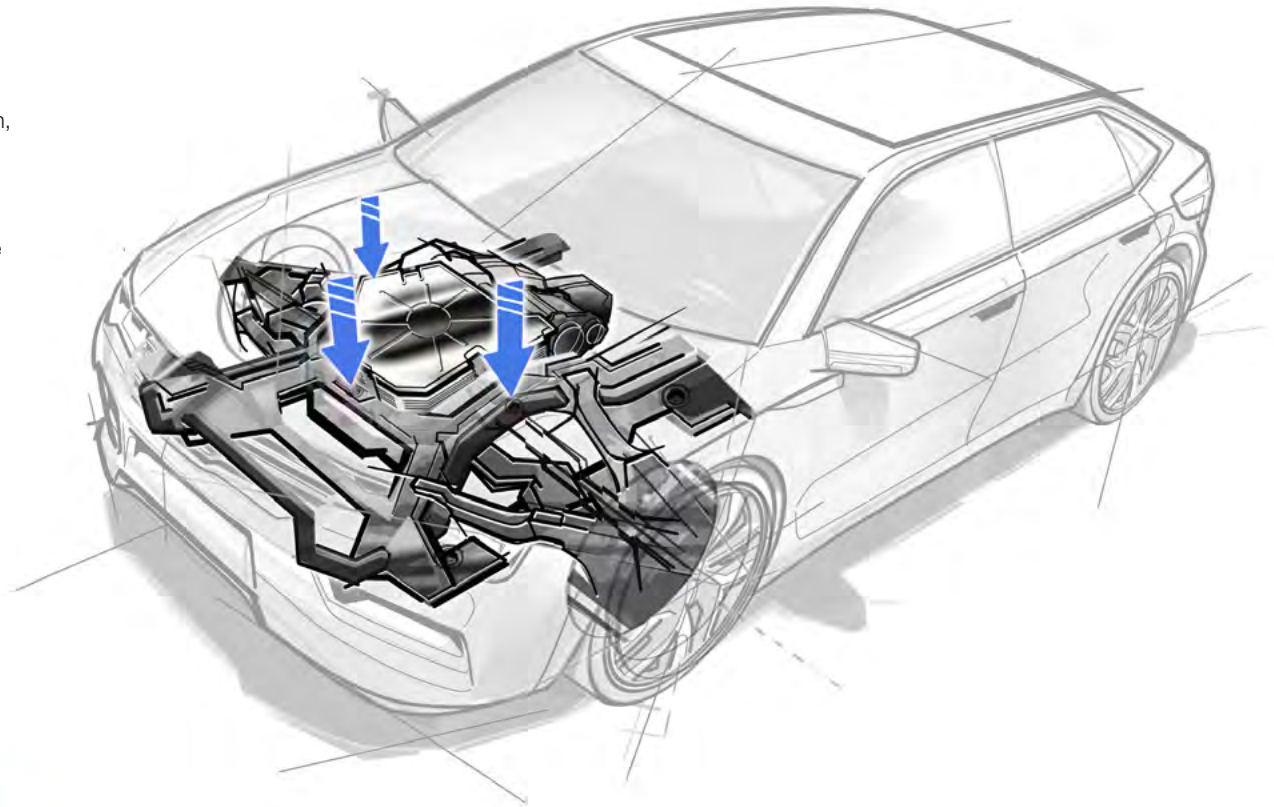
#### Your requirements:

- High-strength thread in aluminium – light metals
- No reduction in preload force
- Minimum space requirement for installation
- Technical cleanliness
- Corrosion resistance

#### Our solution:

### HELICOIL® Smart Coil thread inserts

They generate high-strength joints in low-strength metallic materials.





## The technology

The HELICOIL® thread insert made from a wire with rhombic profile is formed into an elastic spiral. It produces high-strength threads transferring forces from flank to flank into the holding thread.

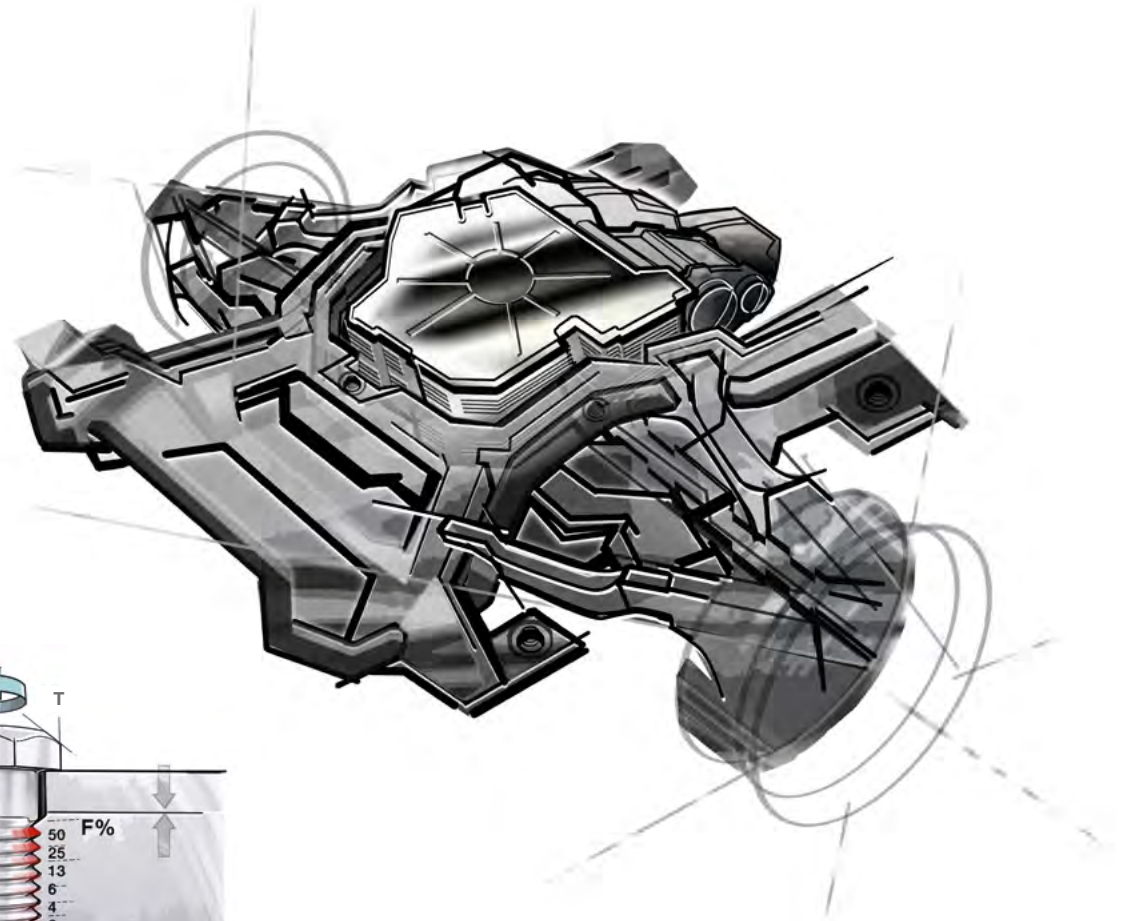
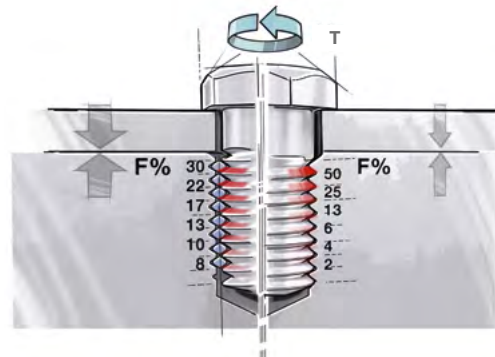
The elastic properties of the HELICOIL® thread insert allow a uniform load and stress distribution. An optimum flank contact is achieved. Deficient pitches and angles are compensated over the entire length of the thread insert. The force transmission from bolt to nut thread is ideal.

The quality of the screw joint is considerably increased – for static as well as dynamic operating loads.

### Your advantages:

- Creation of a high-strength thread
- Uniform load and stress distribution over the entire screw length
- No relaxation
- Wear resistance, low and constant thread friction
- Re-use
- Part of the circular economy

**With the “smart” HELICOIL®, you can generate screw joints with high process reliability that make maximum use of the potentials of lightweight construction.**

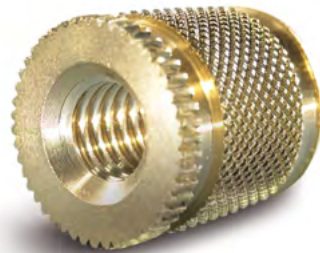


Power electronics in electric cars is a key technology because due to its decisive importance for the performance. It controls the e-machine, establishes a connection with the high-voltage battery and transforms its direct current into alternating current for the propulsion system.

This central switch station for the e-drive may be installed in a plastic housing as part of the drive train between battery and electric motor. A wear-resistant internal thread is needed to ensure a reliable screw joint, while only a minimum installation space shall be required.

**Your requirements:**

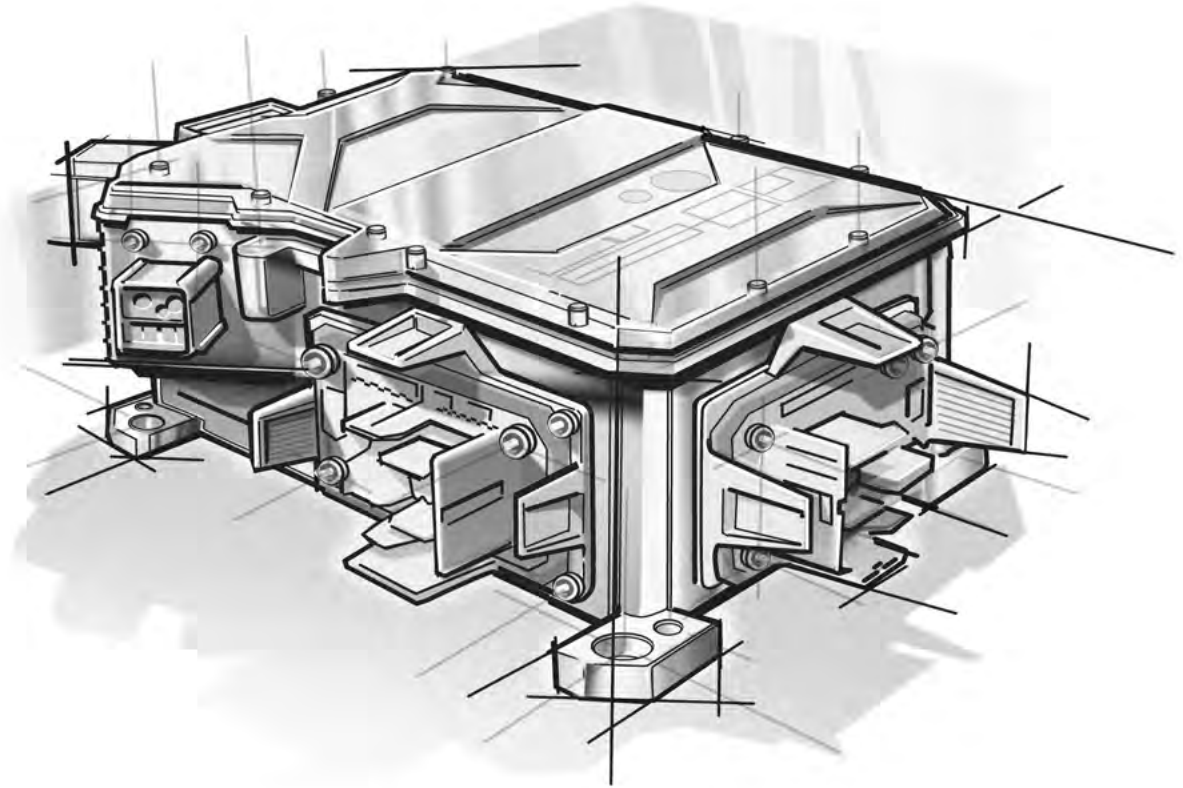
- High strength
- Low-stress interference
- Reusable
- Sealing function optional



**Our solution:**

**HITSERT®** Precision thread inserts

High-strength thread inserts for after-moulding joining in plastic components.



## The technology

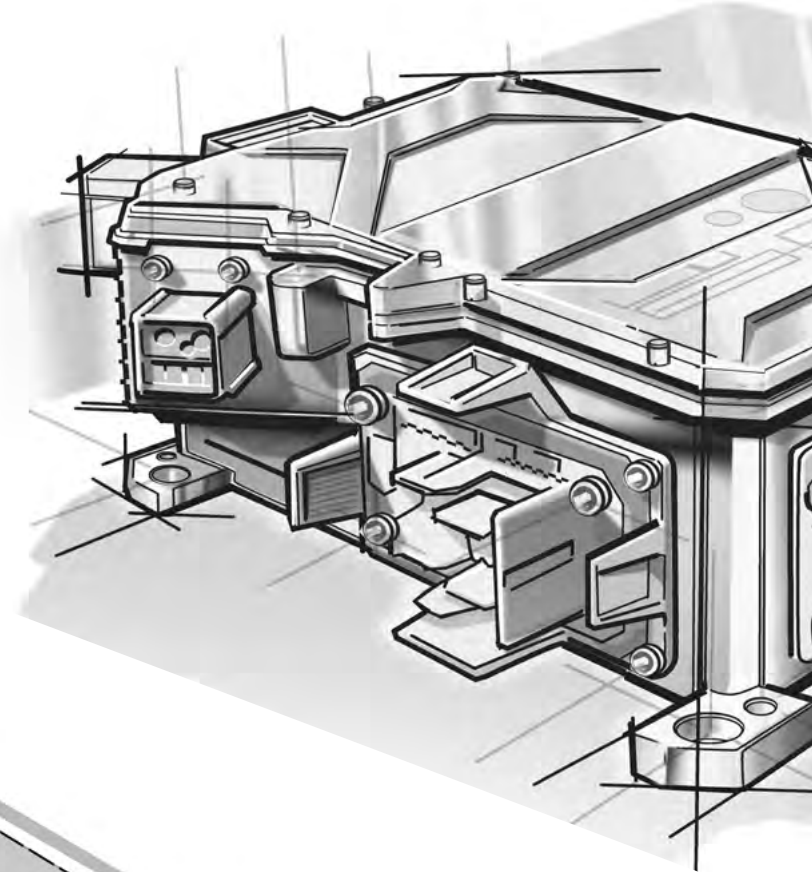
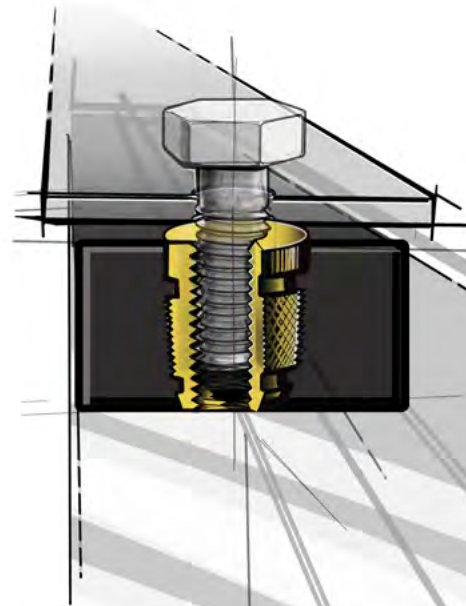
The HITSERT® thread insert is heated to the melting temperature of the plastic. From the heat transfer during insertion, the plastic is temporarily plasticised and flows into the undercut of the thread insert.

During cooling, a high interference fit is achieved while the plastic component is only under low stress.

### Your advantages:

- Ideal for the installation in thermoplastic components
- Low-tension anchoring with screw lock
- Reliable performance also for increased temperatures and dynamic load
- Efficient installation with manual or semi-automatic installation machines or automatic machines with preheating device

**Use the tried and tested HITSERT® technology to create high-strength threads in plastic components – after moulding.**



The Acoustic Vehicle Alerting System (AVAS) is a module which is only used in electric and hybrid vehicles.

Subject to EU regulation this sound box must produce acoustic warning signals up to a speed of approx. 20 km/h as well as during reverse driving. At higher speeds, the tyre noise is so loud that an artificial sound is not required by law.

The sound box should transfer the vehicle sound genuinely and clearly to the outside. In this case, a rigid joint would produce creaking noises.

### Your requirements:

- Secure fastening
- Vibration and noise decoupling
- Easy installation

### Our solution:

## **SITEC® Rivet**

For high-strength thread bodies on thin-walled components with an additional vibration and noise decoupling effect.



## The technology

The SITEC® Rivet consists of a metal sleeve which is usually a brass sleeve with a metric thread covered with elastomer or thermoplastic elastomer. Apart from the fastening function, the main benefit of the SITEC® Rivet is the vibration- and noise-decoupling characteristic.

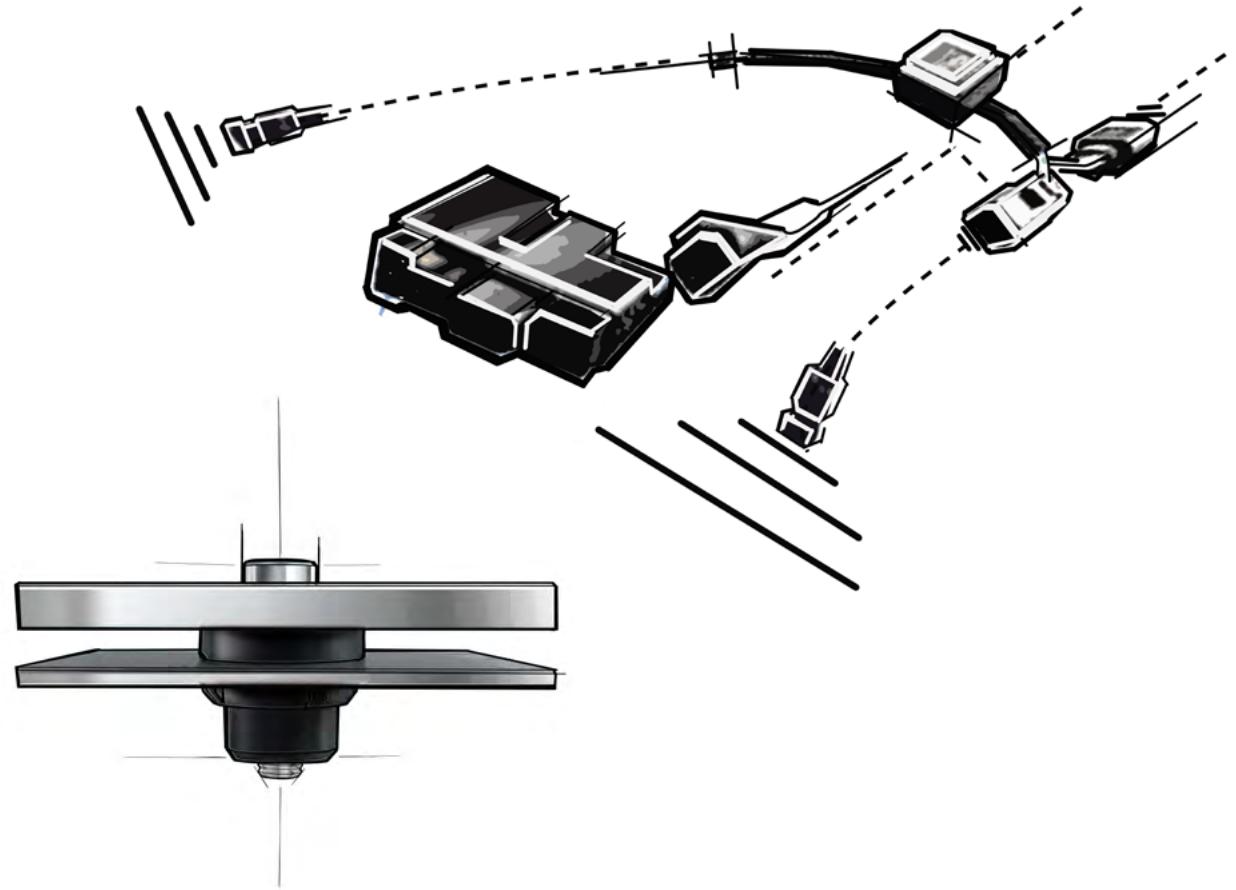
This is achieved by the elastomer covering. Since the metal sleeve is only connected to the covering in the bottom part, a bulge forms on the rear of the component to be fastened when a screw is screwed in. The result: a reliable and reversible blind rivet joint with noise-decoupling function.

Within the framework of a project, new developments according to application-specific requirements can be realised at any time.

### Your advantages:

- One-sided installation with high process reliability – blind installation
- Stable thread on thin-walled components
- Fast and easy installation – screwing and setting are the same
- Thermal and electrical insulation

**This clever joining element reduces vibration and noise to a minimum for you.**



Usually, the main components of the battery pack are a base plate, a cooling device as overheating protection, an external and internal frame as well as a cover for humidity protection.

The base plate or the battery tray is built into the body in the bottom between the axles. It is part of the support structure.

The number of battery modules to be placed in the frame depends on the range. Depending on the requirements, there are steel and aluminium battery packs available. Compared to the aluminium variant, the steel version is heavier, but lower-priced. This “new” assembly of the BIW presents the joining technology with new challenges.

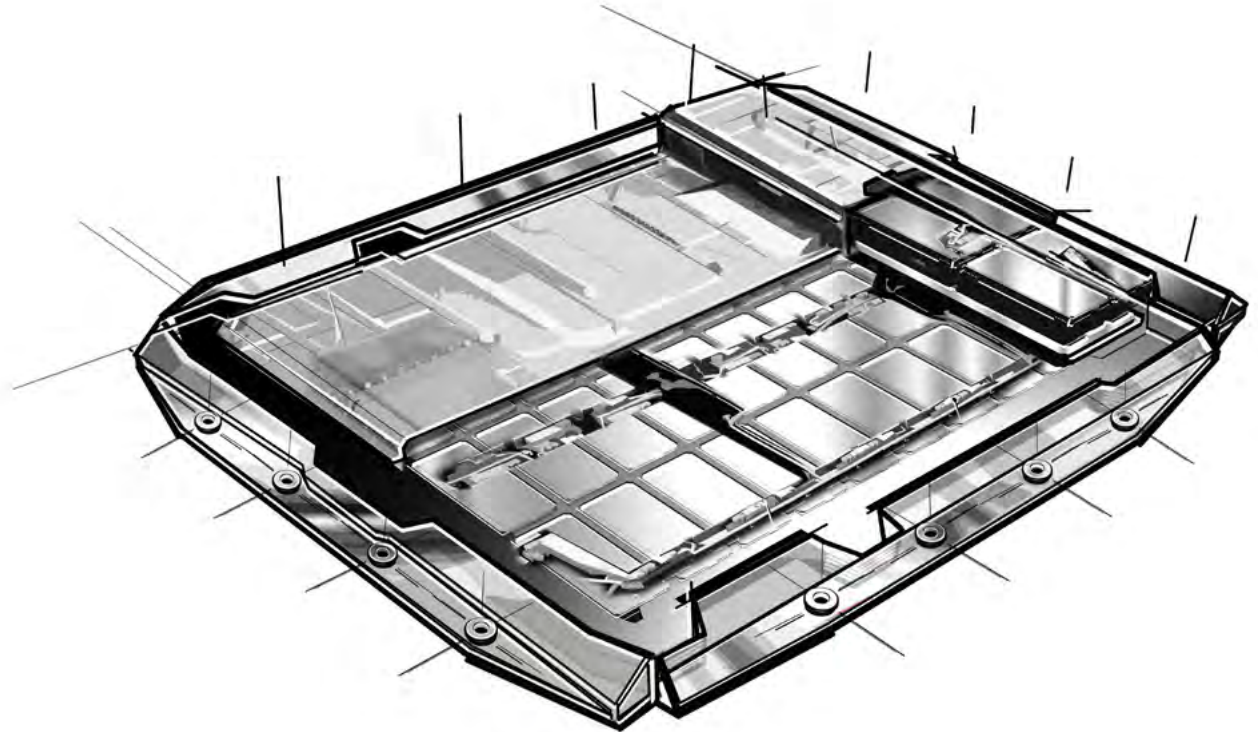
#### Your requirements:

- Brackets of the extruded profiles as fastening points
- 3–4 mm material thickness does not allow tapping
- Stable thread
- Easy installation
- Seal

#### Our solution:

### **RIVNUT® Seal Ring**

The RIVNUT® Seal Ring is a blind rivet nut or stud with an additional integrated sealing function.



## The technology

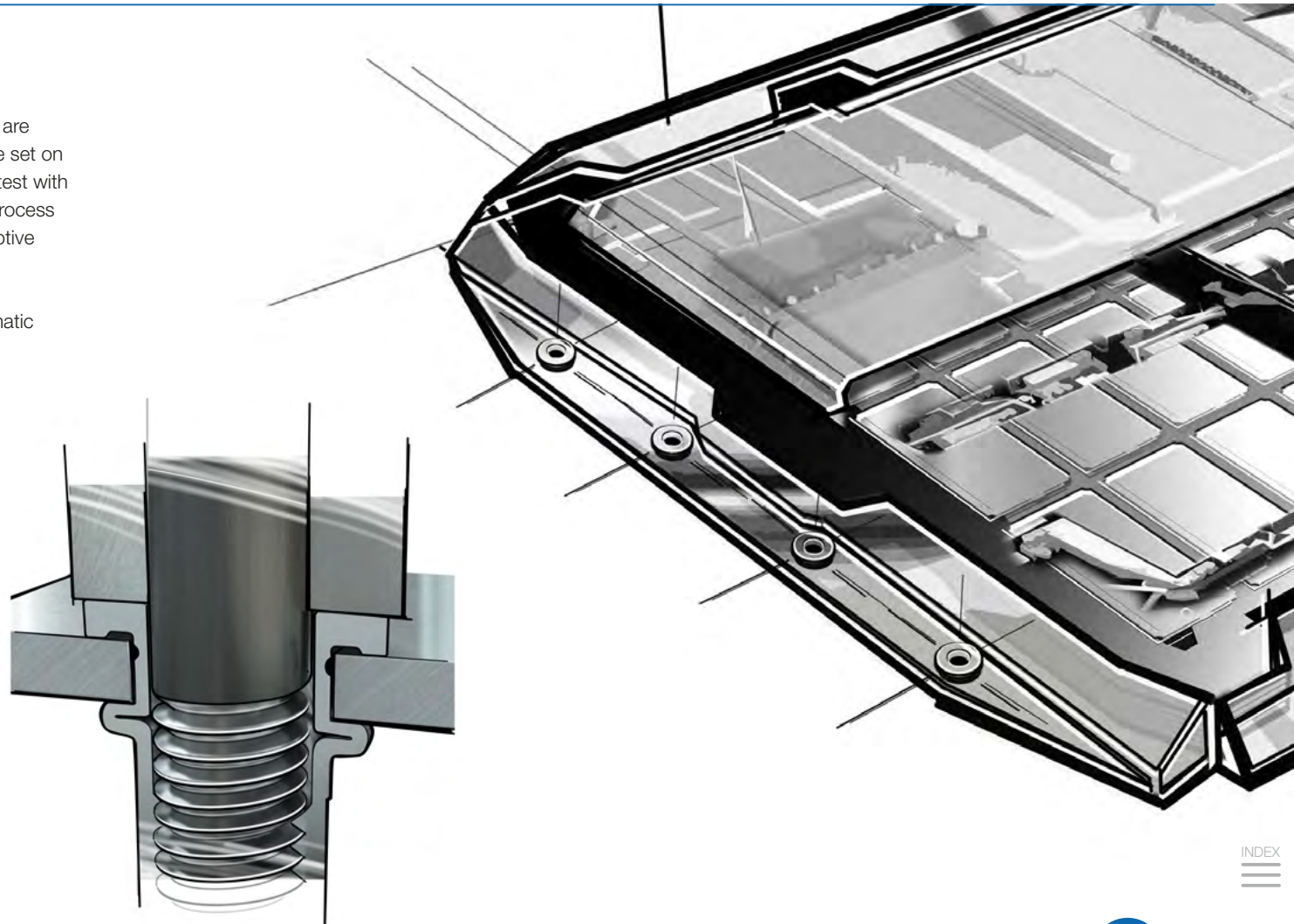
You can use the RIVNUT® Seal Ring to form stable nut threads. They are installed without counter pressure (“blindly”) and can therefore also be set on hollow sections. At the same time, they seal against fluids. A release test with air pressure is performed on all our products according to the strict process requirements (ATEQ) and also the highest requirements of the automotive industry.

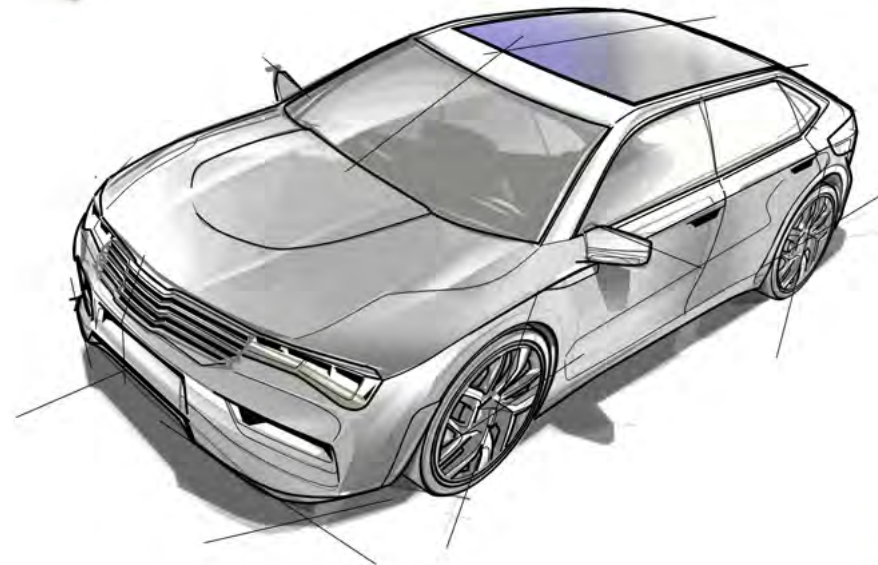
Installation is easy and reliable and can also be performed with automatic blow feed.

### Your advantages:

- Stable thread
- “Blind” installation
- Quality: proven sealing (ATEQ), degree of protection IPX7 as per ISO 20653
- Each fastener is subjected to a visual check (ppm rate)
- Riveting with high process reliability due to comprehensive setting process monitoring

**After the RIVNUT® Seal Ring has been successfully set, the sealing performance corresponds to degree of protection IPX7.**





Thread inserts for thread reinforcement **HELICOIL®**



Thread inserts for plastic parts — after-moulding **AMTEC®**

Bonding of functional elements **ONSERT®**



Thread inserts for in-moulding processes **IMTEC®**

Tolerance compensation systems **FLEXITOL®**



Blind rivet nuts and studs **RIVNUT®**

Vibration- and noise-decoupling plug-in connections **SNAPLOC®**



Blind rivets for high-strength, non-detachable joints **RIVQUICK®**

Vibration and noise decoupling **SITEC®**



Self-pierce riveting technology **RIVSET®**

Quick acting fastening systems **QUICKLOC®**



High-speed joining **RIVTAC®**

Customer-specific development parts and assemblies **TEPRO®**



Insert nuts **KAPTI NUT®**



Resistance element welding **WELTAC®**



Processing systems for fasteners



Joining without fastener **RIVCLINCH®**







## Your partner to succeed in joining – and what that means for you:

### Innovation and development partner

- Modern methods, organisational forms and processes
- Trend analyses
- Research cooperations
- Open innovation
- In-house research and development
- Application engineering and consulting
- Customer-specific development parts
- Manufacture of samples and prototypes
- Value analyses

### Procurement and assembly partner

- Engineering competence thanks to in-house production
- 14 modern production facilities worldwide
- Production methods:
  - Injection moulding
  - Turning
  - Cold working
  - Wire winding
  - Mechanical and plant engineering
- Acceleration of your assembly processes
- Wide range of manual and automated assembly solutions

### Logistics and quality partner

- Supply chain solutions
- Quality management according to IATF 16949
- Quality management according to EN 9100
- Distinctive quality and environmental awareness
- Accreditation of the in-house laboratory
  - according to DIN EN ISO/IEC 17025
  - certification according to DIN EN ISO 14001
- Regular audits through customers

### Distributor and service partner

- Efficient consulting, assistance and service
- Local expert specialists
- Proximity to customers thanks to global presence
- After-sales service
- Expert seminars, training and workshops
- Online seminars
- Customer in-house fairs

## Catalogues

### Product catalogues



#### HELICOIL® Smart

The new generation of thread technology for high-strength joints  
Catalogue No 0155

<https://www.boellhoff.com/en/pdf/helicoil-smart>



#### SITEC®

Fastening elements for vibration and noise decoupling  
Catalogue No 2500

<https://www.boellhoff.com/en/pdf/sitec>



#### AMTEC®

Precision thread inserts for after-moulding joining in plastic components  
Catalogue No 0200

<https://www.boellhoff.com/en/pdf/amtec>



#### RIVNUT® Seal Ring

Blind rivet nuts and studs with additional sealing function  
Catalogue No 2309

<https://www.boellhoff.com/en/pdf/RIVNUT-seal-ring>

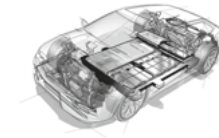
### Industry-specific catalogues – automotive



#### Automotive engineering meets 360° Joining Technology

Exterior – headlights and rear lights  
Catalogue No 0943

<https://www.boellhoff.com/en/pdf/lighting-solutions>



#### E-mobility meets 360° Joining Technology

Catalogue No 8023

[www.boellhoff.com/en/pdf/e-mobility-with-rivnut](http://www.boellhoff.com/en/pdf/e-mobility-with-rivnut)

### Product overview



#### Product Guide

360° Joining Technology  
Catalogue No 1190

<https://www.boellhoff.com/en/pdf/product-guide>

**Videos****Videos joining elements****HELICOIL® Smart**

The new generation of thread technology for high-strength joints

<https://www.boellhoff.com/video/helicoil-smart>

**SITEC® Rivet**

Vibration- and noise-decoupling blind rivet nut

<https://www.boellhoff.com/video/sitec-rivet>

**AMTEC® HITCERT**

Thread insert with sealing ring

<https://www.boellhoff.com/video/hitsert2-with-sealing-ring>

**RIVNUT® Seal Ring**

Blind rivet nuts and studs with additional sealing function

<https://www.boellhoff.com/videos/rivkle-seal-ring>

**Industry-specific videos – automotive****Automotive engineering meets 360° joining technology**

Exterior – headlights and rear lights

<https://www.boellhoff.com/videos/lighting-solutions>

**Automotive industry meets 360° joining technology**

<https://www.boellhoff.com/video/automotive>

**E-mobility meets 360° joining technology**

<https://www.boellhoff.com/video/e-mobility>

# BÖLLHOFF

Passion for successful joining.

## **Böllhoff Group**

Innovative partner for joining technology with assembly and logistics solutions.

Find your local partner at [www.boellhoff.com](http://www.boellhoff.com) or contact us at [info@boellhoff.com](mailto:info@boellhoff.com).

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