b&m
technik produktion logistik

b&m-TIGHT®

Direct screwing system with integrated sealing function for aluminum-steel hybrid applications

Welcome to baier & michels

Group headquarters in an idyllic location in Ober-Ramstadt near Frankfurt

Dear customer,
Dear business partner,

The globally oriented b&m group has built up a strong position as a partner for connection technology and C-parts management in the automotive industry. This is based on innovations in products, processes and systems, and confidence through competence, commitment and soundness.

New innovative products are being developed as problem solvers for customers in the field of technology. Our application engineers support customers with their requirements. A unique standardization tool with an online portal can substantially reduce the variety of parts the customer uses.

As a manufacturer, the b&m Group has the know-how to ensure very high and reliable product quality. With b&m Logistics, the b&m Group has a company that optimizes the customer supply chain worldwide through modern systems such as RFID.

Enjoy reading

Peter Federolf
Managing Director

baier & michels, founded in 1932, has developed a strong position as a supplier of fastener technology in the automotive industry and now employs more than 500 people worldwide. The Würth Group, to which b&m has belonged since 1973, provides additional financial stability with more than 79,139 employees and over 14,41 billion Euro in sales worldwide. baier & michels is now active in Europe, Asia and North America.

Direct Screwing in Metals

WHY DIRECT SCREWING IN METALS?

The principle of non-cutting forming used here produces a thread with high load-bearing capacity due to the uninterrupted grain flow and strain-hardening of the material. Additional screw locking (e.g. to DIN 267-27/28) is therefore unnecessary.

The generated thread is a metric ISO thread, which is compatible with standard parts. Furthermore, the threads formed in this way are free of play and are self-locking. Thread-forming screws can be used in all ductile, i.e. plastically deformable materials.

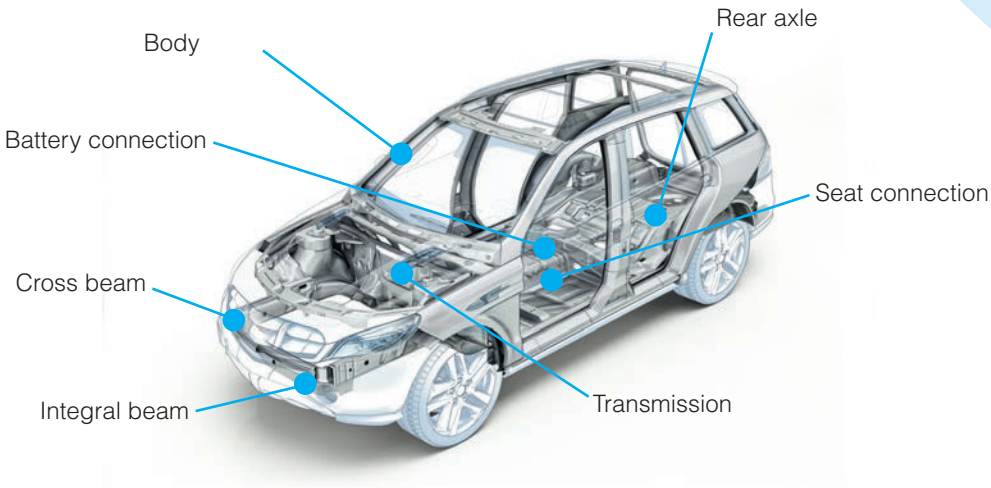
BENEFITS:

- Cost advantages through the elimination of thread cutting and through direct use in cast, drilled or punched holes
- Produces an uninterrupted grain flow and a thread with high load-bearing capacity by strain-hardening of the material
- Through the forming process of the thread, no interfering chips are created
- The thread geometries of all our direct screwing systems have a large tolerance range preventing angular errors when the screw is applied
- No play between the screw and its self-formed nut threads
- No threadlocker is required due to the associated self-locking effect
- Repeat screwing is possible

b&m-TIGHT®

- Universal application for direct screwing of materials from high-strength steel to tough-soft aluminum
- Circular thread cross section and fully pronounced thread flanks offer maximum flank coverage and through this a high overtorque
- Enables screw-in depths of up to 5 x D (D= thread diameter) in low-strength materials
- Self-sealing thread for reliable sealing for under or over pressure of up to 1000mbar (according to MBN 10355)

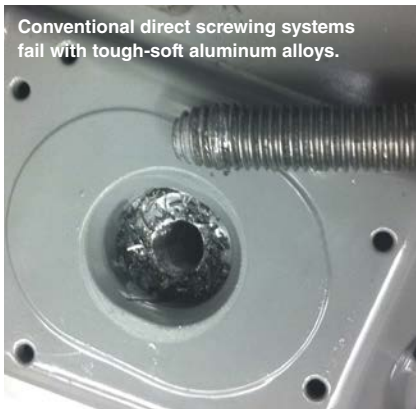
Application examples



b&m-TIGHT®

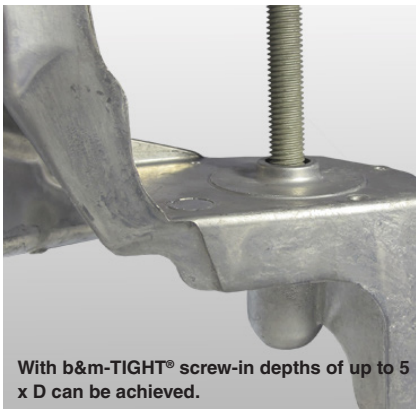
In contrast to „trilobular“ screws, the b&m-TIGHT® is designed with a circular cross-section affecting the entire threaded area. The forming zone is also provided with fully and sharply pointed thread flanks. The b&m-TIGHT® is suitable for assemblies in aluminum-steel hybrid applications.
Special characteristic: when the core hole is adjusted, the b&m-TIGHT® is self-sealing against gases and liquids.

Problems with screwing into aluminum-steel hybrid assemblies



Conventional direct screwing systems fail with tough-soft aluminum alloys.

b&m-TIGHT® allows a robust screw connection without "seizure".



With b&m-TIGHT® screw-in depths of up to 5 x D can be achieved.

CHALLENGE:
Direct screwing failure when forming thread into tough-soft aluminum alloys

The use of thread-forming screws in aluminum-steel hybrid assemblies often leads to problems with the screwing connection. The reason for this is partly due to the different core hole parameters such as diameter, draft angles or surfaces (strain-hardened or machined). Another factor is that material strengths and screw-in depths, which differ greatly from high-strength steels to tough-soft aluminum, are crucial for the connection.

With low-strength materials, the large screw-in depth is often the cause of connection problems. Due to the resulting high friction during the forming of the threads in conventional trilobular direct screwing systems, the screw tends to "seize" in the component. The incomplete flank coverage of these systems also leads to a lower transferability of preload forces.

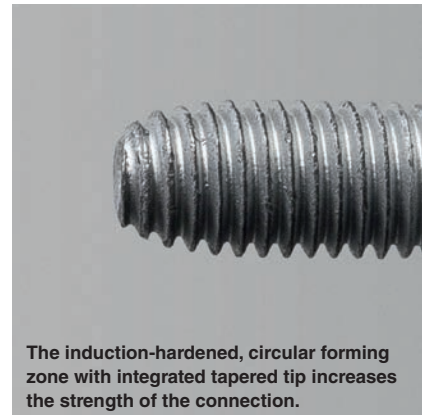
SOLUTION: b&m-TIGHT®
Universally usable for aluminum-steel hybrid assemblies

The b&m-TIGHT® is universally usable as a direct screwing system and it guarantees a secure connection of high-strength steels to tough-soft aluminum. Due to the special forming zone geometry, "seizing" of the screw is prevented and thus screw-in depths of up to 5 x D (D = thread diameter) can be achieved with low-strength materials. The circular thread cross section allows a complete flank coverage and therefore it guarantees a process-safe and robust screw connection.

Corrosion by non-sealed direct screwing connections

Corrosion attacks trilobular screws.

With b&m-TIGHT® the self-sealing thread keeps moisture away from the unprotected connection point and thus prevents corrosion.



The induction-hardened, circular forming zone with integrated tapered tip increases the strength of the connection.

CHALLENGE:

Corrosion in the thread area by penetrating moisture

Due to the interrupted flank coverage of commercially available trilobular direct screwing systems, corrosion can occur due to moisture penetrating the thread area. For this reason there are corrosion-related problems in the automotive industry, in particular at underbodies or in cavities where moisture can accumulate. A common practice is the expensive application of chemical sealing coats to the threads. However, since heat is generated during direct screwing and the sealing coat is displaced during the forming process, the sealing function cannot be guaranteed. Therefore, connections with a specific sealing requirement can often not be realized through a cost-effective direct screw connection.

SOLUTION: b&m-TIGHT®

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PRODUCT FEATURES:

- **Diameter:** M8 - M14
- **Length:** depending on diameter / 20mm - 140mm
- **Property class:** 10.9 according to DIN EN ISO 898-1 + inductive hardened thread-forming zone (6 - 8 threads)
- **Flank angle:** 60°
- **Thread pitch:** metric according to DIN 13
- **Head geometry:** customized solutions available
- **Coating:** optional according to specification (integrated or additionally applied lubricant according to application)
- **Thread-forming zone:** 3 - 4 threads

AREAS OF USE:

- Especially suitable for aluminum-steel hybrid applications
- Direct screwing in high-strength and tough materials, as well as die-cast aluminum
- Applications where a sealing function is required

b&m-TIGHT®

baier & michels worldwide

Call us!

We analyze your screwing situation and offer you a non-binding technical consultation, upon request also on site. Our technical services include:

- Application engineering
- Process optimization
- Development of new connection systems

We also support you in the areas of procurement and logistics.

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