

b&m-TIGHT®

Direct screwing connection 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 joining technology in the automotive industry and now employs more than 400 people worldwide. The Würth Group, to which b & m has belonged since 1973, provides additional financial stability with more than 74,500 employees and over 12,7 billion Euro in sales worldwide. baier & michels is now active in Europe, Asia and North America.



Direct screwing in metals

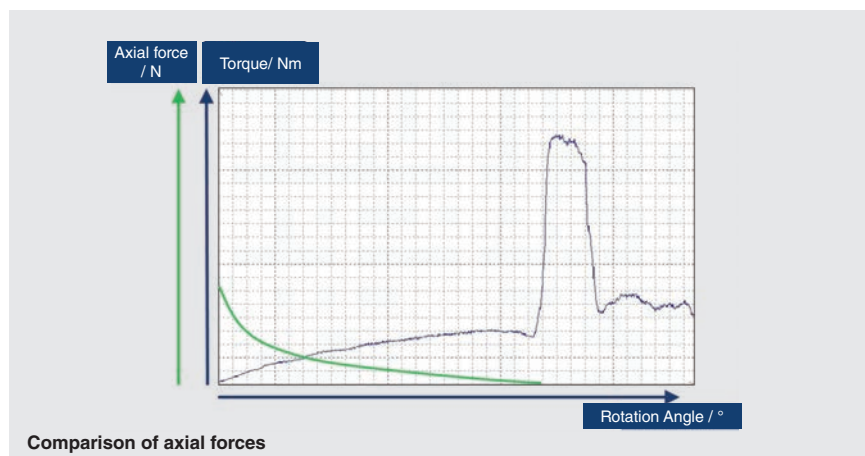
WHY DIRECT SCREWING IN METALS? With direct screwing the fasteners generate a thread when screwed in without cutting.

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 thread locking adhesives (e.g. to DIN 267-27/28) are therefore

superfluous. The generated thread is a metric ISO thread which is compatible with standard parts (except b&m-FORM LG®). Furthermore, the threads formed in this way are backlash-free and self-locking. Thread forming screws can be used in all ductile, i.e. plastically deformable materials.

BENEFITS:

- Cost advantages through elimination of thread cutting/shaping and 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 chips will be created that could interfere further processes
- The thread geometries of all our direct screwing systems have a large installation 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



Project Examples

Product: b&m-TIGHT® M10x22 screw-and-washer assembly
Application: **Transmission frame connection (steel tubes)**
Customer: Market-listed German manufacturer of passenger cars and commercial vehicles



Product: b&m-TIGHT® M10x32 hexalobular with flange
Application: **Seat connection (hybrid screw connection aluminum-steel)**
Customer: Market-listed German manufacturer of passenger cars and commercial vehicles



Product: b&m-TIGHT® M8x35 hexalobular with flange
Application: **Tank strap connection (hybrid screw connection aluminum-steel)**
Customer: Market-listed German manufacturer of passenger cars and commercial vehicles



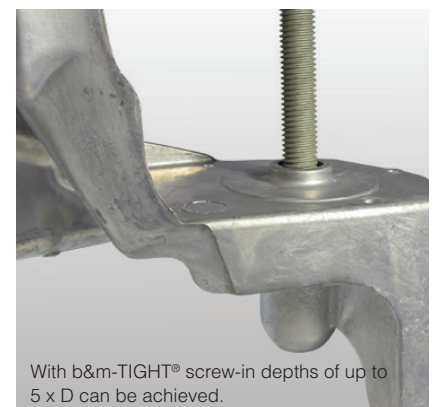
b&m-TIGHT®

The b&m-TIGHT® direct screwing connection system is an in-house development of baier & michels and was specially designed for functional integration (tightness) in aluminum-steel hybrid applications.

The innovative system can be used universally for bolting a wide variety of materials and is suitable for both high-strength and tough-soft materials as well as for hybrid components made of aluminum and steel. Due to the innovative properties of the b&m-TIGHT® the typical challenges faced by designers during direct screwing in hybrid components is a thing of the past.



Problems with screwing into aluminum steel hybrid structures



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

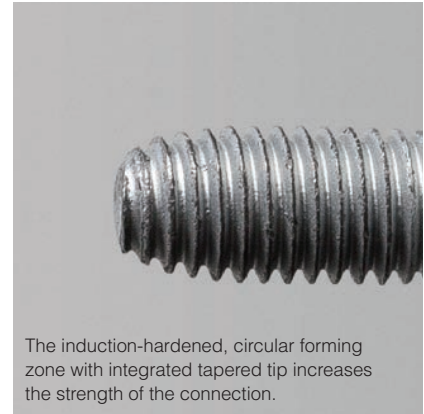
Due to the core hole parameter such as diameter, draft angles, cold-hardened or machined surfaces, etc. the use of thread-forming screws in aluminum / steel composite structures often causes problems with the screwing connection.

Likewise, various material strengths and components depths - on the one hand high-strength steels, and on the other hand tough-soft aluminum materials - place great demands on the screwing system. For example, long screw-in depths in low-strength materials are often the cause for screwing 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: Universal application - suitable for aluminum and steel materials

- Universal application for direct screwing of materials from high-strength steel to tough-soft aluminum
- Enables screw-in depths of up to 5 x D in low-strength materials
- Reliably prevents "seizing" through a special forming zone geometry and a customized lubrication concept
- Full flank coverage due to the rounded thread cross section which provides process reliable, robust screw connections with a high preload force

Corrosion caused by non-sealed direct screwing connections



CHALLENGE:

Corrosion in the thread area caused by incomplete flank coverage of trilobular screws

Due to the incomplete flank coverage of commercially available trilobular direct screwing systems, corrosion may result in the thread area due to moisture. 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, with direct screwing the function is often inadequate due to the displacement of the sealing coat during the cutting process and the resulting heat development during screwing. Therefore screwing connections with a corresponding sealing requirement cannot be considered inexpensive direct screwing connections.

SOLUTION: b&m-TIGHT®

Self-sealing due to special forming zone geometry

- Self-sealing thread for reliable sealing for under or over pressure of up to 1000 mbar
- Reliably prevents corrosion by keeping moisture away from the exposed connection point
- Induction hardened, circular forming zone with integrated tapered cone point. The strength of the supporting thread remains as specified in EN ISO 898 at property class 10.9
- Reliable, robust screwing with a moderate forming torque

baier & michels worldwide



Call us!

We analyze your screw connection 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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