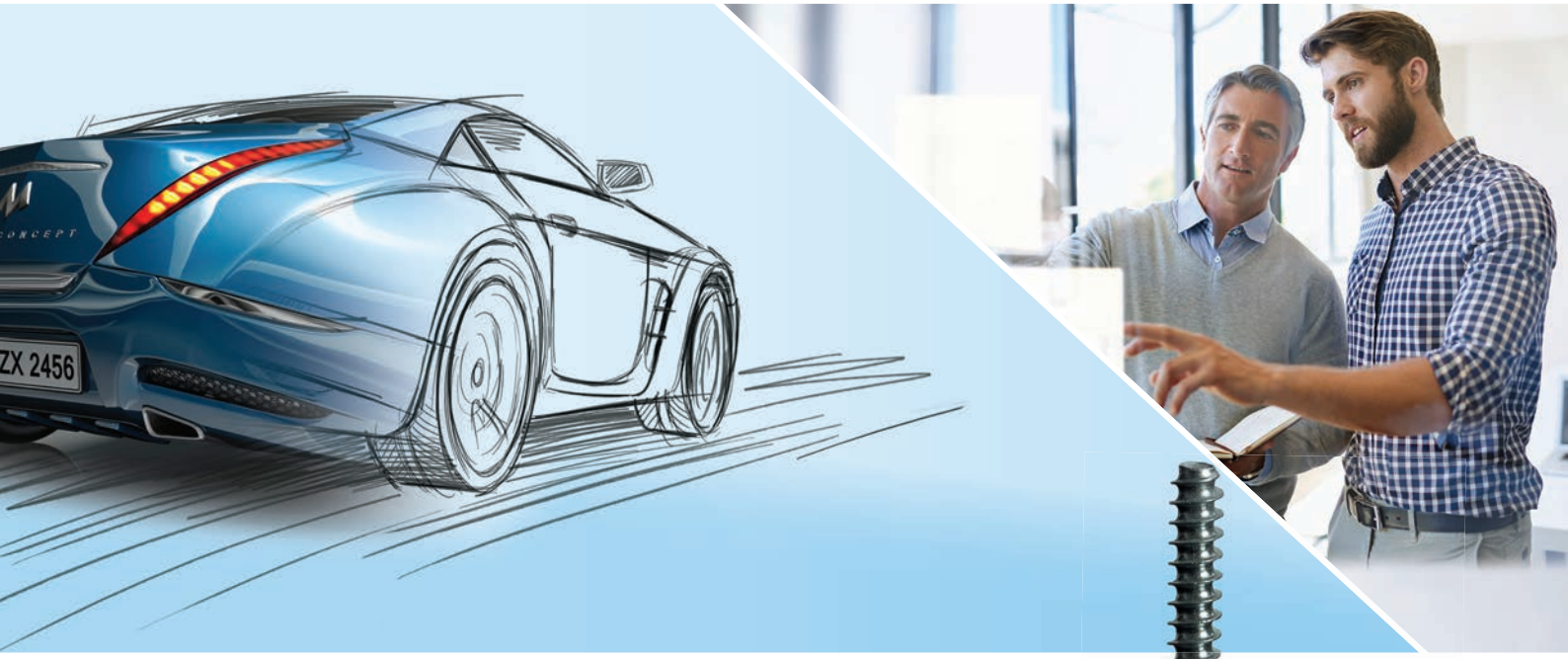
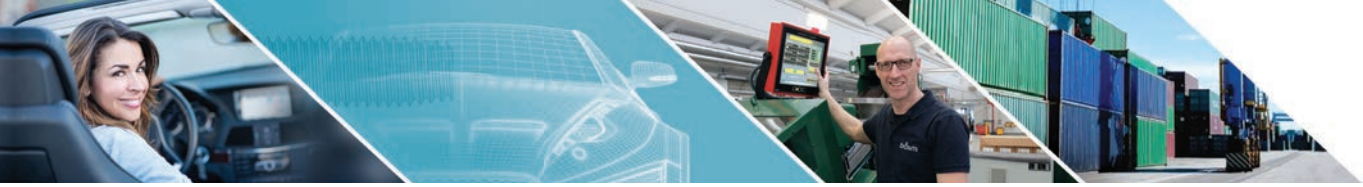
b&m
technik produktion logistik



b&m-PLAST R®

Optimized direct screwing system for high performance plastics



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 established itself internationally as a supplier of innovative fastening and sealing technology. Customers for its products and services primarily include companies in the automotive, electrical and medical industries. With 500 employees worldwide, b&m recently generated sales of around 180 million euros (2021). The Würth Group, to which b&m has belonged since 1973, provides additional financial stability with more than 83,000 employees and over 17,08 billion Euro in sales worldwide. baier & michels is now active in Europe, Asia and North America.

Direct Screwing in Plastics

WHY DIRECT SCREWING?

New applications mean an increasing significance for the use of plastics. The resulting advantages are located in the area of weight reduction, increased chemical resistance and simplified recycling of the components, for example through the possible replacement of metal inserts.

The economical fitting possibilities and ability to disconnect direct screwing connections made into plastics create cost savings in comparison to other joining techniques. In contrast to previous applications (with a flank angle of 60°), b&m thread geometries have a flank angle value of 30° / 25° and reduce radial tension.
This achieves optimal filling of the thread root, whilst enabling material-saving dimensioning of the screw-in tube. The design of thin wall thicknesses enables a weight- and cost-optimized connection. Greater coverage between the thread flanks and the material increases process safety.

BENEFITS:

- High process capability due to consistent screw-in process
- No tolerances between screws and self-formed nut threads
- High assembly speed
- Savings through the ommission of threaded inserts
- Supports lightweight construction targets

b&m-PLAST R®

- The reduced 25° flank angle leads to lower notch effect and reduces radial forces acting on the tube
- The rounded thread root ensures a homogenous material flow of the plastic into the cavities
- Large process window can be achieved between forming torque and overtorque
- Greater flank coverage enables higher pull-out forces
- Improved surface quality through long-stroke rolling
- Reduced wall thicknesses can be achieved through lower radial stresses
- Reliable connection process through tight production tolerances

Project examples

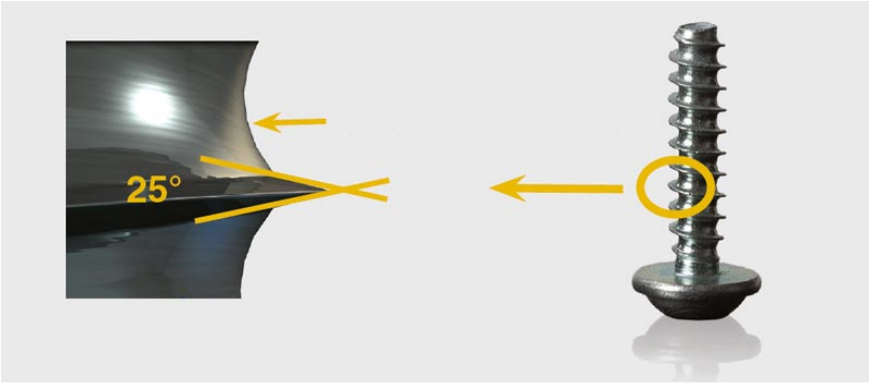
Product: b&m-PLAST R® 5x14
Project: **Sunroof module**
Customer: Leading German supplier to the automotive industry

Product: b&m-PLAST R® 4x18
Project: **Thermo-acoustic engine encapsulation**
Customer: Leading international company in plastics production

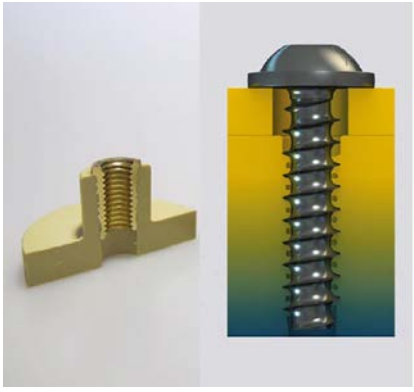
Innovation in the screw connection of high-performance plastics

The b&m-PLAST R® is suited for the direct screwing of low to high-strength plastics, including Thermoset. This screw's reduced flank angle enables the radial stresses to be minimized in the plastic component. At the same time, the optimized geometry of the thread root favors a homogeneous material flow. Thanks to the improved flank coverage and the simultaneously optimized design of the thread pitch, higher tightening torques and preload forces with improved process capacity can be achieved.

High pull-out forces



The optimized thread geometry reduces radial forces and increases flank coverage



The costly topic of embedding thread inserts is unnecessary

CHALLENGE:

Frequent use of threaded inserts in the automotive industry

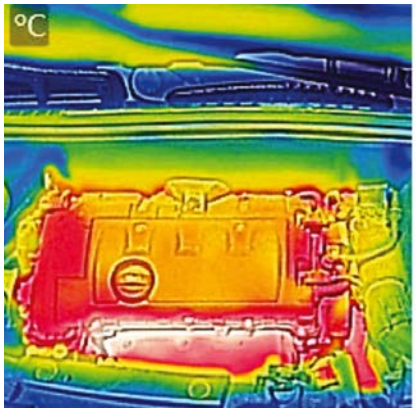
For highly stressed connections of plastic components, often threaded inserts are being injected, pressed-in or embedded by using heat- or ultrasonic installation. This causes high costs in purchasing and in the process chain of creating the connection. Most systems for direct screwing in plastics cannot be used here, because the load capacity of the connection between screw and plastic is too low.

SOLUTION: b&m-PLAST R®

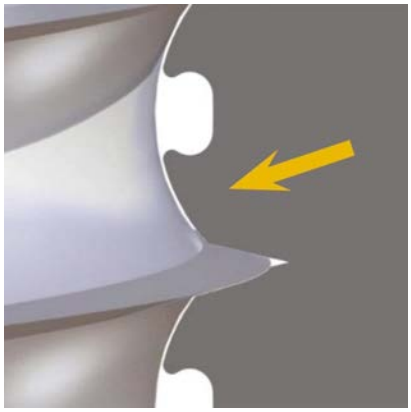
Improved flank coverage enables increased pull-out forces

Thanks to its optimized thread geometry, the b&m-PLAST R® produces a significantly improved flank coverage of the threads. As a result, the pull-out forces and overtorque of b&m-PLAST R® are particularly high and thread inserts can be eliminated by this direct screwing system.

Lower radial stresses in the tube



Thermosets are often used because of the high demands on temperature resistance



Optimized material flow of the plastic in the threads of the screw

CHALLENGE:
Assembly of brittle plastics

Especially brittle thermoplastics and thermosets are difficult to deform. This makes the use of direct screwing very difficult, since the screw is not intended to cut the plastic, but to form it. Often, cracked screwing tubes are the result.

SOLUTION:b&m-PLAST R®
Optimized material flow due to rounded thread root

Due to its rounded thread root, the b&m-PLAST R® generates an optimal flow of material, so that even in brittle materials a thread can be created. In addition, the small flank angle reduces the radial stresses in the tube and prevents it from bursting.

b&m-PLAST R®

PRODUCT FEATURES:

- **Diameter:** 4mm - 10mm
- **Length:** depending on diameter / 8mm - 40mm
- **Property class:** 1000 according to b&m-factory standard WN 03/16
- **Flank angle:** 25°
- **Head geometry:** a variety of head geometry possible (Standard: pan head and pan head with collar)
- **Coating:** optional according to specification

AREAS OF USE:

- Non-reinforced thermoplastics
- High-reinforced thermoplastics (up to 50%)
- Especially suitable for plastics sensitive to stress cracks

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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