

## **b&m-KL PLUG®**

Closing and sealing system for holes with or without internal pressure



# 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 78.686 employees and over 14,27 billion Euro in sales worldwide. baier & michels is now active in Europe, Asia and North America.



# Closing and sealing of holes

## WHY USE SEALING SYSTEMS?

**Coolant and lubricant circuits are required for ensuring component function in a variety of different areas and applications in the automotive industry, from gearboxes and pumps to engine blocks. These have to be closed and sealed.**

Usually, screw plugs (with or without under-head seal) or expander solutions

are used for sealing holes. In contrast to screw plugs, expanders cannot be removed without being destroyed.

In addition, these sealing elements close off the hole, but require complex preparation of the bore hole.

For example, the process of drilling, countersinking, milling the head contact surface and cleaning the

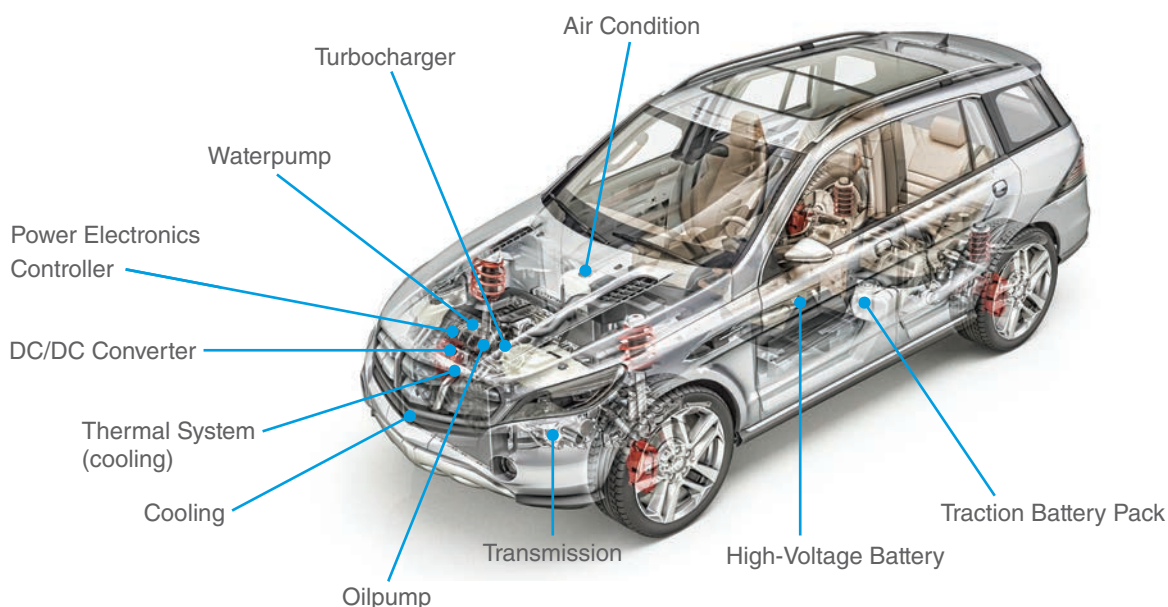
thread when using screw plugs is very time consuming and expensive.

## b&m-KL PLUG®



- One-piece element
- No waste products during assembly
- Non-destructive disassembly
- Combines quality and reliability
- Efficient assembly process

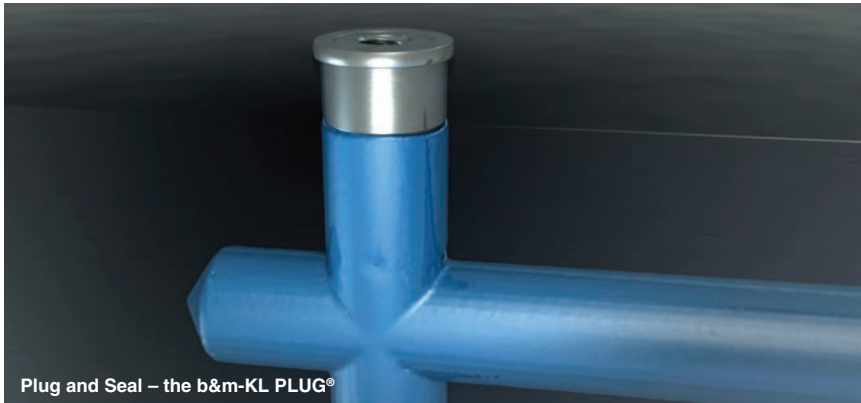
## Project examples



# Innovation in the closing and sealing of holes

The typical challenges with which design engineers used to be confronted with regard to sealing are now a thing of the past thanks to the innovative properties of the b&m-KL PLUG®:

## Pressure resistant sealing



### CHALLENGE:

#### Problem with closing and sealing a hole with internal pressure

Sealing elements are subject to a variety of stresses due to the different areas of application. The different expansion coefficients mean that material pairings have to be selected so that permanent sealing can be ensured.

After defining the suitable materials, the hole or thread has to be prepared for the respective sealing element. This often requires narrow tolerance ranges and high surface quality: these steps

have to be designed so that reliable sealing against media is possible, e.g. water-glycol mixtures or oils.

As sealing elements are often used in areas with critical functions, process verification has to be designed to exclude incorrect use.

### SOLUTION:

#### Reliable closing and sealing under pressure

- Different materials are possible: steel, stainless steel and aluminum
- Drilling tolerance of only +0.2 mm necessary
- Pressure-resistant up to 30 bar
- Force/displacement-monitored use
- Low weight

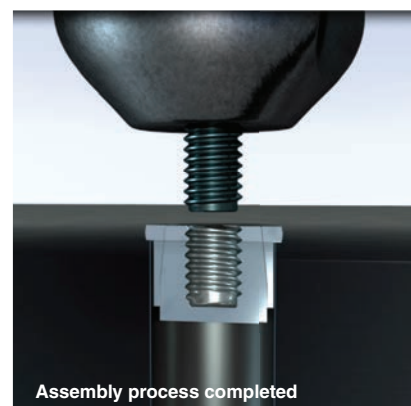
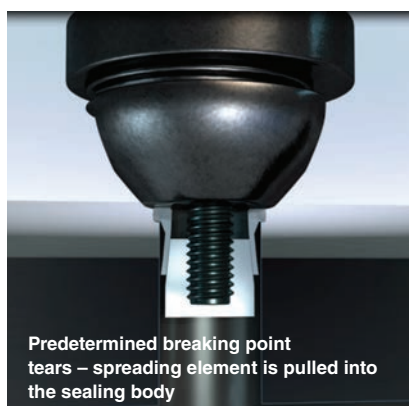
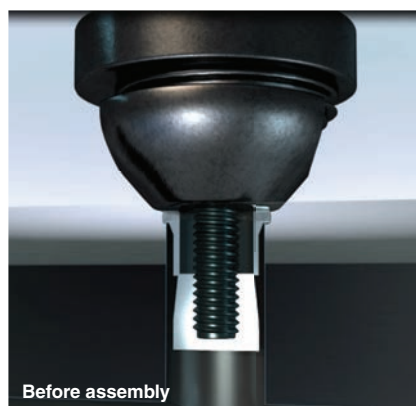
### FEATURES:

- **Diameter:** 8mm - 24mm
- **Length:** depending on diameter
- **Head geometry:** can be produced with or without head
- **Material:** Steel, stainless steel and aluminum depending on the material of the counterpart
- **Coating:** optional according to specification
- **Operating pressure:** up to 30 bar
- **Operating temperature:** applicable from -20°C to +200°C

### AREAS OF USE:

- Seals holes as closure element
- Seals a too large of a hole for repair purposes and provides a smaller thread

## Non-destructive assembly and disassembly



### CHALLENGE:

#### Placing and removing the sealing element without generating waste or dirt

Many sealing elements, e.g. expanders, generate a waste product (mandrel) during assembly which has to be removed and disposed of separately.

If screw plugs are used for sealing holes in aluminum die-cast components, it has to be ensured that the thread in the opposite component can absorb the required tightening torques and shearing forces again (in case of repeated assembly during repairs).

It is not possible to remove these sealing elements from the hole again without producing swarf (exception: screw plugs). Then the hole has to be drilled open to the next larger diameter required for the new sealing element, which is often not possible due to the available packaging space. To seal the hole again, the preparations listed above have to be carried out in addition to cleaning, to remove the swarf produced during disassembly of the sealing element.

### SOLUTION:

#### Efficient, low-cost sealing system

- One-piece element (without waste)
- Reduced risk of corrosion (no open predetermined breaking point)
- Non-destructive disassembly (no swarf)
- Hole can be reused (no repeat preparation required)
- Low investment costs (standard assembly device)

# 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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