

b&m-KL PLUG®

Closing and sealing system
for holes with 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 74,500 employees and over 12,7 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.

Customized solution for sealing holes

Closing and sealing holes with internal pressure is often difficult to achieve in combination with user friendly assembly and disassembly due to the engineering guidelines and the different materials and temperature ranges.

b&m has developed a sealing element for this problem to offer a universal solution for low pressure applications.

The b&m-KL PLUG®

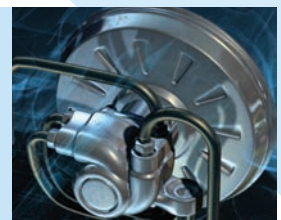


The universal sealing system for holes with internal pressure:

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

Project example

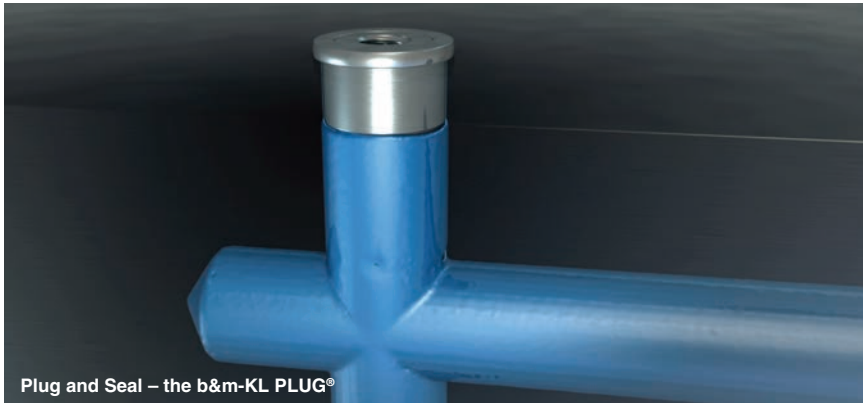
Closing and sealing a cast bearing housing cover for a turbocharger



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.

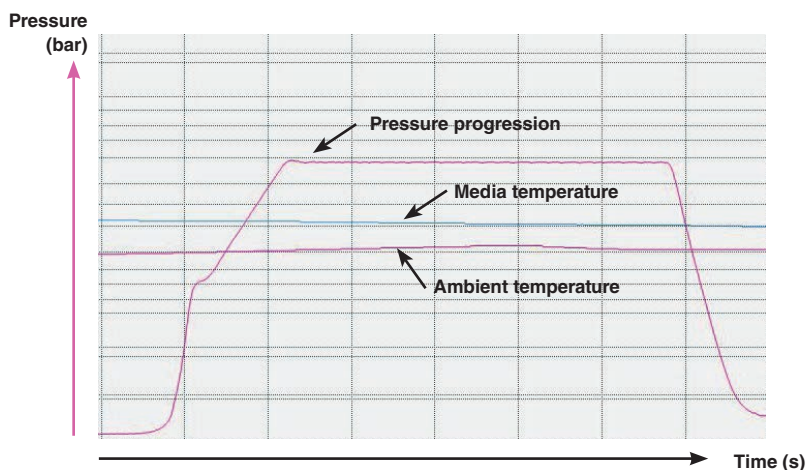
This often requires narrow tolerance ranges and high surface quality: these steps have to be designed so that reliable sealing against media is possible, e.g. water-glycol mixtures or oils.

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

SOLUTION:

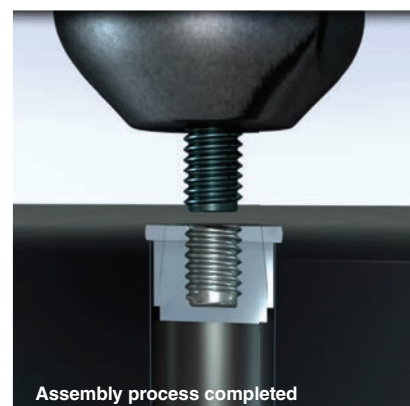
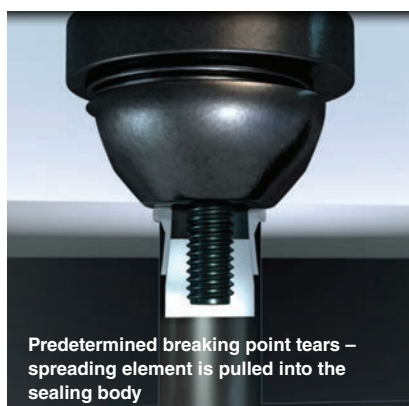
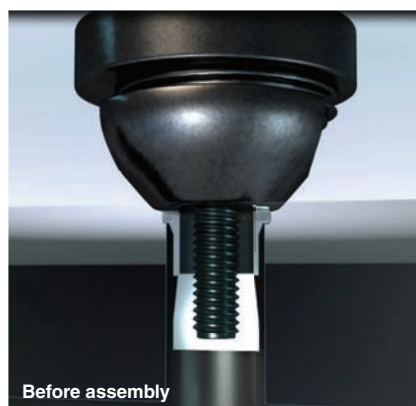
Reliable closing and sealing under pressure

- 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



Pressure progression as per leak-tightness test conducted in cooperation with TÜV Süd

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.

baier & michels GmbH & Co. KG

Carl-Schneider-Straße 1
64372 Ober-Ramstadt / **Germany**
Tel.: +49 (0) 61 54 69 60 - 0
Fax: +49 (0) 61 54 69 60 - 500
info@baier-michels.com
www.baier-michels.com

baier & michels S.r.l.

Via Eugenio Montale n. 6
35030 Selvazzano Dentro (PD) / **Italy**
Tel.: +39 04 98 53 66 00
Fax: +39 04 98 53 66 96
italy@baier-michels.com
www.baier-michels.it

baier & michels USA Inc.

Greenville Office
65 Brookfield Oaks Drive
Greenville, SC 29607 / **USA**
Tel.: +1 864 968 1999
Fax: +1 864 968 1234

Würth baier & michels España S.A.

P.I. Can canals
C/ Formentera, 12
08192 Sant Quirze del Vallès
(Barcelona) / **Spain**
Tel.: +34 (0) 65 19 27 543
Fax: +49 (0) 61 54 69 60 99 236
spain@baier-michels.com
www.baier-michels.com

baier & michels USA Inc.

Detroit Office
37450 Garfield Road, Suite 300
Clinton Township, MI 48036 / **USA**
Tel.: +1 248 877 9956
usa@baier-michels.com
www.baier-michels.com

baier & michels Kft.

Vásártér utca 4.
2351 Alsónémedi / **Hungary**
Tel.: +36 70 421 7205
hungary@baier-michels.com
www.baier-michels.com

Würth baier & michels Automotive Fastener Co., Ltd

No. 1969 Xizha Rd
Nanqiao / Fengxian District
Shanghai 201401 / **P.R. China**
Tel.: +86 21 67 15 60 28
Fax: +86 21 67 15 60 68
china@baier-michels.com
www.baier-michels.com

Würth baier michels Otomotiv Limited Sirketi

Minarelicavus Mahallesi
Çelik Cad. No: 11/1
16140 Nilüfer-Bursa / **Turkey**
Tel.: +90 224 242 04 24
turkey@baier-michels.com
www.baier-michels.com

Wuerth baier & michels México S.A. de C.V.

Cerrada Bicentenario No. 3 Bodega 4
Fraccionamiento Parque Industrial
El Marqués
El Marqués, Querétaro
C.P. 76246 / **Mexico**
Tel.: +52 1 (442) 446 9047
mexico@baier-michels.com
www.baier-michels.com