

# **b&m-FORM LG<sup>®</sup> Vario**

Universally applicable direct screwing system for various materials



# 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 various materials

## WHY DIRECT SCREWING?

**In the automotive industry, direct screwing systems are often used to connect components. Direct screwing offers cost advantages through the elimination of thread cutting and direct use in cast, drilled or punched holes. In addition to this, through the forming process of the thread, no interfering chips are created.**

For various materials, such as plastics and metals, different screws are usually selected, which meet the respective requirements. At the same time, however, the topic of standardization is gaining importance. A hybrid construction

with various materials, such as aluminum, magnesium and zinc die-cast as well as thermoplastics and thermosetting plastics, is becoming increasingly common. With direct screwing systems, which can be used with various materials, existing screws can be replaced and thus the diversity of parts reduced.

## BENEFITS:

- Can be applied for screw connections in metals and plastics
- Standardization of part diversity possible
- Combines the benefits of direct screwing in plastics and in metals

## b&m-FORM LG<sup>®</sup> Vario



- Universally applicable direct screwing system for various materials
- The integrated dog point geometry improves the assembly performance
- Faster process times due to larger pitch compared to metric threads
- The asymmetrical thread form ensures optimized material forming
- The thread form, which is optimized for direct screwing in light metal casting, allows the loss of preload forces to stay at a low level

## Project examples

**Product:** b&m-FORM LG<sup>®</sup> Vario 4x12  
**Project:** **Screw connection of a heat protection shield in a pump housing**  
**Customer:** Manufacturer of pumps in the automotive industry



**Product:** b&m-FORM LG<sup>®</sup> Vario 4x12 and 5x12  
**Project:** **Screw connection into a steering wheel made of aluminum/magnesium die-cast**  
**Customer:** Manufacturer of steering wheels in the automotive industry



# Innovative solution for hybrid applications

The b&m-FORM LG® Vario is suitable for screwing into various materials. It can be used for direct screwing in metals as well as for direct screwing in plastics. The special asymmetrical thread form allows a process- and time-optimized assembly. Thus, the b&m-FORM LG® Vario

offers an excellent solution for standardization within an assembly with different applications.

## Standardization



b&m-FORM LG® Vario screw connection in an application made of zinc die cast and thermoplastic



High flank coverage can be achieved for screw connections in light metal casting alloys and plastics

### CHALLENGE:

#### Using a variety of fasteners for various materials

The requirements regarding lightweight construction with the same or better stiffness and operating strength continue to increase. Cost efficiency also plays an important role here. A hybrid construction with various materials, such as aluminum, magnesium and zinc die-cast as well as thermoplastics and thermosetting

plastics, is becoming increasingly common.

The material combination depends on the respective requirements of the component. This increases the variety of screwing options and therefore also the number of fasteners.

### SOLUTION: b&m-FORM LG® Vario Five materials - One solution

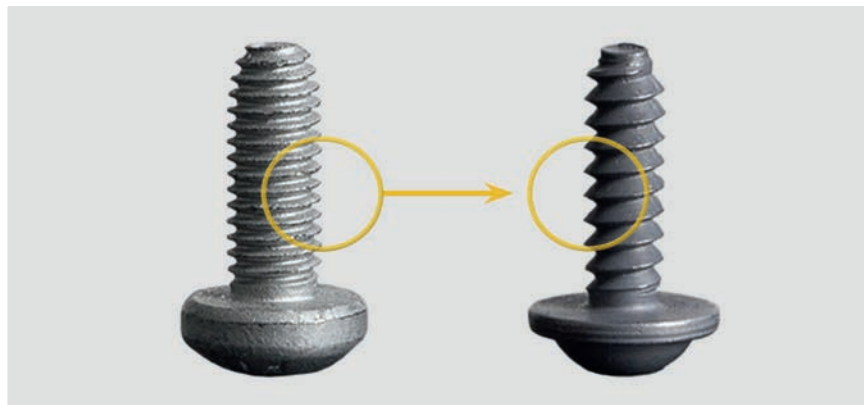
Due to the asymmetrical thread geometry, the b&m-FORM LG® Vario combines the advantages of a direct screwing solution in light metal casting and plastics. The special flank geometry enables a very high flank coverage as well as a homogeneous material flow. Even in ductile materials, high pull-out and preload forces are achieved. Since the b&m-FORM LG® Vario can replace conventional screwing systems, it is an innovative solution for the standardization of fasteners.



# Optimized process times



The focus is on the optimization of process times



Larger thread pitch compared to metric threads

## CHALLENGE:

### Long process times when using conventional direct screwing systems in light metal casting

During the production of automotive components, manufacturing costs play an essential part in the process planning. Optimizing or completely eliminating certain process steps is therefore of particular importance. The duration of the screw-in process

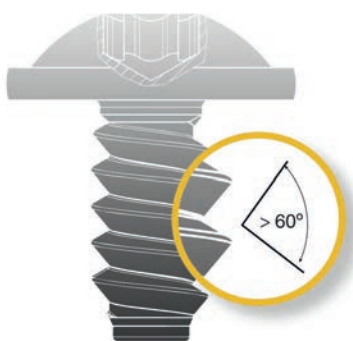
is determined not only by the thread length but also by the thread pitch. The screw-in length and thread pitch define the required rotation angle (the turns). By changing one of these parameters, the process time of the screw connection can be optimized.

## SOLUTION: b&m-FORM LG® Vario

### Reduced assembly times through an increased thread pitch

With our b&m-FORM LG® Vario it is possible to significantly reduce the screw-in times of conventional direct screwing solutions in light metal casting. Due to the increased thread pitch, the assembly time can be improved by 50%. Shortening of the process time this way enables cost savings for the entire component. Therefore the b&m-FORM LG® Vario is an efficient solution to optimize process times and reduce costs.

## b&m-FORM LG® Vario



## PRODUCT FEATURES:

- **Diameter:** 4mm - 8mm
- **Length:** depending on diameter / 10mm - 70mm
- **Property class:** according to b&m-factory standard WN 03/16 or according to DIN/ISO specification
- **Flank angle:** asymmetrical thread flank profile
- **Thread pitch:** larger than metric
- **Head geometry:** customer-specific solutions can be produced
- **Coating:** optional according to specification (integrated or additionally applied lubricant according to application)

## AREAS OF USE:

- Suitable for aluminum, magnesium and zinc die-cast alloys
- Suitable for screwing into thermoplastics and thermosets

# 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.

## **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  
usa@baier-michels.com  
www.baier-michels.com

## **Würth baier & michels España S.A.**

C/Picañol 2B  
08208 Sabadell  
(Barcelona) / **Spain**  
Tel.: +34 (0) 653 194 108  
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 6715 6028  
Fax: +86 21 6715 6068  
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  
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