



RIFAST® SYSTEMTECHNIK INNOVATIONS WITH A SYSTEM

A triumph of system thinking! With RIFAST®, Richard Bergner Verbindungstechnik has succeeded in combining functional elements and mechanical joining technology into a system technology for OEMs and suppliers in the automotive sector. RIFAST® has developed process innovations such as the C-frame with servo direct drive and new functional elements.

RIFAST®, Richard Bergner Verbindungstechnik is a globally renowned manufacturer of fasteners based in Schwabach, Germany, which has struck a nerve in the automobile industry. The reason: The RIFAST® system not only includes production and sales of high-quality functional elements, but also offers the joining technology behind it at the same time.

‘Our success shows that we meet the increasing demands in the field of sheet joining technology with our package,’ summarises Ralph A. Bergner, Head of Division Management of RIFAST® Systemtechnik: ‘Manufacturers are tending to focus ever more strongly on their core competencies and are increasingly shifting the development of components with greater production depth to their suppliers. We meet this desired evolution of product suppliers to technology suppliers precisely with RIFAST®!’

At its core, the RIFAST® technology consists of equipping sheet metal parts, mouldings or cast parts with functional elements through installation processes. The advantages of this sort of fastening connections over classic welding processes have become more and more prevalent in the automotive industry in recent years. This is due, on the one hand, to cost savings through the elimination of downstream processes and technical advantages such as usability in the mixed material vehicle architecture or materials which are difficult to weld, and on the other hand includes additional advantages in regard to the quality of processing, a specified corrosion protection and a high resistance of the joints to torsional and axial forces. The improved process technology ensures that the risk of cracks in the joined parts is excluded and that protrusions are avoided on the joined parts. As a result, joints with even mounting surfaces are possible; accordingly, no slots need to be planned for partner components which are to be assembled.

"The goal, of course, is to manufacture optimum fastened joints, while at the same time we also want to develop our technology further as a whole, particularly when it comes to improvements in cycle time efficiency and availability of the processes."

Ralph A. Bergner
Managing Director

development of RIFAST® functional elements, the reduction of weight and installation space as well as solutions for high-strength and ultra high-strength steel have been predominant topics. The weight reduction which can be achieved with the RIFAST® lightweight nut (LBM) functional element is tremendous. The compact design of the nut offers engineers new options for component design and simplifies installation thanks to improved accessibility. Depending on size, the new nuts enable weight reduction of up to 75 percent. In practice, this means, for example: In a construction with 220 nuts per vehicle, weight can be reduced by approximately one kilogram compared to previously used nuts. 'Our solutions are ideally tuned to customer application,' says Dr. Markus Hirschmann, Head of Product and Process Development at RIFAST® Systemtechnik.

Beginning in 2015, the products RIFAST® clinching nut ENM and RIFAST® clinching bolt ENB have been developed especially for applications in high-strength and ultra high-strength steel.

RIFAST® offers another impressive innovation in the field of process technology. Until now, RIFAST® staking bolts (EPB) could only be used in combination with a corresponding pre-piercing of holes. With the development of the C-frame CSE-Inline DPC, mated with the also newly developed servo direct drive (CLD), the need for pre-piercing is a thing of the past. The new C-frame independently performs the corresponding dome and piercing processes before it installs the staking bolt. The staking bolts are provided by the feeding unit – also a component of the overall RIFAST® system. The tool carrier holds the component in place while the hole is pierced with a pre-stressed placement device, it is then moved into the loading position and finally joins the staking bolt and component.

The entire process sequence is monitored by the path and force process parameters. The designers have succeeded in limiting the required cycle time for the process – doming, piercing and clinching – to a maximum of six seconds and converting the complete processing of the component, including feeding, into a fully automated system. Other advantages of C-frames with the omission of pre-piercing are obvious: Operators can dispense with a complete upstream work step. Other process efforts – for example, positioning the component – are eliminated, because the piercing is already implemented through the use of the C-frame.

RIFAST® is now one of the standard systems in the automotive industry. That is why a variety of RIFAST® functional elements are listed in the standard parts catalogues of OEMs. Nevertheless, we continue to make every effort in the development of RIFAST® in order to meet the increased demands of joining technology through product and process innovations. In the course of the development



"Customers benefit from expanded flexibility, because there is only one type of component involved. They can then equip it with selected elements in accordance with specifications or even continue processing it without them."

Markus Voh
Head of Design

Furthermore, the combination of pre-piercing and the actual joining in one step also has positive effects on the entire manufacturing process. In addition, there are always new requirements with regard to variant components. These differ in part only in that functional elements are required in different positions. In standard processing, the corresponding pre-piercing of holes must be integrated into pressing tools. Thanks to the new, innovative C-frame, variant preparation is no longer necessary. The functional elements are placed in the desired positions. The customer then saves on pressing tools and gains a high degree of flexibility. This once again demonstrates the advantages of the combination of functional elements and technology. Ralph A. Bergner: 'One decisive argument for customers is the system thinking, particularly in connection with the services we offer from a single source at RIFAST®. Customers purchase from us a technology which is specially adapted to their requirements. That begins with our in-house analysis of the joining point and the selection of the optimum functional elements. The associated feed and processing technology is then designed, produced and put into operation at the customer's facility by our service team. The customer's employees are also trained, if desired. Additionally, we offer maintenance and repair services over the entire lifetime of our system.'

› RIFAST® LIGHTWEIGHT NUT (LBM)

Compact product design ensures that weight can be reduced by up to 75 percent with the new RIFAST® lightweight nut (LBM), depending on design. That saves about one kilogram in the use of around 220 nuts for body construction. The space saving thanks to the smaller dimensions of the nut also allows more flexibility in the use of the installation space.

› RIFAST® CLINCHING NUT (ENM) AND RIFAST® CLINCHING BOLT (ENB)

The RIFAST® clinching nut (ENM) and RIFAST® clinching bolt (ENB) were developed in answer to the increasing use of high-strength and ultra high-strength steel in the automotive industry. Both products can be used in steel with a tensile strength greater than 600 MPa. A crucial part of the solution here is a compression collar which is designed so that the functional elements fill the pre-punched hole in the steel, thus ensuring a smooth mounting surface for the installation components.

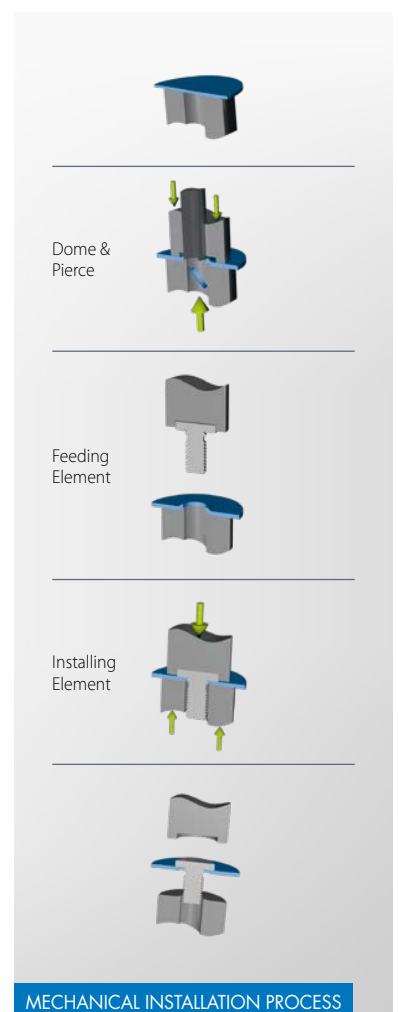
› RIFAST® CSE INLINE-DPC

The new RIFAST® CSE Inline-DPC makes the pre-piercing of holes, which was once required for the processing of the staking bolt (EPB), unnecessary. The C-frame is designed so that it completely takes over the pre-piercing and doming – before the staking bolt is inserted. This is made possible by the newly developed servo direct drive (CLD).

Furthermore, the combination of pre-piercing and the actual joining in one step also has positive effects on the entire manufacturing process. In addition, there are always new requirements with regard to variant components. These differ in part only in that functional elements are required in different positions. In standard processing, the corresponding pre-piercing of holes must be integrated into pressing tools.



RIFAST® CSE-INLINE DPC



MECHANICAL INSTALLATION PROCESS

