

## **(Joining) technologies resolve joining tasks**

Efficient and economical integration of nuts, bolts and special functional elements by means of cold forming

The technology company TOX® PRESSOTECHNIK GmbH & Co. KG has been known and recognized for many years for its industrial solutions in the fields of joining sheet metal and assembly/press-in technology. Based on the core competencies of press force drive technology, clinch technologies/applications and process know-how, the medium-sized company has all the components to be able to represent the process chains joining/pressing seamlessly. This way, TOX® PRESSOTECHNIK provides solutions that are used in all sheet metal processing industries like the automotive industry and its suppliers, apparatus and enclosure construction, electrical engineering and electronics, air conditioning and ventilation systems etc.

With the emergence of such complex topics like new materials and material combinations, composite construction and hybrid materials as well as lightweight construction, suppliers and producers of components and assemblies are faced with new challenges, which cannot be met with conventional and even more recent thermal joining processes. The mechanical joining and also adhesive technology in the form of clinching and press-in procedures as well as adhesive application now increasingly comes into play. Another considerable challenge is the insertion of functional elements like nuts, bolts, screws and special functional parts, to which further components and assemblies are to be attached at a later stage.

With the competence and the know-how from the cold forming clinching technology, TOX® PRESSOTECHNIK has taken on the topic of joining solutions for functional elements and provides the technologies as well as the tools and the production technology equipment for this. The portfolio covers the four most common processes: Clinching in with functional element (the component and the element are deformed during the joining process, without any preparatory work); punching in (the element usually punches the component which is deformed during the joining process, without any preparatory work, but the stamping waste must be disposed of); press fitting (the component is deformed during the joining process, but the component must be preprocessed for inserting the element); riveting (the element is deformed during the joining process to ensure the correct hold values, the component must also be preprocessed).

These cold forming connections can be more or less automated and are significantly more cost effective than conventional thermal solutions. No rework is required and there is no component distortion. The connections are very durable and can be seamlessly checked and documented with regard to torques, press-out forces and reproducible quality. As indicated, the system and problem-solving competence of TOX® PRESSOTECHNIK comprises the technologies/procedures as well as the equipment for

industrial production. Depending on the requirement, modules like benchtop or frame presses, C-frame, stationary tongs and robot tongs are used, attached to base frames or robot-controlled, and are combined with respectively suitable drives (pneumohydraulic, electric, hydraulic) as well as the controls. The specific equipment for inserting the functional elements includes bunker systems, sorting, feeders/conveyors, setting heads, tools, component holders and finally system control, process monitoring and safety technology. As a result, customers receive a complete, operable solution from one responsible source, and do not need to deal with interface issues.

### Image descriptions:

Image 1 shows an overview of the four processes

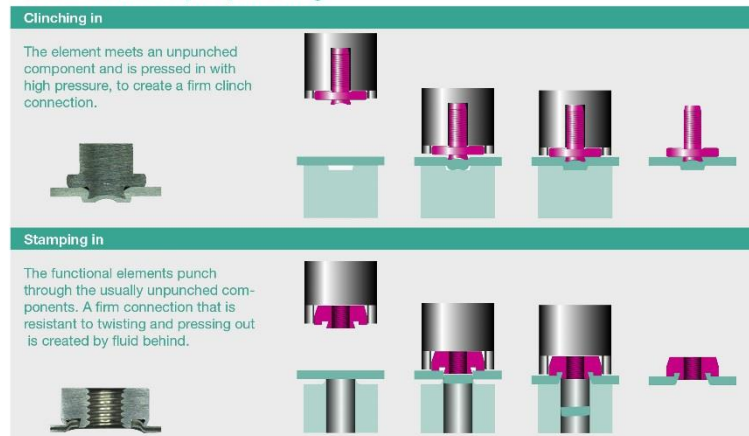
Image 2 shows modules for a complete solution

Image 3 shows various samples

Image 4 shows different functional elements

Image 1 shows an overview of the four processes

#### Process without pre-punching



#### Process with pre-punching

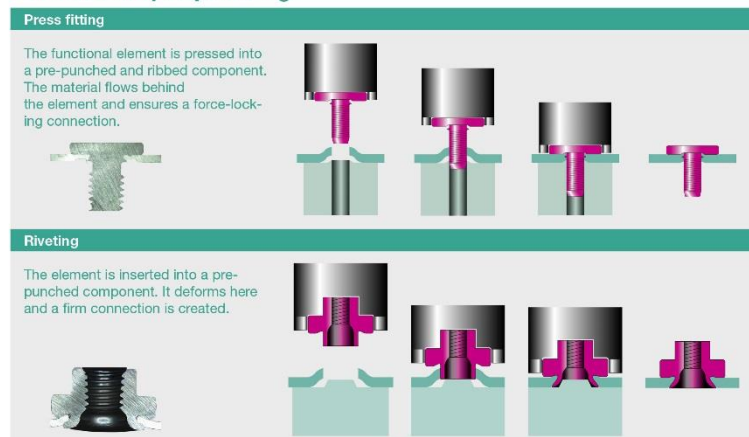


Image 2 shows modules for a complete solution



- 1 Bunker system
- 2 Sorting and conveying device
- 3 Singulator and feeding unit
- 4 Drive
- 5 Control and process monitoring
- 6 Safety equipment
- 7 Setting head
- 8 Tool
- 9 Component holder

Image 3 shows various samples



Image 4 shows different functional elements

