

Comprehensive competence for (sheet metal) joining technology

TOX® PRESSOTECHNIK meets joining-related challenges with the know-how-supported combination of technologies, process technology, standard and special press systems and long-standing experience with mechanical joining technology.

About 30 years ago, with the development of the TOX®-Round Joint sheet metal joining procedure, all sheet metal-processing industries – notably the automotive industry and its suppliers – gained a rational, qualitative and economic alternative to conventional, mechanical and thermal joining processes. The process developed by the south German technology company TOX® PRESSOTECHNIK GmbH & Co. KG, operating worldwide, gradually won recognition in very different fields and also enabled material combinations of different sheet metal materials which had been unthinkable up to then. Today, “TOX®-Clinching” is generally one of the most important (pressure) joining processes with regard to joining sheet metals in the automotive industry and vehicle construction, in the white goods industry, in enclosure and apparatus construction as well as for air conditioning and ventilation systems. There is no more need for preparatory drilling/punching processes, and the parts can also be oiled as well as galvanically coated or powder-coated. The required crash resistance for automotive applications was also proven in numerous tests and test series, which is significantly increased again with the further development of clinching and the use of additional elements like ClinchRivet®, solid punch rivet and semi-hollow punch rivet.

For the requirements of today and tomorrow: Mechanical joining technology

A very good example for this is the automotive lightweight construction industry, which is using a broad range of materials by now and boasts significant gains in rigidity and crash resistance by means of material combinations. The mechanical joining processes based on the basic principle of form fit and partially also adhesive bond enable the industrial use of material combinations like conventional steel/steel of different qualities and thicknesses, ultra high-strength steel (hot formed), aluminium/steel, aluminium-sheet metal, aluminium-profile, aluminium-cast, magnesium, carbon-fibre reinforced plastic (CFK). The big challenge from a production technology point of view is to join the components and assemblies of the respective material mix at high quality as well as rationally and thus efficiently. For this, depending on the material composition, thermal and increasingly also mechanical joining processes are being used. In addition to TOX®-Clinching, which is suitable for joining in the area of thin and thick metal sheets as well as for sheet metals with or without galvanically or powder-coated surfaces, the technologies ClinchRivet® for thin metal sheets, solid punch rivet for universal use and semi-hollow punch rivet for greatest joint strengths are preferably used. In all cases, the “rivet auxiliary joining

part" is inserted into the parts to be joined, whereby the rivet and/or part material are formed, and a stamping process accompanies the actual forming process.

The ClinchRivet®

The ClinchRivet® is particularly well suited to the joining of thin sheet metal and can be used even for smallest joining flange dimensions. The ClinchRivet® Joint is gas- and liquid-tight, and by filling the cavity, provides advantages with regard to varnishing and corrosion behaviour. Furthermore, material recycling is supported, as absolute purity of variety is guaranteed by using an aluminium rivet for an aluminium/aluminium joint.

The solid punch rivet

The solid punch rivet can be universally used for the joining of high-strength workpieces which cannot be formed on die side, and for multi-layer joining. What is of advantage here is that just one rivet length can be used for different material strength combinations, or that the use of suitable rivet lengths results in good surface flatness on both sides.

The semi-hollow punch rivet

The semi-hollow punch rivet provides the widest range of applications, is ideal for the joining of high-strength materials, ensures greatest joint strengths, and is gas- and liquid-tight on die side.

Process-reliable solutions for quality joining

Equipped with the know-how and experience from tens of thousands applied TOX®-Clinching and complementary mechanical TOX®-Joining solutions, the TOX®-Standard Modular Kit enables the timely and economical realization of sub- and complete systems. Industrially tried and tested components are available from the standard product range, including for example the TOX®-Rivet Tongs (optionally with controlled pneumohydraulic drive TOX®-Powerpackage or with electromechanical servo drive TOX®-ElectricDrive for the pressing process, the single- or multi-track TOX®-Rivet Supply System as well as the TOX®-Control and TOX®-Process Monitoring including TOX®softWARE (with intuitive user interface). The rivet can be directly shot with the rivet supply system using the conveying hose; the conveying hose can be up to 20 m long here, enabling installation of the rivet supply system outside the process area. The rivet is delivered from the rivet magazine via the docking station. The capacity is 2 x 30 rivets, ensuring a production buffer in case of a fault. The respective TOX®-Rivet Tongs are part of a modular tongs system, which includes the drives (pneumohydraulic or electromechanical) for 55 or 80 kN press force, the rivet heads and dies as well as the C-frames for all rivet processes as a basis. As one of only a few companies, TOX® PRESSOTECHNIK can provide technologies and processes as well as the process know-how from one source, based on own

developments. This is independent of the respective rivet element's manufacturer!

Image descriptions:

Figure 1 shows a clinched TOX®-Round Joint sheet metal joint

Figure 2 shows the micrograph of a ClinchRivet®-Joint

Figure 3 shows the micrograph of a solid punch rivet joint

Figure 4 shows the micrograph of a semi-hollow punch rivet joint

Figure 5 shows TOX®-Tongs with clinching punch and die

Figure 6 shows a complete press system for mechanical joining from the TOX®-Modular Kit System

Contact partner for queries

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Figure 1 shows a clinched TOX[®]-Round Joint sheet metal joint



Figure 2 shows the micrograph of a ClinchRivet[®]-Joint

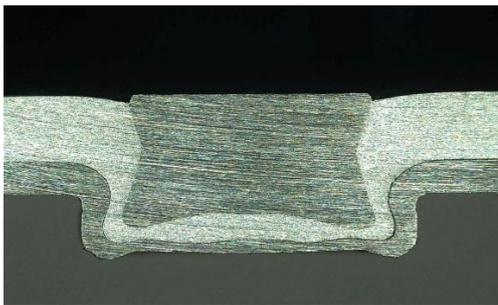


Figure 3 shows the micrograph of a solid punch rivet joint

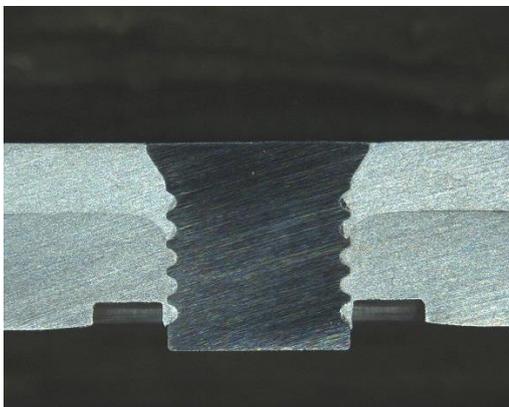


Figure 4 shows the micrograph of a semi-hollow punch rivet joint



Figure 5 shows TOX[®]-Tongs with clinching punch and die

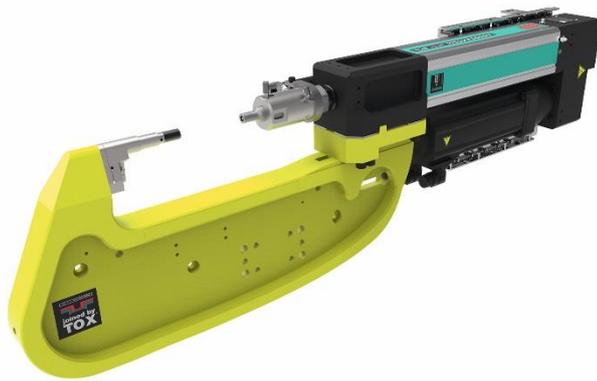


Figure 6 shows a complete press system for mechanical joining from the TOX[®]-Modular Kit System

