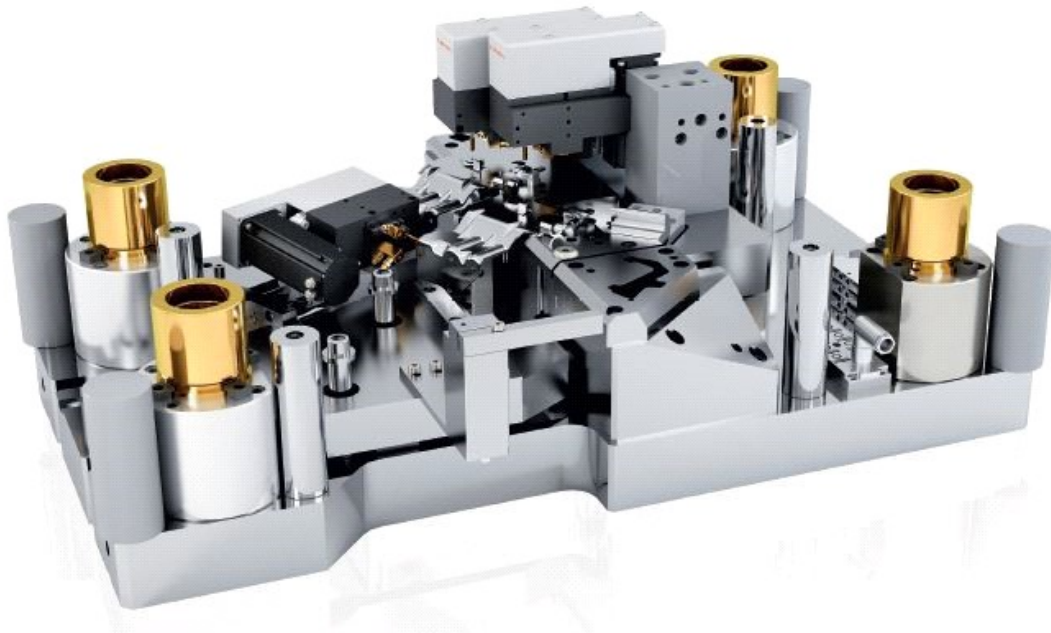


Translation from the **ORIGINAL PUBLICATION IN GERMAN**

Complexity as standard

When it comes to standard parts for the punching tool engineering sector, every specialist immediately thinks of guide units, springs or tool racks. However, with its "S-Former" product line, Steinel has shown that it is possible for complex tool systems to be part of the standard parts category.



Fully integrated: Punching tool with "S-Former E", a tool system for forming high-strength threads directly in the punching and bending process. Shown here is a version with three differently aligned tapping unit heads.

According to the definition, standard parts are "standardised machine elements that are not subject to any national or international norms". However, they are being described by industry or company standards. Due to their standardisation, they are intended to be easy and economical to use. It is exactly this type of standardisation that the punching technology specialist Steinel says it has consistently implemented in recent years with its "S-Former E" product line.

Christian Pape, Steinel's head of sales and marketing, explains: "With the S-Former E, we not only wanted to offer our customers a reliable and safe tapping system that can be integrated into modern punching tools. We also wanted to create a standard that makes

things easier for toolmakers and allows the systems to be used over and over in different tools".

Manufacturers of punched bending parts will be able to benefit greatly

The S-Former E is a process-integrated tapping system that allows the production of top-quality threads directly in the punching and bending process. In contrast to thread cutting, tapping compresses the microstructure of the metal. As a result, the formed threads boast improved maximal tensile strengths and stability – and therefore a greater tensile strength capacity and durability. The non-machining process is very clean and the direct integration into the punching and bending tool ensures high production speeds and low handling costs.

The S-Former E consists of multiple tapping unit heads with high-performance AC servodrives as well as a programmable logic controller (PLC). The tapping unit heads are available in four thread diameter sizes from 1 to 26 mm. Up to four tapping unit heads can be controlled and monitored by one control unit. If necessary, the control unit can be upgraded to accommodate additional tapping unit heads.

The high torques and rotation speeds, as well as the steep acceleration curves, enable the number of cycles to reach up to 160 strokes per minute. The tap is moved to the part pneumatically. Because the pitch of the tap, which draws itself into the part, is defined, the tapping process is not subject to axial forces. This maximises the lifetime of the tap and increases the quality of the thread.

Rotation speed and acceleration are determined by the control unit and can be individually adapted to the respective tools and processes. Because the drive of the S-Former E is completely independent of the tool and the press, it can easily be removed from one tool and then installed into another – true to the motto: one investment and many uses. This means that companies using punching technology do not have to equip each tool with their own tapping unit heads as long as they are not used simultaneously. Due to their standardised sizes and compact design, the standardised tapping unit heads can easily be integrated into the tools while saving space. In addition, thanks to a high-speed clamping system, replacing the roll tap, which is the wearing part of the system, is very simple. In this way, Steinel hopes to minimise production downtimes. The roll tap can be removed and replaced by pushing down on the pressure plate. Using a square wheel driver guarantees a safe torque transmission and prevents the tap from slipping.



Precision down to the smallest details: a tapping unit head of the S-Former E with its central components, a pneumatic feed unit (1), the gear (2) and an AC servodrive (3)



A solution that saves time: The roll tap, which is the wearing part of the system, can also be replaced easily thanks to a high-speed clamping system.

Various monitoring functions increase the process reliability

As opposed to mechanical thread tapping units, the S-Former E offers a wide range of monitoring functions and, as a result, a top process and production reliability. Features such as the punching mode, watchdog, daily, monthly and annual production and defect statistics, as well as long-term record keeping, ensure smooth production processes and provide all data needed to prevent machine downtimes as well as defective parts. There are also many remote maintenance options to help with diagnosing problems and to assist with servicing the equipment.

Each tapping unit head can be parametrised individually. The settings can be saved in programs, which means that the operator can switch between different production series without any delay. The simple, multilingual menu instructions and the 12" touch display guide the operator through all relevant menus and provide all important system information – obviously in a manner that can be processed easily.

In preparation for process monitoring, the torque curve is recorded and averaged in several cycles with an optimal system function using the teach-in process. The manual definition of tolerance ranges allows for the calculation of an envelope, which can be displayed together with the torque curve on the colour display. To ensure an even higher monitoring accuracy, the monitoring itself can be limited to a defined sector with narrow tolerances.

During production, the torque curve is continuously measured and compared with the envelope. If the torque curve lies within the envelope, the PLC sends a signal to the press control unit and the next feed begins. If it is outside of it, the press is stopped and the cause of the problem (for example a worn tap, an incorrectly positioned part, a punched hole that is too large or too small) can be rectified. This ensures that no part with a defective thread leaves the production. The data can be visualised on the display at any time, including during operation, before being output and further processed as part of process and quality check (proof of defect-free production).



User-friendly: The control unit of the S-Former E with 12" touch display