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Components

Systems

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Worldwide

Worldwide presence, local competence: TOX® PRESSOTECHNIK is represented around the globe in 45 countries with its own production and sales locations. Local subsidiaries with highly qualified employees who are familiar with the regional product requirements provide support to each market and its customers.
TOX® PRESSOTECHNIK designs production processes more economically – with special systems that include intelligent assembly and fully automatic feeding with additional functions. We focus on process optimization starting with development and design. As we aim to find the best solution for users, our machines are the product of close cooperation between our customers and our project managers. Our service team will also be available quickly and reliably once the systems are completed.

**Identify demand**
Special machines and production systems must be designed in detail based on in-depth discussions. We use know-how and a high level of expertise to determine the required components and develop a concept layout. Our lab provides optimal conditions for performing sample runs with original materials, pieceparts and elements.

**Development process**
The specific system concept is forwarded to our design department. Experts create the system layout and generate detailed drawings for production. We produce or procure the mechanical components according to the design and assemble the system. Thereafter, the electrical components are installed and the controller is configured.

**Commissioning**
Once complete, a trial run of the system is performed. Once everything meets customer expectations, the customer approves the system. Following delivery, set-up and installation of the system, commissioning is performed by our qualified personnel.

**After-sales service**
We train the operating personnel extensively – either at our premises or on site using the delivered system. Often, we also support initial production and provide advice and assistance. When everything is running smoothly, we are happy to perform regular maintenance tasks on request.
TOX®-Powerpackage

Press force between 2 and 2000 kN

TOX® PRESSOTECHNIK knows how to effectively combine the benefits of compressed air and oil. The result is the TOX®-Powerpackage series – powerful pneumohydraulic drive cylinders, providing a press force between 2 and 2000 kN. The functional design with few moving parts reduces wear and increases the service life. The low impact forces of the fast approach stroke protect the tool and reduce the noise level. A mechanical spring with dual function ensures low energy consumption. The low air consumption in the unit allows for high speeds with the smallest valve cross-sections.

Advantages
- Few moving parts
- Low energy consumption
- High wear resistance
- High stroke frequency
- Long service life

![Diagram of TOX®-Powerpackage]

- Patented separation of oil and air
- Intensifier piston
- Powerstroke valve
- Central power bypass
- Measuring and control connection
- Throttle X
- Patented separation of oil and air
- Hydraulic end position damping protects tools and reduces noise
- Depending on the model: mechanical or pneumatic spring
- Working piston
The pneumohydraulic drive family

The line-Q series
- Available in common standard sizes
- Shortest delivery times
- Attractive price
- Mechanical return spring

Press forces: 2 – 300 kN
Total stroke: up to 200 mm
Powerstroke: up to 52 mm
Compressed air: 2 – 6 bar

The line-X series
- Most configurable
- Can be configured according to the applications
- Precisely controllable and adjustable
- High stroke speeds
- Pneumatic spring

Press forces: 2 – 1700 kN
Total stroke: up to 400 mm
Powerstroke: up to 69 mm
Compressed air: 2 – 6 bar

Special types
- Application-specific design
- Complete range of types
- Compatible with the whole range of accessories
- Mechanical spring or air spring (depending on the version)

Press forces: 2 – 1740 kN
Total stroke: up to 400 mm
Powerstroke: up to 80 mm
Compressed air: 2 – 10 bar

X-KT system
- With separate intensifier for one or several working cylinders
- For long powerstrokes
- Working cylinders can be activated individually
- Compact size, flexible mounting

Press forces: 2 – 2000 kN
Total stroke: up to 400 mm
Powerstroke: up to 400 mm
Compressed air: 2 – 10 bar

The series RP (marking cylinder), T (turbo cylinder) and RZ (robot tong cylinder)

Press forces: 2 – 160 kN
Total stroke: up to 200 mm
Powerstroke: up to 12 mm
Compressed air: 2 – 10 bar
Modular servo drives up to 1000 kN

If a flexible, dynamic and highly precise working process is required, electromechanical servo drives are the right choice. The TOX®-ElectricDrive provides an energy-efficient drive solution for various applications with a usable press force range up to 1000 kN. The drives are equipped with a ball screw or planetary roller screw and can thus be used for a wide range of applications. They are easy to parameterize / control / operate and can be operated as stand-alone solution, without a computer or PLC. The working process can be monitored and documented via the integrated sensors.

**Advantages**
- Maximum energy efficiency
- Robust construction
- High precision
- Highly dynamic

The TOX®-ElectricDrive drives are complemented by the following components:

<table>
<thead>
<tr>
<th>Servo controller</th>
<th>Load resistor</th>
<th>Cable set</th>
<th>TOX®softWare HMI (Human Machine Interface)</th>
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</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Servo controller" /></td>
<td><img src="image2.png" alt="Load resistor" /></td>
<td><img src="image3.png" alt="Cable set" /></td>
<td><img src="image4.png" alt="TOX®softWare HMI" /></td>
</tr>
</tbody>
</table>
The electromechanical drive family

**line-Q**
- Ball screw
- Cost-effective

**TOX®-ElectricDrive EQ-K**
Fields of application: Pressing, single drive with medium space requirement
- 4-element force measurement
- Press force 2 – 100 kN
- Total stroke 150/300/450 mm
- Speed up to 300 mm/s

**EPMK**
- Planetary roller screw
- Press force up to 1000 kN

**TOX®-Electric Power Module EPMK**
Fields of application: Multi-point clinching and riveting, high force press applications
- Press force 300 – 1000 kN
- Total stroke 300 mm
- Speed up to 90 mm/s
- Optional with safety brake

**line-X**
- Planetary roller screw
- High precision, 4-element force measurement
- High power density with low weight

**TOX®-ElectricDrive EX-K**
Fields of application: Insertion of functional elements, clinching, riveting, press applications in a limited installation space, punching
- Press force 10 – 200 kN
- Total stroke 150/300/450 mm
- Speed up to 300 mm/s
- Optional with safety brake

**TOX®-ElectricDrive EX-F**
Fields of application: Punching, press applications requiring short cycle times
- Press force 5 – 100 kN
- Total stroke 150/300 mm
- Speed up to 800 mm/s
- Increased service life

**The robot tong drive**

**TOX®-Electric Power Module EPMR**
Fields of application: Clinching, riveting
- With special flange for TOX®-Robot Tongs
- Press force 55/80/100 kN
- Total stroke 150/240 mm
- Speed up to 200 mm/s
Safe and reliable controls are indispensable for operators. TOX®-Controls stand for safe process control – either with the pneumatic basic version, the electropneumatic version or a programmable logic controller. All controls from TOX® PRESSOTECHNIK are based on a flexible modular principle. They are simple to operate and correspond to the new Machine Directive MRL 2006/42/ec. Implementation of the functional safety from the design phase to validation of a machine is ensured (e.g. PLe according to DIN EN ISO 13849-1, DIN EN ISO 13849-2).

Advantages

- Well thought out control concepts
- Flexible, modular design
- Simple operation
- Up to PLe according to DIN EN ISO 13849-1, DIN EN ISO 13849-2
TOX®-Monitoring

The process at a glance

Production processes are getting ever more complex as demands on quality are rising. Monitoring systems ensure reproducible precision. They monitor the work processes, represent them in a user-friendly way, reliably store data and provide this data for later tracking. Reliable monitoring is indispensable for the production of a large number of high-quality products. TOX®-Monitoring stands for seamless oversight of force processes. Integrated into common bus systems, our systems provide important information about the process. Our TOX®-softWare connects control, monitoring and analysis.

Advantages

- Force-displacement monitoring
- Freely definable windows
- Teachable envelopes
- Process control
- Versatile application and connection options
Clinching, riveting, punching, press fitting, marking – the TOX® PRESSOTECHNIK modular tong system provides an individual solution for each of these applications. Depending on requirements, brackets, tools and drives can be combined with controls and monitoring to form a complete solution. The standard interfaces of our components ensure the high quality of our systems. In addition to the process, the part handling style decides whether robot, machine or hand-held tongs are used.

The handheld tongs with their compact dimensions are perfectly suited to all areas of sheet metal joining technology. It must be possible to integrate tong systems perfectly into automated production environments. The tongs can be mounted to the robot arm (robot tongs) or in a production line station (machine tongs) via the console.

**Advantages**
- Flexible, modular design
- Consistently proven concept
- Adaptable to suit customer requirements
- Solutions for a wide range of technologies

**Innovative tong systems**
In automated production environments, tong systems must be perfectly integrated.

- Clinching
- Riveting
- Pressing In

**DATA**
- HMI and Software
- Multi technology control
- Process parameters
- Tool data
- Lot sizes
- Plant data
- Piecepart information
- Configuration parameters
- Actuator data
- Final values
**TOX®-Robot Tongs**
TE-C type, punch on the drive side

**TOX®-PowerKurver**
with purely pneumatic drive

**TOX®-Machine Tongs**
with compensating slide

**TOX®-Handheld Tongs** with hydraulic drive and external pressure intensifier

**TOX®-Mini Tongs** – ideal for clinching applications in compact format

- **Type CHH 03.45** / **Type CHH 03.75**
- **Type CHH 04.45**
- **Type CMH 03.45**
- **Type CMH 01.45**
- **Type CMH 02.30**
- **TOX®-Flange Tongs**
- **Type CMH 04.45**
TOX®-Presses

Press forces from 2 up to 2000 kN

The modular system of the TOX®-Presses enables application-oriented assemblies. The machine basis is our C-Frame, 2- and 4-Column press design. The TOX®-Drives are mounted to the pressframe and the machine can be completed with a controller, safety enclosure, tools and process monitoring to form a complete solution.

All complete presses ready for operation are type-tested.

Advantages

- Flexible, modular design
- Simple implementation of special solutions
- Conformity to local standards
- Simple integration of tools
- Customized complete solutions
TOX®-C-Frame-Benchtop Presses

Benchtop Press
TOX®-FinePress

C-Frame Benchtop Press
MC series

C-Frame Benchtop Press
MCC series

C-Frame Benchtop Press
CEB/CMB series

TOX®-C-Frame and C-Bow Presses

C-Frame Press
CEU series

C-Frame Press
CEC series

C-Frame Press
CEJ series

C-Frame Press
PC series

TOX®-Column Presses

TOX®-2-Column Press
MB/MBG series

TOX®-4-Column Press
MA/MAG series
TOX®-Clinching

TOX®-Clinching describes a simple, robust joining process which works without additional elements or heat – like riveting without a rivet. The positive-locking clinching point is produced when a punch presses the sheets into a specially contoured die. The economical and reliable cold forming process is used throughout the sheet metal processing industry.

Advantages

- Up to 60 percent more cost effective than spot welding
- Allows point sizes from 2 to 26 mm
- High dynamic strength
- Resistant against corrosion
- Electrically conductive
- Joins dissimilar materials
- Can be automatically monitored and documented

Clinching in six steps:

- Penetration
- Upsetting
- Forming the upper contour
- Filling of the ring groove
- Flowing of the sheet metal
- Finished TOX®-Round Joint

TOX®-Clinching Tools (punch and die)
TOX®-Clinching joins ...

Dissimilar materials

Dissimilar thicknesses

Several layers

Dissimilar hardnesses

TOX®-Multipoint Tool

The right point shape for each application

TOX®-Round Joint

TOX®-SKB

TOX®-TWINpoint

TOX®-MICROpoint

TOX®-Flat Joint

TOX®-Varo Joint
Riveting technology

The complete solutions of TOX® PRESSOTECHNIK for riveting comprise competitive feeding and setting technologies, modern controls and systems for process monitoring. Sheet metals are joined application-specifically and reliably with different riveting procedures.

Advantages
- Proven quality through laboratory testing
- Tried and tested feeding technology for all common rivet types
- Standard user interfaces
- Software-based system adjustment (rivet type and manufacturer)
- Systems test and configure themselves independently
- Resistant against impact and electromagnetic fields

ClinchRivet®

The combination of clinching and riveting: A simple, symmetrical ClinchRivet® is pressed into the sheet layers and forms a high-strength connection without cutting. This procedure is particularly suited to the joining of thin sheets.

Cross-section of a ClinchRivet® connection.
Semi-hollow punch rivet (SPR)

If different materials need to be joined, the semi-hollow punch rivets are ideal joining elements. The first layer is punched, and the rivet creates an undercut in the second layer. Due to their diverse application capability, these rivets are mainly used in automotive lightweight construction.

Solid punch rivet (FPR)

Riveting with solid punch rivets – punching and joining in one step. For a positive-locking connection, the rivet cuts through both sheet layers, then deforms the dieside material for a fatigue resistant joint. This technique is recommended for high-strength connections, brittle material combinations and large variations in thickness.
Fastener Insertion Technology

Process competence

Functional elements like nuts, bolts, rivets or screws can be pressed into almost any material. TOX® PRESSOTECHNIK, with its technological solutions, has specialized in the processing of joining and functional elements. Our experts have comprehensive process competence and offer advice and support, from project planning, production of prototypes and validation up to design, manufacturing and assembly as well as commissioning of systems for the insertion of functional elements. This results in quick processes that are easy to reproduce, with energy-saving work processes that impress with high positional accuracy and do not conduct any heat into the component. The product is complemented by training programs and services.

Almost all functional elements are based on four fundamental processing technologies. Clinch elements are shaped such that the component is formed into the element during the pressing process and the element is thus firmly fixed. Self-punching elements are characterized by the component also being pressed into undercuts of the element, after the element punches the required pre-punched hole itself. Press-in elements and rivet elements are inserted in pre-punched and preformed holes where applicable. The rivet is characterized by the element being formed in the process, while the press-in element deforms the component for a strong connection.

Advantages

- Fast processes that are easy to reproduce
- Energy saving
- High positional accuracy
- No additional materials required
- No component distortion caused by heat exposure
System competence

Based on decades of experience, TOX® PRESSOTECHNIK has comprehensive system competence with regard to automatic systems for the processing of functional elements. All process steps – provision, separation, feeding, placing and pressing in – smoothly follow one another and are monitored and analyzed precisely. This achieves consistent quality and repeatable accuracy. The modular TOX®-System enables individual systems that are suitable for numerous functional elements. Our solution is built around the specification of the fastener by our customers.

System design

The system design depends on the functional elements as well as the particular application. Systems can be designed as tongs – stationary or mobile – or as a press, depending on requirements. They can be conceptualized as fully automatic, semi-automatic or as pure manual workstations.

Certified quality of all applications by means of test reports

TOX® PRESSOTECHNIK determines the ideal process for the respective application in advance in their own test lab. Preliminary tests are performed and analyzed based on samples. The results deliver important parameters, like the required press force and tool geometry, which contribute to the system configuration and processing technology. Final test reports guarantee the quality of the connection.
Sheet metal, plastic, cardboard, textiles or film – the modular system from TOX® PRESSOTECHNIK provides complete solutions for almost every punching and coining application. Usually, a TOX® PRESSOTECHNIK drive is mounted to a press frame, and equipped with a tool coupling. Special attention is placed on the damping of the punching impact, to be able to achieve a high service life. Dies, punches and strippers are designed as an assembly, which is moved to the component via guides and guiding carriages. A secured disposal of the slags completes the setup of the punching system.

Punch contours are adjusted to the individual requirements – from round holes and contours to notches. We can equip the system with punch and slug monitoring on request.

**Advantages**
- Modular system solution from one source
- Robust and durable drive technology from TOX® PRESSOTECHNIK
- Comprehensive technology protection
Assembly / Press-in systems

The pressing in and on of bushings and bearings or the production of press-fits are complex processes, which require high precision and repeatable accuracy. TOX® PRESSOTECHNIK offers customized solutions, which are delivered ready to use from process analysis and design, to mechanical engineering and software development to integration into existing production systems.

Advantages

- Pressing in and on measuring force and displacement
- Excellent repeat accuracy
- Well thought-out process and quality monitoring

Press-in machine for turbocharger housings