

DORST Technologies and Alvier PM Technology: Advancing Gear Manufacturing with E-Powered Pressing Systems SVZe for Helical Gears

E. Prommer

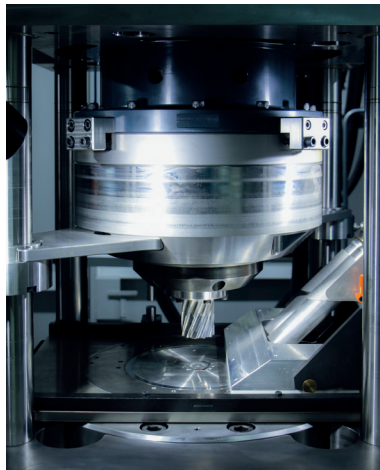


Fig. 1 E-powered pressing system SVZe300 (Courtesy: DORST Technologies)

In the realm of PM gear manufacturing, the adoption of advanced technologies has revolutionised production processes, enhancing efficiency, precision, and overall quality. One such innovation is the e-powered pressing system, specifically designed for pressing helical gears. This technical article explores the role of DORST Technologies and Alvier PM Technology, leading companies in the field, in advancing gear pressing through their state-of-the-art e-powered pressing systems. Helical gear systems are widely used in various industries, offering superior performance and efficiency compared to other gear types. With their unique design and capabilities, helical gears play a critical role in power transmission, allowing for smooth and precise rotational motion.

Helical gears offer several advantages that make them popular in numerous applications

Increased load-carrying capacity: The inclined teeth of helical gears allow for multiple teeth to be in contact simultaneously, distributing the load more evenly. This enhanced tooth engagement results in higher torque transmission capabilities.

Eric Prommer
DORST Technologies GmbH & Co. KG
82431 Kochel am See
Germany

E-mail: Eric.Prommer@dorst.de
www.dorst-technologies.com

Keywords: helical gears, PM technology, power transmission, rotational motion, EV vehicles, automotive industry, industrial machinery, power generation, robotics and automation

Smooth and quiet operation: The gradual tooth engagement of helical gears reduces noise and vibration compared to other gear types, such as spur gears. This characteristic makes helical gears ideal for applications where low noise levels are critical, such as automotive transmissions in combustion engines, but also in EV vehicles.

Efficiency and reduced backlash: The helical tooth geometry enables a larger contact area, resulting in improved power transmission efficiency. Additionally, the inclined teeth minimise backlash, enhancing the accuracy and repeatability of motion control systems.

Smooth running and porosity: Helical gears produced with the PM process (press and sinter) create higher surface porosity and enables a smooth running in use.

Extensive use across numerous industries and applications

Automotive industry: Helical gears are commonly employed in vehicle transmissions,

providing smooth and efficient power transfer between the engine and wheels.

Industrial machinery: They are widely used in various industrial applications, such as pumps, compressors, conveyors, and machine tools, where high torque and precise motion control are essential.

Power generation: Helical gears play a crucial role in power generation equipment, including wind turbines, hydroelectric generators, and steam turbines.

Robotics and automation: The precision and efficiency of helical gears make them indispensable in robotics, enabling accurate and reliable motion control in robotic systems.

Alvier PM Technology: pioneering gear manufacturing solutions

Alvier PM Technology is a renowned global provider of high-quality tools and helical gear system solutions. With decades of expertise and continuous innovation, Alvier has earned a reputation for delivering cutting-edge equipment and systems that meet the evolving demands of the industry.

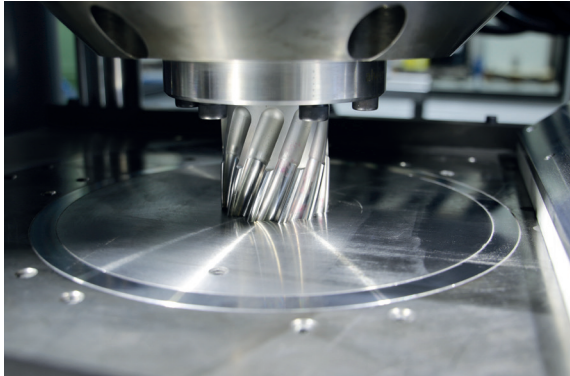


Fig. 2 Perfect software synchronization between upper punch and die
(Courtesy: DORST Technologies)



Fig. 3 Samples of helical gear parts
(Courtesy: Alvier AG PM Technology)

E-powered pressing systems by DORST Technologies and Alvier PM Technology

DORST and Alvier together have developed the e-powered pressing system tailored specifically for helical gear pressing and sizing. This system combines precision engineering, advanced control mechanisms, and intelligent software to optimise the pressing process, ensuring superior performance and efficiency.

Highlights

- Servo-electrical driven rotation motion
- Closed loop controlled
- No mechanical pairing required
- Perfect synchronization of upper punch
- High-dynamic and efficient
- Helix angle freely programmable.

Characteristics

- Easy installation
- Fully integrated into the control system
- Comfortable setup and programming
- Right and left-handed gears
- Low maintenance costs.

The e-powered pressing system SVZe offered by DORST and Alvier incorporates several key features

Intelligent control algorithms: DORST and Alvier's e-powered pressing system utilise

advanced control algorithms that enable precise force and alignment control during the gear pressing process. These algorithms ensure consistent pressing results and minimise variations in gear performance.

Servo-electric technology: The system employs servo-electric technology, leveraging high-performance servo motor to rotate actively the upper outer punch with a controlled force and motion. This technology enables accurate speed and position control, facilitating precise alignment and pressing of gear components.

Integrated force sensors: Force sensors integrated within the pressing system measure and monitor the applied force during pressing. This real-time force feedback allows for dynamic adjustment and control, ensuring consistent results across production cycles.

User-friendly interfaces: The e-powered pressing system features intuitive operator interfaces that allow for easy input of gear specifications, real-time monitoring of the pressing process, and adjustment of parameters if required. These interfaces enhance user control, flexibility, and ease of operation.

Customers added value

- Highly efficient and powerful
- Highest precision
- Significantly reduced tool wear
- Reduced investment costs.

Summary

By incorporating the e-powered pressing system SVZe into existing presses or new presses from DORST, producers can benefit from several advantages:

Unparalleled precision and repeatability: The e-powered pressing system offer precise control of force and alignment, ensuring consistent gear pressing and minimising variations in performance. This level of precision leads to enhanced product quality and customer satisfaction.

Improved productivity and efficiency: The advanced capabilities of the e-powered pressing system SVZe streamline the gear production process, reducing setup time and enabling faster and more efficient production cycles. This translates to higher throughput and increases overall productivity.

Enhanced cost-effectiveness: By eliminating manual setup errors and using software pressing parameters storing in tool programs for reuse, the e-powered pressing system reduces reject rates and scrap. This results in significant cost savings for producers, enhancing their bottom line.

Availability

- Exclusively for DORST equipment
- For presses from 1600 kN up to 10 000 kN
- Approved also for press upgrades.

www.cfi.de