TOX-Servo Drives optimize hot stamping machines from BSH

Perfectly stamped

The hot stamping of plastic parts is a dynamic process, which must run very precisely at the vacuum cleaner manufacturer BSH. To be able to finish the components automatically, quickly and with low energy consumption, BSH counts on the electromechanical ElectricDrive servo drives from TOX PRESSOTECHNIK.

“With the new, completely automated hot stamping systems, we can define the process much more precisely in advance”, Andreas Zehe says admiringly, who works at BSH Hausgeräte GmbH in Bad Neustadt as Production Engineer. “We are working faster and more precisely, have reduced rejects by 60 to 70 percent and consume significantly less energy than before with the pneumatic drives.” The vacuum cleaner manufacturer, who produces with 400 employees on behalf of Bosch-Siemens, has been using its second hot stamping machine with two electromechanical ElectricDrive servo drives from TOX PRESSOTECHNIK GmbH & Co. KG from Weingarten. The system was planned and installed by Gebr. Gierlich GmbH & Co. KG located in Bonn, who specialize in the production of hot stamping systems.

BSH uses the system to finish components for vacuum cleaners with a thin plastic foil by applying pressure and heat. The process is fully automatic: A linear handling system removes the plastic parts from the injection molding machine, and inserts them into a hot stamping mount. In the first stamping step, the foil is heated and pressed onto the component with a stamp. In the second step, a tempered silicone stamp moves onto the plastic part with high pressure and briefly stops there, before it retracts. The foil part comes off the carrier and attaches to the component. A camera then checks the process.

Pressure is crucial

For a stable process and error-free result, the parameters of the individual stamping steps must be precisely set. The pressure with which the stamp moves onto the component is crucial, but the temperature, the stroke speeds and the stroke lengths of the cylinders are also important. “Here, the precise adjustment option of the electromechanical servo drives comes in handy”, says Andreas Zehe. “Since we equipped our hot stamping machines with the TOX-Embossing

Cylinders, we can measure the pressure during the stamping process automatically and readjust it." If stamps are replaced, the system independently readjusts the pressure, as all parameters were previously stored in the software.

According to Andreas Zehe, for the old systems with pneumatic drives, everything needed to be configured manually. Any number of programs can now be stored due to automation, and be selected by the system operator at the touch of a button. "Previously, we constantly needed to readjust and configure the mechanics. Now we can determine precisely in advance which speed and which stroke is required", says Mr. Zehe. The operator can then read whether the process ran as planned, and then readjust again if required.

Less energy, more service life

BSH already put the first hot stamping machine with electromechanical servo drives from TOX PRESSOTECHNIK into operation in the middle of 2020, a third system is in the planning stage. "We are very pleased that the system designer as well as the user are so satisfied with our drive systems", adds Peter Wilhelm, who works in the sales department of TOX PRESSOTECHNIK. "The hot stamping project was a special application for us as well, as usually we are approached with regard to our drive units when processes such as clinching, pressing in, riveting and punching are required." The fact that the stamp at BSH is held in position for a few seconds, before it is retracted, is not standard for conventional applications according to Mr. Wilhelm, but can be implemented easily and quickly with specifications via software parameters.

Two ElectricDrive drive units respectively are used in the hot stamping machines. Each unit consists of a servo press – depending on requirements, a ball screw or a planetary threaded spindle is used here –, a controller, the control cabinet and an integrated software. The energy efficient drive solution is suited to applications with an effectively usable press force range between 0.02 and 1,000 kilonewton, and can be used in multiple ways.

In conclusion, Peter Wilhelm emphasizes the low energy consumption of the electromechanical servo solution compared to pneumatic drives, and the significantly higher service life of the systems. And Andreas Zehe of BSH is certain that the investment in this solution will be amortized within three to four years. Cooperation was entirely smooth for both business partners, the project is a real win-win-situation for all parties involved.

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Captions:

Image 1: BSH finishes the plastic parts of its vacuums in a hot stamping system, which is automated via electromechanical servo drives.

Image 2: BSH is now using its second hot stamping system with the TOX-ElectricDrive drive system, a third system will go into operation still this year.

Image 3: With the ElectricDrive drive system, all settings for the hot stamping steps can be programmed in advance, manual readjustment is no longer required.

Image 4: The energy efficient drive solution TOX-ElectricDrive is suited to applications with an effectively usable press force range of up to 1,000 kilonewton, and can be used in multiple ways.

Images: TOX PRESSOTECHNIK GmbH & Co. KG, BSH Hausgeräte GmbH

About the company:

TOX® PRESSOTECHNIK is a supplier of presses, systems as well as components for sheet metal joining and assembly technology. Since its foundation in 1978, the family business has become a global player with more than 1400 employees worldwide, 550 of which are based at the headquarters in Weingarten near Ravensburg, Germany. The success story started with one pneumohydraulic drive – the TOX®-Powerpackage. The “Components” division now includes pneumohydraulic and electromechanical drives as well as controls, sensors and software for process monitoring and quality assurance. In addition to a large range of presses, the system range comprises manual, machine and robot tongs. Another mainstay are modern sheet metal joining procedures, also incorporating the TOX®-Clinching Technology, which makes the company today’s market leader.

Drives, processes and systems from TOX® PRESSOTECHNIK can be found at automotive manufacturers and their suppliers as well as at industrial businesses for household appliances, electronic components, furniture and much more. Special versions of the TOX®-Drives are also approved for the food industry.

TOX® PRESSOTECHNIK is represented worldwide: 18 subsidiaries, amongst others in the USA and South America, Europe and South Africa, India, China and the entire Pacific Region. 20 representatives in many other markets support and advise local customers.

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