

# 5 QUESTIONS WITH AN EXPERT

## Integrating Automation with a Servomechanical Press



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### 1 How is press automation typically integrated with a conventional flywheel mechanical press?

With the introduction of servo-based coil-feed and transfer systems, this equipment typically has been integrated into conventional flywheel presses via a press-mounted resolver or programmable limit switch outputs from the press control. Setpoints (in deg.) are calculated for the beginning and end of the automation cycle, dependent on clearance within the tooling. The maximum allowable press speed relates to the time available (in milliseconds) between the setpoints vs. the required time for the automation to complete its cycle.

### 2 What challenges do metal formers face when integrating a servomechanical press with automation?

With a conventional mechanical press, including link-motion presses, the automation time (in milliseconds) is fixed to the press stroke rate. With a servo press, as stroke rate and ram speed can vary, so can the available automation time. With the ability of servo presses to run in pendulum motion and perform rapid restrikes, it's not possible to run the automation off of a standard rotary press resolver, as is historically done. A linear encoder can be used to account for servo-motion profiles, but is limited in interface and requires recalibration with each change in motion.

### 3 So, how then can stampers integrate automation to a servo press control?

There are two main methods. The first: Have the servo-press control house all of the automation-control functions. This means that the metal stamper must work within the automation options provided by the press manufacturer.

Another option: Look for a servo-press interface with a virtual encoder option. Equipped with this feature, the

press control prepares a virtual encoder signal based off of the programmed servo-motion profile. This creates “virtual angles” for the automation equipment to follow, as if it is following a mechanical press resolver signal, and, therefore, permits utilization of the standard transfer program, irrespective of the actual slide motion. This allows integration of the end user's preferred automation equipment and potential incorporation of compatible third-party transfer screens into the press control.

### 4 What other challenges do stampers face when integrating a coil-feed system?

The main challenge, which also represents an opportunity to improve productivity, occurs when running progressive dies in a servo press in pendulum mode. As the stamper begins to optimize the stroke rate and reduces stroke length to increase run rates, the feed window also begins to decrease. It is important to understand the feed-length capabilities with shorter feed windows (75, 90 or 120 deg.). We often recommend that stampers upgrade their straightener throughput speed by around 50 percent so that the feed line does not become the limiting factor. If considering a combination feeder-straightener, stampers should look closely at these rates, as they require opening and closing all of the rolls for the pilot release. Adding a servo pilot release on the feeder can help with these challenges.

### 5 How about challenges related to integrating part-transfer equipment?

The optimization of the automation portion of the servo press stroke is more complicated with a transfer system than with a coil-feed system. There can be several different limiting factors affecting press-line output. We recommend that stampers look at simulation software that accounts for the tooling and that they work closely with the press manufacturer's servo application engineers to provide optimization training to those working on the pressroom floor.