# Upprade, Automate and Maximized press seture mets not only the requirements for today's stamping jobs, but

allows for flexibility to meet the

demands of tomorrow's jobs. Then, with the right presses in place, stampers should focus on minimizing part-to-part changeover.

#### **BY DENNIS BOERGER**

For stampers, remaining competitive requires them to make the right technology choices, to not only meet current job demands but also to have the infrastructure in place to support customers' future requirements. Stampers can support ongoing growth and productivity by considering three primary elements when choosing new pressroom equipment.

1) Press equipment should be flexible and have the capability to produce a variety of parts. This type of versatility means less equipment on the shop floor and less overall capital-equipment costs.

2) Stampers must optimize machinery uptime by investing in quick-change equipment that can reduce part-to-part changeover.

3) Press automation must be considered, to boost overall output.

On a more fundamental level, press equipment must be reliable and wellmaintained. If equipment is sound initially and maintained on a regular basis

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In this automated transfer-press cell, a coil line feeds sheet through an oscillating shear and a pair of robots load the shaped blanks into the press.

as part of a preventive-maintenance program, stampers can avoid downtime due to unscheduled repairs.

#### **Profile on Press Flexibility**

To determine press flexibility, look at the types of operations it can perform.

In addition to draw work and heavy forming, a versatile press also can efficiently perform blanking operations. The most flexible presses also can run progressive dies with coil feeding, or transfer operations with an in-press transfer system. For example, transfer presses can be designed with destack feeders and coil feeders. A destack feeder allows the stamper to blank parts offline to save material, and then run the transfer press using the blanks.

Automated multi-press systems offer another option to achieving flexible pressroom operations. When considering such a system, for coil-fed or transfer applications, the press of choice can be either a straightside or a gapframe unit.

Double-crank straightside presses, ranging from 300 to 3000 tons or more, find use for producing massive parts requiring large stroke lengths. When used in a tandem line, automation can deliver improved productivity as parts move from press to press.

In a system of two or more presses, a straightside press can be run individually or, when extra tooling is required, as a single large transfer press by initiating the intermediate stage between the presses and running them in a continuous, synchronized operation. Transfersystem programming can optimize the acceleration/deceleration curves for maximum productivity and strokes per minute. A free programmable dimension in three-axis capability (transfer pitch, clamp pitch and lift pitch) can further increase flexibility.

Tie-rod straightside presses can be selected with long or short strokes for transfer- or progressive-die operations, and can significantly enhance flexibility in the pressroom. Suitable for largepart production, these presses also are compatible with third-party transfer mechanisms.

Straightside unitized-frame presses (typically 200 to 400 tons) find use for multipurpose applications. When used as a transfer unit, two presses can provide for as many as 12 tooling stations, with material feeding left to right through both presses. When used individually, the first press feeds left to right with as many as six tooling stations. The second press can stamp a different part feeding material right to left, with as many as six tooling stations. This combination can provide added tonnage capacity without incurring the



A destack feeder enables the continuous run of shaped blanks produced on a blanking line. This feeder detects and rejects double blanks before they enter the transfer press, minimizing the chance for press or tool damage.

capital-equipment costs of a dedicated transfer system.

### Gap-Frame-Press Transfer Systems

A gap-frame-press transfer system offers a flexible alternative to stampers that can cost one-third that of a dedicated straightside transfer system, while preserving the advantages offered by transfer operations. Also, this type of transfer system allows stampers to handle a range of stampings and to handle future customer orders. Stampers can connect as many gap-frame presses as needed.

Unlike larger straightside presses, the physical size of a gap-press-transfer system is relatively small and can be used in factories plagued with low ceiling heights. Such a system does not require any large accessory equipment, and standard gap-frame presses do not require a pit, making press-layout changes a breeze. If a problem occurs with the transfer equipment, gap-frame presses allow operators to perform normal production manually. And, since the dies are the same size as normal gap-frame press dies, manufacturing costs remain relatively low. Gap-press selection for progressivedie operations is less complicated than that for transfer-die production. Progressive-die operations use a single press while transfer operations can be performed in a single, two-point-suspension gap press, or in a multiple-press cell where a stamper can group one- and two-point-suspension machines to provide total capacity of 1000 tons or more and a bed area of 20 ft. or more. Cycle times often approach those of a dedicated transfer press.

To further improve flexibility and uptime, servo technology can be added to a range of mechanical presses, including straightside and gap. With servo technology stampers can produce a range of parts from materials such as aluminum and magnesium alloys, highstrength steels and titanium alloys, while achieving higher speeds and working energy, improved control and precision. Preprogrammed motion curves and the ability to design programs unique to the job at hand, along with the ability to change from producing one part to the next quickly, also add to the system's versatility. When compared to a conventional press line that operates in automatic single-stroke mode, a

## **Maximize Uptime**

servo-driven gap-press transfer line operated in continuous mode can deliver productivity rates as much as 50percent higher.

#### Part-to-Part Changeover

Typically, when stampers consider quick-change equipment that can reduce part-to-part changeover, they tend to target quick-die-change systems. However, to further reduce partto-part changeover time, stampers should look closely at all aspects of the stamping operation, including coil feeding, part destack changeover and die change, as well as part and scrap removal. Every component of the metalforming system must be reviewed from the perspective of reducing downtime and improving changeover time.

Available equipment options to help

stampers improve the productivity of blank-fed operations include:

• A blank-feeding device that can increase productivity by sensing and correcting double-blank misfeeds. The device then reloads the blank feeder without requiring the operator to stop the press. The blank-feeding device should be able to automatically discharge extra blanks when a double blank is detected.

• Blank-hold devices that allow blanks to be automatically held while the next blank stacker is changed. These eliminate the need for the operator to stop the press when the supply of blanks is low.

• A data-bank formula device, which can raise productivity by making it possible to perform die changes quickly.

Also, a servo-transfer mechanism installed on a press allows stampers to change the motion profile for the transfer pitch, the transfer-bar clamp motion and the lift motion. The result: optimized production speeds and efficiency, because all three profiles can be adjusted and retimed for each part or each job to achieve optimal operating speed. In addition, once job programs have been written, they can be stored in job memory, eliminating the need to constantly reprogram the press.

#### More on Automation

In addition to the press itself, automation can include coil-feeding equipment for progressive-die operations, transfer units or press-to-press robots (pick-and-place and articulated). When considering automation, understand the production rate of the press, the offloading of the finished part and the limitations of the operator. If parts are especially large, the ability of the operator to lift and place that part repeatedly may ultimately call for automating part removal and stacking. Stampers that install flexible equipment, incorporate a system-wide approach to part-to-part changeover and make automation part of their operations have an opportunity to remain competitive with lower-cost MF labor markets.