Speedy Feed Setups Maximize Profitability

That's one reason why Cleveland, OH-area metalformer Automation Tool & Die (ATD) opted for complete automation when it invested in a new coil line. Replete with all the bells and whistles, the line is a perfect mate for ATD's new 330-ton servo press.

BY BRAD F. KUVIN, EDITOR

Nine weeks from order to PPAP for seven new automotive-stamping dies—that's the reality of the market faced by metal stamper/tool and die house Automation Tool & Die (ATD), Brunswick (Cleveland), OH. So says ATD co-owner and president Bill Bennett, setting the stage for a metalforming-technology evolution underway at the company.

"Constricted lead times coupled with the trend toward tighter tolerances means we have to perform more monitoring in the pressroom, pay closer attention to how we build our tools, and—ultimately—invest in new manufacturing technology to continuously improve our capabilities," says Bennett. "We need the best, most flexible and automated equipment."

Lately, the drive to leverage technology has seen the firm invest in value-added activities, including its first foray (early in 2014)) into automated projection welding. Also it plans to, early in 2015, bring robots online to automate a two-press stamping cell that also includes a tapping station.

The Perfect Feed Line for a New Servo Press

Making the most direct impact right now, however, on productivity and quality at AT&D is a new progressive-die press line acquired early in 2014. It features an Aida 330-ton servo press outfitted with a Wintriss Servo Pac 2 Servo control, and a fully automated and robust Dallas Industries feed line engineered to handle nearly every job AT&D can throw at it. Traditionally known for stamping automotive bracketry and mounts, as well as parts for

ATD outfitted its new coil line, which delivers material to a new servo press, with two complete and independent line-control stations, one at each end of the line. This saves operator steps and makes the setup process as efficient as possible.

Speedy Feed Setups Maximize Profitability

industrial hose reels and hardware, AT&D typically stamps mild and high-strength steels from 0.030 to 0.40 in. thick.

"Early in 2013, when we knew we needed to add press capacity to the shop," Bennett recalls, "we decided that servo-press technology was the best way for us to be able to cover such a wide range of material thickness. And, we had to be prepared to take on more of the higher-strength steel projects that we were quoting.

"Then, to ensure that we could consistently use the new press line to straighten and feed thicker and higher-strength steels," Bennett emphasizes, "we focused on adding the most robust feed line we could find, to consistently remove any and all coil set.

Noting that the feeder on its 600-ton press line has had some overheating issues when dealing with higher strength steels, ATD's Bennett says that the new line has the right gear ratio and motor capacity (20-hp motor with AC variable-frequency drive) to handle heavy-gauge high-strength work.

"We want the tool to be the limiting factor on our projects," Bennett concludes, "not the feed line and not the press."

Setup Automation and Redundant Controls

In addition to coil-line robustness, setup automation scored high on the ATD wish list when the firm went shopping for a feed-line partner for its servo press.

"We not only wanted to eliminate the chance for setup errors," Bennett says, "but felt that coil-line setup automation would greatly enhance our ability to accomplish quick changeovers."

Long a focus at AT&D, setup-time reduction on its presses moved further up the priority list in mid-2013 when the firm conducted a thorough and shop-wide lean event. Feed-line changeover clearly offered opportunities for improvement. Among the automation features built into the new Dallas line, all-told allowing the firm to accomplish job setups in less than 2 min., is adjustment of feed passline height, feeder entry guide-roll width, straightener rollers, and straightener entry guide-roll width.

On the reel, Dallas supplied a keeperless coil-guide device that automatically adjusts to center the coil throughout the system and contain the coil throughout the run. Outside coil-guide rolls automatically pivot open for coil loading. A threader table with telescoping peeler blade supports the leading coil edge for hands-free thread-up, and a proportional valve controls brake pressure and provides automatic back-tension adjustment as coil weight diminishes during a run.

During the changeover-time-reduction lean event, ATD also charted how often its press operators had to move from one end of the coil line to the other during setups, and sought to save steps.

"That led us to invest in two complete and independent line-control stations, one at each end of the coil line," adds Bennett. He's certain that the ability to adjust settings—during setup of new jobs or to tweak parameters of existing jobs to deal with material inconsistencies—will return the investment by saving operator steps and making the process more efficient.

"We think, after talking to our operators, that the redundant line controls reduce setup time by at least 5 min. per setup," Bennett says. "Thanks in large part to the automated features of our new press line, coil-line changeovers that might take as long as 15-20 min. now occur in 2 min. or less."

An Eye Toward the Future

The feed line handles a maximum coil weight to 20,000 lb. and coil width to 30 in. Its drive train permits feeding of 24-in.-wide ¼-in.-thick steel. Pinch rolls measure 5.25-in. dia., while its seven straightening rolls are 3.5-in. dia. and the two feed rolls are 6-in. dia. Payout speed ranges from 20 to 80 ft./min.

Bennett and his team also talked, when evaluating the specifications for its new press line, about the company's ability to meet future demands. These include the growing use of higher-strength steels and even advanced high-strength steels such as dual-phase alloys. That led to working with Dallas to ensure line robustness, including specifying a seven-roll straightener—compared to the five-roll straightener

the firm employs at its 600-ton press.

"That 600-ton press line also has a feed line with an oversized motor," adds Bennett, "yet we've had some overheating issues there. So we made sure this new line has the right gear ratio and motor capacity (20-hp motor with AC variable-frequency drive) to handle heavy-gauge high-strength work."

AT&D already has seen benefits from the servo-press line that have enhanced its competitiveness in the market. For example, Bennett cites a job where the press performs multiple hits in one die station at the bottom of the stroke, with just a 1-mm rise in the ram between hits.

"In this case we're effectively warm-forming the part," he says, "which allows us to eliminate preform die stations. That operation is supported by the seamless and flawless integration of the feed-line controls with the press controls. In the end, we eliminate a die station so that the die is smaller, less complex and less expensive, improving our competitiveness."

Bennett also points out the laser-based loop control feature provided with the feed line, with synchronized payout at feed rate. And, he expresses appreciation for the Dallas Profile Select feed programming function that automatically matches the speed of the feed advance to the available feed window and press-speed requirement, which can be tricky when synchronizing with the action of the servo press.

"This technology allows us to minimize movement in the loop, so that it remains consistent," Bennett adds. "We feel this helps in consistently delivering straight, flat material to the press."

Having Operators' Backs

Also noted when we took a look at the new coil line was a pair of Hypertherm plasma-arc-cutting (PAC) machines docked to the line, to allow operators to trim the leading edges of coils as needed.

"This relatively minor investment means that the press operator need not take the time to leave the press to locate a cutting machine and move it over to the press so he can trim the coils," says Bennett. He notes that ATD plans to eventually add PAC equipment to all of its press lines.

"We're listening to what the operators are telling us," Bennett continues, "addressing their needs and letting them know that we're committed to making their jobs easier and making them more productive and efficient. It's all about productivity."

Bennett describes the firm's production schedules as becoming "more erratic day by day, requiring more frequent setups. If we're not prepared to do that in an efficient manner, we'd be costing ourselves money. Customers won't pay for setups, only for press run time. Everything else is added costs we must absorb, so we're working to reduce those." **MF**