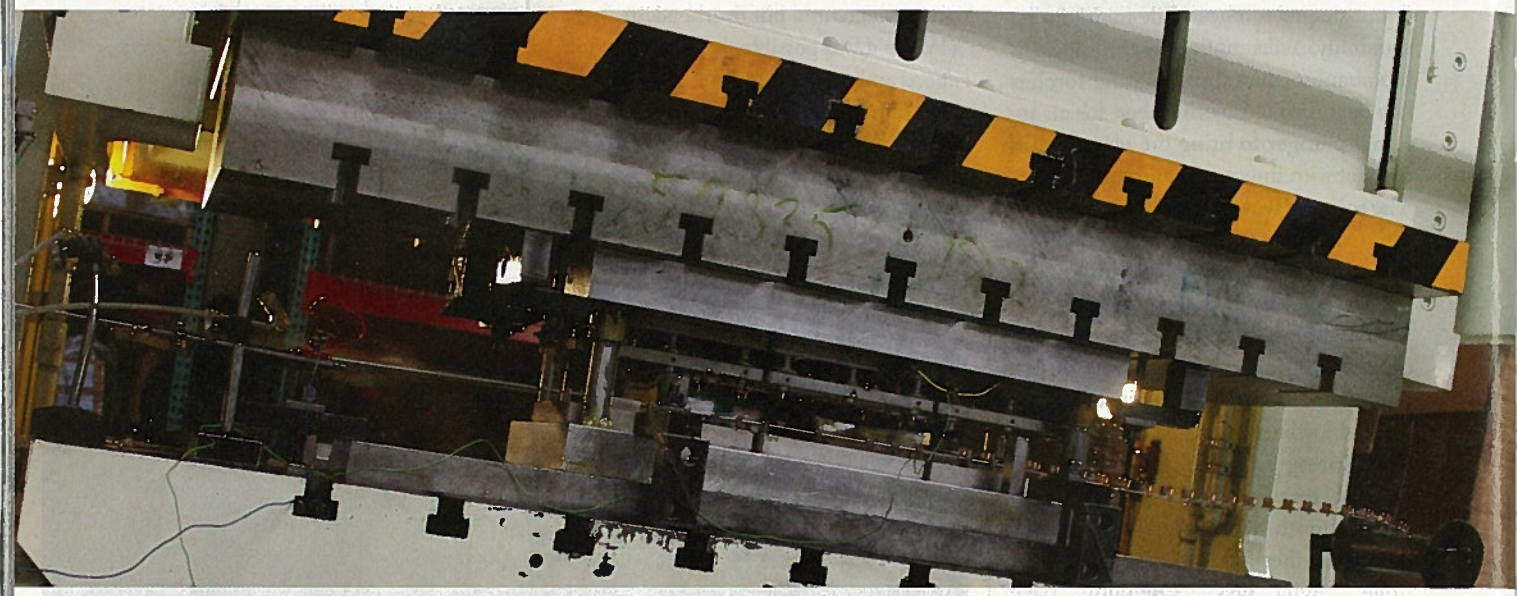
BY LYNN STANLEY, SENIOR EDITOR



Programmable PRESS POWER

Royal Die & Stamping reduces labor and scrap with an advanced mechanical press

"We have a vision that we can do things differently," says CEO Henrik Freitag of his company Royal Die & Stamping Co. Inc. When the Environmental Protection Agency began to push for removal of lead-based products, Freitag determined how to make his battery terminals lead-free. The company's 78,000-sq.-ft. facility in Bensenville, Ill., is now home to an extensive patented, stamped battery terminal line.

A specialist in producing eyelet terminals, connectors and other electronic components for the automotive, electronics and telecommunications markets, the company uses continuous-improvement principles to help fuel its growth. "The automotive industry is on an upswing," he says. "Most of our new business is coming from that sector. Our ability to get products to market faster is the key to our increase in business."

With 70-plus presses on its production floor, Royal Die & Stamping needed a mechanical press to support new work. Freitag and his son, Erik Freitag, president of Royal Die & Stamping, saw Aida-America's ServoPro technology demonstrated at a trade show. "We didn't have a servo-driven mechanical press and decided it was time we found out what they were all about," says Henrik Freitag. "We knew we needed slower speeds for the work we planned to run on the press, so its adjustable stroke was attractive. The servo press was also more cost effective than a conventional press."

In-die assembly

Aida-America, Dayton, Ohio, manufactures a complete line of metal-forming presses including gap, straightside, progressive die, transfer, high speed, cold forging and servo-driven mechanical presses. The press builder also offers turnkey solutions with feeders and automation. Royal Die & Stamping installed a mechanical Aida NS2-D 200-ton press equipped with ServoPro technology in 2010. Operators quickly found the full programmability of the press allowed it to adapt to most tools and applications.

During an in-die assembly operation for a job that required the insertion of nuts, operators slowed press speed and gained the time needed to verify the nuts were installed properly before closing up the part. "Our servo-driven press technology allows the customer to perfectly time slide position and stroke speed while the assembly process is taking place in the die," says Rand Mellinger, regional sales manager for Aida-America. "The operator also has the ability to pause or extend the dwell time required to allow the event to occur before the die closes."

Royal Die & Stamping runs high-volume lot sizes using steel, stainless steel, copper and aluminum. The press runs two 10-hour shifts during a five-day work week. The ability to produce high-quality parts with rapid response times keeps the

ServoPro technology improves part quality, press productivity, life of dies and manufacturing flexibility.

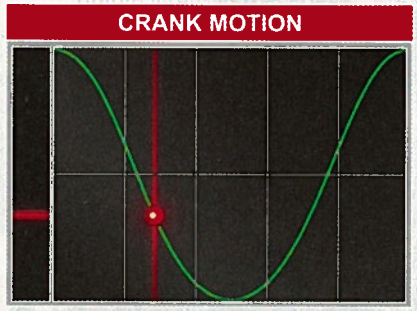
73-year-old company competitive. "Tooling is coming back from overseas," says Freitag. "The price advantage is really not there anymore. Metal stamping is not a labor-intensive operation to begin with. We can compete with the rest of the world as long as prices for raw material remain stable."

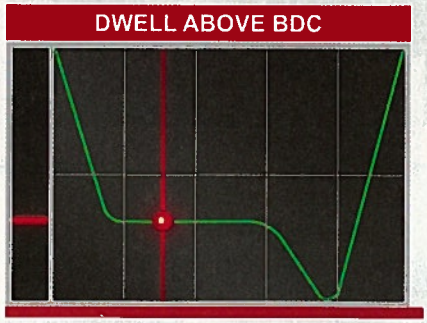
Double production

The manufacturer reduced labor and scrap by running a copper busbar with very small extrusions on the servo-driven press. Used in an automotive assembly of electronic components, the busbar is a strip of copper that conducts electricity. Royal Die & Stamping starts with a copper flat stock about 3 in. long and 1 in. wide. The stock is cut to shape before being placed in the press where small holes are extruded.

"The programmable stroke was a big help on this job," says Freitag. "We could do the job on another press but we were having issues with the small punches breaking. With the servo-driven press, we've been able to minimize the fracturing that can take place with these small extrusions and more than double our production on this job." Once the busbar leaves the press, it's ready to be assembled into the part the customer is making.

Unlike a conventional mechanical press, the main motor, flywheel, clutch and brake





The ability to adjust stroke length and operating speed and program slide motion optimizes performance.

in the servo-driven press have been replaced by a high-torque, low-rpm servo motor.

"We can't use off-the-shelf commercially available servo motors because these motors do not offer the capacity required for each press size we supply in a direct drive concept," says Mellinger. "Our servo motor was designed and built in-house so we could apply them to our standard mechanical press designs. The stroke length is programmed to suit the part being run in the press. This means the operator can choose from several pre-programmed slide motion profiles or write a unique program to optimize a specific job. The number of ways the operator can use the fully programmable slide motion and adjustable stroke length to program stroke, velocity and dwell profiles is nearly unlimited."

In addition to the busbar, Royal Die & Stamping is making parts such as large aluminum heat syncs that measure 8 in. wide and 6 in. long for automotive lighting applications. "With the programmability of the press, our operators are figuring out how to perform jobs that we would not have done on a conventional press," says Freitag. The manufacturer also is finding it can achieve better part quality with ServoPro's ability to dwell. Maintaining tight tolerances is essential for parts production. The manufacturer also has to be able to achieve repeatability and consistency with each part run.

"We had a part with angles that didn't want to form up correctly," says Freitag. "By adjusting the dwell time on the press, we were able to hold the part longer during forming. The ability to hold the part longer in the bottom of the stroke allowed us to achieve better angles."

Greater accuracy

Conventional mechanical presses don't have the capability to dwell because of a fixed slide velocity profile. The servo-driven mechanical press can be programmed to dwell any distance off the bottom of the stroke and for any duration of time. This allows operators to adapt the press to get the part quality they need. With light draw work, Royal Die & Stamping also has been able to slow the final draw and set the part for greater accuracy and less material springback.

In addition to metal stamping, the manufacturer performs molding, assembly,

anical Presses

and tooling. With more than 25 , Royal Die & Stamping makes of its own tooling in a 10,000-sq.- l tool room. The manufacturer's ol-build capabilities provide cus- h cost control, flexibility and eduction. The flexibility of the ı press allows tool makers to de- sign tooling around the press. "We have three designers that understand the Servo-Pro technology and its capabilities," says Freitag. "If we plan the tooling right, we have found we can save secondary operations. This allows us to take on more interesting work."

While performance and function are important features for the manufacturer, the small footprint of the press and lower power consumption has proved to be an advantage. "Even with the large-capacity motors, the power supply requirement is significantly lower than that of a conventional press," says Mellinger. ServoPro capacitors store electrical energy when the servo motor is not under load. When the motor is loaded, power is drawn from the capacitors and not the main power supply.

Aida's mechanical ServoPro technology can produce high-quality parts with rapid response times.

Royal Die & Stamping has purchased a second servo-driven mechanical press, a 160-ton NS2-D. "Because this was new technology for us, we were a little concerned about how it would stand up to the demands of our work environment," Freitag says. "We've experienced no issues with the press at all and are a lot more comfortable with the technology. Generally, we place jobs in the presses we think are best suited to run in that press. Now our operators look at how ServoPro might do the job even better." FFJ

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