

Linear Servo Presses Find Roles in Automotive Manufacturing

Until recently, the application of all-electric presses had been limited by tonnage capacity, cycle time and acquisition cost. However, a new line of higher-tonnage linear servo presses launched at FABTECH 2022 by Beckwood Press Co. promises to combat these challenges, while offering the flexibility of hydraulic presses and the performance and rigidity of servomechanical presses.

Beckwood's LSP presses, company representatives say, employ patented technology to achieve a high degree of forming flexibility at production-level speeds. Together with the company's EVOx line of low-tonnage all-electric presses (rated to 100 tons), Beckwood now can supply linear servo machines ranging from 125 to 500 tons of force.

Beckwood specifically notes application for its LSP technology in the automotive industry, including cold and hot stamping, compression molding and assembly. The ability of linear servo presses to provide full tonnage anywhere in the stroke eliminates the need for a rated tonnage point from bottom dead center. This prevents users from having to derate tonnage, or from over-buying on tonnage. Additionally, tonnages aren't derated for long draws or long strokes. Being fully programmable, die-setup times reportedly are minimized and do not require the use of parallels or adjustments to counterbalance the systems.

The use of a rigid frame structure and two or more actuators allows for active parallelism control, company officials note, helping to prolong die life and minimize die-maintenance costs. Standard tonnage monitoring and overload protection provide real-time diagnostics. A simplified actuator design results in as much as 80-percent fewer components than hydraulic presses. And, the readily available servo motors reportedly are affordable and easy to source.

Linear servo technology also is significantly more energy efficient than hydraulic systems, even when the press sits idle or at dwell. Because the presses only use energy on demand, stampers reportedly can expect as much as 70-percent

energy savings compared to hydraulic presses. And, by eliminating flywheels, crankshafts, external lubrication systems, energy-management systems and hydraulic-power units, the presses are safe, clean and

perform R&D on new batteries for electric vehicles. During the process the press acts as a clamp, compressing solid-state battery cells into a fixture. To do so requires infinite dwell capability and advanced data acquisition for part traceability.

The firm also requested electrically heated platens to laminate the batteries in a secondary operation. Using a linear servo actuator in lieu of a hydraulic system provides the manufacturer positional accuracy within ± 0.0005 in., and data logging at a rate of one sample/msec. during any segment of the cycle profile.

In a third application, a wheel manufacturer has begun producing custom wheels using high-strength carbon-fiber composites rather than aluminum or other lightweight metal alloys. It's using a 250-ton linear servo press equipped with heated platens and infinite dwell to handle its compression-molding operations. With this press the firm can run millions of cycles without any scheduled maintenance or unplanned downtime, and the system's intuitive iFlex controls package manages speed, pressure, position, temperature and dwell time. The programming infrastructure also offers strict part traceability with instant feedback for diagnostics and data acquisition on torque, force, position and time, all while monitoring key components to ensure press health and part quality.

Finally, while some automotive manufacturers may shy away from the cost and lead time of new machinery, Beckwood officials point out that because linear servo-actuation systems are modular, manufacturers can retrofit them in place of hydraulic or mechanical flywheel systems on existing presses. Presses retrofitted with linear servo technology still reap all of the benefits of a servo-electric press but at a fraction of the cost and lead time. Retrofits also provide a great option for high-temperature applications such as hot stamping.

Beckwood Press Co.:
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reliable, according to company officials.

Automotive Applications

Describing applications for the press technology in the automotive industry, Beckwood notes a Canadian Tier 1 supplier using the technology to stamp, form and bend tube and wire. The firm sought a press that was flexible, safe and programmable, and after discovering that servoelectric presses could achieve full tonnage throughout the stroke, it installed a custom 50-ton machine with a large 30 by 48-in. forming area.

In another case, a manufacturer of advanced battery systems sought a press to