

STAMPERS FINDING WAYS TO REDUCE CAPITAL COSTS AND CARVE OUT NEW PRODUCTION EFFICIENCIES

These days everyone is looking for ways to squeeze new efficiencies from their production processes, reduce operational costs and find competitively priced equipment that can help them navigate new business landscapes. An unlikely hero is emerging. The pneumatic press is finding its way onto shop floors to shoulder workloads normally reserved for mechanical and hydraulic presses at nearly half the capital equipment cost. Until recently, the air press was almost always associated with roll forming operations. But technology advances are helping the sturdy workhorse cross over to day-to-day stamping operations and progressive die applications.

The air-driven press with the small footprint (3 to 210 tons) is also flexible because it can be programmed with a PLC press control, equipped with an automated feed system or grouped to create a transfer line.

98 Percent Uptime

Traditionally, stampers needing bigger die space have tended to purchase a press with more tonnage. The air-tube- or air-bladder-driven machine offers the large die space but with smaller tonnage. Unlike a mechanical press which only develops full tonnage about 1/8 inch off the bottom, full tonnage on the pneumatic machine is available through the entire stroke. The stroke can be controlled so it cycles down to strike material as quickly or as slowly as the application requires. In addition, the press delivers a much faster response time with tonnage that is more equalized so that off-center loads can be effectively run.

Boasting a production uptime of 98 percent, a pneumatic press can generally be described as a four-post or two-post precision die set (nominal tonnage rated at 100-PSI input pressure), that uses air pressure on the downstroke and mechanical springs for the upstroke of the press ram. On the downstroke, the air tube/elastomeric actuator is filled with air at the signal from the control system, forcing the air tube to expand and apply pressure to perform the required work. When the blanking or forming is complete, the control signals the valves to shift (exhausting the air), and the mechanical springs return the press ram to top of stroke, completing the cycle. Air offers the same characteristics as oil, but eliminates the potential problem of leaks.

A rectangular assembly with a low profile and flat underside, this configuration makes the machine suitable for integration into automated processing systems. It can be mounted in unconventional attitudes at any angled position, including an inverted upside-down mounting at 180 degrees, or with a fixed horizontal stand for hand-fed operations. Because of the structure and basic design of the air press, stampers can expect to use 40 percent less floor space than conventional press models. Yet for operators, the new generation of pneumatic presses has the familiar look and feel of a mechanical or hydraulic press with a few advantages.

Instead of a framework, guide posts with bushings align RAM movement, the die and other key components for accurate parts production. Part accuracy is also supported by the plates which are designed with low deflection characteristics comparable to that of a crankshaft-driven press.

The pneumatic press is 10 times faster than a hydraulic press but has the capability to stop instantly. Once the operator signals the valve, the press stops whether at a 100 strokes or 200 strokes a minute. The stroke length and shut height are adjustable making the press suited to forming complex shapes and applications requiring different heights or tonnages.

Long feed lengths are easily accommodated on the pneumatic press due to its ability to run in continuous mode. Since the press does not cycle until the feed function is complete, an operator could run a part 10 feet long then just as easily switch to production of a 3-inch part.

Maintenance is minimal. With fewer moving parts and no recirculating lubrication, the only components requiring grease are the guideposts. Air tubes last as long as five years. If needed, spare parts can be shipped the same day if orders are received by 2:30 EST. Power and air consumption are also cost effective.

Maximizing Investment Through Technology Advances & Upgrades

The standard pneumatic press can meet requirements for general stamping, piercing, blanking, forming, cut-off, coining, embossing, laminating, plastics, paper, and pressurized curing and assembly type operations and run all types of materials including high strength low alloy grades of steel, aluminum, plastics and cardboard. Straightside models able to support progressive stamping operations and gap press machines designed to accommodate automating production processes are also available.

Surprisingly, the cost to engineer custom models to meet specialized needs is quite reasonable. In addition, ongoing technology advances are helping stampers carve out greater efficiencies in their production processes. One customer manufacturing trapezoidal flat sheet parts needed to achieve faster cycle speeds. A special dampening material placed in key areas helped absorb the energy of the pivoting shear mechanism. The result was a 30 percent increase in production.

During a part run, as the bed deflects, the dampening material absorbs the energy. Placing dampening material between the press bed and mount eliminates steel-on-steel contact. Because energy is no longer absorbed through steel, vibration is reduced by 80 percent. This dampening material technology helps manufacturers create a work environment that is more operator friendly since less vibration means less impact on workers' joints. Parts production is improved while tool and press wear is reduced.

A shrink disk instead of a bolt clamp more effectively grips the machine's guide posts allowing the press to better withstand the tonnage generated during the stamping process.

Remote flow control, another key development, allows the operator to control RAM speed. This is critical for stampers that must meet a requirement to prevent tearing or marking the material to preserve the surface quality of the part. The ability to control RAM speed reduces noise levels and impact forces on die and equipment for longer equipment life. Tonnage buildup when the upper die is in the down position is also controlled. For machines that have more than one manual flow control, it can become difficult for operators to maintain consistency between the individual units. Using a remote flow control eliminates this problem by ensuring each unit is the same. In addition, a valve light allows operators to confirm that the flow rate is in the correct position.

One of the newest advances, an inching circuit allows operators to inch the slide up or down in small increments, stopping anywhere in the working stroke cycle of the press. Operators can also stop as many times as needed. This feature provides the capability to inch through a punch stroke to ensure die set up is correct and perform other functions like setting the pilot position on the roll feed, spray lubrication and other ancillary equipment. Production set-up is quicker and the potential for production of bad parts eliminated. The inching circuit is more flexible than inching features on mechanical press models which require operators to continue through the bottom of a stroke cycle.

While pneumatic press technology advances can harvest greater efficiencies, the machines are paving the way for stampers to enter new markets as well. The compact press is producing generator laminations for the wind turbine market. A customer making tin connectors for MRI caps was producing them manually using a bench press. Specially designed pneumatic tooling allowed the customer to eliminate the manual process and make part-to-part changeovers in just 20 minutes.

While there are applications a pneumatic press is not a fit for, the low cost, low maintenance option is a suited to wide range of applications from stamped parts for grain bins to truck flaps, plastic parts for the appliance market and cardboard packaging. Stampers looking to increase tonnage or strokes per minute or who want a bigger die space or need features like a feed or pick and place unit may find that pneumatic presses offer the solutions they need.

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