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Hydraulic Press/Space Saving Coil Feed Line Key to Success

Perma-Column "Posts a Stamping Room Victory"

As their engineered building product volumes grew, Perma-Column Inc. knew their operation had to drastically change...and that meant bringing the production control inside and being able to do so fast and seamlessly. Integrated to their solution was a blanking press system that included a 400-ton Pacific Press Technologies (Mt. Carmel, IL) OBL blanking press and Spacemaster Series 3 Compact Coil Line (Sterling Heights, MI) from Coe Press Equipment.

Perma-Column Inc. (Ossian, IN) was created from a construction company's idea to produce structural columns for the post-frame industry. Environmental concerns of burying chemically pressure treated posts or poles (often still called "pole barns") have had a tremendous effect on the materials used in wood-framed construction of ag buildings (from equipment sheds, animal barns, specialty horse arenas), as well as many commercial applications such as mini-storage units, smaller retail outlets, and manufacturing/warehouse facilities. In the past, wood posts would be treated with chemicals like arsenic to extend the building's life and reduce post rot or pest/varmint damage. And the process of digging post holes and pouring concrete footers around the post on the job site has proven to be a costly process…in overall labor additions in setting the posts into concrete at the site and in potential damage to the job site from large concrete trucks.

So, Bob Meyer, a construction owner designed a more permanent solution for the post-frame industry—one that is both economically sound for the post-frame construction industry and delivers the strength and durability of a concrete constructed foundation. Perma-Column units include a laminated wood column that is attached to a reinforced pre-cast concrete column base with a steel U-shaped connector for the 2nd piece.

Meeting Production Demands

"So we needed to change our "onesie/twosie" production mentality from a couple years ago," stated Bob Meyer, Perma-Column inventor and President. "Our volume has grown four fold from 2003 to 2004 and we project the volumes to be hundreds of thousands of units annually soon."

Until recently, the company has been contracting the production work to local fabrication and welding shops…now, localized Perma-Column "licensed producers"

will do the concrete, assembly and delivery work of the final unit. But the U-shaped connector part of the assembly is key to the increased manufacturing demands. And they needed to find a way to produce higher volumes of this part to meet increased demands. This meant bringing the steel fabrication in house.

These metal brackets are blanked from .250" thick steel (in both five and seven inch coil widths and from 35"-45" lengths), bent into a U-shape, and then a total of four 5/8" diameter/5' length of rebar are welded on the steel connector to provide the connection between concrete and steel.

"Upon deciding that we were going to get into the manufacturing side of the business, we had to take a look at a lot of processes to determine what made sense to our operation," stated Brandon Meyer, Production Manager. "We looked at everything from mechanical to hydraulic presses, plasma and laser cutting equipment, hand-feeding versus coil-fed lines, manual versus automated welding processes."

And in the end, the manufacturing process had to meet a few key challenges…

Simplified operation and fast startup—they felt there was a lot to be learned about becoming a manufacturer, so "painless and seamless" was important. Lowest manpower requirements as possible—without spending too much on the automation side. Minimized space requirements—even though they built a new building for their operations, equipment height and stamping press line length/coil storage created a space challenge. Their end result—a stamping line that included a hydraulic blanking press and a space-saving coil feed system.

The Hydraulic vs. Mechanical Decision

"Machine capabilities—especially punching through thick stock as we are—was most important, but other factors like overall cost, ease of operation/setup/controllability, and meeting our space requirements were also important," stated Brandon. "As we settled on a press solution, we considered both mechanical and hydraulic power. Our Pacific OBL 400 blanking press was chosen because it helped to meet all of our initial requirements." He also added…

Reduction of multiple operations: "The coil fed blanking press can produce a final blanked shape in one operation. Before, it took our vendor up to six touches (shear to length, hole punching of three different holes, stamping the identification information, and related material handling requirements) to the part to do what we now do in one. So labor costs are lower and one machine does the job versus multiple machines." Handling the thick material stamping requirement: "After much consideration, we were sold that the hydraulic OBL could handle the tough breakthrough blanking shock involved in the job due to it's rigid steel frame construction and shock absorbing dampers. We were impressed with the Pacific-built hydraulic system design—it just seemed extremely beefy and calmed any fears of the "break-through shock" issue. Plus, as needed, we liked the fact that we can use the hydraulic for a wider range of future jobs (vs. limited operations when buying a mechanical press)."

Speed of operation: “When looking at mechanical presses working in an automated/ continuous mode, we found that they might run too fast for our production rates.

The hydraulic press eliminates worry on burning up clutches and brakes. Being able to control the entire hydraulic press stroke (using only a half inch or so of needed travel across our progressive die) helps us to keep up with the heavy-duty coil material press feeding…it simply is not an issue. And all of our operation’s functionality—including nitrogen returns and other features—can be easily programmed and controlled on the easy-to-use touch screen menus.” Down the road, the company plans on automating the part exit stacking and this will increase the output from 5 seconds/stroke to as fast as 3-1/2 seconds/stroke.

Building height limitations: “To achieve the same tonnage in a mechanical straight side press, we were looking at a much taller machine and our building couldn’t support it… and when you looked at other types of processes such as plasma or laser tables and the storage space for material, it would eat up too much of our usable floor space.” Machine Cost: “Based on our volumes and type of part, it was easy to see that press working vs. laser or plasma cutting was the way to go. After we were confident that hydraulic operations could handle the job, we were pleasantly surprised that it was also more economical to go the hydraulic route. Fast and simple startup: “Pacific really held our hand along the way…from selling us on the benefits of hydraulics through initial training, setup and operation. They even spent extra time to help set up custom programming for our part and optimizing features like oil heaters and others.” Their Pacific 400-ton OBL offers a 78” x 36” bed bolster, 18” stroke and 25-3/4” open height, two pressing and three rapid advance/return speed settings (rapid advance of 334 ipm – fast press of 160 ipm at 200 tons), an adjustable 6-point square type gibbing system for accurate slide alignment, and an Allen Bradley SLC 500/PanelView 600 Control/Operator Interface System. Many other standard, auxiliary and optional features were also included in the press system.

Loopless Feeding of Thick Coil Stock

But the press solution was only half the battle. Determining the best coil handling/feed system to support automated feeding and “hands free” loading of this thicker, “tougher to work with” material needed to be addressed. And line length limitations were also an issue.

“While feeding coil stock made economic and production sense, handling the material was a little intimidating,” added Brandon. “Our feed system length is measured at 16’ and a conventional line would have required more than 30’…not to mention the space and cost required for a looping pit. (It probably would have cost an additional $15,000-25,000 to install a pit and would have produced problems for future plant layout changes, according to Brandon.)

“So the SpaceMaster was a no-brainer for us…no loop pit, buying one complete unit versus several components, and suited to handle the precision feeding and hand’s free loading of the coil.” Their SpaceMaster Series 3 allows them to address:

Limited line length: “The savings of space—in my estimate, half of what a conventional line would require—allows us to keep our production equipment in the middle section of our building and compact to be near the automated welding and bending equipment. Plus raw material storage and room for pallets of finished blanks and production racks of completed assemblies. We really have the room and a “pitless” configuration that suits our operation.” Equipment built to process thick coil: “The coil reel and traveling

coil cars are built to handle thicker gauge coils. The straightener flattens material to the tolerances our automated welding operations need…and that's not an easy job when you consider factors like clock spring and coil set found in material this thick. And the servo feed gives us fast and precise press feeding of the long stamped part." Hands free loading: "This system takes much of the danger out of handling the coil stock. Its overall robust design, automated hold down arm, debender arm and coil guides allows us to confidently get the material fed into the system. We can easily changeover to a new coil in 10 minutes and that keeps us productive." Their SpaceMaster Series 3 compact coil line provides three functions of unwinding, straightening, and feeding in a single compact machine base. A 60' per minute production speed can be realized. It delivers up to .250" x 10" wide capacity (or .156" x 16" wide), can handle 11,000# coil weights, and has seven straightener rolls for optimized straightening. A closed loop Yaskawa digital servo is used to drive the precision feeder-straightener and an AC variable speed inverter duty drive provides continuous payoff of the uncoiler. A ServoMaster MMI provides the operator with easy set up, job storage, and machine control.

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