A panoramic view of the Minster presses at Pax Machine Works.

Pax Machine Works Grows on Foundation of Quality

Built on the simple philosophy of "care and pride in workmanship" Pax Machine Works, Inc. has become recognized as one of the most modern and complete stamping plants in the United States.

Taking root in a small out-building on the family farm near Celina, Ohio in 1948, Pax has seen three generations of growth, innovation and success. Recently the company took delivery of press serial number 30,000 from The Minster Machine Company.

Pax Machine Works near Celina, Ohio.

The E2-1000, equipped with Minster's Alternative Slide Motion (ASM) is the 21st Minster Press at Pax.

"We need presses that give us uptime and reliability. That's why we look at Minster," said the company's President Emeritus Francis Pax.

"Thirty-four years ago we bought a 100-ton press with a four-inch stroke from Minster. It was a P2-100," Francis continued. "The press was designed to run at 160 strokes per minute. Today, we have the capability of running that press at 230 strokes per minute, and I don't think we've changed a thing on it.

"I couldn't tell you how many parts we've run on that press," he added. "At one point we were running a million parts a day, and

we've never had a mechanical problem. The only thing we've ever done to that press was put on a new control and wire in some upgraded standards. That's what I mean when I say we need the reliability of Minster Machine."

President Mike Pax said that Pax provides a full complement of manufacturing capabilities with its biggest customers being Tier I automotive suppliers producing suspension and mounting components, safety restraint devices and OEM and after market oil filter parts.

"Our niche is in parts that require high accuracy and repeatability," Mike said. "Our capabilities range from small intricate parts, to large complex progressive die stampings."

This Minster E2H-350 press includes a completely integrated coil line featuring a Minster Feed, Straightener and Reel.

Pax designs, develops and maintains tooling for its customers in addition to offering a variety of secondary operations, including: nut and bolt staking; vibratory finishing; tapping; threading and assembly. Pax also has the capability for complete prototyping, packaging and warehousing.

The ability to respond quickly to the needs of their customers is important to Pax.

"The integration we get from Minster's press, control and feed line is very important to us," Mike Pax said. "The PMC control is very easy to use, and it integrates each job with the Minster feed, reel and straightener. This gives us the versatility we need to react and respond to our customers' needs."

"The precision we get with the Minster presses is also important," Mike said. "We don't have a press out there that we won't put a tool in because it's not accurate. This too makes us very flexible, and that's a tremendous asset."

Pax Machine Works has a rich tradition of technological innovation. In fact the company has spun off a subsidiary -- Pax Products -- which markets die lubrication systems and conveyors that have been developed and proven in Pax's own press room.

Pax will take a Minster press and uniquely integrate it into their own system of manufacturing.

"The main reason we work with Minster is that they don't sell a cookie cutter machine," said Plant Engineering Manager Bryan Pax. "Minster has always been willing to work with us to tie in the technologies that we want. The engineers at Minster are very knowledgeable and very willing to work with us."

A small sampling of parts produced at Pax.

With technical support from Minster, Pax is able to get the most out of its equipment.

"We have an 800-ton machine with a six-inch stroke running 120 strokes per minute," Bryan said. "Considering the tonnage, we have some of the fastest machines in the world, and we could only accomplish that with Minster presses."

Service and parts availability is another issue for Pax.

"Uptime is very important, and that means it's vital to get dependable service and parts." Francis said. "Minster has excellent availability for parts. They can supply any part for any press. With Minster, you call them up, give them a serial number, and usually the part is on the way."

Serial No. 30,000 Installed at Pax

The Minster Machine Company produced its first mechanical power press in 1926. Through the years Minster has produced thousands of presses. Each of these presses have been assigned serial numbers in sequential order.

Early this year, Minster reached a milestone when press Serial No. 30,000 -- an E2-1000 -- was delivered to Pax Machine Works. The E2-1000 features a 168-inch bed and is equipped with Minster's Alternative Slide Motion.

Because of its size, the press had some special installation requirements at Pax. Holes had to be cut in the ceiling of the manufacturing facility.

After the major press components were stacked, maintenance personnel at Pax completed the press setup with a unique system for installing the tie rods.

A temporary crane was erected with the supports built on top of the press itself and a scaffolding was set up on the roof of Pax's press facility.

Each of the four tie rods were lifted up though the holes in the ceiling, and then lowered into the press.

Supports for roof-top crane constructed on top of press.

Tie rod is hoisted through a hole cut in the roof.

Bryan Pax (right) inspects as tie rod is lowered into press by maintenance personnel at Pax.

The Pax Lubrication System begins with the press foundation. Once the pit is ready, a layer of anti-vibration material is applied. This helps reduce the vibration throughout the press room.

The maintenance personnel at Pax fabricate a stainless steel holding tank for the lubricant. Each tank is custom built to fit the Minster press being installed.

The maintenance personnel at Pax also construct an elaborate re-bar system that will be placed into the pit. The stainless steel tank is placed inside the rebar which will then support the concrete poured into the pit.

Pax Lubrication Reclamation System Brings "Efficiency" to New Levels

From the press foundation to finished parts, Pax Machine Works has revolutionized the use of in-die lubrication.

At Pax, improved lubricant systems have not only resulted in more efficient, cost-effective applications, but have also led to increased productivity, less maintenance, cleaner operating conditions, and even a product line of lubrication systems.

In 1980, Pax began manufacturing stock/die lubrication systems which were developed and designed by skilled tool and die craftsmen and tested in Pax's own stamping facility. This development led to the creation of Pax Products, Inc. which also manufactures in-die conveyors that were originally designed for use in the Pax stamping facility.

But when it comes to the overall efficiencies of lubricants in the manufacturing process, the Pax Lube System is just a small part of the Pax philosophy which stresses continuous in-house improvement.

Lubricant reclamation begins with the press foundation. The press is mounted in a stainless steel pit that is integrated into the foundation. The pit is designed such that when the press is placed into the pit, the top of the bolster is at a specific height above the floor. Doing this ensures consistent setup and easy access for the operator. Most of the Minster presses that Pax machine owns are mounted in this fashion, and is standard on all new installations.

"We use stainless steel to create a sanitary operation, which maximizes the life of the lubricant," said Plant Engineering Manager Bryan Pax. "The stainless steel will not rust, it's very stable and it inhibits bacteria growth which can create an unhealthy and unpleasant situation."

Once the lubricant is dispensed into the die, it drains through the center of the bed via cutouts in the bolster or special troughs on the outside of the bolster. Both the cutouts and the troughs are custom features that are added by the Minster Machine Company.

Pax also custom designs its own die doors, which are slanted toward the bed, directing any lubricant toward the bed troughs and eventually into the stainless steel tub below the press. The lubricant drains to the bottom of the tub where it is pumped directly back into the lube system reservoir, filtered and used again.

The lubricant is constantly agitated in the reservoir with air, which keeps the lubricant well mixed and reduces the chance of stagnation.

The lubricant that does not end up in the press pit ends up on the finished part. This can be another source for lubricant reclamation. Pax uses specially designed part drainers that actually tip the basket of parts over and drains the lubricant off of the parts. This lubricant is recovered, filtered and re-used in the process.

The moisture vapor that comes off the parts during the manufacturing process in the work area of the press is also recovered using a centrifugal filter. The moist air is drawn from the die space into the filter. The moisture is condensed and flows into the pit below the press. The filter exhausts dry, filtered air into the pressroom. This process helps to maintain a clean environment in the factory.

Depending on the press and the application, Bryan Pax said there can be anywhere from 15 to 50 gallons of lubricant being recirculated, of which very little is ultimately wasted.

"We never intentionally throw lube away," he said. "We periodically check the concentration in order to maintain the exact lubrication characteristics required to perform the specific job. We maintain the proper concentration by adding necessary mix to replenish the water and oil lost in the process."

Pax Products offers several models of lube systems. The newest model features electronic adjustment for both volume and timing.

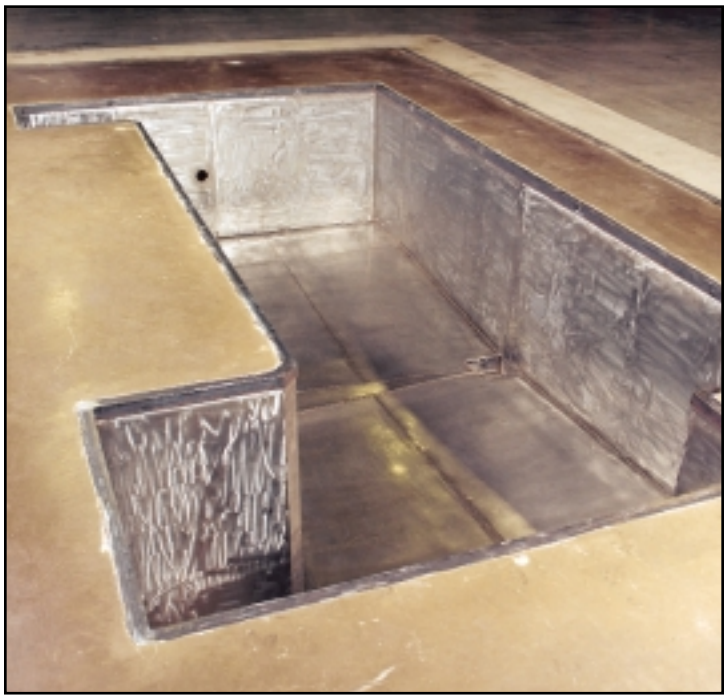
"This allows for maximum versatility," Bryan Pax said. "Each point on the new lube system can be customized to dispense at any time in whatever volume the user chooses. The PLC on the lube system receives a stroke position signal from the press. Depending on the program set-up, the lube system reads this signal and dispenses the lubricant in the necessary volume determined by the program."

For More Information About Pax Products:

Pax Products, Inc
P.O. Box 257
5097 Monroe Road
Celina, Ohio

Phone: (419) 586-6948; (800) 733-6930
Fax: (419) 586-6932
www.paxproducts.com

Pax maintenance personnel make final preparations to the press foundation before the concrete is poured.



The lube reclamation pit is now ready for the press.

The Pax-designed and manufactured Lube System is the heartbeat of the entire operation.