

Office furniture manufacturer discovers flexible processing with multiple system upgrades

Above (from left to right): Denis Bergeron, vice president of manufacturing, Eric Lamy, engineering manager, and Richard Provencher, plant technical support manager inspect a part formed on the EBe Express Bender.

For the past 30 years, Artopex Plus, Inc. has earned a reputation for building quality office furniture in Quebec, while building solid business relationships with its customers throughout North America. In 1980, Daniel Pelletier and his two brothers created Artopex with a clear vision – realizing steady growth while maintaining healthy, secure financial management processes.

Today, this privately-owned corporation, headquartered in Granby, Quebec, has become a premiere office equipment manufacturer offering a full line of wood veneer furniture, laminate case goods, systems furniture, seating, metal storage products, and made-to-measure furniture. The company has four plants – two in Granby, one in Laval, and one in Sherbrooke – totaling over 400,000 square feet of production capacity, a team of over 400 employees, three Canadian showrooms (Montreal, Toronto, and Calgary) and a North American distribution network. Among its many awards and recognitions, in 2009 Artopex was named Business of the Year by the Quebec Federation of Chambers of Commerce, and in February 2011, the company was named one of Canada's 50 Best Managed Companies for the fourth year in a row.

With its four plants, Artopex has a large production capacity and technological expertise that allows for efficient management of all major projects within the required deadlines. Artopex management remains competitive by purchasing state-of-the-art manufacturing equipment that ensures high-quality products and short delivery times.

According to Denis Bergeron, Vice-President of Manufacturing, the cyclical office furniture market has had it challenge the past few years.

"Currently, the economy is better in Canada than in the U.S.," explains Bergeron. "With the weakening U.S.

dollar, the larger U.S. office furniture manufacturers are now looking to the north to sell their furniture, which has dramatically increased competition. To protect ourselves, we have invested in flexible equipment over the past five years for our wood and laminate production as well as our sheet metal fabrication."

Sheet metal automation

To automate its sheet metal fabrication capability, Artopex purchased a C5 Compact Express in 2006 from Prima Power (formerly Prima Finn-Power). The C5 Express adds unmanned operation to the C5 turret punch press through highly compact load/unload automation. The unit's loading/unloading solution uses the space above and below the machine, requiring only slightly more space than a turret punch press. It is fast – with simultaneous loading and unloading during processing – accurate, and it does not limit easy manual operation.

"The C5 Compact Express helped us enter the contract or custom market to work with designers and architects," says Bergeron. "It was purchased for the flexibility to allow us to enter this new market...and to save money on production. We used to have a lot of machines, working with hard tools. We didn't want to replace these tools, so we decided to replace those machines with new equipment. The purchase of the C5 was more for flexibility than the need for increased capacity."

"Prior to purchasing the C5 Compact Express, we were a batch manufacturer using two old turret punch presses," adds Richard Provencher, plant technical support manager. "We wanted to become a Just in Time (JIT) manufacturer with no inventory. We wanted to begin nesting linked to the existent MRP system. The C5 Compact Express was our first step into flexible automation."

Next stage – punch/shear/bend cell

To increase its flexibility and decrease its material handling, Artopex purchased a Prima Power punch/shear/bend cell in 2009. "Our goal was to reduce our fabrication cycle by being able to punch and shear parts, then immediately bend the part with the system and eliminate additional material handling," explains Provencher.

The PSBB cell contains the following equipment:

- Shear Genius punch/shear combination;
- Automated storage tower;
- Two position loading system;
- Sorting System;
- Stacking robot with direct connection to the EBe automated bender; and,
- EBe Express bender.

Shear flexibility

With the Shear Genius integrated punch/right angle shear combination concept, the objective is to provide one machine capable of transforming a full-sized sheet into punched parts. These parts can be moved to secondary operations using the sorting and stacking automation and then on to bending operations without being touched by human hands. As loading, punching, and shearing of parts become automated, the result is finished parts with a dramatic reduction in scrap and manual labor while increasing profitability.

The Shear Genius eliminates wasteful skeletons and costly secondary operations such as deburring. Nibbled edges on the part exteriors are eliminated through the use of the integrated right angle shear. In fact, the same clamps that hold the sheet for punching also hold it for shearing. In essence, the system allows

the automated process to begin with a full-sized sheet of material and end with a punched part after automated loading, punching, forming, shearing, stacking and unloading -- all in one operation. This allows true single-piece flow to be synchronized with a customer's takt time.

"We like the fact that there are no longer skeletons or tab marks," explains Eric Lamy, engineering manager. "The parts come out complete."

EBe Express Bender

The EBe servo electric Express Bender is a bending solution that is designed specifically for each fabricator's production requirements to achieve maximum productivity, quality, and repeatability. The bending operation is fully automated, from the loading of flat punched parts to unloading of the finished product.

The EBe bender has a maximum bending length of 100.39 in. and a maximum opening height of 8 in. The new construction features actuations of the bending blade movements (vertical and horizontal) by NC servo axes instead of hydraulic cylinders. The upper tool movements are also made by another NC servo axis.

Finn-Power EBe provides the high bending quality required in demanding applications. The quality is achieved through precise control of bending axes, fast and smooth bending motion, open programmability, and rigid construction that is immune to variation in thermal conditions.

Justification

The stacking robot transfers the parts automatically from the Shear Genius to the bender.

The Shear Genius allows the automated process to begin with a full-sized sheet of material and end with a punched part after automated loading, punching, forming, shearing, stacking and unloading - all in one operation.

The stacking robot, with direct connection to the EBe automated bender, moves the part from the Shear Genius to the bender.

"We were looking to purchase either a press brake or an automated system," says Lamy. We evaluated this purchase from a cost standpoint, from how we could manufacture our products, and what it would bring us in terms of new ways to design our products. When we looked at the EBe bender, we liked the fact that everything was linked together, and you could start with a full-sized sheet on one end and it came out a completed part. In the future, this cell will drive the way our products are manufactured."

"When we visited the Prima Power customers that had the bender, we realized that the bender alone was not the complete solution to what we needed," explains Bergeron. "It was better for us to link the bender to the Shear Genius and sell the C5 Compact Express. The reason for this purchase was both capability and new product development possibilities."

Just in Time

Artopex is committed to flexible manufacturing. "We want to produce enough parts on a daily basis without having inventory," continues Bergeron. "This means JIT production. This is a consequence of going after specialized markets. You can't stock parts for products that you will sell just a few times a year. It is too expensive. Our factory is also a subcontractor for several other companies we have in the group. And we do approximately 50 bending jobs a day – all small lots."

Higher production, lower labor costs

Artopex runs the Shear Genius and EBe bender with just one operator. "We like the fact that there are so few setups," says Lamy. "We can also bend many parts on the EBe that we could not do on the press brake. For example, last year we did a special product for the

University of Montreal that included table legs bent on the EBe with a progressive radius which consisted of 60 hits with the EBe. We could not have made this product without the EBe. We won this job with our Prima Power system.

"The EBe has opened up many possibilities into new product design, while reducing the time to produce our product."

Prima Power laser

In 2010, Artopex purchased the Prima Power Platino 2D Laser System. The Platino is equipped with lasers developed and produced at Prima Industrie in laser powers ranging from 3,000 to 5,000 W. The laser cuts a broad range of materials and thicknesses with speed and precision without the need for manual adjustments.

The system's laser cutting head gives users a choice of a 10-inch focal length in addition to the standard 5-inch and 7.5-inch lenses. The 10-inch lens enhances the application flexibility by increasing the depth of focus and enlarging the spot diameter for high and uniform cut quality of thick stainless (5/8 in.), thick aluminum (1/2 in.) and thick mild steel (1 in.).

"We purchased the Platino to perform a specific job," explains Bergeron. "We are bringing all the laser parts that we subcontract back in-house. So we are in the process of filling the machine with parts. We can also use the laser for design and concept prototypes. In addition, we have two laminate lines that use a lot of tube. We also want to produce these parts in-house. We were attracted to the rotary axis option for tube cutting on the laser."

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