

Taming the Recession

A Nova Scotia manufacturer sets growth sights high with flexible fabrication equipment

The dream of every manufacturer is to bring products to market that have wide appeal and demand, no matter what the economic condition. Obviously, this goal is especially important in a recession. That dream is a reality for Nu-Air Ventilation System Inc., Windsor, NS, a small but rapidly growing manufacturer of high-efficiency heating, air conditioning, and ventilation products.

“For the size of our company, we are very strong in R&D and developing new products,” explains Nu-Air’s founder and president Earl Caldwell. “Our success is due to a new product that we began developing nearly eight years ago. This integrated product heats, cools, and ventilates. It is used in single-family homes, condos or apartment buildings, and allows each tenant to control their humidity, heat, and cooling levels.”

Nu-Air’s growth has been accelerating with the introduction of its innovative Advanced Integrated Mechanical Systems (AIMS). AIMS products are essential to the success of engineers, builders and HVAC contractors who are responsible for the success of environmentally friendly buildings (e.g., LEED certified). Nu-Air’s first product in this new and rapidly expanding segment of the HVAC market is the Enerboss, which received an innovation award from the National Research Council and the Canadian Manufacturers Association.

Issue: New fabrication equipment to keep up with production.
Solution: A flexible manufacturing cell, a punch/shear combo unit.



Earl Caldwell with one of his AIMS (Advanced Integrated Mechanical Systems) units fabricated on the new Finn-Power equipment, seen below in an overview image.



Earl Caldwell entered the HVAC industry in 1984 in a single car garage, and founded Nu-Air in 1992. The company evolved through a series of larger facilities, and today's location has 22,000 sq ft and 35 employees. Caldwell's two sons, Brad, plant manager and Greg, vice president operations, have joined the Nu-Air's management team. An expansion planned for this summer will double the size of the company to 45,000 sq ft and 50 employees. "Our sales will double this year," says Caldwell. "And we expect them to triple next year." Nu-Air markets its products in Canada and the US, and to a lesser degree in Europe and Asia.

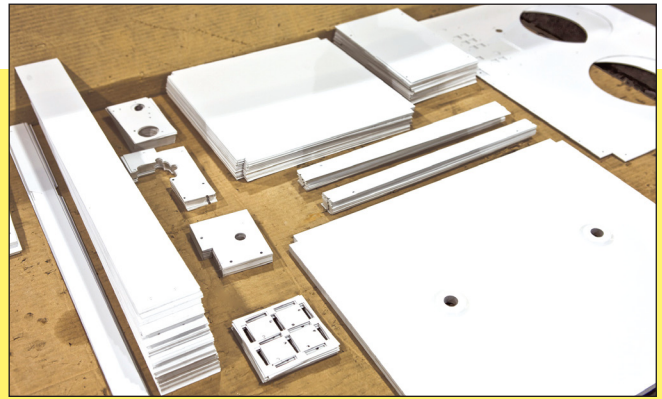
SHEET METAL FABRICATION

In the early days of the company, sheet metal fabrication was all done by hand. Nu-Air purchased a hydraulic turret punch press in 1996. However, with business booming and sales outpacing production, the company began a search for more productive and flexible fabrication equipment in late 2007. After attending FABTECH 2007 and extensive research, Nu-Air chose the Finn-Power Shear Genius punch/shear combination flexible manufacturing cell. The Shear Genius cell and a Finn-Power servo-electric E press brake were installed in September 2008.

The objective of the Shear Genius concept is to provide one machine capable of transforming a full-sized sheet into finished parts. These parts can be moved to final production stages for immediate integration directly into final product assembly. The Shear Genius accomplishes this in less floor space—approximately 30 ft (9 m) of space to fabricate raw material into finished parts on one machine. As loading, punching, and shearing of parts become automated, the result is finished parts with a dramatic reduction in scrap and manual labour while increasing profitability. "We wanted to take the accountability for quality from our machine operators and put it solely in the hands of engineering," explains Brad Caldwell, production manager. "With the Shear Genius, we no longer have to pre-shear blanks. We have eliminated that step of production." The system functions with sophisticated simplicity, able to perform the most demanding jobs with minimal setup times and "lights out" operation. The equipment increases material productivity through efficient and versatile nesting programs. The level of automation can be customized through Finn-Power's flexible modular solutions for raw material storage, loading, unloading, sorting and stacking. These features can be added later as budgets allow and production demands increase.

Ease of operation does not compromise the cell's per minute part production, flexibility, or ability to fabricate complex parts. On average, Shear Genius reduces total manufacturing time by 60 per cent and saves one blank sheet out of every 10. "Our scrap waste is down 20 per cent from increased sheet utilization," says Earl Caldwell.

The fabricating cell eliminates wasteful skeletons and costly secondary operations such as deburring. Nibble edges on the part exteriors were eliminated through the use of the



Above: Components of Nu-Air's AIMS product produced on the Finn-Power Shear Genius cell, seen assembled at left.



integrated right angle shear. In fact, the same clamps that hold the sheet for punching also hold it for shearing. In essence, the Shear Genius allows the automated process to begin with a full-sized sheet of material and end with a finished part after automated loading, punching, forming, shearing, and unloading, all in one operation.

INCREASED PRODUCTIVITY

The Shear Genius has dramatically increased productivity at Nu-Air. "There is a part that took 42 minutes to make on our old turret punch press that now takes just 15 minutes," says Caldwell. The new equipment has "cut processing time by two thirds. When you are making 100, 200 or 300 of these parts, the savings are huge."

Labour savings are also dramatic. "We've been able to eliminate a lot of overtime shifts," says Caldwell. "To keep up with the increased production demands, we were going to add another shift, but now we don't have to." He adds that the new equipment "saved us from having to add another 25 people to our production team at this time. Now we can add the employees after the expansion."

OTHER BENEFITS OF THE SHEAR GENIUS INCLUDE:

- **Toolholders.** Finn-Power incorporates an individual toolholder concept that allows customers to design their own turret layouts. Unlike other designs, specific tool stations are not machined into the turret. Finn-Power offers the only flexible selection of toolholders in the industry. Any tooling style from Mate Precision Tooling or Wilson Tool International can be installed in a Finn-Power turret. Up to 10 auto-index, forming, or Multi-Tool stations may be installed in a Finn-Power turret.
- **Auto-Index.** An auto-index system rotates the punch and die in the toolholders. Rotation in .001° programmable increments gives the machine the ability to rotate beyond 360°, allowing the system to select automatically the shortest path to rotate to a programmed angle input into the NC part program with simplicity, speed, and reliability. Nu-Air has three full-tonnage auto index stations.
- **Multi-Tool.** The Multi-Tool stations increase the number of tools available in a turret, reducing setup and



Earl Caldwell says the Shear Genius punch/shear manufacturing cell has cut processing time by two thirds, "huge savings."

increasing productivity. The Multi-Tool system allows multiple tools to be put in one station and is offered in 6, 8, 10 or 24 different punch/die combinations in only one station—a turret within a turret. Using a 40 station alpha/numeric part identification, programs are fast and easily done. Nu-Air has three Multi-Tool stations.

- **Upward Forming System.** The upward forming option provides more accurate forming and greater forming heights up to 16 mm (.63 in.) and 127 mm (5 in.) in diameter. Another advantage is that all dies are at the same height and there are more high-forming dies in the turret, reducing risk of material damage and increasing machine uptime.

E SERVO ELECTRIC PRESS BRAKE

The final piece of Finn-Power equipment that Nu-Air installed was the E Series servo-electric press brake. This press brake is a fast, accurate bending solution. By applying mechanics and electronics, a unique, patented, mechatronic drive was developed. This drive is based on the pulley principle resulting in an even distribution of forces in the top beam, high accuracy, increased productivity, decreased energy consumption and few maintenance requirements. The frame concept makes it possible to utilize the back gauge system across the entire working length.

"Before Finn-Power, we had an old hydraulic press brake with just a manual back gauge," explains Caldwell. "The E press brake has cut at least 80 per cent off our bending time."

"The E press brake has improved our production," adds Brad Caldwell. "It is quick... four times as fast as our old press brake...accurate, and more flexible. The accuracy has really improved the quality of our finished products."

And today one person is doing the work of three with the older equipment."

According to Nu-Air, the Finn-Power equipment has opened up a world of possibilities in design and assembly. "The equipment gave us a great deal of flexibility by allowing us to quickly change production as needed," says Earl Caldwell. "There are no surprises with the Finn-Power equipment. The quality of our product has really improved, and it has allowed us to grow. We now design our parts to tight tolerances. Our production is three times what we had before. And if we were running lights out 24/7, we could go 10 or 15 times higher in production."

Nu-Air was also impressed with the high level of service and flexibility for training from Finn-Power. "Finn-Power sent the trainers to our facility in Nova Scotia," explains Caldwell. "Our employees learned on our machines...making our parts. This was a great help in facilitating the process and helping us produce parts in the quickest time."

THE RIGHT PRODUCT AT THE RIGHT TIME

"We are finding that energy-efficient programs for buildings are very strong this year," says Caldwell. "When the market tightens, you need an edge. Today, one critical feature is to reduce the operating cost of the house. And it is those energy-efficient products that are driving our sales...not the traditional ventilation systems."



The bodies of the AIMs units ready to be assembled into finished products.

"In previous years, people would think that green technology was either a luxury or a general hindrance to the economy," concludes Greg Caldwell. "But now people are coming around to the realization that green technology will actually be a salvation for the economy. People are looking at the cost savings of electrical efficiency, and the new jobs that will be created within the emerging green economy. And our investment in the Finn-Power equipment has allowed us to meet the increased demand for our product today and into the future." **CM**

Finn-Power International www.finnpower.com